

# RT Box Workshop

## Real-Time Simulation using the PLECS RT Box

### Content

In the workshop, you will learn modeling techniques for real-time simulations using PLECS with the PLECS RT Box. You will work hands-on with hardware-in-the-loop (HIL) and rapid control prototyping (RCP) application examples. You will see that step size can be reduced to microseconds, even for large-scale models. In addition to the technical aspects, the workshop offers an opportunity to connect with the developers of PLECS. The required software and PLECS RT Box hardware will be provided for the workshop.

### Timetable

08:30	Registration and Installation of Necessary Features
09:00	<ul style="list-style-type: none"><li>● Overview and Introduction to RT Box Workflow using PLECS</li><li>● PLECS overview</li><li>● Ideal switch concept</li><li>● From PLECS offline models to RCP and HIL</li><li>● Code Generation</li></ul>
09:30	<ul style="list-style-type: none"><li>● RT Box Introductory Exercise</li><li>● PLECS RT Box features</li></ul> <p><b>Exercise: Introductory exercise using I/O ports</b></p>
10:15	Break
10:30	<ul style="list-style-type: none"><li>● Real-time Simulation of a Voltage Source Inverter (VSI)</li><li>● PLECS model creation using the target blocks library</li><li>● Deployment on the RT Box</li></ul> <p><b>Exercise: Voltage Source Inverter (VSI)</b></p>
12:00	Lunch

13:00	<ul style="list-style-type: none"> <li>● Timing Overview and Step Size Selection</li> <li>● Example of a Buck Converter using continuous, switched implementation</li> <li>● Step size and calculation time</li> <li>● Motivation for sub-cycle averaging using PWM capture module</li> <li>● Example of a Buck Converter with sub-cycle averaged configuration</li> </ul>
13:45	<ul style="list-style-type: none"> <li>● Model Optimization</li> <li>● Sub-cycle averaging and power modules</li> <li>● Model separation</li> </ul> <p><b>Exercise: Model splitting using a DTC example</b></p>
15:00	Break
15:15	<ul style="list-style-type: none"> <li>● Virtual Prototyping</li> <li>● Concept of virtual prototyping</li> <li>● Extension of VSI with controls</li> <li>● Multiple RT Box interconnection settings.</li> </ul> <p><b>Exercise: Virtual prototyping &amp; MMC Demo</b></p>
16:00	Q&A - End of Workshop

## Participation

The course is free for participants covers workshop participation and documentation.

## Language

The workshop will be held in English. The documentation will be in English.

## Speaker

Mr. LUO MIN, Field Application Engineer of Plexim GmbH

## Date and Venue

8<sup>th</sup>.November Wednesday

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## Contact

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