dSPACE Training 2012
July – December

NEW: XSG Electric Components Library
Program

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Welcome

dSPACE offers hands-on experience and practical exercises based on a well-founded theoretical background. The needs of our users, the positive feedback from our participants, and our new product releases are all reasons why we are always introducing more courses.

All training courses that previously included ControlDesk® will be held with dSPACE ControlDesk Next Generation. It unites functionalities that used to be covered by several specialized tools. ControlDesk Next Generation provides access to simulation platforms and connected bus systems, and can perform measurement, calibration and diagnostics on ECUs, for example, via standardized ASAM interfaces. Its flexible, modular structure provides high scalability to meet the requirements of specific application cases. In the ControlDesk Next Generation training courses (p. 7-8), you will gain experience in handling experiments and visualizing model variables on instrument panels. You will learn about data acquisition with ControlDesk and how to handle different data sets.

The AUTOSAR training course (p. 4) introduces you to the main goals and contents of the AUTOSAR standard. In the TargetLink® AUTOSAR Support training course (p. 12), you will design models with the TargetLink AUTOSAR blockset. You will learn to import, export and modify the AUTOSAR information in TargetLink and the dSPACE Data Dictionary, as well as to validate the behavior of AUTOSAR models by simulation.

The dSPACE SCALEXIO training course (p. 13) will show you which hardware components you need to integrate in order to customize and extend an off-the-shelf hardware-in-the-loop (HIL) simulator so that it matches your requirements. Step by step you will get to know the idea behind HIL simulation and its potential.

If you want to increase the productivity of your test environments by means of automation, see our AutomationDesk® courses (p. 14-15). You can learn how to run tests, generate test reports, and organize the handling of test projects. The AutomationDesk Project Process course (p. 15) guides you through a whole project, from test specification to tests.

Training courses take place in Paderborn, unless stated otherwise. Other courses are also being held at our project centers in Stuttgart and Munich. As an additional service, we can also provide on-site training exclusively for your company.

Check out all of the latest news and additions on our website: www.dspace.com/goto?training

The dSPACE Training Team
AUTOSAR

Over the last few years, the AUTOSAR initiative (AUTo-motive Open System ARchitecture, www.autosar.org) has successfully worked on establishing a standard for automotive software architectures. This course introduces you to the main goals and contents of this standard. Some of the aspects covered are the methodology behind AUTOSAR, the concept and purpose of the virtual functional bus (VFB), and the different layers of the standard software architecture, which are described in different templates (application layer, run-time environment (RTE), basic software).

Goals
- Get an overview of AUTOSAR with the main focus on application software and system modeling
- Learn about the contents of and the relationship between the different documents and templates
- Get to know the basic terminology (e.g. RTE, SWC, VFB)

Course Contents
- Introduction to AUTOSAR
- Methodology of AUTOSAR
- Concept of the virtual functional bus (VFB)
- Software architecture: application layer (software component template)
- System description
- Software architecture: run-time environment (RTE)
- Software architecture: basic software (Basics)

Participants
- System engineers, software architects, software developers
- Anyone involved in the development process for automotive software

AUTOSAR
(1-Day Training Course)
Fee per person: € 500 (plus tax)

Dates
July 03, 2012 (Paderborn)
October 09, 2012 (Paderborn)
December 12, 2012 (Project Center Stuttgart)

Times
9:00 a.m. to 5:15 p.m.
SystemDesk®

SystemDesk is a tool for modeling, integrating and simulating complex system architectures and distributed software systems. This training course covers all the steps from modeling a system architecture to generating the AUTOSAR Run-Time Environment (RTE) as well as validating the results with simulations.

Participants
- System engineers, software architects, software developers, software testers, ECU testers
- Recommended: Basic knowledge of AUTOSAR

Goals
- Get an overview of SystemDesk
- Model a software architecture and a complex system
- Integrate a system including RTE Generation
- Simulate a software architecture, a single ECU and an ECU network

Tools and Systems
- SystemDesk Multi ECU Design version
- AUTOSAR RTE Generation Module
- SystemDesk Simulation Module

Course Contents
- Introduction to SystemDesk
- Modeling software architectures
- Implementing software components
- Modeling hardware topologies
- Network communication
- System integration
- AUTOSAR import/export
- Automation options
- SystemDesk simulation features

SystemDesk
(1-Day Training Course)
Fee per person: € 770 (plus tax)
20% discount for universities

Dates
July 04, 2012
October 10, 2012
December 05, 2012

Times
9:00 a.m. to 5:15 p.m.
dSPACE Real-Time Systems

This 2-day training course introduces you to the main features of dSPACE prototyping systems and dSPACE Simulator single-processor systems.

