

Unmatched Versatility for System Simulation

ANSYS Simplorer® is a powerful platform for modeling, simulating, and analyzing virtual system prototypes. Simplorer enables product development teams to verify and optimize performance of their software-controlled, multi-domain systems designs.



With flexible modeling capability and tight integrations with ANSYS solutions for 2-D and 3-D multiphysics simulation and embedded software design, Simplorer provides broad support for assembling system-level physical models and helping product development

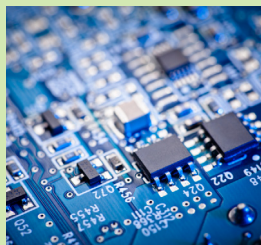
organizations connect conceptual design, detailed analysis, and system verification.

Read more about Simplorer capabilities for:

- ["Multi-Domain System Modeling"](#)
- ["Multi-Domain System Simulation"](#)
- ["Analysis and Reporting"](#)

Pedigree in Power Electronics

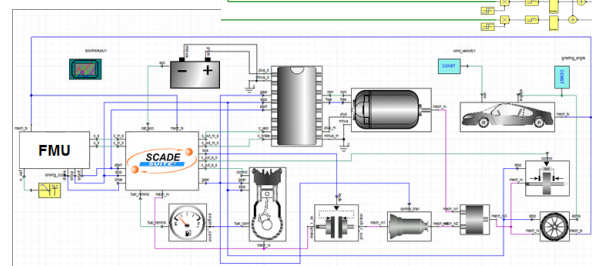
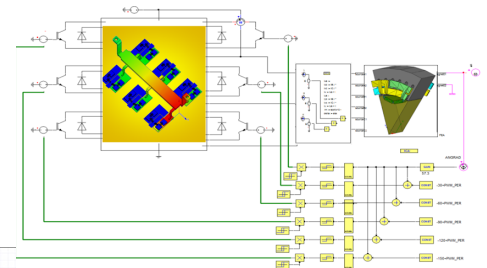
Simplorer has a long history of success in simulating and analyzing complex power electronic systems. Simplorer libraries include a broad range of state-averaged and switch-level components that support modeling at different levels of fidelity required through stages of development. Simplorer's proven solver technology is designed to handle the highly nonlinear nature of power circuits efficiently and accurately, including switching elements, analog and digital control, and a mixture of system time constants and multi-domain effects. Powerful waveform analysis tools give engineers the ability to analyze responses, extract measurements, and perform detailed studies of power system behavior.



Multi-Domain System Modeling

Powerful Graphical Modeling

- Create hierarchical schematics of complex power electronic circuits and multi-domain systems
- Model with standard languages and exchange formats, including:
 - VHDL-AMS (IEEE 1076.1)
 - SML (Simplorer Modeling Language)
 - FMI (Functional Mock-up Interface)
 - C/C++
 - SPICE
 - Modelica (via FMI support)
- Use wizard-driven editors to edit VHDL-AMS, SML, C/C++ and SPICE models as text
- Combine conserved (acausal), signal-flow (causal), and discrete event system behaviors
- Use on-the-fly dynamic checking to assure consistency of connection types and physical domains



Access to Extensive Model Libraries

- Model complete electrical/electronic systems with libraries of analog and power electronics components, digital and logic blocks, sensors, and transforms
- Select from broad collections of characterized manufacturers components: Power Semiconductors, Power Management ICs, Magnetic Devices, and Ultracapacitors

- Include multi-domain effects with mechanical, hydraulic, and thermal components
- Use application-specific libraries for switch-mode power supplies, hybrid electric vehicle powertrain systems and aircraft electrical power systems
- Manage user and corporate model libraries with built-in graphical tools

Reduced-Order Model Generation from ANSYS 2-D and 3-D

- Reduced-Order Modeling (ROM) interfaces to generate accurate, compact models from detailed 2-D and 3-D descriptions
- Link to a variety of ANSYS tools to create high performing models for electromagnetic machines & actuators, circuit parasitics and cables, excitations for EMI/EMC, electronics thermal networks, signal integrity, general flow and heat transfer characteristics and rigid-body dynamics
- Multiple ROM generation techniques (including state-space, electrical circuit equivalent, SVD, modal response) support a range of analysis requirements

