

dSPACE Release

# New Features and Migration

Release 2017-A – May 2017

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## How to Contact dSPACE Support

To contact dSPACE if you have problems and questions, fill out the support request form provided on the website at <http://www.dspace.com/go/supportrequest>.

The request form helps the support team handle your difficulties quickly and efficiently.

In urgent cases contact dSPACE via phone: +49 5251 1638-941 (General Technical Support)

## Software Updates and Patches

dSPACE strongly recommends that you download and install the most recent patches for your current dSPACE installation. Visit <http://www.dspace.com/go/support> for software updates and patches.

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# About This Document

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**Contents** This document informs you about the new features of all the dSPACE software products in Release 2017-A. It also gives you an overview of software products with no or minor changes. There are instructions on migrating from earlier dSPACE releases, especially from earlier product versions, if required.

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**Where to go from here** Information in this section




<i>Conventions</i>	9
<i>Accessing Online Help and PDF Files</i>	11

## Conventions

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**Symbols** This manual uses the following symbols:

Symbol	Description
	Indicates a hazardous situation that, if not avoided, will result in death or serious injury.
	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

Symbol	Description
<b>NOTICE</b>	Indicates a hazard that, if not avoided, could result in property damage.
<b>Note</b>	Indicates important information that you should take into account to avoid malfunctions.
<b>Tip</b>	Indicates tips that can make your work easier.
	Indicates a link that refers to a definition in the glossary, which you can find at the end of the document unless stated otherwise.
	Precedes the document title in a link that refers to another document.
	Indicates a link that refers to another document, which is available in dSPACE HelpDesk.

**Naming conventions**

This manual uses the following naming conventions:

**%name%** Names enclosed in percent signs refer to environment variables for file and path names.

**< >** Angle brackets contain wildcard characters or placeholders for variable file and path names, etc.

**Special folders**

Some software products use the following special folders:

**Common Program Data folder** A standard folder for application-specific configuration data that is used by all users.

`%PROGRAMDATA%\dSPACE\`

or

`%PROGRAMDATA%\dSPACE\`

**Documents folder** A standard folder for user-specific documents.

`%USERPROFILE%\My Documents\dSPACE\`

**Local Program Data folder** A standard folder for application-specific configuration data that is used by the current, non-roaming user.

`%USERPROFILE%\AppData\Local\dSPACE\`

## Accessing Online Help and PDF Files

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**Introduction** After you install your dSPACE software, the documentation for the installed products is available as online help and Adobe® PDF files.

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**Online help** You can access the online help, dSPACE HelpDesk, as follows:

**Windows Start menu** Select Start – (All) Programs – <ProductName> – dSPACE HelpDesk (<ProductName>) to open dSPACE HelpDesk with the start page of the selected product displayed. You can also navigate and search in the user documentation of any other installed software product and its supported hardware.

**Context-sensitive** Press the **F1** key or click the Help button in the dSPACE software to get help on the currently active context.


### Note

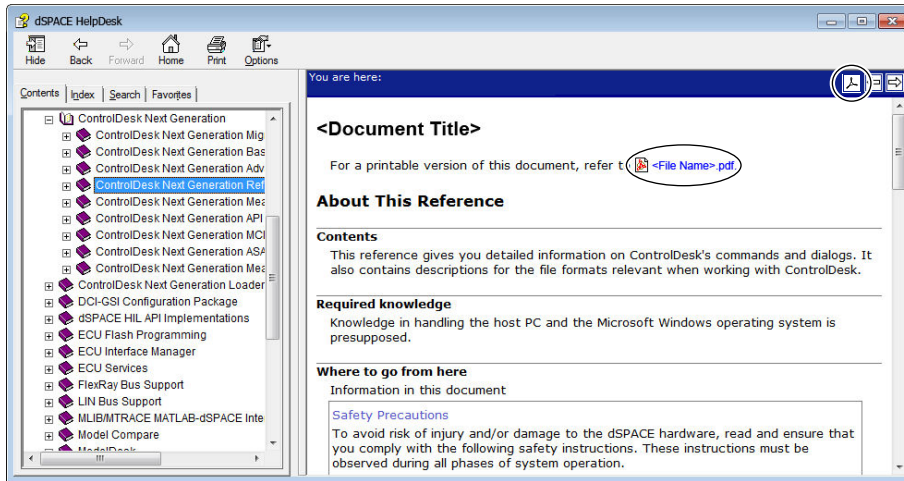
In some software products, context-sensitive help is not available.

**Help menu in the dSPACE software** On the menu bar, select Help – Contents or Help – Search (not available in all software products) to open dSPACE HelpDesk. It opens at the start page of the currently active product. You can also navigate and search in the user documentation of any other installed software product and its supported hardware.

### PDF files

You can access the PDF files as follows:

**dSPACE HelpDesk** Click the PDF link at the beginning of a document or  on a topic pane's header:



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# Overview of dSPACE Release 2017-A

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**Introduction** Gives you an overview of the new key features in Release 2017-A and information about unchanged products.

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**Where to go from here** Information in this section

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<i>Features of the New dSPACE Help</i>	19
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## General Enhancements and Changes

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**Introduction** The following new features and changes concern several dSPACE products.

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**64-bit Python distribution** As of dSPACE Release 2016-B, all products are available only as 64-bit variants. As a consequence, dSPACE Release 2016-B and later support only the 64-bit variant of the Python distribution.

**Components of the dSPACE Python distribution** The following component versions of the 64-bit variant of Python 2.7 are available.

Python Component	64-Bit Version
Python core	2.7.13
PyWin32	220.10
Numpy	1.11.2
Matplotlib	1.5.3
WxPython	3.0.2.0
Py2exe	0.6.9
Comtypes	1.1.3
Python for .NET	2.1.0
Cycler	0.10.0
Pillow	3.4.2
Pip	9.0.1
Pyarsing	2.1.10
Python_dateutil	2.6.0
Pytz	2016.7
Six	1.10.0

**Using 32-bit Python and 64-bit Python in parallel** Both Python variants can be used in parallel on your computer, with the following restrictions:

- The shortcuts in the Windows Start menu and the file associations for PY, PYC and PYW files can be set to only one Python version. This is usually the latest installed Python version.
- Environment variables are used by both Python versions. Their values (e.g., for PYTHONHOME), must be set to the Python installation you want to work with. For an overview of the environment variables set by Python, refer to <http://docs.python.org/2/using/cmdline.html>.
- To switch from the 64-bit variant to the 32-bit variant of Python, you have to execute the **Repair** command of the following Python components:
  - Python Core
    - Click **Repair** in the context menu of the `python-2.7.9.msi` or `python-2.7.10.msi` file.

You can also start the repair for the Python 2.7.9 or Python 2.7.10 entry using Control Panel\Programs\Programs and Features.

- PyWin32

Execute `pywin32-219.10.win32-py2.7.exe`.

You find both files on the dSPACE DVD from dSPACE Release 2016-A and earlier in `Disc1\Products\Common\Python2.7`.

- To switch from the 32-bit variant to the 64-bit variant of Python, you have to execute the **Repair** command of the following Python components:

- Python Core

Click **Repair** in the context menu of the `python-2.7.10.amd64.msi` or `python-2.7.13.amd64.msi` file.

You can also start the repair for the Python 2.7.10 or Python 2.7.13 entry using Control Panel\Programs\Programs and Features.

- PyWin32

Execute `pywin32-220.10.win-amd64-py2.7.exe`.

You find both files on the dSPACE DVD from dSPACE Release 2016-B and later in `Disc1\Products\Common\Python2.7_x64`.

For more information, refer to *Notes on 64-bit Compatibility of dSPACE Products* on page 169.

## Contents of DVDs

The dSPACE software is provided on two disks. The disks contain the following dSPACE software packages and main products:

- Disk 1:
  - AutomationDesk 5.4
  - ControlDesk 6.1
  - TargetLink 4.2
  - Model Compare 2.7

### Note

#### Product use prohibited in United States

You are not licensed to use Model Compare in the United States. You are not allowed to use or permit others to use this product in the United States or in any way that violates the laws of the United States.

- SystemDesk 4.8
  - VEOS 4.0
  - Various other dSPACE software tools
  - Disk 2:
    - RCP and HIL software
- RCP and HIL software* is a generic term for a software package containing several dSPACE software products, such as RTI, ConfigurationDesk, MotionDesk, and ModelDesk.

### Tip

Disk 2 does not contain any other dSPACE software products.

### New hardware dongles for dongle licenses

As of dSPACE Release 2014-B, the hardware dongle for dongle licenses is now a CmDongle instead of a WibuKey dongle. Both are products of WIBU-SYSTEMS and are shown below.



With dSPACE Release 2014-B, the new CmDongles were shipped with new dSPACE systems for the first time.

Keep the following compatibility information in mind:

- In general, you can use dSPACE Release 2017-A with an already delivered WibuKey dongle. As of dSPACE Release 2014-B, the drivers for both dongle versions are installed on your host PC. The driver software automatically detects which dongle is used. No further user action is necessary.
- If you want to use dSPACE Release 2014-A and earlier with the new CmDongle, you have to install dSPACE Installation Manager 3.8 (or later) on your host PC. This version contains the driver for the new dongle. You can download the latest version of dSPACE Installation Manager from <http://www.dspace.com/go/imupdate>.
- dSPACE Release 6.3 and earlier versions have not been tested for the new CmDongle. If necessary, contact dSPACE Support.

### First products with new online help

With this Release, three dSPACE products come with dSPACE Help as their new online help. For more information, refer to *Features of the New dSPACE Help* on page 19.



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**Restrictions when working with dSPACE HelpDesk**

dSPACE HelpDesk is installed in Release-specific folders.

According to the dSPACE software products, which are now all implemented as 64-bit applications, the user documentation for dSPACE Release 2017-A is installed in C:\Program Files. Up to dSPACE Release 2016-A the user documentation was installed in C:\Program Files(x86).

Note the following restrictions:

Links to documents might not work and might return the following error message: *Selection is not associated with any topics*. The possible reasons are:

- The documents for the product are not installed, because the product is not included in your license key.
- The documents for the product are installed in another dSPACE HelpDesk. For example, if a product in the current dSPACE Release has not been changed, its user documentation is installed in the dSPACE HelpDesk version that the product setup was created for.

After you install dSPACE Release 2017-A, you can find the user documentation for the following products in dSPACE HelpDesk 2016-B:

- Container Manager 4.5
- Model Compare 2.7
- TargetLink 4.2

If you are not sure where to find the user documentation for your product, use the product-specific dSPACE HelpDesk shortcut in the Windows Start menu to open the online help.

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**Printed user documentation**

With dSPACE Release 2017-A, the printed user documentation is not delivered automatically. You can decide which of the available printed documents you want to have. To order printed documentation, refer to <http://www.dspace.com/go/requestreleasematerial>.

**Note**

If you do not order printed documentation, use dSPACE HelpDesk or PDF files to obtain information about new features, enhancements, and the safety precautions regarding your products.