Participants
- Engineers working with rapid prototyping and hardware-in-the-loop (HIL) testing
- Engineers who are new to dSPACE or who plan to purchase dSPACE prototyping systems or simulators in the near future
- Recommended: Experience with MATLAB® and Simulink®

Goals
- Set up dSPACE real-time hardware and corresponding software
- Implement I/O in Simulink
- Build real-time code with Real-Time Interface
- Change parameters and capture data with ControlDesk®
- Learn advanced features

Tools and Systems
- dSPACE single-processor hardware
- MATLAB/Simulink
- Real-Time Interface
- ControlDesk Next Generation

Course Contents
1st Day – Basics
- Software/hardware setup
- Introduction to ControlDesk Next Generation
- ControlDesk platform management
- Introduction to Real-Time Interface
- I/O implementation with Real-Time Interface
- ControlDesk project and experiment management
- ControlDesk instrumentation

2nd Day – Advanced Features
- ControlDesk basic data acquisition
- Basics on bus communication using ControlDesk
- Multitasking and interrupt handling
- Programming S-functions

Dates
- July 10-11, 2012 (Paderborn)
- September 04-05, 2012 (Paderborn)
- October 16-17, 2012 (Project Center Stuttgart)
- December 04-05, 2012 (Paderborn)

Times
- 9:00 a.m. to 5:15 p.m.

dSPACE Real-Time Systems
(2-Day Training Course)
Fee per person: € 1070 (plus tax)
20% discount for universities

20% discount for universities
ControlDesk® Next Generation Basic

Book a 1-day training course to familiarize yourself with ControlDesk Next Generation. Gain experience in handling experiments and visualizing model variables on instrument panels. Learn about data acquisition with ControlDesk Next Generation.

Participants
- Engineers new to ControlDesk
- Engineers who want to switch from ControlDesk 3.x to ControlDesk Next Generation

Goals
- Set up systems with ControlDesk
- Manage projects and experiments
- Build and use virtual instrument panels

Tools and Systems
- ControlDesk Next Generation

Course Contents
- Introduction to ControlDesk
- ControlDesk platform management
- ControlDesk project and experiment management
- ControlDesk instrumentation
- ControlDesk data acquisition

ControlDesk Next Generation Basic
(1-Day Training Course)
Fee per person: € 770 (plus tax)
20% discount for universities

In combination with ControlDesk Next Generation Advanced, the overall fee per person is € 1070 (plus tax).

Dates
- October 09, 2012
- November 27, 2012

Times
- 9:00 a.m. to 5:15 p.m.
ControlDesk®
Next Generation Advanced

This course covers the advanced steps in ControlDesk Next Generation. It is ideal for acquiring all-around information about ControlDesk’s advanced features, such as ControlDesk Signal Editor or the Bus Navigator.

Participants
- Engineers interested in increasing their knowledge of ControlDesk’s advanced features

Goals
- Learn about the advanced measurement concept
- Automate ControlDesk
- Use ControlDesk Bus Navigator
- Use ControlDesk Signal Editor

Tools and Systems
- ControlDesk Next Generation
- Bus Navigator
- Signal Editor

Course Contents
- Advanced measurement and recording
- Signal Editor
- Bus Navigator
- Data set handling
- Introduction to ControlDesk Automation
- ControlDesk event handling

Dates
- October 10, 2012
- December 06, 2012

Times
- 9:00 a.m. to 5:15 p.m.

Fee per person: € 770 (plus tax)
20% discount for universities

In combination with ControlDesk Next Generation Basic, the overall fee per person is € 1070 (plus tax).
RapidPro

Integrating automotive sensors and actuators is a key task in rapid prototyping performed for electronic control unit functions. dSPACE's RapidPro hardware provides unprecedented flexibility in adapting sensor and actuator signals to prototyping platforms (dSPACE MicroAutoBox/AutoBox). The RapidPro training gives you a step-by-step introduction to using the RapidPro software and hardware together with a dSPACE prototyping system. You will learn how to configure the RapidPro system with the ConfigurationDesk® configuration software and to implement the required I/O with the RapidPro Control Unit Blockset if you work with a RapidPro Control Unit. If you are not familiar with the dSPACE prototyping systems or with the ControlDesk® and Real-Time Interface software, it is recommended to request this course in combination with the dSPACE Real-Time Systems course (p. 6).