Native Import with SCADE Suite® for Embedded Control Software Design

- Verify, optimize, and calibrate performance of safety critical software with the multi-domain physical system
- Use SCADE Suite to interactively monitor and debug embedded software execution

Power Electronic Device & Module Characterization

- Use intuitive graphical tools to create Power MOSFET, IGBT and Diode components from datasheet information
- Characterize DC/DC converter models or choose from a library of behavioral models for manufacturers' components

Model Import from External Tools

- Compatible with Functional Mock-up Interface (FMI) version 1.0 for Model Exchange (Import) to connect with all FMI-compliant tools
- Create or reuse C/C++ models with the Simplorer C Interface
- Import MathWorks® Simulink® models using Simulink Coder™

How is Simplorer used?

Simplorer is a key part of model-based design flows in organizations around the globe to model and simulate multi-domain systems in the automotive, aerospace, electronics, energy, and industrial machinery segments.



With a unique ability to integrate power electronics, multi-domain dynamics, and embedded software, Simplorer is used for electric drives and electromechanical system design, power generation, conversion, storage and distribution systems, EMI/EMC studies, and general multi-domain system optimization and verification.

Multi-Domain System Simulation

Robust Solvers

- Perform fast and accurate simulation of continuous-time, discrete-time, digital and analog/mixed-signal behaviors
- Achieve high numerical efficiency with sophisticated solver synchronization and adaptive time-step control
- Connect to High Performance Compute resources to increase throughput of simulation runs

Basic Simulation Experiments

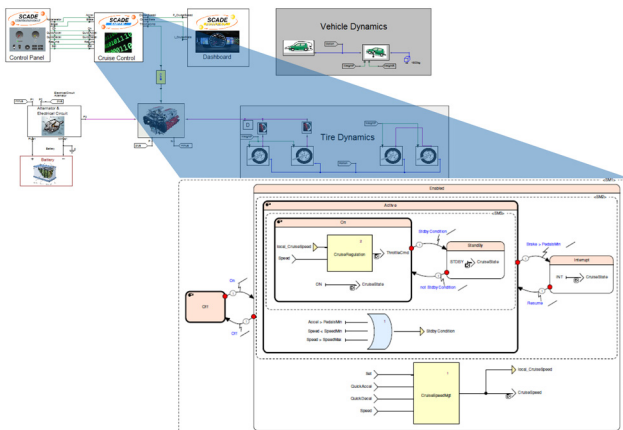
- Calculate Steady-State, Time-Domain and Frequency-Domain responses of the system
- Create multiple analysis configurations with options for fine-grain control of solver settings
- Replay simulations from existing results

Advanced Simulation Studies

- Sweep parameter values within defined ranges to identify effects on system response
- Optimize system performance based on cost functions of specified design variables
- Determine the sensitivity of performance metrics to variations in model parameters
- Analyze the effects of statistical variations (e.g., manufacturing tolerances, environmental uncertainty, etc.) on system performance
- Change variable values interactively to tune performance of the model
- Connect with ANSYS Workbench to construct and manage simulation project workflows with 2/3-D solvers
- Use ANSYS DesignXplorer to construct sophisticated design exploration studies

Tool Integration and Customization

- Connect with SCADA Suite® and SCADA Display® for interactive white-box and black-box simulation with embedded control designs