### Software support discontinuation

**Discontinuation of processor-in-the-loop (PIL) simulation with VEOS and SystemDesk** As of dSPACE Release 2017-A, VEOS and SystemDesk no longer support processor-in-the-loop (PIL) simulation. This includes the generation of V-ECUs for PIL simulation and the simulation of these V-ECUs on evaluation boards.

**Discontinuation of MPC5554 Support in ConfigurationDesk - Configuration Version** As of dSPACE Release 2017-A, ConfigurationDesk - Configuration Version no longer supports the MPC5554 microcontroller.

The MPC5554 is the core component for a RapidPro system that is used as a stand-alone prototyping ECU.

**SYNECT server connection** As of dSPACE Release 2017-A, ControlDesk and ConfigurationDesk can no longer connect to the SYNECT server. As a result, exchanging data, such as build results provided by ConfigurationDesk, with the SYNECT server is no longer possible.

### Discontinuation of dSPACE hardware

**DS1005 PPC Board** This product was discontinued in December 2016. New Releases of dSPACE software will continue to support the DS1005 until at least the end of 2019.

However, for new projects we recommend that you use the successor, the dSPACE DS1007 PPC Processor Board.

**DS1103 PPC Controller Board** This product was discontinued in December 2016. New Releases of dSPACE software will continue to support the DS1103 until at least the end of 2018.

However, for new projects we recommend that you use the successor, dSPACE MicroLabBox.

**MicroAutoBox II 1401/1511/1512 and MicroAutoBox II 1401/1512/1513** MicroAutoBox variants with DS1512 I/O Board were discontinued in December 2016. New Releases of dSPACE software will continue to support these MicroAutoBox variants until at least the end of 2019.

However, for new projects we recommend that you use the successors MicroAutoBox II 1401/1511/1514 or MicroAutoBox II 1401/1513/1514.

**DCI-CAN1** This product will be discontinued as of December 2017. New Releases of dSPACE software will continue to support the DCI-CAN1 until at least the end of 2019.


However, for new projects we recommend that you use the successors DCI-CAN2 or DCI-CAN/LIN1.

**DCI-GSI1** This product will be discontinued as of December 2017. New Releases of dSPACE software will continue to support the DCI-GSI1 until at least the end of 2019.

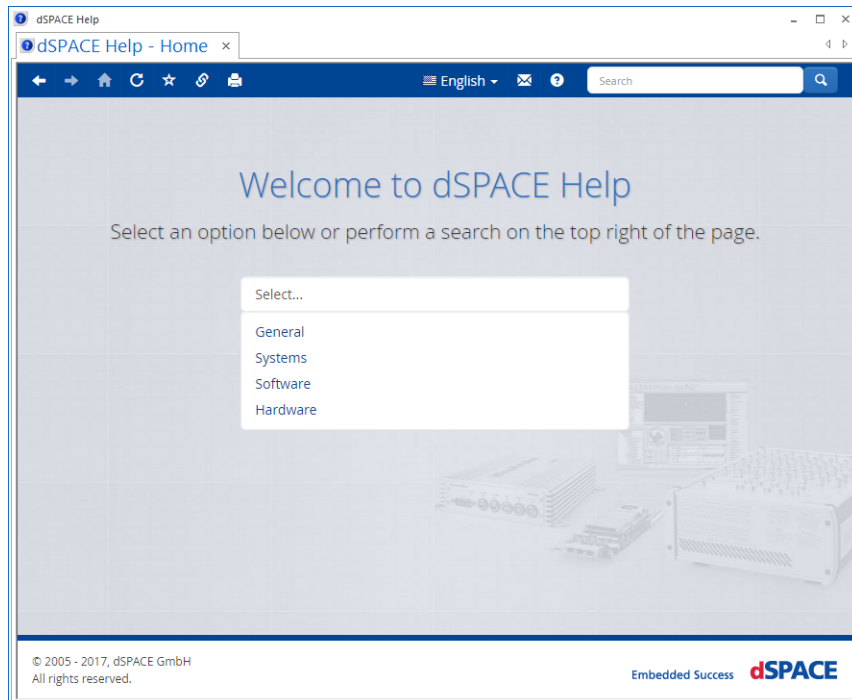
However, for new projects we recommend that you use the successor DCI-GSI2.

## Features of the New dSPACE Help

### New online help

With dSPACE Release 2017-A, the online help is based on a new technology that provides some helpful new features. The key benefits are listed in this topic. For a more detailed description of the features in the online help, click the  button in dSPACE Help. However, the user documentation of the below-mentioned products is also available in dSPACE HelpDesk. This lets you use cross-references to the user documentation of the other products.

The Microsoft HTML Help, also known as Compiled HTML Help (CHM), will be replaced by the new help platform.



### Availability

With Release 2017-A, only the following dSPACE products are available with the new dSPACE Help:

- ConfigurationDesk Configuration Version
- Firmware Manager
- SystemDesk

With dSPACE Release 2017-B, all dSPACE products will support the new dSPACE Help.

### Look and Feel

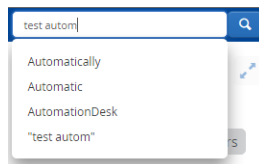
**Attractive design** The layout was completely redesigned and updated. The user interface of dSPACE Help is now more intuitive, user-friendly and modern. When you change the size of the window, the responsive design automatically adjusts the content and control elements for a correct screen presentation.

**Clearly legible** dSPACE Help uses new fonts that are optimized for working on-screen. Together with the customized white space, the content is clearly legible and structured.

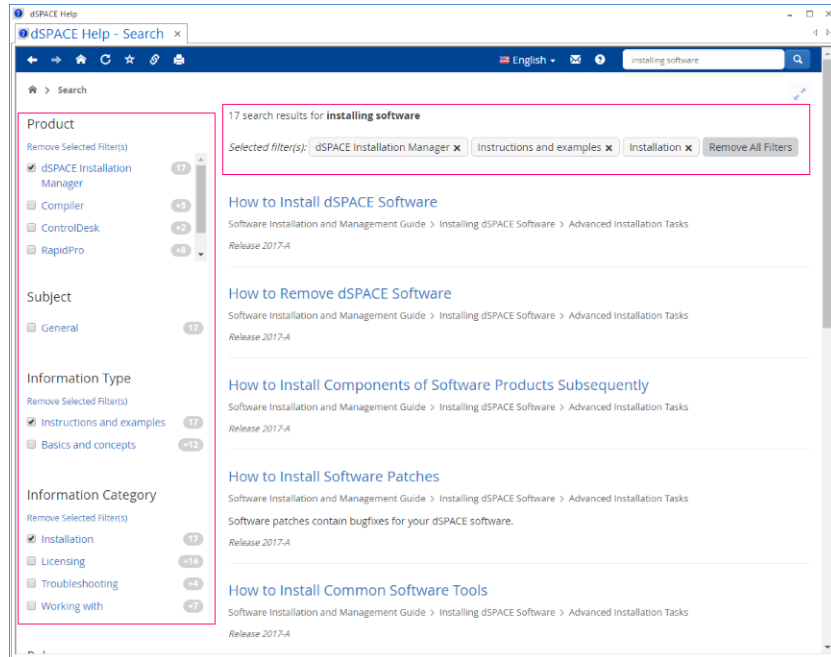
**Familiar browser handling** dSPACE Help is based on standard web browser technology. The handling is known from other browsers, so switching to the new help is very easy.

### Search

**Search suggestions** Entering search queries is now supported by suggestions. They help you search for exact words and get better results.



**Faceted filtering** Faceted filtering enables you to reduce a large number of search results. The facets are categorized and show the number of the remaining results.

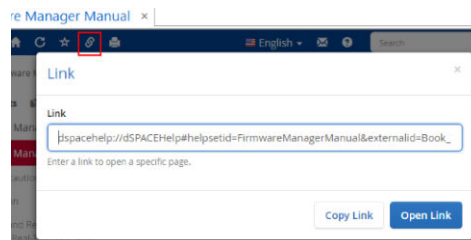


## Navigation

The navigation concept is lean and clear. A combination of navigation path and main navigation guides you through the documentation structure.

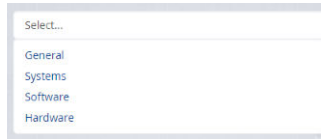
## Link sharing

dSPACE Help lets you share or get links to a specific page. This makes it possible for you to communicate with colleagues or dSPACE Support, in case you cannot find a certain information or topic you are looking for.



**Selector**

The documentation selector is a new feature on the home page of dSPACE Help. It helps you navigate through the documentation structure if several products, product versions or dSPACE Releases are installed on your PC.



## Product Version Overview

**Product versions**

The following table is an extract from product version histories showing the product versions of the current Release and of the three preceding Releases. If a product has new features, there is a link to the brief description in this document.

Product	dSPACE Release			
	2015-B	2016-A	2016-B	2017-A
AutomationDesk	5.1	5.2	5.3	5.4 Refer to <i>AutomationDesk</i> on page 37.
Automotive Simulation Models	8.1	8.2	8.3	8.4 Refer to <i>Automotive Simulation Models (ASM)</i> on page 41.
Bus Manager (stand-alone)	–	5.5	5.6	5.7 Refer to <i>Bus Manager (Stand-Alone)</i> on page 73.
ConfigurationDesk	5.4	5.5	5.6	5.7 Refer to <i>ConfigurationDesk</i> on page 77.
Container Manager	4.4	4.4	4.5	4.5
ControlDesk	5.5	5.6	6.0	6.1 Refer to <i>ControlDesk</i> on page 85.

Product	dSPACE Release			
	2015-B	2016-A	2016-B	2017-A
DCI Configuration Tool	3.5	3.6	3.7	3.7.1 Refer to <i>DCI Configuration Tool</i> on page 103.
dSPACE CAN API Package	2.7.4	2.7.5	3.0	3.0.1 Refer to <i>dSPACE CAN API Package</i> on page 105.
dSPACE ECU Flash Programming Tool	2.2.6	2.3	2.3.1	2.3.2 Refer to <i>dSPACE ECU Flash Programming Tool</i> on page 107.
dSPACE FlexRay Configuration Package	3.6	3.7	3.8	3.9 Refer to <i>dSPACE FlexRay Configuration Package</i> on page 109.
dSPACE HIL API .NET	2.0	2.1	-	-
dSPACE Python Extensions	2.0	2.1	2.2	2.3 Refer to <i>dSPACE Python Extensions</i> on page 111.
dSPACE XIL API .NET	2015-B	2016-A	2016-B	2017-A Refer to <i>dSPACE XIL API .NET</i> on page 113.
ECU Interface Manager	1.7	1.8	2.0	2.1 Refer to <i>ECU Interface Manager</i> on page 115.
Firmware Manager	2.0	2.1	2.2	2.3 Refer to <i>Firmware Manager</i> on page 117.
Model Compare	2.6	2.6	2.7	2.7
ModelDesk	4.2	4.3	4.4	4.5 Refer to <i>ModelDesk</i> on page 119.
Model Interface Package for Simulink	3.1	3.2	3.3	3.4 Refer to <i>Model Interface Package for Simulink</i> on page 123.