Goals
- Set up RapidPro signal conditioning and power stages
- Configure the RapidPro Units with ConfigurationDesk
- Learn about the structure and features of the RapidPro system
- Implement the I/O of a RapidPro Control Unit with the corresponding Real-Time Interface

Tools and Systems
- dSPACE prototyping systems
- Real-Time Interface
- ControlDesk Next Generation
- RTI RPCU Blockset
- ConfigurationDesk
- MATLAB/Simulink

Course Contents
- Introduction to the RapidPro hardware
- Introduction to ConfigurationDesk
- Monitoring and diagnostics of a RapidPro System
- Introduction to the RapidPro RTI blocksets

Participants
- Engineers working with rapid prototyping
- Engineers who want to use the dSPACE prototyping systems and the RapidPro hardware and software
- Necessary: Experience with MATLAB® and Simulink®, as well as ControlDesk and Real-Time Interface

RapidPro
(1-Day Training Course)
Fee per person: € 770 (plus tax)
20% discount for universities

Dates
On request
TargetLink® Basic

This basic training course covers all the steps of code generation for production ECUs with TargetLink. TargetLink automatically generates production-quality C code for fixed-point and floating-point controllers directly from Simulink®/Stateflow® models. The entire work process of transforming a Simulink/Stateflow diagram into an ECU executable is shown, as well as code integration details and TargetLink configuration options.

Participants
- Control strategy engineers, system engineers, function and software developers
- Recommended: Experience with ANSI-C programming, especially for production ECUs
- Necessary: Experience with MATLAB® and Simulink

Goals
- Get an overview of TargetLink
- Transfer a Simulink subsystem to a target ECU
- Understand code generation options
- Customize TargetLink to your company environment

Tools and Systems
- TargetLink Base Suite with simulation and optimization modules

Course Contents
- TargetLink blockset
- Scaling a model
- Implementation options
- Code generation
- Code integration issues
- Simulation and code verification
- Document generation
- TargetLink API

Participants
- Control strategy engineers, system engineers, function and software developers
- Recommended: Experience with ANSI-C programming, especially for production ECUs
- Necessary: Experience with MATLAB® and Simulink

Goals
- Get an overview of TargetLink
- Transfer a Simulink subsystem to a target ECU
- Understand code generation options
- Customize TargetLink to your company environment

Tools and Systems
- TargetLink Base Suite with simulation and optimization modules

Course Contents
- TargetLink blockset
- Scaling a model
- Implementation options
- Code generation
- Code integration issues
- Simulation and code verification
- Document generation
- TargetLink API

TargetLink Basic
(1-Day Training Course)
Fee per person: € 770 (plus tax)
20% discount for universities

In combination with TargetLink Advanced, the overall fee per person is € 1070 (plus tax).

Dates
July 17, 2012 (Paderborn)
September 11, 2012 (Paderborn)
October 23, 2012 (Project Center Stuttgart)
December 11, 2012 (Paderborn)

Times
9:00 a.m. to 5:15 p.m.
TargetLink® Advanced

TargetLink offers a lot of features for advanced users. One of them is the dSPACE Data Dictionary for model-independent data management. In addition, a freely installable blockset allows models to be exchanged even without a TargetLink license.

Participants
- Control strategy engineers, system engineers, function and software developers
- Necessary: Experience with MATLAB® and Simulink®, as well as TargetLink

Goals
- Use the TargetLink features and optimization options for production code generation
- Integrate TargetLink into your company environment

Tools and System
- TargetLink including all modules

Course Contents
- The dSPACE Data Dictionary
- Testing the code coverage of the application
- Code and data variants
- Integration of custom code
- Model referencing

TargetLink Advanced
(1-Day Training Course)
Fee per person: € 770 (plus tax)
20% discount for universities

In combination with TargetLink Basic, the overall fee per person is € 1070 (plus tax).

Dates
July 18, 2012 (Paderborn)
September 12, 2012 (Paderborn)
October 24, 2012 (Project Center Stuttgart)
December 12, 2012 (Paderborn)

Times
9:00 a.m. to 5:15 p.m.
TargetLink® AUTOSAR Support

TargetLink supports the generation of AUTOSAR-compliant code, and files generated by AUTOSAR authoring tools can be imported into TargetLink. With the TargetLink AUTOSAR blockset, information from the files can be referenced and used during code generation. Simulations are run to validate the behavior of the model and the generated code. Finally, TargetLink generates AUTOSAR description files for import into other tools.

Participants
- System engineers, software architects, and software developers
- Necessary: Experience with TargetLink and the dSPACE Data Dictionary as well as basic knowledge of AUTOSAR

Goals
- Import, export and modify the AUTOSAR information in TargetLink and the dSPACE Data Dictionary
- Design models with the TargetLink AUTOSAR blockset
- Validate the behavior of AUTOSAR models by simulation
- Learn the role of TargetLink in the workflow according to AUTOSAR

Tools and System
- TargetLink AUTOSAR blockset
- AUTOSAR fragment from the dSPACE Data Dictionary

Course Contents
- Importing and exporting AUTOSAR data
- Modifying AUTOSAR information in the dSPACE Data Dictionary
- How to use the TargetLink AUTOSAR blockset
- Simulating AUTOSAR models
- Interaction between TargetLink and SystemDesk

TargetLink AUTOSAR Support
(1-Day Training Course)
Fee per person: € 770 (plus tax)
20% discount for universities