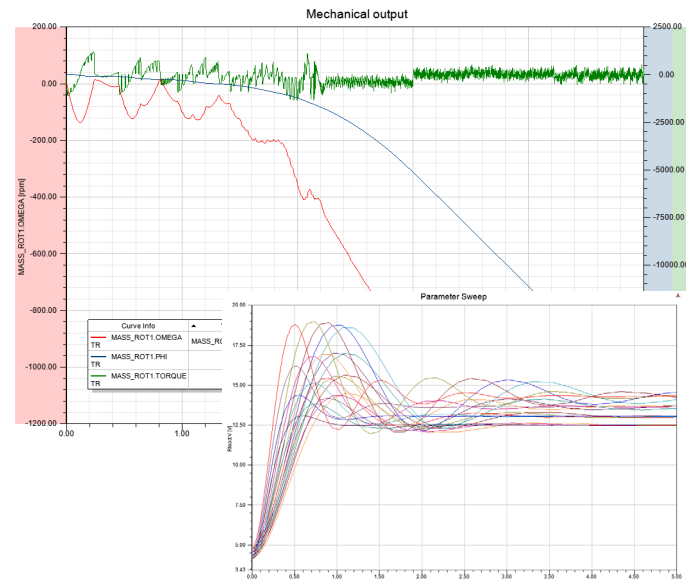


- Dynamically couple with ANSYS 2-D and 3-D electromagnetic (low and high frequency), CFD and mechanical solvers
- Build custom graphical panels with SCADA LifeCycle® Rapid Prototyper to control and monitor Simplorer simulations
- Co-simulate with MathWorks Simulink and PTC® Mathcad
- Write or record Python or Visual Basic scripts to automate simulation workflows
- Build custom toolkits with Simplorer comprehensive Python API

Analysis and Reporting

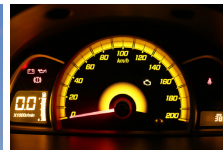
Creating Graphical and Tabular Reports

- Select from a broad range of graphical and tabular reports for displaying and analyzing simulation results
- Plot time-domain and frequency-domain waveforms and parametric relationships in 2-D and 3-D
- Display frequency-domain responses as Bode and Nyquist plots
- Generate data tables and numeric displays
- Display graphical reports directly on system diagrams and update them as the simulation progresses
- Apply a range of transformations, markers, and measurements to waveform traces



Export to Other Environments

- Quickly export diagrams, plots, and tables to Microsoft® Excel® or a variety of image formats
- Automatically generate Design Summary reports in HTML



System Requirements

OS Platforms	Microsoft Windows 7 Professional and Enterprise Editions (64-bit) Microsoft Windows 8 / 8.1 Professional and Enterprise Editions (64-bit) Microsoft Windows HPC Server 2008 (64-bit) Microsoft Windows Server 2012 Standard (64-bit)
Supported Compilers	Microsoft Visual Studio 2010 Microsoft Visual Studio C++ 2010 Express Microsoft Visual Studio 2008 Microsoft Visual Studio C++ 2008 Express Microsoft Visual Studio 2005 Microsoft Visual Studio C++ 2005 Express
CPU	2 GHz or faster
RAM	2 GB minimum (4GB or higher recommended)
Disk Space	10 GB recommended
Graphics	DirectX 9 graphics device with WDDM 1.0 or higher driver

Simplorer Product Solutions

Simplorer Basic:

- Integrated modeling & simulation environment
- SML, C/C++ and SPICE support
- Model libraries of basic and multi-domain components
- Model libraries of analog and power electronics components
- Model libraries of characterized manufacturers components
- Reduced-Order Model (ROM) creation from ANSYS 3-D
- Co-simulation with ANSYS 2-D and 3-D solvers
- FMI for Model Exchange – Import
- Device characterization tools for IGBTs, MOSFETs, Diodes
- Time-domain, frequency-domain, and steady-state analyses
- Optimization, sensitivity, and statistical analyses (Optimetrics)
- Waveform analysis and reporting
- Application scripting and automation

Simplorer Multi-Language (ML):

Simplorer Basic plus VHDL-AMS language support:

- VHDL-AMS model libraries of basic and digital components
- Application-specific model libraries for Hybrid-Electric Vehicles and Aircraft Electrical Systems
- Digital and mixed-signal simulation
- VHDL-AMS model encryption

Simplorer Advanced:

Simplorer ML plus 3rd party interfaces:

- MathWorks® Simulink® co-simulation
- PTC Mathcad® co-simulation

SMPS Power Package Add-on

- DC/DC converter modeling tool
- Switch-Mode Power Supply Model Library

Simplorer Control Option

Add-on to Simplorer Basic

- MathWorks® Simulink® co-simulation

Contact Information

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Discover the latest news on our products and technology at

<http://www.esterel-technologies.com>

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