Product	dSPACE Release			
	2015-B	2016-A	2016-B	2017-A
MotionDesk	3.7	3.8	3.9	4.0 Refer to <i>MotionDesk</i> on page 125.
MotionDesk Blockset	2.4	2.4.1	2.5	2.5.1 Refer to <i>MotionDesk</i> on page 125.
Real-Time Testing	2.6	3.0	3.1	3.2 Refer to <i>Real-Time Testing</i> on page 129.
RTI <sup>1)</sup>	7.5	7.6	7.7	7.8 Refer to <i>RTI/RTI-MP and RTLib</i> on page 131.
RTI-MP <sup>2)</sup>	7.5	7.6	7.7	7.8 Refer to <i>RTI/RTI-MP and RTLib</i> on page 131.
RTI Bypass Blockset	3.5	3.6	3.7	3.8 Refer to <i>RTI Bypass Blockset</i> on page 135.
RTI CAN Blockset	3.4.1	3.4.2	3.4.3	3.4.4
RTI CAN MultiMessage Blockset	4.2	4.3	4.4	4.5 Refer to <i>RTI CAN MultiMessage Blockset</i> on page 137.
RTI Electric Motor Control Blockset	1.2	1.3	1.3.1	1.4 Refer to <i>RTI Electric Motor Control Blockset</i> on page 139.
RTI Ethernet Blockset	1.2	1.2	1.2.1	1.2.2
RTI Ethernet (UDP) Blockset	1.4	1.4	1.4.1	1.4.2
RTI FPGA Programming Blockset	3.0	3.1	3.2	3.3 Refer to <i>RTI FPGA Programming Blockset</i> on page 141.
RTI LIN MultiMessage Blockset	2.5.1	2.6	2.7	2.8 Refer to <i>RTI LIN MultiMessage Blockset</i> on page 145.
RTI RapidPro Control Unit Blockset	2.2.1	2.2.1	2.2.2	2.2.2
RTI USB Flight Recorder Blockset	1.2	1.2	1.2.1	1.2.1



Product	dSPACE Release			
	2015-B	2016-A	2016-B	2017-A
RTI Watchdog Blockset	1.0	1.0	2.0	2.1 Refer to <i>RTI Watchdog Blockset</i> on page 147.
SCALEXIO firmware	3.3	3.4	3.5	3.6 Refer to <i>SCALEXIO Firmware</i> on page 149.
SYNECT server	1.4.1	1.4.1	1.4.1	-
SystemDesk	4.5	4.6	4.7	4.8 Refer to <i>SystemDesk</i> on page 151.
TargetLink/TargetLink Data Dictionary	4.1	4.1	4.2	4.2
Variable Editor	2.2	2.3	2.3 <sup>3)</sup>	2.3 <sup>3)</sup>
VEOS	3.5	3.6	3.7	4.0 Refer to <i>VEOS</i> on page 159.

<sup>1)</sup> Including the standard I/O blocksets.

<sup>2)</sup> Including the RTI Gigalink Blockset.

<sup>3)</sup> The Variable Editor is no longer part of the dSPACE Release DVD. It is available at <https://www.dspace.com/go/requestreleasedownload>.

If you have not updated regularly, refer to the *New Features and Migration* documents for the dSPACE Releases listed above for information about the new features and necessary migration steps.

## New Product Key Features

### Introduction

This is an overview of each product's new key features. For more information, refer to the product-specific sections.

### Information in this topic

*AutomationDesk* on page 26  
*Bus Manager (stand-alone)* on page 27  
*ConfigurationDesk (Configuration Version)* on page 27  
*ConfigurationDesk (Implementation Version)* on page 27  
*ControlDesk* on page 28  
*DCI Configuration Tool* on page 30  
*dSPACE CAN API Package* on page 30  
*dSPACE ECU Flash Programming Tool* on page 30  
*dSPACE XIL API* on page 30  
*ECU Interface Manager* on page 30  
*Firmware Manager* on page 31  
*ModelDesk* on page 31  
*MotionDesk* on page 31  
*Real-Time Testing* on page 31  
*RTI, RTI-MP, and RTLib* on page 32  
*RTI Bypass Blockset* on page 32  
*RTI CAN MultiMessage Blockset* on page 32  
*RTI Electric Motor Control Blockset* on page 32  
*RTI FPGA Programming Blockset* on page 32  
*RTI LIN MultiMessage Blockset* on page 33  
*RTI Watchdog Blockset* on page 33  
*SCALEXIO firmware* on page 33  
*SystemDesk* on page 33  
*VEOS* on page 33

### AutomationDesk

The new key features of AutomationDesk are:

- New data object in the Main library to create a data object providing a string-value mapping.
- New configuration dialogs in the XIL API Convenience library to edit error configurations.
- General options to control the inclusion of MDF results in a report.
- Support of hyperlinks in the Output window.
- Example for editing a custom edit dialog in Python using C#/.NET libraries.

- Support of the DS6001 Processor Board as a new platform.
- Support of remote access to VEOS as a platform.
- Enhancements to the COM API, such as accessing the dSPACE Log file.
- Refresh of the AutomationDesk Tutorial with new structures and demo projects.

For more information on the new features, refer to *New Features of AutomationDesk 5.4* on page 37.

---

#### **Bus Manager (stand-alone)**

The new key features of the Bus Manager (stand-alone) are:

- Inspecting bus communication of communication clusters independently from the involved ECUs
- Support of additional PDU types and end-to-end protection for ISignal groups
- Additional configurable communication matrix elements
- New bus configuration feature
- Mapping of model ports to bus configuration function ports via table views

For more information, refer to *Features of the Bus Manager (Stand-Alone) 5.7* on page 73.

---

#### **ConfigurationDesk (Configuration Version)**

The new key feature of ConfigurationDesk is:

- User documentation is now available as dSPACE Help in a new help format.

---

#### **ConfigurationDesk (Implementation Version)**

The new key features of ConfigurationDesk are:

- Support of new SCALEXIO hardware: DS6001 Processor Board, DS6221 A/D Board, DS6331-PE Ethernet Board, and DS6332-CS Ethernet Board.
- Various enhancements of the Bus Manager for configuring bus communication for simulation and inspection purposes.
- Support of new FPGA application types.
- Updating the ECU Interface Container (EIC) files of ECU Interface Configuration function blocks in ConfigurationDesk.

For more information, refer to *ConfigurationDesk – Implementation Version* on page 78.

### ControlDesk

The new key features of ControlDesk 6.1 are:

#### General enhancements

- SCALEXIO platform: DS6001 support
- VEOS platform: Remote simulation support

For more information on the new features, refer to *New General Features (ControlDesk 6.1)* on page 86.

#### Platform/device enhancements

- Improved CAN FD support
- Improved selection of CAN/LIN channels of SCALEXIO and VEOS
- CCP, XCP and DCI-GSI2 devices: Measurement and recording of maps and curves in event rasters
- XIL API MAPort platform: Disabling/enabling timer synchronization

For more information on the new features, refer to *New Features of Platform Management and Platforms/Devices (ControlDesk 6.1)* on page 87.

#### Variable management enhancements

- Visualization of parameters tagged as INITONLY in TRC/SDF files
- Combined filters in the Filter list
- Multiscaling tables: subscaling information
- Structs, struct arrays: struct-specific information

For more information on the new features, refer to *New Variable Management Features (ControlDesk 6.1)* on page 88.

#### Layouting enhancement

- Enhanced Instrument Navigator

For more information on the new features, refer to *New Layouting Features (ControlDesk 6.1)* on page 89.

#### Instrument enhancements

- Time Plotter, Index Plotter: Scroll bar

For more information on the new features, refer to *New Instrument Features (ControlDesk 6.1)* on page 90.

#### Measurement and recording enhancements

- Disabling/Enabling variable observation
- Adding reduction data to MF4 files
- Enabling the time cursor even during a running measurement
- No loss of recording data in offline simulations executed at maximum speed

For more information on the new features, refer to *New Measurement and Recording Features (ControlDesk 6.1)* on page 92.

#### **Data set management enhancements**

- Import of CDFX 2.1 files
- Adding parameters to a sub data set
- Removing parameters from a sub data set
- Importing data sets with the same name
- Grouping data sets

For more information on the new features, refer to *New Data Set Management Features (ControlDesk 6.1)* on page 91.

#### **Bus Navigator enhancements**

- Improved CAN FD support for VEOS
- Monitoring: Displaying bus statistics
- Monitoring: Time cursor support
- Support for bus communication inspection
- Bus Instrument (TX Type for CAN/LIN, TX Status Type for CAN/LIN): Enabling IPDU transmission
- Support of IPDU containers

For more information on the new features, refer to *New Bus Navigator Features (ControlDesk 6.1)* on page 93.

#### **Electrical error simulation (failure simulation) enhancements**

- Support of the DS5390 High Current FIU
- Lock scrolling

For more information on the new features, refer to *New Electrical Error Simulation Features (ControlDesk 6.1)* on page 96.

#### **Signal Editor enhancements**

- Enhanced graphical user interface:
  - New Signal Editor ribbon
  - Visualization of signal description sets
- More export formats supported
- Defining conditions more comfortably
- Data File segment: Support of stop trigger

For more information on the new features, refer to *New Signal Editor Features (ControlDesk 6.1)* on page 97.

### Further enhancements

- Searching items in the Properties controlbar
- New tutorial videos

For more information on the new features, refer to *Further Enhancements with ControlDesk (ControlDesk 6.1)* on page 98.

---

### DCI Configuration Tool

The new key feature of the DCI Configuration Tool is:

- Improved A2L file adaptation

For more information on the new feature, refer to *New Features of the DCI Configuration Tool 3.7.1* on page 103.

---

### dSPACE CAN API Package

The new key features of the dSPACE CAN API Package are:

- Support of Vector Informatik's VN5610A (dSPACE CAN API 2.0 only)
- Support of CAN bus statistics (dSPACE CAN API 2.0 only)
- Detection of the CAN FD mode (dSPACE CAN API 2.0 only)

For more information on the new features, refer to *New Features of dSPACE CAN API Package 3.0.1* on page 105.

---

### dSPACE ECU Flash Programming Tool

The new key features of the dSPACE ECU Flash Programming Tool are:

- Support of more CAN interfaces
- XCP connect mode
- Sequence numbers for erasing and programming physical memory segments

For more information on the new feature, refer to *New Features of the dSPACE ECU Flash Programming Tool 2.3.2* on page 107.

---

### dSPACE XIL API

The new key feature of dSPACE XIL API is:

- XIL API MAPort now supports the DS6001 Processor Board.
- XIL API EESPort now supports further FIU boards used with, e.g., dSPACE Simulator Mid-Size.

For more information on the new features, refer to *New Features of dSPACE XIL API .NET 2017-A* on page 113.