Date
September 13, 2012
December 13, 2012

Times
9:00 a.m. to 5:15 p.m.
dSPACE SCALEXIO® System

Hardware-in-the-loop (HIL) simulation makes it possible to test new ECUs and software in a largely virtual environment throughout the entire development cycle, without real vehicles or prototypes. The idea is to connect real ECU prototypes to real-time models of the vehicle and its mechanical, electrical, hydraulic and electronic components. This allows systematic and fully automated testing of the ECU and the entire electronic vehicle system. This course uses the new dSPACE SCALEXIO HIL technology to demonstrate which hardware components you need to integrate in order to customize and extend an off-the-shelf simulator so that it matches your requirements. Step by step, you will learn the idea behind HIL simulations and the potential they offer. Please note: ControlDesk® Next Generation and AutomationDesk® are not covered by this course. If you want to learn about the extensive and powerful method of automated testing in combination with ECU diagnostics, fault simulation, and report generation, we recommend to book this course in conjunction with the AutomationDesk courses.

Goals
- Become familiar with the SCALEXIO philosophy
- Learn about the requirements and the capabilities of HIL
- Plan, set up and expand a SCALEXIO system
- Use ConfigurationDesk® to describe the connected devices (ECUs, loads), to assign I/O functions and hardware, and to connect the I/O to the model
- Integrate ECUs and simulate failures for diagnostic purposes

Tools and Systems
- dSPACE SCALEXIO HIL system
- MATLAB®/Simulink
- ControlDesk Next Generation
- ConfigurationDesk

Course Contents
- Structure of a SCALEXIO test system
- HighFlex and MultiCompact I/O
- Planning and setting up an HIL project
- Configuring and customizing a dSPACE SCALEXIO system
- Using ConfigurationDesk to set up the simulator
- Failure simulation
- Examples of signal generation and acquisition

Participants
- Engineers who want to use a SCALEXIO system.
- Engineers who want to customize an off-the-shelf SCALEXIO system to their own requirements.
- Necessary: Experience in using dSPACE ControlDesk Next Generation and MATLAB®/Simulink®

- dSPACE SCALEXIO System
  (2-Day Training Course)
  Fee per person: € 1070 (plus tax)
  20% discount for universities

  The number of participants is limited to six persons.

- Dates
  October 23-24, 2012
  November 28-29, 2012

- Times
  9:00 a.m. to 5:15 p.m
AutomationDesk®

The course covers the access to HIL platforms as well as a wide variety of tools, e.g. the Failure Insertion Unit, calibration and diagnostic tools, MATLAB®, and ControlDesk® Next Generation. The trainer shows you how to work with custom libraries filled with self-defined generic test steps and complete tests. You can gain hands-on experience in using predefined frameworks for your test implementation.

Participants
- Engineers interested in increasing the productivity of their test environments by means of automation
- Recommended: Experience with ControlDesk Next Generation

Goals
- Set up automatic tests efficiently
- Develop reusable tests based on library blocks
- Develop tests efficiently using debugging and offline execution
- Generate meaningful test reports
- Capture and manipulate real-time signals
- Perform automatic signal evaluation and post-processing
- Access third-party hardware and software via AutomationDesk libraries
- Structure tests with the AutomationDesk framework libraries

Tools and Systems
- AutomationDesk
- ControlDesk Next Generation

Course Contents
- Motivation for automated testing
- Introduction to AutomationDesk
- Test execution and test results
- Create tests with the Sequence Builder
- Access to dSPACE hardware
- Debugging
- Signal evaluation
- AutomationDesk’s built-in libraries
- Execution of Python scripts in AutomationDesk
- Stimulus of real-time parameters
- Test framework library and framework builder
- Automation interface to AutomationDesk

AutomationDesk (2-Day Training Course)
Fee per person: € 1070 (plus tax)
20% discount for universities

In combination with the AutomationDesk Project Process course, the overall fee per person is € 1380 (plus tax).

Dates
- September 11-12, 2012
- November 06-07, 2012

Times
- 9:00 a.m. to 5:15 p.m.
AutomationDesk® Project Process

The course discusses the structures and processes needed to integrate AutomationDesk in an existing test process. You are guided through a whole project from test specification to tests. You will build custom libraries and then use them to create implementations. The course explains the interrelation between the structure of a test project and corresponding custom library test steps. It also discusses the conventions necessary for AutomationDesk elements, real-time model structure and test specifications to guarantee test reusability with a minimum of effort.

