

Model-based Development of Embedded Software in Compliance with ISO 26262

Challenges and Effective Solutions - 2 days

Date	Location	Language
Jan 19–20, 2021	Online Registration	English
Mar 1–2, 2021	Online Registration	German
Mar 30–31, 2021	Online Registration	English/Chinese
Apr 20–21, 2021	Online Registration	English
Jun 1–2, 2021	Online Registration via dSPACE	English
Jul 1–2, 2021	Online Registration	English
Sep 14–15, 2021	Online Registration	German
Oct 26–27, 2021	Online Registration	English
Nov 15–16, 2021	Online Registration via dSPACE	English

More dates and in-house training classes available worldwide on request: sales@model-engineers.com.

[Our Trainers](#)

[Location Details](#)

[Online Registration](#)

This training class describes how to develop and safeguard safetycritical embedded software in serial projects with Simulink in compliance with ISO 26262 (part 6). Beginning with a general overview of the ISO standard, we proceed by focusing on the ISO 26262 requirements that are specifically relevant to modelbased development. We address the impact the standard has had on model-based development with Simulink, as well as the requirements for model and software architecture in safetycritical software. We also look at modeling guidelines and testing before wrapping up the class by assessing ISO 26262 readiness of controller functions. All theoretical knowledge is supplemented by means of several practical examples, which you can take straight back to your desk.

Target Audience

This training class is designed for developers, testers, project managers, and quality managers, whose focus is modelbased development of safety-critical embedded software using MATLAB/Simulink.

Highlights

- Developing safety-critical software in compliance with ISO 26262
- All contents updated for ISO 26262:2018
- Impact of ISO 26262 on development of embedded software with Simulink
- Model architectures for safety-critical software
- Safeguarding ISO 26262-compliant models with modeling guidelines and complexity metrics
- ISO 26262-compliant testing for model-based SW development
- Tool qualification
- Prioritization of ISO 26262 requirements for process adaptation

Jared Key

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"This training provides an insightful and comprehensive walk-through of model-based design in compliance with ISO 26262, and how to best use model-based design to improve your project."

Learning Objectives

By completing this course, the participants will achieve the following:

- An understanding of the characteristics and benefits of model-based development
- Know-how to apply model-based methods to develop safety-related systems in compliance with ISO 26262
- An understanding of the model-based development process as outlined by ISO 26262
- Ability to assess elements of effective software architecture according to ISO 26262
- An understanding of how to implement software architecture in models
- The skills to analyze and evaluate model structures
- An understanding of how to ensure model quality with effective modeling guidelines
- Ability to recall the approach to tool qualification that aligns with ISO 26262
- Knowledge of how to apply methods to ensure model quality with model testing
- An understanding of approaches to detailed design in model-based development
- An understanding of the priorities for process adaptation towards ISO 26262 compliance

Cost & Conditions

-  MES terms and conditions - Training classes (41.8 KiB)

A fee-based **SAE Certificate of Competency** can be obtained in this class by passing the evaluation test.

Overview: Model-based software development with Simulink

- Foundations of model-based development
- Overview of development and quality assurance activities
- Characteristics of ISO 26262-compliant development

Agenda - Day 1

TIME	TOPIC
10:30 a.m.	Safety-related software development in compliance with ISO 26262
10 a.m.	Welcome and introduction round <ul style="list-style-type: none">• Topics on the development process• Hazard analysis and risk assessment, ASIL determination• Strategies for safety concepts – deriving software safety requirements• ASIL decomposition• Safety Of The Intended Functionality (SOTIF)
12:30 p.m.	Lunch break and open dialog
1:30 p.m.	ISO 26262-compliant development process <ul style="list-style-type: none">• Reference workflow• Process phases and work products• Process manuals and developer guides
2:15 p.m.	Software architecture according to ISO 26262 <ul style="list-style-type: none">• Basics of software architecture• Expected properties of an ISO 26262-compliant software architecture
3:15 p.m.	Short break
3:30 p.m.	Implementing software architectures in models <ul style="list-style-type: none">• Software architecture in models• Principles for layered models• Interface handling in models• Simulink design patterns for safety-critical software
4:30 p.m.	Analysis and evaluation of model architecture <ul style="list-style-type: none">• Model structure analysis• Introduction to complexity metrics• Calculation of model complexity• Measures to reduce model complexity• Identification of ineffective interfaces and model clones
5 p.m.	Hands-on: Analysis and evaluation of model architecture
	End of day

Agenda - Day 2

TIME	TOPIC
9 a.m.	Detailed design in model-based development in compliance with ASPICE 3.0 <ul style="list-style-type: none">• Relevance of ASPICE for automotive software development• Requirements for compliance with ASPICE v3.0• Demonstration of base practices of detailed design in model-based development• Principles of software unit design
10 a.m.	Ensuring model quality with modeling guidelines <ul style="list-style-type: none">• Overview of modeling guidelines• General modeling guidelines for MISRA- and ISO 26262-compliant modeling• Specific guidelines on improving code generator application• Automatic checking of modeling guidelines
	Hands-on: Ensuring model quality with modeling guidelines

Tool qualification in compliance with ISO 26262

- 11:30 a.m.
- Foundations of tool qualification
 - Determination of the tool confidence level
 - Qualification methods
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12:30 p.m. **Lunch break and open dialog**

Ensuring model quality with model testing

- 13:30 p.m.
- ISO 26262 requirements in the testing process
 - Test goals on different testing levels
 - Regression testing and back-to-back testing, MiL – SiL – PiL
 - Model and code coverage
 - Automatic test evaluation with test assessments
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Priorities for process adaptation in compliance with ISO 26262

- 3 p.m.
- Prioritizing ISO 26262 requirements for model-based development
 - Assessing costs and benefits of ISO 26262 requirements
 - Available methods and tools for process tailoring
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3:45 p.m. **Short break**

4 p.m. **Evaluation test to qualify for the SAE Certificate of Competency (optional)**

4:30 p.m. **Wrap up of the event**

5 p.m. **End of training class**