---

### ECU Interface Manager

The new key feature of the ECU Interface Manager is:

- Support of ECU interfacing with SCALEXIO systems, including the new DS6001 Processor Board

For more information on the new features, refer to *New Features of ECU Interface Manager 2.1* on page 115.

---

**Firmware Manager**

The new key features of the Firmware Manager are:

- Support of the DS6001 Processor Board as a new platform.
- User documentation is now available as dSPACE Help in a new help format.

For more information on the new feature, refer to *New Features of Firmware Manager 2.3* on page 117.

---

**ModelDesk**

The new key features of ModelDesk are:

- ModelDesk's user interface is more intuitive: Its menu bar and toolbars have been replaced by ribbons and the Backstage view used in ControlDesk, Microsoft Office, etc.
- Support of the DS6001 Processor Board as a new platform.
- Support of remote access to VEOS as a platform.
- Import of OpenDRIVE files improved.
- Alias support: Defining and managing alias names for scalar maneuver and traffic scenario parameters for easier access.
- Tool automation of the Road Generator is completed.

For more information on the new features, refer to *New Features of ModelDesk 4.5* on page 119.

---

**MotionDesk**

The new key features of MotionDesk are:

- MotionDesk's user interface is more intuitive: Its menu bar and toolbars have been replaced by ribbons and the Backstage view used in ControlDesk, Microsoft Office, etc.
- Support of the DS6001 Processor Board as a new platform.
- Support of remote access to VEOS as platform.
- Several camera sensors supported.
- Several laser sensors supported.
- Visualization of shadows improved.

For more information on the new features, refer to *New Features of MotionDesk 4.0* on page 125.

---

**Real-Time Testing**

The new key features of Real-Time Testing are:

- Support of the DS6001 Processor Board as a new platform.
- Support of remote access to VEOS as a platform.

- The `rttlib.canapilib` module supports CAN FD messages for VEOS.
- The `rttlib.datastream` module supports files in the ASAM MDF format (ASAM Common MDF Version 4.1, file extension: MF4).

For more information on the new features, refer to *New Features of Real-Time Testing 3.2* on page 129.

---

### RTI, RTI-MP, and RTLib

The new key feature of RTI, RTI-MP, and RTLib is:

- Support of MATLAB R2017a

For more information on the new feature, refer to *New Features of RTI/RTI-MP and RTLib* on page 131.

---

### RTI Bypass Blockset

The new key feature of the RTI Bypass Blockset is:

- Support of Function block for on-target bypassing with TargetLink

For more information on the new features, refer to *New Features of the RTI Bypass Blockset 3.8* on page 135.

---

### RTI CAN MultiMessage Blockset

The new key feature of the RTI CAN MultiMessage Blockset is:

- Support of the DS6001 Processor Board as a new platform.

For more information on the new features, refer to *New Features of the RTI CAN MultiMessage Blockset 4.5* on page 137.

---

### RTI Electric Motor Control Blockset

The new key features of the RTI Electric Motor Control Blockset are:

- Configurable minimum encoder speed to be measured.
- Simultaneous enabling of all digital outputs when using multichannel and block-commutated PWM signal generation.
- Position-independent signal generation when using block-commutated PWM signal generation.

For more information on the new features, refer to *New Features of RTI Electric Motor Control Blockset 1.4* on page 139.

---

### RTI FPGA Programming Blockset

The new key features of the RTI FPGA Programming Blockset are:

- Extended Xilinx® software support.
- Enhancements to the FPGA frameworks for the DS2655 FPGA Base Board and I/O modules.
- Enhancements to the FPGA framework for MicroLabBox.

For more information on the new features, refer to *New Features of the RTI FPGA Programming Blockset 3.3* on page 141.



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**RTI LIN MultiMessage Blockset**

The new key feature of the RTI LIN MultiMessage Blockset is:

- Support of the DS6001 Processor Board as a new platform.

For more information on the new features, refer to *New Features of the RTI LIN MultiMessage Blockset 2.8* on page 145.

---

**RTI Watchdog Blockset**

The new key feature of the RTI Watchdog Blockset is:

- Enhancement by the Memory Integrity and Extras blockset.

For more information on the new feature, refer to *Features of RTI Watchdog Blockset 2.1* on page 147.

---

**SCALEXIO firmware**

The new key features of the SCALEXIO firmware are:

- Support of the DS6001 Processor Board
- Support of the DS6221 A/D Board
- Support of the DS6331-PE Ethernet Board
- Support of the DS6332-CS Ethernet Board

For more information on the new features, refer to *New Features of the SCALEXIO Firmware 4.0* on page 149.

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**SystemDesk**

The new key features of SystemDesk 4.8 are:

- Support of AUTOSAR 4.3.0
- Support for port interface mappings to connect software component ports
- A wizard now lets you connect software components of a composition by port name or interface type
- Support of the digital I/O driver and port driver basic software modules for generating V-ECUs
- SystemDesk's ECU configuration framework now lets you configure code-based V-ECUs
- User documentation is now available as dSPACE Help in a new help format.

For more information on the new features, refer to *New General Features* on page 152.

---

**VEOS**

The new key features of VEOS are:

- Running an offline simulation on a remote simulator
- Support of blocking communication
- CAN FD support

- No loss of recording data in offline simulations executed at maximum speed

For more information on the new features, refer to *New Features of VEOS 4.0* on page 159.

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# Aspects of Migrating from Previous Releases

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## Introduction

After you install products of the current dSPACE Release, some additional steps might be necessary. The migration steps required when you are updating from the last dSPACE Release are described in the product-specific migration topics in this document. If you are updating from an earlier dSPACE Release, refer to the related *New Features and Migration* document.

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## Migrating to dSPACE Release 2017-A

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### Introduction

After you install Release 2017-A, some additional steps might be necessary.

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### Migrating from dSPACE Release 2016-B

**Product-specific migration steps** Product-specific migration steps are usually performed automatically by the products. For exceptions, refer to the product-specific migration descriptions.

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### Migrating from dSPACE Release 2016-A or earlier

To migrate from dSPACE Release 2016-A or earlier to Release 2017-A, you also have to perform the migration steps of the intervening dSPACE Releases. All of the required migration steps can be performed with Release 2017-A installed.

For more information on the required migration steps, refer to the *New Features and Migration* documents of the intervening dSPACE Releases.

### Previous release documents

The PDF files of previous Releases are called `NewFeaturesAndMigrationxx.pdf`, where `xx` stands for the Release number.

You can find the *New Features and Migration* files for previous Releases at the following locations:

- In the installation folder of the current dSPACE HelpDesk. Refer to `C:\Program Files\Common Files\dSPACE\HelpDesk 2017-A\Print\PreviousReleases`.
- On the dSPACE DVDs. Refer to `\Doc\Print\PreviousReleases`.
- At [www.dspace.com/go/migration](http://www.dspace.com/go/migration) for download. Here, you can also find *New Features and Migration* documents for very early Releases.

# AutomationDesk

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## Where to go from here

Information in this section

<i>New Features of AutomationDesk 5.4</i>	37
<i>Migrating to AutomationDesk 5.4</i>	39

## New Features of AutomationDesk 5.4

---

### Information in this topic

<i>General enhancements</i> on page 37
<i>Enhanced platform support</i> on page 38
<i>Improved user documentation</i> on page 38
<i>Usability improvements</i> on page 37
<i>Enhancements to the libraries</i> on page 38
<i>Main Library</i> on page 38
<i>Signal-Based Testing library</i> on page 39
<i>XIL API Convenience library</i> on page 39
<i>Enhancements to the COM API</i> on page 39

---

### General enhancements

#### Usability improvements

- The Options dialog has been updated and enhanced by the following library-specific settings:
  - Add MDF data when using XIL API Convenience plot blocks
  - Add MDF data when using Signal-Based Testing

Both settings let you configure the handling of MDF data to decrease the amount of data to be handled and increase the performance of AutomationDesk.

- Enhanced output
  - For outputs that you generate via Print blocks or the related `print` statements in Exec blocks, you can specify the font color.
  - Outputs generated by AutomationDesk also use the color configuration, e.g., to categorize messages.
  - Error messages in the Output Viewer now provide hyperlinks to the automation blocks that caused the errors.
- Enhanced hyperlink handling
  - In addition to the generated hyperlinks in the Output Viewer, you can now access a hyperlink via the `_INFO_` namespace.
  - You can also specify hyperlinks in Print or Exec blocks to be displayed in the Output Viewer.
- There is now an example that shows you several possibilities for customizing the Edit dialog of a data object. The Python script uses CLR (Common Language Runtime) to access C#.NET libraries in Python.

**Enhanced platform support** AutomationDesk supports the new platforms that are introduced with dSPACE Release 2017-A:

- Support of the DS6001 Processor Board as a new platform.
 

The DS6001 is a SCALEXIO processor board that can be integrated in a SCALEXIO LabBox with an on-board IOCNET infrastructure (IOCNET Link board and router), an Ethernet-based host, and I/O interface.
- Support of remote access to VEOS as a platform.

**Improved user documentation** The *AutomationDesk Tutorial* has been updated to represent changed software concepts and features from the earlier versions also in the user documentation. The demo projects and the sequences to be created have been restructured and modified to show use cases that are more practice-oriented than before.

---

## Enhancements to the libraries

The following libraries have been enhanced:

**Main Library** The Main Library now provides a new data object:

- LabeledValue

This data object is used to provide a mapping with string-value pairs. You can specify a descriptive string for the related value and

use this to parameterize your automation blocks. For example, instead of parameterizing with 0 or 1, you can create a LabeledValue data object with the string-value pairs `Ignition_On:1` and `Ignition_Off:0`. Then you can parameterize the referencing data object in an automation block via `Ignition_On` or `Ignition_Off`.

For more information, refer to *Main Library* ([AutomationDesk Library Reference](#)).

**XIL API Convenience library** The XIL API Convenience library provides new configuration dialogs:

- **SinglePinErrorConfiguration dialog**

This dialog is used to graphically edit the error configuration for a `PrepareSinglePinErrorWithCondition` block or a `PrepareSinglePinErrorWithDuration` block.

- **MultiPinErrorConfiguration dialog**

This dialog is used to graphically edit the error configuration for a `PrepareMultiPinErrorWithCondition` block or a `PrepareMultiPinErrorWithDuration` block.

For more information, refer to *XIL API Convenience* ([AutomationDesk Library Reference](#)).

**Signal-Based Testing library** The time tag information is now available in the MDF file as bookmarks. This simplifies the analysis of measured data, e.g., in ControlDesk.

For more information, refer to *Signal-Based Testing Library* ([AutomationDesk Library Reference](#)).

---

#### Enhancements to the COM API

The AutomationDesk COM API provides the following enhancements:

- Handling of the dSPACE Log.
- Handling of hyperlinks.

For more information, refer to [AutomationDesk API Reference](#).