Participants
- Engineers who are familiar with AutomationDesk

Goals
- Use AutomationDesk in a real project
- Understand the rules for reusable custom library elements
- Structure projects and custom libraries to provide a solid basis for a large number of tests
- Get to know a real-time model interface suitable for test automation

Tools and Systems
- ControlDesk® Next Generation
- AutomationDesk

Course Contents
- Using AutomationDesk in a test automation project
- Building custom libraries of basic test steps held in libraries of test step groups and complete tests
- Creating AutomationDesk projects for handling large numbers of tests
- Conventions and structures that ensure traceability from test specification to test report.
- Roles of test automation team members and associated tasks and qualifications
- Checklist of preconditions that must be fulfilled before test automation can start

AutomationDesk Project Process
(1-Day Training Course)
Fee per person: € 770 (plus tax)
20% discount for universities

In combination with the AutomationDesk course, the overall fee per person is € 1380 (plus tax).

Date
November 08, 2012

Times
9:00 a.m. to 5:15 p.m.
Real-Time Testing

Real-time hardware can be accessed via an interpreter running on the processor board. Since the interpreter is executed at the same rate as the real-time application, it can be used to perform real-time tests. This training course provides an introduction to programming real-time tests based on the Python programming language. Course participants will discuss standard applications and implement them in practical examples.

Participants
- Engineers familiar with Python programming and real-time applications

Goals
- Use Python to describe real-time tests
- Set up a workflow for real-time testing
- Understand the structure of real-time tests
- Create standard implementations and understand their temporal behavior

Tools and Systems
- ControlDesk® Next Generation
- AutomationDesk®
- Real-time hardware

Course Contents
- The necessity of real-time tests
- Workflow of real-time testing (from script to executable real-time test, test management)
- Introduction to special Python programming elements for real-time testing
- Structure of real-time tests (initialization phase, time-synchronous execution)
- Accessing model variables from real-time tests
- Test modularization
- Relation between Python scripts on the PC and on the real-time platform
- Libraries for test automation by real-time testing (e.g., for variable access, and data exchange between independent tests)
- Implementing standard test scenarios

Real-Time Testing
(1-Day Training Course)
Fee per person: € 770 (plus tax)
20% discount for universities

Date
September 13, 2012

Times
9:00 a.m. to 5:15 p.m.
ASM Vehicle Dynamics Basic

The Vehicle Dynamics Simulation Package is an open Simulink® model for real-time simulation of vehicle dynamics behavior within an environment. The model is typically be used on dSPACE Simulator for hardware-in-the-loop testing of electronic control units (ECUs) or during the design phase of controller algorithms for early validation by offline simulation. It is a complete and independent model that supports all the relevant phases of the model based development process.

All Simulink blocks in the model are visible, so it is easy to add or replace components with custom models to adapt the vehicle’s properties perfectly to individual projects. Roads and driving maneuvers can be easily and intuitively created using graphical tools with preview and clear visualization. You will learn about the concept and the structure of the ASM Vehicle Dynamics model. The course will also deal with the options for parameterizing the vehicle, as well as the road generator and maneuver editor.

Goals
- Get an overview of the ASM Vehicle Dynamics Simulation Package
- Use the ASM Vehicle Dynamics model offline and on a dSPACE system
- Use ModelDesk for model parameterization and road and maneuver creation
- Parameterize the model
- Visualize and measure signals in ModelDesk

Tools and Systems
- ASM Vehicle Dynamics Simulation Package including ModelDesk and MotionDesk
- MATLAB/Simulink

Course Contents
- Introduction to the ASM Vehicle Dynamics Simulation Package
- Using the model for offline simulation
- Using the model for online simulation on dSPACE hardware
- Generating roads and maneuvers using ModelDesk
- Basics on parameterizing the model using ModelDesk

Participants
- Engineers working on HIL testing of ECUs for vehicle dynamics
- Engineers who validate controller algorithm designs by doing offline simulation
- Necessary: Experience with MATLAB® and Simulink

ASM Vehicle Dynamics Basic
(1-Day Training Course)
Fee per person: € 770 (plus tax)
20% discount for universities

Date
September 18, 2012
November 21, 2012

Times
9:00 a.m. to 5:15 p.m.
ASM Engine Simulation Basic

For engine applications, dSPACE offers a Diesel and a Gasoline Engine Simulation Package. Both are open Simulink® models for the real-time simulation of engines. They are fully integrated into the dSPACE tool chain and are typically be used on dSPACE Simulator for hardware-in-the-loop testing of electronic control units. They are complete and independent engine models that support all the relevant phases of the model-based development process, from early controller design to testing in the laboratory. Since the simulation packages are open Simulink models, users can simply add components or replace them with custom models to meet specific project requirements. The model parameters can even be tuned while online simulations are performed. You will learn about the concept and the structure of the ASM Engine Simulation models. The course will also deal with the options for parameterizing the engine.

