

REAL-TIME WORKSHOP

Advanced Modeling, Simulation and Code Generation of Power Electronic Systems
Plexim GmbH, 17. / 18. September 2024

08:30	Registration
09:00	Introduction to PLECS <ul style="list-style-type: none">▶ General use of PLECS▶ Instantaneous switching▶ Variable and fixed-step operation Exercise: Modeling a switched-mode power supply
10:00	Break
10:30	Solver Settings <ul style="list-style-type: none">▶ Definition of stiff and non-stiff systems▶ Explicit and non-explicit solvers▶ Stability domains▶ Accuracy considerations, step size control▶ Proper handling of discontinuities, zero-crossing detection
12:00	Lunch
13:00	Introduction to Thermal Modeling & Simulation <ul style="list-style-type: none">▶ Switching & conduction loss descriptions▶ Combined electrical-thermal simulation▶ Approach for determining the loss values from the data sheet Exercise: Thermal modeling of a buck converter
14:30	Break
15:00	Overview of PLECS Tools <ul style="list-style-type: none">▶ Custom components▶ Steady state analysis▶ Small signal analysis▶ State machine▶ Simulation scripting (Octave and Python)▶ Parallel simulations
16:00	Q&A with Plexim Engineers <ul style="list-style-type: none">▶ Open discussions▶ Bring your questions/models
16:30	End of workshop day 1

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08:30	Introduction to PLECS Coder for Embedded Targets <ul style="list-style-type: none">▶ Embedded code generation motivation▶ Code generation workflow▶ Control task execution and timing▶ Multitasking
09:30	Break
10:00	Tutorial 1: Workflow <ul style="list-style-type: none">▶ Blinking an LED▶ Generate PWM output signals▶ Use the external mode and parameter inlining
12:00	Lunch
13:00	Tutorial 2: Timing Configuration and Real-Time Setup <ul style="list-style-type: none">▶ Control task execution and timing▶ Code generation workflow▶ Real-Time Example
15:00	Overview and Introduction to the PLECS RT Box <ul style="list-style-type: none">▶ Hardware-in-the-Loop (HIL)▶ Rapid control prototyping (RCP)▶ Demonstration of a real-time simulation
16:00	End of workshop day 2
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