## Migrating to AutomationDesk 5.4

### General migration aspects

If you open an AutomationDesk project with a later AutomationDesk version, the software automatically detects whether a migration is necessary. Click OK in the message dialog to start the migration. If you also want to continue working with the old project, you should

not overwrite it with the migrated project, because the versions are not downward compatible. Save the migrated project to another path or name.

### Note

Before you open an older project with the new AutomationDesk version, make sure that the following preconditions are fulfilled:

- You must create backups of the project and of the linked custom libraries.
- AutomationDesk must be running properly. The Log Viewer must not display any error messages.
- The built-in libraries, required custom libraries and other packages must be loaded correctly.
- To import an older project to a new AutomationDesk version, the exported project or custom library must be available in ZIP format. The automatic migration does not support the XML format.

If you are using a version control system, there are some preconditions for successful migration, refer to *How to Migrate Projects Under Version Control* ([📖 AutomationDesk Guide](#)).

For more information, refer to *Migrating AutomationDesk* ([📖 AutomationDesk Guide](#)).



# Automotive Simulation Models (ASM)

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## Where to go from here

### Information in this section

<i>All ASM Blocksets</i>	43
<i>ASM Base InCylinder Blockset</i>	44
<i>ASM Brake Hydraulics Blockset</i>	45
<i>ASM Diesel Engine Blockset</i>	47
<i>ASM Diesel Exhaust Blockset</i>	50
<i>ASM Diesel InCylinder Blockset</i>	52
<i>ASM Drivetrain Basic Blockset</i>	53
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Information in other sections

*Migrating ASM Models* ( *ASM User Guide*)

Provides general information on the migration of ASM models.

# All ASM Blocksets

## New Features of All ASM Blocksets

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### ASM demo models

The standard platform in the model startup go files has been changed from *RTI* platforms to *SCALEXIO*.

As a consequence, if you use RTI platforms (e.g., DS1005, DS1006), you need to start the model with `go('platform', 'RTI')` before starting code generation to choose proper compiler options.

If you use *SCALEXIO*, you can use the model right away to trigger the code generation from ConfigurationDesk.

You can find further information on the input arguments of the go file and the model startup procedure in the corresponding file header and the tutorials in the ASM Model Descriptions.

# ASM Base InCylinder Blockset

## New Features of ASM Base InCylinder Blockset 2.3.1

---

### **START\_STOP**

The engine soft ECU has been extended with a start-stop system soft ECU. It can be used to simulate the basic functionality of a start-stop system. To activate the system, you have to set the corresponding switch in the block.

# ASM Brake Hydraulics Blockset

## Where to go from here

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<i>Changes in the ASM Brake Hydraulics Demo Model</i>	46
<i>Migrating to ASM Brake Hydraulics Blockset 2.0</i>	46

## New Features of ASM Brake Hydraulics Blockset 2.0

### **EXPECTED\_VEHICLE\_BEHAVIOR**

This block is new in the Soft ECU ESP subsystem. It simulates a vehicle bicycle model to calculate the expected yaw rate.

### **SLIP\_CURRENT**

This block is new in the Soft ECU ESP subsystem. It calculates the current slip and velocities of each wheel.

### **TORQUE\_REQUEST\_ESP**

This block is new in the Soft ECU ESP subsystem. It sets a torque request for the engine ECU during an ESP or ASR intervention.

### **PUMP\_CONTROLLER**

This block is new in the Soft ECU ESP subsystem. It controls the hydraulic pump and the precharge and change-over valves of the brake hydraulics.

### **SLIP\_CONTROLLER**

This block is new in the Soft ECU ESP subsystem. It determines the reference slip for each wheel. These values and the current slip are used to control the inlet and outlet valves of the brake hydraulics. The controller supports ABS, ESP and ASR interventions.

### **BRAKING\_CIRCUIT\_BASIC\_CTRL**

This block is new. It simulates the wheel brake cylinder pressure of each wheel depending on the inlet and outlet valve control signals and the master brake cylinder pressure. The brake pressure dynamics are based on a first-order time delay model approach.

## Changes in the ASM Brake Hydraulics Demo Model

---

### Soft ECU Brake

The dSPACE ASM Brake Hydraulics Library contains two new Soft ECU Brake demo models.

The *basic* demo includes only the Desired Brake Pressure model to calculate a desired master brake cylinder pressure from a braking torque request. A brake torque request is sent from ACC or hybrid ECUs, for example.

The *advanced* demo can be used for simulating an ESP ECU system that improves the vehicle's stability with an electronic stability program (ESP) including an anti-lock braking (ABS) and an anti-slip (ASR) functionality. The Desired Brake Pressure component to calculate a desired master brake cylinder pressure from a braking torque request is also included.

## Migrating to ASM Brake Hydraulics Blockset 2.0

---

### BRAKING\_CIRCUIT\_BASIC

Dummy inports have been added to the block for compatibility with the BRAKING\_CIRCUIT\_BASIC\_CTRL block. The functionality was not changed.

---

### SOFT\_ECU\_BRAKE

The SOFT\_ECU\_BRAKE block was renamed DESIRED\_BRAKE\_PRESSURE. The functionality did not change.

# ASM Diesel Engine Blockset

---

## Where to go from here

Information in this section

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<i>Changes in the ASM Diesel Engine Demo Model</i>	48
<i>Migrating to ASM Diesel Engine Blockset 2.5</i>	48

## New Features of ASM Diesel Engine Blockset 2.5

---

### PUMP\_TORQUE

There is a new `Trq_Mean_Pump[Nm]` output for the simulation of the mean pump torque of the engine, which is basically the torque of the gas exchange. The output is used to calculate the mean effective engine torque.

To avoid the oscillations in the calculation of the cylinder pressure during the compression/expansion, the pressure of the intake manifold (`p_InMan[Pa]` inport) is held constant during the compression/expansion.

---

### LP\_EXHAUST\_MANIFOLD

This is a new component in the low-pressure EGR demo model. The block is modeled as a container to calculate the temperature and pressure before the low-pressure EGR system. For detailed information on the demo model of the low-pressure EGR, refer to *How to Work with the LP EGR Demo Model* ([\[1\]](#) *ASM Diesel Engine Model Description*).

---

### EXHAUSTTHROTTLE

The modeling of the block was changed. It is implemented as a standard ASM throttle, which calculates the mass flow rate. A former version of the block was created: `EXHAUSTTHROTTLE_4_0`.

---

### LP\_EGR\_VALVE

The implementation (revert direction) of the `return[0|1]` signal has been modified. It is `1` (reverse flow direction) if `p_Out_LPEGR[Pa]` is greater than `p_In_LPEGR[Pa]`. Before the modification, the logic was converse.

**START\_STOP**

The engine soft ECU has been extended with a start-stop system soft ECU. It can be used to simulate the basic functionality of a start-stop system. To activate the system, you have to set the corresponding switch in the block.

## Changes in the ASM Diesel Engine Demo Model

**Mean effective engine torque**

The mean pump torque of the engine (Trq\_Mean\_Pump[Nm] output) of the PUMP\_TORQUE block is used to calculate the mean effective engine torque. In previous Releases, the current, i.e., the time-dependent pump torque was used to calculate the mean effective engine torque.

**Truck variant**

The truck variant of the Engine Diesel demo model, including the SAE turbo model, has been parameterized with the new measurements.

**Low-pressure EGR**

The demo model of the low-pressure EGR has new inports and outports:

- Inports: p\_Ambient[Pa], Ctrl\_ExhThrottle[0\_1] and mdot\_Out\_DPF[kg/s]
- Outports: mdot\_ExhThrottle[kg/s], T\_LPExhMan[K] and T\_LPExhMan[K]

The mdot\_HPEGR[kg/h] and mdot\_Out\_Engine[kg/h] inports have been removed.

**Start-stop system soft ECU**

The engine soft ECU has been extended with a start-stop system. The system shuts down and restarts the engine automatically and can control vehicles equipped with manual as well as automatic transmissions. The dashboard layout in the ControlDesk project has been extended to show the start-stop system status.

## Migrating to ASM Diesel Engine Blockset 2.5

**COMBUSTION\_TORQUE\_CI**

The size of the Map\_eta\_lambda parameter increased from [12, 1] to [13, 1].



<b>PUMP_TORQUE</b>	The original labels (Trq_MeanPump_Engine[Nm], Trq_MeanPump_Cyl[Nm]) in the ASMSignalBus were restored and the new Trq_Mean_PumpTorque[Nm] was terminated.
<b>EXHAUSTTHROTTLE</b>	During migration, the library link of the block changes to its former version: EXHAUSTTHROTTLE_4_0. For the new features, use the new version of the EXHAUSTTHROTTLE block together with the LP_EXHAUST_MANIFOLD block.
<b>LP_EGR_VALVE</b>	The logic of the return[0 1] output is inverted by means of the NOT block.

# ASM Diesel Exhaust Blockset

## Where to go from here

Information in this section

<i>New Features of ASM Diesel Exhaust Blockset 2.1.4</i>	50
<i>Changes in the ASM Diesel Exhaust Demo Model</i>	50
<i>Migrating to ASM Diesel Exhaust Blockset 2.1.4</i>	51

## New Features of ASM Diesel Exhaust Blockset 2.1.4

### ADBLUE\_PUMP

The block has been improved regarding the switching of flow direction and (heater) temperature calculation. Several outputs of the temperature have been discontinued.

The block has two new outputs to simulate the temperature and mass flow downstream of the AdBlue pump:

- `mdot_Out_AdBluePump[kg/s]`
- `T_Out_AdBluePump[K]`

A former version of the block has been created: `ADBLUE_PUMP_10_0`

## Changes in the ASM Diesel Exhaust Demo Model

### Non-air SCR demo

The mass flow of the pressure regulation valve and the vent valve is set to 0 and the temperature to 293 K.

### Exhaust system

The demo model of the exhaust system has new outputs and inports:

- Output: `mdot_Out_DPF[kg/s]`
- Inports: `mdot_Muffler[kg/s]` and `T_In_Muffler[K]` (`T_In_SCR[K]` for the SCR variant)

## Migrating to ASM Diesel Exhaust Blockset 2.1.4

---

**DIESEL\_OXIDATION\_**  
**CATALYST**

A UnitDelay of the T\_Out\_Turb[K] inport inside the block has been removed. To keep the same functionality after migration, a UnitDelay block with the same initial condition is placed before the DIESEL\_OXIDATION\_CATALYST block. The initial value of the T\_Out\_DOC[K] integrator is set by a new parameter: Const\_T\_Out\_DOC\_Init. In previous Releases, this initial value was set by the removed UnitDelay.

---

**PUMP\_HOSE**

The block has new parameters:

- Map\_Factor\_AdBlue\_Damper
- Map\_Factor\_AdBlue\_InjValve

---

**ADBLUE\_PUMP**

During migration, the library link of the block changes to its former version: ADBLUE\_PUMP\_10\_0. For the new features, use the ADBLUE\_PUMP block from the ASM Diesel Exhaust Library.