Goals
- Get an overview of the ASM Engine Simulation Packages
- Use the ASM Engine model offline and on a dSPACE system
- Parameterize the model

Tools and Systems
- ASM Diesel Engine Simulation Package
- ASM Gasoline Engine Simulation Package
- MATLAB/Simulink

Course Contents
- Introduction to the ASM Engine Simulation Packages
- Using the model for offline simulation
- Using the model for online simulation on dSPACE hardware
- Parameterization of the model

Participants
- Engineers working on HIL testing of ECUs in the area of engine applications
- Engineers who validate controller algorithm designs by doing offline simulation
- Necessary: Experience with MATLAB® and Simulink

ASM Engine Simulation Basic
(1-Day Training Course)
Fee per person: € 770 (plus tax)
20% discount for universities

Date
September 19, 2012
November 22, 2012

Times
9:00 a.m. to 5:15 p.m.
ASM Engine InCylinder Simulation

The ASM Diesel Engine InCylinder Simulation Package and the ASM Gasoline Engine InCylinder Simulation Package are open Simulink® models for developing and testing advanced electronic control units (ECUs) that support engine management based on in-cylinder pressure, variable valve timing, etc. They are fully integrated into the dSPACE tool chain and are typically used on a dSPACE Simulator for hardware-in-the-loop (HIL) testing of ECUs. They are complete and independent engine models that support all the relevant phases of the model-based development process, from early controller design to testing in the laboratory. Since the simulation packages are open Simulink models, users can simply add components or replace them with custom models to meet specific project requirements. The model parameters can even be tuned while online simulations are running.

You will learn about the concept and the structure of the ASM Engine InCylinder Simulation models. The course will also explain the basics of in-cylinder-pressure-based engine simulation. Other items covered are engine model parameterization and model parameter optimization.

Goals
- Get an overview of the ASM Engine InCylinder Simulation Packages
- Use the ASM Engine InCylinder model offline and on a dSPACE system
- Parameterize the model
- Optimize parameters

Tools and Systems
- ASM Diesel Engine InCylinder Simulation Package
- ASM Gasoline Engine InCylinder Simulation Package
- MATLAB/Simulink

Course Contents
- Introduction to in-cylinder-pressure-based engine simulation
- Introduction to the ASM Diesel / Gasoline Engine InCylinder Simulation Packages
- Offline simulation with the model
- Online simulation with the model on dSPACE hardware
- Measuring engine data
- Parameterizing the model
- Optimizing model parameters

Participants
- Engineers working on HIL testing of ECUs in the area of advanced engine applications
- Engineers who validate controller algorithm designs by doing offline simulation
- Necessary: Experience with MATLAB® and Simulink

ASM Engine InCylinder Simulation (2-Day Training Course)
Fee per person: € 1070 (plus tax)
20% discount for universities

Dates
On request

Times
9:00 a.m. to 5:15 p.m.
NEW: XSG Electric Components Library

dSPACE’s new XSG Electric Components Library contains plant models for electric drive applications. They are implemented as open Xilinx® System Generator (XSG) models and required for FPGA-based hardware-in-the-loop (HIL) simulation. The Simulink® block library contains plant models for the simulation of electric drives and power electronics, position sensor virtualization and interface functions. A supplementary set of tools and utilities makes the library easy to use. Users can simply add components or replace them with custom XSG models to meet specific requirements. In addition, the RTI FPGA Programming Blockset can be used to embed the DS5203 FPGA Board’s onboard I/O. Interface blocks enable the user to apply the real-time processor’s host service to tune and capture parameters and data from the FPGA during online simulation.

You will learn about the concept and the structure of the XSG Electric Components models. The course provides all the basics required to embed your own real-time FPGA application and to parameterize the plant models.

Participants
- Engineers working on the HIL testing of ECUs for e-drive applications
- Engineers who validate controller algorithm designs with the DS5203 FPGA Board
- Necessary: Experience with MATLAB®/Simulink

Goals
- Get to know the XSG Electric Components Models
- Build and embed FPGA applications for the DS5203 FPGA Board
- Interface and configure FPGA applications
- Access the DS5203’s onboard I/O

Tools and Systems
- XSG Electric Components Models
- MATLAB/Simulink
- XILINX System Generator (XSG)

Course Contents
- Introduction to the XSG Electric Components Library
- Implementing applications for the DS5203 FPGA Board
- Using the XSG Electric Components Library for online simulation
- Parameterizing of the plant models

XSG Electric Components Library
(1-Day Training Course)
Fee per person: € 770 (plus tax)
20% discount for universities

Dates
September 18, 2012
November 20, 2012

Times
9:00 a.m. to 5:15 p.m.
The RTI CAN MultiMessage Blockset can especially be used for handling the complex CAN setups which typically occur in testing environments for ECUs. It is a time-efficient and cost-efficient solution for managing complex CAN setups in Simulink® and from ControlDesk® and AutomationDesk®, with as little manual editing effort as possible.

In this training course, you will learn how to use the RTI CAN MultiMessage Blockset and manage large CAN message bundles (> 200 messages) from one Simulink block.

