

Simulation of Power Electronics at System Level

■ PLECS

PLECS® is a circuit simulator that makes it simple to model and simulate complex electrical systems along with their controls. Supporting a top-down approach, it lets you start with ideal component models in order to focus on system behavior. Low-level device details can be added later to account for parasitic effects.

PLECS

With the intuitive, easy-to-use schematic editor, new models are set up quickly. Thanks to a proprietary handling of switching events, simulations of power electronic circuits are fast and robust. Whether you are simulating a simple power electronic converter or a complex electrical drive, PLECS is a powerful tool that will help you quickly obtain the results that you need.

At a glance:

Efficient circuit simulation

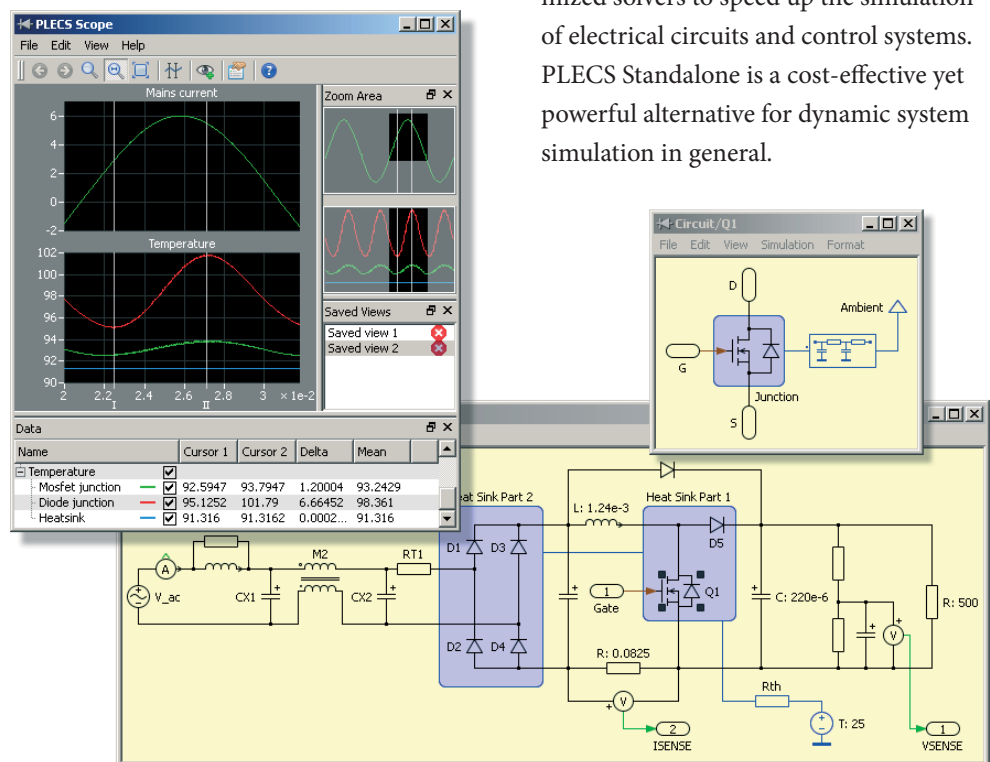
Power semiconductors modeled as ideal switches speed up the simulation of large converter systems.

Control system modeling

PLECS offers a wide collection of control and signal processing blocks. The C-Script block accepts custom C code.

Appealing visualization

PLECS displays schematics and simulation results clearly. They are easily exported as high-quality graphics.



■ Blockset or Standalone

PLECS is available in two different editions. Choose between the blockset for MATLAB®/Simulink® and the independent standalone solution.

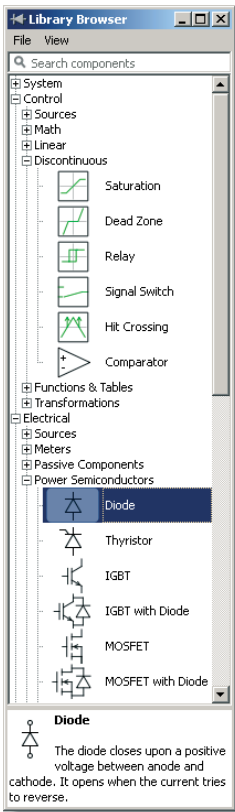
PLECS Blockset for Simulink®

The PLECS Blockset is seamlessly integrated with Simulink. This allows to access the functionality of Simulink and extend the scope of system-oriented simulations. In a Simulink worksheet, a PLECS circuit appears as a subsystem block with control inputs and measurement outputs.

Rather than relying on co-simulation, the Simulink engine itself solves the circuit equations alongside the control system. The PLECS Blockset offers full compatibility with simulation settings, supporting both variable and fixed time-step solvers.

PLECS Standalone

The PLECS Standalone edition is a simulation platform on its own. It provides optimized solvers to speed up the simulation of electrical circuits and control systems. PLECS Standalone is a cost-effective yet powerful alternative for dynamic system simulation in general.



Fast and efficient models

PLECS uses ideal component models where possible to simplify switching transitions and to allow for larger simulation time steps. At the circuit and system levels, this results in a fast and efficient simulation because only those details that affect the circuit response are modeled.

Comprehensive library

The PLECS library comprises all components commonly used for controlled electrical systems. Continuous and discrete signal processing blocks as well as algebraic functions and discontinuities let you create virtually any analog or digital control.

In addition to a range of standard electrical components, the library comes with specialized elements for power electronics. Ideal and non-ideal semiconductor switches are included as well as customizable converter, machine and transformer models.

C-Scripts

The C-Script block allows custom functionality to be implemented directly in the C programming language. The code is compiled internally in PLECS, there is no need to install additional development tools.

Thermal modeling

PLECS supports the modeling of thermal structures and the calculation of switching and conduction losses. Simulation speed is not adversely affected during loss calculations since ideal switching is maintained. Device losses are calculated after each switching occurrence by referring to lookup tables that are created using an integrated visual editor.

Analysis tools

PLECS offers a steady-state analysis tool that rapidly iterates to the periodic operating point of a switching power system. Particularly useful for electro-thermal systems, this tool calculates final device temperatures without wasting hours of simulation time.

The AC sweep tool and the impulse response analysis allow control systems engineers to obtain important small signal transfer functions such as the loop gain of a system.

PLECS Scope

With advanced zooming and panning features, the new PLECS scope is a convenient tool for viewing your results. The scope has cursors for reading data values and measuring time differences, and can perform simple analyses such as obtaining the RMS value of a signal. Printing and saving your results is easy with the customizable export feature.

Code generation

The PLECS Real-Time Coder can generate stand-alone C code from a circuit schematic. This allows you to simulate a system in PLECS first, then generate C code e.g. for real-time simulations. The code generation integrates seamlessly with Real-Time Workshop®, so that at the push of a button the code is inserted at the appropriate places for the various targets.

Try it

Find out why industry-leading companies have adopted PLECS. To obtain your free trial license for the latest version of PLECS, visit www.plexim.com.

Contact us:

US and Canada:

Plexim, Inc.
420 Broadway
Cambridge, MA 02138
United States
+1 (617) 209 2121

Other countries:

Plexim GmbH
Technoparkstrasse 1
8005 Zurich
Switzerland
+41 44 445 24 10