# ASM Diesel InCylinder Blockset

## Changes in the ASM Diesel InCylinder Demo Model

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### **Start-stop system soft ECU**

The engine soft ECU has been extended with a start-stop system. The system shuts down and restarts the engine automatically and can control vehicles equipped with manual as well as automatic transmissions. The dashboard layout in the ControlDesk project has been extended to show the start-stop system status.

# ASM Drivetrain Basic Blockset

## Where to go from here

Information in this section

<i>New Features of ASM Drivetrain Basic Blockset 4.3.1</i>	53
<i>Migrating to ASM Drivetrain Basic Blockset 4.3.1</i>	53

## New Features of ASM Drivetrain Basic Blockset 4.3.1

### ASM Driver

The driver is now able to automatically drive backwards with manual transmission. In case of a negative reference velocity course, it controls the clutch and the gear to follow it.

Moreover, the driver can now be used for the simulation with a start-stop system.

## Migrating to ASM Drivetrain Basic Blockset 4.3.1

### GEAR\_SHIFTER

A new inport for the start-stop system status has been added to the block: `State_StartStop[1Off|2NotReady|3Ready|4EngStopped]`. During migration, this inport is connected to a Constant block.

### LONGITUDINAL\_CONTROL

A new inport for the start-stop system status has been added to the block: `State_StartStop[1Off|2NotReady|3Ready|4EngStopped]`. During migration, this inport is connected to a Constant block.

### LONGITUDINAL\_CONTROLLER\_HYBRID

The block has new inports:

- `Pos_AccPedal_Maneuver[%]`
- `Pos_BrakePedal_Maneuver[%]`
- `AccBr_Mode[1Stim|2Driver]`

These inports are used to keep the driver inactive during stimulus maneuvers. Moreover, they enable a gentle pedal transition when switching between stimulus and driver maneuvers.

During migration, these inports are connected to Constant blocks.

# ASM Electric Components Blockset

## Where to go from here

Information in this section

<i>New Features of ASM Electric Components Blockset 3.4</i>	54
<i>Migrating to ASM Electric Components Blockset 3.4</i>	54

## New Features of ASM Electric Components Blockset 3.4

<b>SUPERCAPACITOR</b>	This block is new. It describes a simplified model of a supercapacitor.
<b>ASM_EC_ROUTING</b>	This block is new. It can change the phase order for three-phase systems.
<b>SIGNALS_ROUTING</b>	This block is new. It can change the order of the input signals.
<b>DUTYCYCLES_ROUTING</b>	This block is new. It can change the order of the input duty cycles according to the input type.

## Migrating to ASM Electric Components Blockset 3.4

<b>BATTERY_THERMAL</b>	Heat generation according to the chemical battery main reaction and the loss reaction, e.g., gassing effects, must be calculated for each cell of the battery pack. For this, a multiplication of these two thermal powers with the number of cells was added.
<b>BATTERY</b>	Heat generation according to the chemical battery main reaction and the loss reaction, e.g., gassing effects, must be calculated for each cell of the battery pack. For this, a multiplication of these two thermal powers with the number of cells was added.
<b>BATTERY_MULTICELL</b>	Heat generation according to the chemical battery main reaction and the loss reaction, e.g., gassing effects, must be calculated for each cell of the battery pack. For this, a multiplication of these two thermal powers with the number of cells was added.

These changes affect only the thermal mode battery mean temperature. If the temperature is simulated for each individual cell, the thermal main reaction and power loss reaction has been simulated correctly.

---

**THREE\_PHASE\_DCM\_  
INVERTER**

An initial condition for the sample time and a simple inverter function for debugging purposes have been added to the block.

---

**LIGHTING\_SYSTEM**

A new parameter and a new inport for turn signals have been added to the block.

# ASM Environment Blockset

## Where to go from here

Information in this section

<i>New Features of ASM Environment Blockset 4.6</i>	56
<i>Migrating to ASM Environment Blockset 4.6</i>	56

## New Features of ASM Environment Blockset 4.6

### ASM Driver

The driver is now able to automatically drive backwards with manual transmission. In case of a negative reference velocity course, it controls the clutch and the gear to follow it.

Moreover, the driver can now be used for the simulation with a start-stop system.

### ASM Road

The lane sensor now provides additional information about the direct and oncoming preferred lanes.

## Migrating to ASM Environment Blockset 4.6

### GEAR\_SHIFTER

A new inport for the start-stop system status has been added: `State_StartStop[1Off|2NotReady|3Ready|4EngStopped]`. During migration, this inport is connected to a Constant block.

### LONGITUDINAL\_ CONTROLLER\_HYBRID

Three new inports have been added to the block:

- `Pos_AccPedal_Maneuver[%]`
- `Pos_BrakePedal_Maneuver[%]`
- `AccBr_Mode[1Stim|2Driver]`

These inports are used to keep the driver inactive during stimulus maneuvers. Moreover, they enable a gentle pedal transition when switching between stimulus and driver maneuvers.

During migration, these inports are connected to Constant blocks.



---

**ASM Road**

The signal bus of the LaneSensor outport has been extended by two new signals for the preferred lanes in the direct and oncoming direction.

# ASM Gasoline Engine Basic Blockset

## Where to go from here

Information in this section

<i>New Features of ASM Gasoline Engine Basic Blockset 2.1.1</i>	58
<i>Changes in the ASM Engine Gasoline Basic Demo Model</i>	58

## New Features of ASM Gasoline Engine Basic Blockset 2.1.1

### START\_STOP

The engine soft ECU has been extended with a start-stop system soft ECU. It can be used to simulate the basic functionality of a start-stop system. To activate the system, you have to set the corresponding switch in the block.

### REL\_AIRMASS\_MAPBASED

A calculation and an output for mass flow into the engine have been added. The actual mass flow into the engine might differ from the mass flow through the throttle valve. Using the mass flow through the throttle valve as the mass flow into the engine causes a wrong injection calculation at transient operation points and produces oscillations on fixed operation points.

## Changes in the ASM Engine Gasoline Basic Demo Model

### Start-stop system soft ECU

The engine soft ECU has been extended with a start-stop system. The system shuts down and restarts the engine automatically and can control vehicles equipped with manual as well as automatic transmissions. The dashboard layout in the ControlDesk project has been extended to show the start-stop system status.

### PORTINJECTOR

Division by zero in the signal bus during the calculation of  $q_{\text{Mean\_Inj}}[\text{mm}^3/\text{cyc}]$  is now avoided.

# ASM Gasoline Engine Blockset

---

## Where to go from here

Information in this section

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<i>Changes in the ASM Engine Gasoline Demo Model</i>	59

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## New Features of ASM Gasoline Engine Blockset 3.5

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### START\_STOP

The engine soft ECU has been extended with a start-stop system soft ECU. It can be used to simulate the basic functionality of a start-stop system. To activate the system, you have to set the corresponding switch in the block.

---

### REL\_AIRMASS\_MAPBASED

A calculation and an output for mass flow into the engine have been added. The actual mass flow into the engine might differ from the mass flow through the throttle valve. Using the mass flow through the throttle valve as the mass flow into the engine causes a wrong injection calculation at transient operation points and produces oscillations on fixed operation points.

---

## Changes in the ASM Engine Gasoline Demo Model

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### Start-stop system soft ECU

The engine soft ECU has been extended with a start-stop system. The system shuts down and restarts the engine automatically and can control vehicles equipped with manual as well as automatic transmissions. The dashboard layout in the ControlDesk project has been extended to show the start-stop system status.

---

### PORTINJECTOR

Division by zero in the signal bus during the calculation of  $q\_Mean\_Inj[mm3/cyc]$  is now avoided.

# ASM Gasoline InCylinder Blockset

## Changes in the ASM Gasoline InCylinder Demo Model

---

### **Start-stop system soft ECU**

The engine soft ECU has been extended with a start-stop system. The system shuts down and restarts the engine automatically and can control vehicles equipped with manual as well as automatic transmissions. The dashboard layout in the ControlDesk project has been extended to show the start-stop system status.

# ASMPParameterization

## Discontinuation of ASMPParameterization

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### Discontinuation for Release 2017-B

As of dSPACE Release 2017-B, ASMPParameterization is no longer supported.

The parameterization functionalities of ASMPParameterization have been included in ModelDesk Processing since Release 2014-B. Consequently, the parameterization projects for mean value engine models have been implemented in ModelDesk in Release 2014-B and for InCylinder models in Release 2015-A. Projects starting with these Releases or later should use only the corresponding demo projects in ModelDesk for engine model parameterizations. You should use ModelDesk as the engine parameterization tool to benefit from new parameterization features.

To transfer the model parameters to a ModelDesk project, you can use the `ImportMDLFromWorkspace` processing function. The function is provided together with the engine demo projects and imports the MATLAB workspace to the active parameter set.

For more information on the ModelDesk processing functionalities, refer to *Basics of Processing* ([📖 ModelDesk Processing](#)).

For a detailed description of implementing and using customer-specific processing functions, refer to *ModelDesk Processing* ([📖 ASM User Guide](#)).

# ASM Traffic Blockset

## Where to go from here

Information in this section

<i>New Features of ASM Traffic Blockset 3.6</i>	62
<i>Changes in the ASM Traffic Demo Model</i>	62
<i>Migrating to ASM Traffic Blockset 3.6</i>	63

## New Features of ASM Traffic Blockset 3.6

### SOFT\_ECU\_ACC

The internal table parameter of the dynamic acceleration limit and an acceleration rate of the velocity controller are now available.

A vehicle acceleration limitation was added to the traffic fellow acceleration for low velocities and fellow distances (stop and go).

### Final drive assembly subsystem

All the delivered final drive assembly subsystems were merged into one subsystem. Therefore, to switch between different drivetrain configurations, only the relevant option has to be set in ModelDesk and no Simulink subsystems need to be exchanged anymore.

### OBJECT\_SENSOR\_2D\_CALCULATION

The block was extended with the sensor detection mode sector. This mode allows the detection of free scope zone sectors of a 2-D sensor instance. Detection mode and scope zone properties are parameterized with the OBJECT\_SENSOR\_2D\_PARAMETERS block.

## Changes in the ASM Traffic Demo Model

### Drivetrain stabilization

The drivetrain stabilization has been revised and a new concept for the information exchange between the ASM blocks and the stabilization has been introduced. The previous stabilization blocks were changed to former versions and new blocks have been added. The new concept offers a unified and modular interface for the information exchange with the stabilization. In addition, it introduces

the possibility to delete the stabilization and thus facilitates the integration of third-party models.

---

**Object\_Sensor\_2D subsystem**      The block now simulates a scheduled sensor chain consisting of seven sensor instances. Each sensor instance can be individually parameterized regarding mounting position, orientation, scope zone, sensor detection mode, and scheduling parameters.

## Migrating to ASM Traffic Blockset 3.6

---

**TARGET\_SELECTION\_ACC**      A yaw rate correction for the standstill condition has been added for the fellow inline check.