**Participants**
- Engineers working with complex CAN setups
- Recommended: Experience with ControlDesk Next Generation and MATLAB®/Simulink
- Necessary: Experience with CAN

**Goals**
- Run restbus simulation
- Handle the special CAN testing features
- Use a software gateway and a manipulation gateway
- Integrate CAN communication into the Simulink model

**Tools and Systems**
- RTI CAN MultiMessage Blockset
- Simulink
- Real-Time Workshop®
- ControlDesk Next Generation with the Bus Navigator

**Course Contents**
- Configuring the RTI CAN MultiMessage Blockset
- Signal- and message related manipulation options
- Parameterization based on a DBC file
- Instrumentation with the ControlDesk Bus Navigator
- User-specific solutions:
  - Custom code
  - Checksums
  - Variant handling

**RTI CAN MultiMessage Blockset**
- (1-Day Training Course)
  - Fee per person: € 770 (plus tax)
  - 20% discount for universities

**Dates**
- September 06, 2012
- November 20, 2012

**Times**
- 9:00 a.m. to 5:15 p.m.
The dSPACE FlexRay Configuration Package is used to integrate dSPACE hardware as simulation nodes or monitoring nodes in a FlexRay network. Nodes are configured with the dSPACE FlexRay Configuration Tool according to a communication matrix containing scheduling information for signals and frames transmitted via the FlexRay bus. The communication information is linked to a MATLAB®/Simulink® model by the RTI FlexRay Configuration Blockset. The resulting FlexRay application can be executed on a dSPACE system. The package is an extensive solution for using FlexRay in dSPACE’s MicroAutoBox or modular systems.

In this training course, you will learn how to configure a dSPACE system as a simulation node in a FlexRay network and create application-specific Simulink models. Additional special features such as failure simulation and implementing CRC algorithms are also covered.

Participants
- Function developers and engineers who want to use FlexRay on an RCP or HIL system
- Control strategy system engineers
- Necessary: Experience in using dSPACE products (ControlDesk® Next Generation, Real-Time Interface) and MATLAB/Simulink
- Recommended: Experience with FlexRay

Goals
- Simulate one or more nodes in a FlexRay network
- Perform restbus simulation

Tools and Systems
- dSPACE FlexRay Configuration Package
- Real-Time Interface (RTI)
- ControlDesk Next Generation with Bus Navigator

Course Contents
- Basic principles of FlexRay
- Overview of FlexRay hardware and software
- Workflow of the dSPACE FlexRay Configuration Package
- dSPACE FlexRay Configuration Tool
- RTI FlexRay Configuration Blockset
- Introduction to the ControlDesk Next Generation Bus Navigator for FlexRay
- Overview of failure simulation methods
- Using CRC algorithms

**dSPACE FlexRay Configuration Package**
(1-day Training Course)
Fee per person: € 770 (plus tax)
20% discount for universities

**Dates**
October 25, 2012

**Times**
9:00 a.m. to 5:30 p.m.
What We Offer

**Learning by Doing**
Our training rooms are equipped with one dSPACE system for every two participants. The number of participants is limited to twelve. When a course is booked to capacity, we use two trainers to guarantee that each participant gets optimal support. For the dSPACE SCALEXIO training course, the number of participants is limited to six.

**Ask the Expert**
The instructors are experienced dSPACE application engineers.

**Language**
The courses are held in English or German, depending on the nationality of the participants.

**Included**
The fee includes course material (in English), a certificate for successful participation, lunch, coffee and refreshments.

**Customer-Specific Training**
We offer on-site training and individual training on demand. A minimum of 4 participants is required. For special schedules, please contact us via phone or e-mail.

**Dress**
We recommend casual clothing.
Registration and Location

How to Register
Please register at least 14 days before the training course begins. Fill in the registration form (p. 27), and fax or mail it to us. If you want to register more than one participant, please use a copy for each additional person.

You can also register online at www.dspace.de/goto?training

Fees and Schedule
The fee for a 1-day training course is € 770 (plus tax). If you book a 2-day training course or two directly consecutive courses (e.g., the TargetLink Basic and Advanced courses) the fee is € 1070 (plus tax). If you book three directly consecutive courses, the fee is € 1380 (plus tax).

Please pay the participation fee after receiving your confirmation of registration and the invoice. With the confirmation you will also receive a map showing how to reach us and information about accommodation.
Accommodation
Please use the hotel list which you receive with your confirmation to reserve a room yourself. The participation fee does not include accommodation and travel.

Cancellation
Please note that we will charge you €25 if you cancel your registration 14 days before the training course begins. If you cancel after that date, we will charge you 50% of the training fee.

Switching Participants
It is possible to switch participants without paying any additional fee. Please inform us of the change.