---

**OBJECT\_SENSOR\_2D\_GEOMETRY\_PARAMETERS**      The block has a new `Sensor_Detection_Mode[1Ray|2Sector]` output. During migration, the output is connected with a Terminator block.

---

**OBJECT\_SENSOR\_2D\_PARAMETERS**      The block has a new `Sensor_Detection_Mode[1Ray|2Sector]` output. During migration, the output is connected with a Terminator block.

---

**SENSOR\_SCHEDULER**      The block has a new `SensorIndex_All[]` output. During migration, the output is connected with a Terminator block.

---

**OBJECT\_SENSOR\_2D\_CALCULATION**      The block has a new `Sensor_Calculation_Ctrl[]` inport. During migration, the inport is connected with a Constant block with the value [1 1].

    The block has a new `SensorIndex_All[]` inport. During migration, the inport is connected with a Constant block with the value [1].

---

**OBJECT\_SENSOR\_2D**      The block has a new `Sensor_Calculation_Ctrl[]` inport. During migration, the inport is connected with a Constant block with the value [1 1].

    The block has a new `SensorIndex_All[]` inport. During migration, the inport is connected with a Constant block with the value [1].

# ASM Trailer Blockset

## Where to go from here

Information in this section

<i>New Features of ASM Trailer Blockset 2.6.1</i>	64
<i>Changes in the ASM Trailer Demo Model</i>	64
<i>Migrating to ASM Trailer Blockset 2.6.1</i>	64

## New Features of ASM Trailer Blockset 2.6.1

### Final drive assembly subsystem

All the delivered final drive assembly subsystems were merged into one subsystem. Therefore, to switch between different drivetrain configurations, only the relevant option has to be set in ModelDesk and no Simulink subsystems need to be exchanged anymore.

## Changes in the ASM Trailer Demo Model

### Drivetrain stabilization

The drivetrain stabilization has been revised and a new concept for the information exchange between the ASM blocks and the stabilization has been introduced. The previous stabilization blocks were changed to former versions and new blocks have been added. The new concept offers a unified and modular interface for the information exchange with the stabilization. In addition, it introduces the possibility to delete the stabilization and thus facilitates the integration of third-party models.

## Migrating to ASM Trailer Blockset 2.6.1

### SUSPENSION\_FORCE\_ KINEMATICS\_TRAILER\_ REAR\_\*\*\*

Two signals have been added to the ASMSignalBus: AxleLoad\_Left and AxleLoad\_Right.



# ASM Truck Blockset

## Where to go from here

Information in this section

<i>New Features of ASM Truck Blockset 3.0.1</i>	65
<i>Changes in the ASM Truck Demo Model</i>	65
<i>Migrating to ASM Truck Blockset 3.0.1</i>	66

## New Features of ASM Truck Blockset 3.0.1

### Modular axle simulation

The Drivetrain subsystem has been revised and restructured to introduce modular axle simulation. With the new approach, the model can be easily extended with further axles. It is also possible to set any axle to be driven or undriven. Each axle can now be configured using the new `VehicleDynamics/Switches/VEHICLE_AXLE_SWITCH` block.

The block describes the following axle parameters:

- Axle existence
- Driven axle state

These parameters can be set using ModelDesk.

## Changes in the ASM Truck Demo Model

### Drivetrain

The 6x6 Drivetrain subsystem has been revised and restructured. It is now easier to extend the model with further axles. You can now also set any axle to *on/off* or *driven/undriven* state.

## Migrating to ASM Truck Blockset 3.0.1

---

**SUSPENSION\_FORCE\_  
KINEMATICS\_\*\*\***

Two signals have been added to the ASMSignalBus: AxleLoad\_Left and AxleLoad\_Right.

# ASM Turbocharger Blockset

---

## Where to go from here

Information in this section

<i>New Features of ASM Turbocharger Blockset 3.2</i>	67
<i>Changes in the ASM Turbocharger Demo Model</i>	67
<i>Migrating to ASM Turbocharger Blockset 3.2</i>	68

## New Features of ASM Turbocharger Blockset 3.2

---

### COMPRESSOR

A continuous bypass valve has been added to the block. It allows for a compressor pressure ratio lower than 1 to simulate zero rotational speed behavior.

A PT1 constant for output pressure and temperature has been added for parameterization in ModelDesk.

---

### COMPRESSOR\_HP

A continuous bypass valve has been added to the block. It allows for a compressor pressure ratio lower than 1 to simulate zero rotational speed behavior.

A PT1 constant for output pressure and temperature has been added for parameterization in ModelDesk.

---

### POS\_DISPL\_COMPRESSOR

This new compressor block has been added to the library for modeling all types of positive displacement supercharger compressors.

## Changes in the ASM Turbocharger Demo Model

---

### TURBINE

The TURBINE block has been merged with the TURBINE\_SAE block to allow switching between a larger variety of parameterization approaches without the need to change the Simulink model and the ModelDesk parameterization. Inside the block, enabled subsystems have been introduced, so the turnaround time does not increase, because only the active calculation approach is used.

## Migrating to ASM Turbocharger Blockset 3.2

---

**TURBINE\_SAEJ922**                      The block is moved to the Former versions sublibrary.

---

**COMPRESSOR**                              The block is moved to the Former versions sublibrary.

---

**COMPRESSOR\_HP**                        The block is moved to the Former versions sublibrary.

# ASM Vehicle Dynamics Blockset

---

## Where to go from here

Information in this section

<i>New Features of ASM Vehicle Dynamics Blockset 3.5</i>	69
<i>Changes in the ASM Vehicle Dynamics Demo Model</i>	69
<i>Migrating to ASM Vehicle Dynamics Blockset 3.5</i>	70

## New Features of ASM Vehicle Dynamics Blockset 3.5

---

### Final drive assembly subsystem

All the delivered final drive assembly subsystems were merged into one subsystem. Therefore, to switch between different drivetrain configurations, only the relevant option has to be set in ModelDesk and no Simulink subsystems need to be exchanged anymore.

---

### Import of magic formula "\*.tir" file to ModelDesk

To import the magic formula (MF) \*.tir file to ModelDesk XML, a script is available: `asm_vd_tire_import_mf.m`.

## Changes in the ASM Vehicle Dynamics Demo Model

---

### Drivetrain stabilization

The drivetrain stabilization has been revised and a new concept for the information exchange between the ASM blocks and the stabilization has been introduced. The previous stabilization blocks were changed to former versions and new blocks have been added. The new concept offers a unified and modular interface for the information exchange with the stabilization. In addition, it introduces the possibility to delete the stabilization and thus facilitates the integration of third-party models.

The new concept has been built with the following new library blocks:

- DRIVETRAIN\_STABILIZATION
- FROM\_STABILIZATION
- TO\_STABILIZATION

- FROM\_ASM
- TO\_ASM

## Migrating to ASM Vehicle Dynamics Blockset 3.5

### New drivetrain stabilization

Due to the new structure of the drivetrain stabilization, some blocks cannot be automatically migrated. Therefore, during migration, the links to the blocks are changed to the former versions.

The following blocks are affected:

- STABILIZATION\_4\_0
- STABILIZATION\_FF\_FF4WD\_2\_0
- STABILIZATION\_TO\_TRANSMISSION\_2\_0
- TRANSMISSION\_TO\_STABILIZATION\_3\_0

### DIFFERENTIAL blocks

New inports and outports have been added: FROM\_STABILIZATION[] and TO\_STABILIZATION[]. These ports represent the connection with the drivetrain stabilization. During migration, these ports are connected with the corresponding Goto and From blocks.

### GEARBOX blocks

The Stabilisation\_Out output has been renamed TO\_STABILIZATION[] for unification purposes.

### CLUTCH and LOCKUP\_CLUTCH

The Stabilisation\_Out output has been renamed TO\_STABILIZATION[] for unification purposes.

The omega\_dt\_Clutch[rad/s] inport has been renamed FROM\_STABILIZATION[] for unification purposes.

### CLUTCH\_4WD

New inports and outports have been added: FROM\_STABILIZATION[] and TO\_STABILIZATION[]. During migration, these ports are connected with the corresponding Goto and From blocks.

### CRANK\_SHAFT

New inports and outports have been added: FROM\_STABILIZATION[] and TO\_STABILIZATION[]. During migration, these ports are connected with the corresponding Goto and From blocks.

### CRANK\_SHAFT\_RIGID

The CopyFcn callback has been removed from the block. This does not cause any functional change in the block itself.

<b>TORQUE_CONVERTER</b>	The Stabilisation_Out output has been renamed TO_STABILIZATION[] for unification purposes.
<b>TRANSFER_GEARBOX</b>	New inports and outports have been added: FROM_STABILIZATION[] and TO_STABILIZATION[]. During migration, these ports are connected with the corresponding Goto and From blocks.
<b>SHAFT Blocks</b>	New inports and outports have been added: FROM_STABILIZATION[] and TO_STABILIZATION[]. During migration, these ports are connected with the corresponding Goto and From blocks.
<b>FRONT_DIFFERENTIAL_RIGID</b>	The SW_DrivetrainMode[1 2 3] inport has been renamed Sw_Axle_Driven[0Undriven 1Driven]. During migration, this change is compensated.
<b>REAR_DIFFERENTIAL_RIGID</b>	The SW_DrivetrainMode[1 2 3] inport has been renamed Sw_Axle_Driven[0Undriven 1Driven]. During migration, this change is compensated.
<b>CENTRAL_DIFFERENTIAL_RIGID</b>	The SW_DrivetrainMode[1 2 3] inport has been renamed Sw_DiffMode[1FrontRear 2Front 3Rear]. This does not cause any functional change in the block itself.
<b>STEERING_3DOF_VARIABLE_RATIO</b>	All the Memory blocks have been replaced with MemoryWithReset blocks.  Resets have been added to all triggered subsystems in the friction elements to reset the friction elements with global resets.
<b>VEHICLE_MOVEMENT_INFO_CAR</b>	The vehicle side slip angle calculation is set to 0 if the vehicle velocity is low.
<b>SUSPENSION_FORCE_KINEMATICS_***</b>	Two signals have been added to the ASMSignalBus: AxleLoad_Left and AxleLoad_Right.





# Bus Manager (Stand-Alone)

---

## Where to go from here

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<i>Migrating to Bus Manager (Stand-Alone) 5.7</i>	75

---

## Features of the Bus Manager (Stand-Alone) 5.7

---

### Inspecting bus communication

The Bus Manager now lets you inspect the bus communication of communication clusters. You can inspect the bus communication independently from the involved ECUs and for each cluster and channel separately. To configure bus communication for inspection purposes, bus configurations provide a new Inspection part. You can assign communication matrix elements to this bus configuration part and configure the bus communication to be inspected independently from the bus communication to be simulated. For more information, refer to *Basics on Bus Configurations* ([📖 Bus Manager \(Stand-Alone\) Implementation Guide](#)).