How to Reach Us

- **By plane to Paderborn**
The Paderborn-Lippstadt Airport is just 20 minutes away from dSPACE by car. For more information, please see www.flughafen-paderborn-lippstadt.de

- **By plane to Stuttgart**
Stuttgart Airport is just 30 minutes away from the dSPACE project center by car. For more information, please see www.stuttgart-airport.com

- **By plane to Munich**
Munich Airport is just 30 minutes away from the dSPACE project center by car. For more information, please see www.munich-airport.de

- **By train**
For train schedules, please see www.bahn.de

- **By car**
If you come by car, please use the map in the company section of our Web site www.dspace.com

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training@dspace.de

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85276 Pfaffenhofen, Germany
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Fax: +49 8441 7870 100
training@dspace.de
Overview

AUTOSAR
Introduction to the main goals and contents of the AUTOSAR standard

SystemDesk®
From modeling a system architecture to generating the AUTOSAR Runtime Environment (RTE)

dSPACE Real-Time Systems
Single-processor systems in detail (dSPACE prototyping systems and dSPACE Simulator)

ControlDesk® Next Generation Basic
Introduction to ControlDesk’s instrumentation and management features

ControlDesk Next Generation Advanced
Introduction to more features such as ControlDesk Automation and the Bus Navigator

RapidPro
Introduction to the RapidPro System

TargetLink® Basic
The workflow from a Simulink® model to code generation with TargetLink

TargetLink Advanced
More features to customize and validate the code generation

TargetLink AUTOSAR Support
Generation of AUTOSAR-compliant code

dSPACE SCALEXIO® System
Introduction to SCALEXIO

AutomationDesk®
Test automation and test management based on AutomationDesk

AutomationDesk Project Process
Using AutomationDesk in a small project and building a custom-library-based test solution

Real-Time Testing
Introduction to programming real-time tests based on the Python programming language

ASM Vehicle Dynamics Basic
Real-time simulation of vehicle dynamics behavior within a development environment

ASM Engine Simulation Basic
Real-time simulation of diesel and gasoline engines

ASM Engine InCylinder Simulation
Real-time simulation of an in-cylinder-pressure-based engine

XSG Electric Components Library
Simulation of electric drives and power electronics, position sensor virtualization and interface functions

RTI CAN MultiMessage Blockset
Handling of complex CAN setups in hardware-in-the-loop applications

dSPACE FlexRay Configuration Package
Simulation of one or more nodes in FlexRay networks
Overview

**July**
- Tue 03: AUTOSAR
- Wed 04: SystemDesk
- Tue 10 / Wed 11: dSPACE Real-Time Systems
- Tue 17: TargetLink Basic
- Wed 18: TargetLink Advanced

**September**
- Tue 04 / Wed 05: dSPACE Real-Time Systems
- Thu 06: RTI CAN MultiMessage Blockset
- Tue 11: AutomationDesk
- Tue 11 / Wed 12: TargetLink Basic
- Wed 12: TargetLink Advanced
- Thu 13: Real-Time Testing
- Thu 13: TargetLink AUTOSAR Blockset
- Tue 18: ASM Vehicle Dynamics Basic
- Tue 18: XSG Electric Components Library
- Wed 19: ASM Engine Simulation Basic

**October**
- Tue 09: ControlDesk Next Generation Basic
- Tue 09: AUTOSAR
- Wed 10: ControlDesk Next Generation Advanced
- Wed 10: SystemDesk
- Tue 16 / Wed 17: dSPACE Real-Time Systems (PCS)
- Tue 23: TargetLink Basic (PCS)
- Tue 23 / Wed 24: dSPACE SCALEXIO System
- Wed 24: TargetLink Advanced (PCS)
- Thu 25: dSPACE FlexRay Configuration Package

**November**
- Tue 06 / Wed 07: AutomationDesk
- Thu 08: AutomationDesk Project Process
- Tue 20: RTI CAN MultiMessage Blockset
- Tue 20: XSG Electric Components Library
- Wed 21: ASM Vehicle Dynamics Basic
- Thu 22: ASM Engine Simulation Basic
- Tue 27: ControlDesk Next Generation Basic
- Wed 28 / Thu 29: dSPACE SCALEXIO System

**December**
- Tue 04 / Wed 05: dSPACE Real-Time Systems
- Wed 05: SystemDesk
- Thu 06: ControlDesk Next Generation Advanced
- Tue 11: TargetLink Basic
- Wed 12: TargetLink Advanced
- Thu 13: AUTOSAR (PCS)
- Thu 13: TargetLink AUTOSAR Blockset

PCS = Project Center Stuttgart
dSPACE Training 2012 – Registration Form

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I hereby register for the above training course.
I am fully aware of the conditions of participation. Date/Signature

**Invoice address, if different:**

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**Note (You can add any extra information such as special dietary requirements here.)**

Please send or fax dSPACE Training 2012, Training department
Fax: +49 5251 16198-0, Online registration: www.dspace.de/goto?training