Inspecting bus communication requires an additional license. For more information, refer to *Basics on Licenses for Working with the Bus Manager (Stand-Alone)* ([📖 Bus Manager \(Stand-Alone\) Implementation Guide](#)).

---

### New supported PDU types

The Bus Manager now supports additional PDU types, such as container IPDUs, network management PDUs, diagnostic PDUs, and service PDUs. For container IPDUs, the Bus Manager provides a new Bus Container IPDU element type. The other additionally supported

PDU types are treated as PDUs of APPLICATION type. Such PDUs can be accessed via the Bus ISignal IPDU element type in the ConfigurationDesk application. For more information, refer to *Supported PDU Types and Signal Data Types* (📖 *Bus Manager (Stand-Alone) Implementation Guide*).

---

### Support of end-to-end protected ISignal groups

The Bus Manager now supports end-to-end protection for ISignal groups according to the following AUTOSAR end-to-end protection profiles:

- Profile 01 (including the profile variants 1A, 1B, 1C)
- Profile 02
- Profile 05
- Profile 06

When the communication matrix defines end-to-end protection for an ISignal group, the Bus Manager can transmit the ISignal group, including the required end-to-end protection information, and receive the end-to-end protected ISignal group. For more information, refer to *Aspects of Supported AUTOSAR Features* (📖 *Bus Manager (Stand-Alone) Implementation Guide*).

---

### New configurable communication matrix elements

The Bus Manager now lets you configure further communication matrix elements. You can now configure:

- The baud rate and data phase baud rate (only CAN FD) of communication clusters.
- The initial value, length, coded base data type, and physical base data type of ISignals.

The specified settings apply to the affected element and all its instances in the active ConfigurationDesk application. For more information, refer to *Specifying User-Defined Settings for Communication Matrix Elements* (📖 *Bus Manager (Stand-Alone) Implementation Guide*).

---

### New bus configuration feature

The Bus Manager now provides the IPDU Enable bus configuration feature. When you add this feature to a TX IPDU of a bus configuration, you can enable and disable the transmission of the IPDU for the affected ECU during run time. For more information, refer to *Working with Bus Configuration Features* (📖 *Bus Manager (Stand-Alone) Implementation Guide*).

---

### Mapping model ports to bus configuration function ports via table views

The Bus Manager now lets you map model ports to bus configuration function ports via bus configuration table views. For example, you can drag a model port from the Model Browser to a function port in the

Bus Configuration Function Ports table view to map the ports. Various filter options in the browser and the table views can support you when you map the ports.

## Migrating to Bus Manager (Stand-Alone) 5.7

---

### **Changes in the tool automation interface**

There are changes in the tool automation interface. Some of these changes affect the data model and can cause code from previous Releases to malfunction. For details, refer to *Changes to the Automation Interface for Release 2017-A* ([📖 ConfigurationDesk Automating Tool Handling](#)).



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# ConfigurationDesk

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## **Two variants for different use scenarios**

ConfigurationDesk is provided in two variants that are useful for different use scenarios. You can use ConfigurationDesk - Implementation Version to implement real-time applications. You can use ConfigurationDesk - Configuration Version to configure dSPACE RapidPro hardware.

# ConfigurationDesk – Implementation Version

## Where to go from here

Information in this section

<i>New Features of ConfigurationDesk 5.7 (Implementation Version)</i>	78
<i>Migrating to ConfigurationDesk 5.7</i>	84

## New Features of ConfigurationDesk 5.7 (Implementation Version)

### Enhancement of tasks

The Jitter and latency optimization task property can now be set to *Low jitter, low latency*. This setting lets you reduce jitter and latency if required. Before you configure a task as *Low jitter, low latency*, you should be familiar with the limitations of this feature. Refer to *Basics on Configuring Tasks* ([📖 ConfigurationDesk Real-Time Implementation Guide](#)).

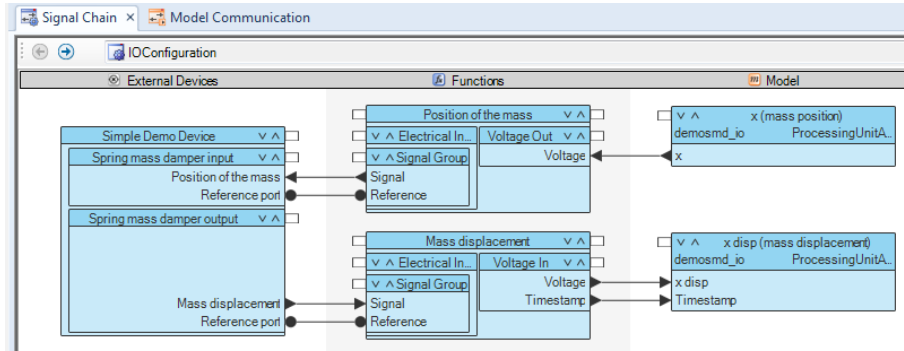
### Download to flash memory

ConfigurationDesk now lets you download the real-time application to the flash memory of a platform. This option is available for DS6001 Processor Boards. When you reboot the DS6001 Processor Board, the application is copied to the RAM and then started automatically. Refer to *Basics on Downloading Real-Time Applications* ([📖 ConfigurationDesk Real-Time Implementation Guide](#)).

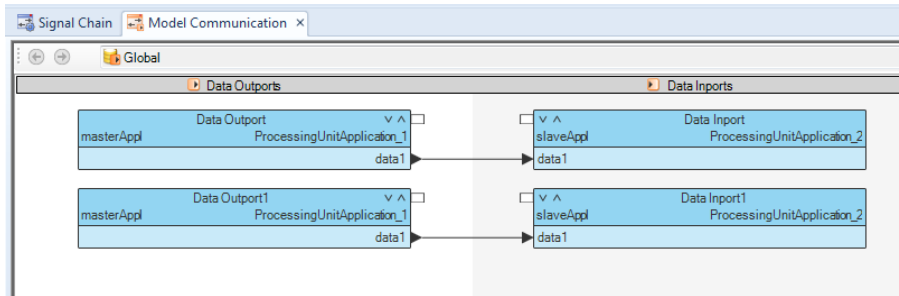
### New Signal Chain Browser and Model Communication Browser

The graphical display of signal chain elements (blocks, ports, mappings) is now shown in the Signal Chain Browser or the Model Communication Browser.

In the Signal Chain Browser, you can open and browse working views, such as the Global working view or user-defined working views.



The Model Communication Browser shows the Data Output and Data Input blocks from selected working views and the mapping lines between them.



For more information, refer to *Using Working Views to Handle a Signal Chain* ([ConfigurationDesk Real-Time Implementation Guide](#)).

**Improved structure of table views**

The structure of table views has been improved for a better overview:

- Subviews have been removed.
- Element hierarchies have been restructured.
- Properties are now available in the Properties Browser.

**New types of FPGA applications**

ConfigurationDesk now supports new types of FPGA applications for the following use cases:

- FPGA applications supporting multicore real-time applications
- FPGA applications supporting inter-FPGA communication

For more information, refer to *Types of FPGA Applications* ([📖 ConfigurationDesk I/O Function Implementation Guide](#)).

**New features of the V-ECU support**

**Supported V-ECU implementation container versions** The following table shows the tool versions that export supported V-ECU implementation containers, and the related container versions:

V-ECU Implementations Created With...	V-ECU Implementation Version
dSPACE Release 2017-A: ■ SystemDesk 4.8	2.5
dSPACE Release 2016-B: ■ SystemDesk 4.7 ■ TargetLink 4.2	2.4.1
dSPACE Release 2016-A: ■ SystemDesk 4.6	2.4
dSPACE Release 2015-B: ■ SystemDesk 4.5 ■ TargetLink 4.1	2.3

**New function block types**

**Trigger In** The Trigger In function block generates a trigger signal each time the external input signal matches the defined triggering conditions. The function block works as a provider: Other function blocks can use the generated trigger signal as a trigger source.

For more information, refer to *Trigger In* ([📖 ConfigurationDesk I/O Function Implementation Guide](#))

**Enhanced function block types**

**Voltage In** The Voltage In function block type now supports the following new features:

- The function block supports the Analog In 6 channel type, which is available on the DS6221 A/D Board.
- Now you can use a Trigger function as a trigger source. In this case, the measurement starts with an external trigger that is provided by a specific trigger function. This can be, for example, the Trigger In function block. Trigger function providers have their own defined trigger conditions.

For more information, refer to *Voltage In* ([📖 ConfigurationDesk I/O Function Implementation Guide](#)).


**Voltage Signal Capture** The Voltage Signal Capture function block type now supports the Analog In 6 channel type, which is available on the DS6221 A/D Board. In combination with this channel type:

- You can additionally use a new trigger source for capturing sequences:



Using the Trigger function trigger source, a sequence is started by an external trigger which is provided by a specific trigger function. This can be, for example, the Trigger In function block.


- You can specify a trigger source that is used to take samples. The Analog In 6 channel type supports the following sample trigger sources:
  - Time (free-running): Samples are taken equidistant at a fixed configurable sample period regardless whether a sequence is captured or not.
  - Time (sequence-aligned): Only if a sequence is captured, samples are taken equidistant at a fixed configurable sample period.
  - Angle: Samples are taken equidistant from an angle unit with a fixed configurable angle distance.
  - Trigger function: A sample is taken from an external signal via a specific trigger function, for example, the Trigger In function block.

For more information, refer to *Voltage Signal Capture* ( *ConfigurationDesk I/O Function Implementation Guide*).

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### New features of the ECU interfacing support

You can now update ECU interface container (EIC) files in the active ConfigurationDesk application. This allows you to easily adapt the ECU interfacing you implemented in the signal chain to a new version of the related ECU interface container. You can update the EIC file in each ECU Interface Configuration function block separately. If you do so, the function block's model interface, the I/O events, and the requirements regarding the ECU interface are derived from the new EIC file. Depending on the differences between the new and the old EIC file, existing function block elements (e.g., function ports) are updated or become obsolete and new elements are added to the function block.

For more information, refer to *Updating ECU Interface Containers in ConfigurationDesk Applications* ( *ConfigurationDesk Real-Time Implementation Guide*).

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### New features of the Bus Manager

**Inspecting bus communication** The Bus Manager now lets you inspect the bus communication of communication clusters. You can inspect the bus communication independently from the involved ECUs and for each cluster and channel separately. To configure bus communication for inspection purposes, bus configurations provide a new Inspection part. You can assign communication matrix elements to this bus configuration part and configure the bus communication

to be inspected independently from the bus communication to be simulated. For more information, refer to *Basics on Bus Configurations* ([📖 ConfigurationDesk Bus Manager Implementation Guide](#)).

Inspecting bus communication requires an additional license. For more information, refer to *Required Licenses* ([📖 ConfigurationDesk Real-Time Implementation Guide](#)).

**New supported PDU types** The Bus Manager now supports additional PDU types, such as container IPDUs, network management PDUs, diagnostic PDUs, and service PDUs. For container IPDUs, the Bus Manager provides a new *Bus Container IPDU* element type. The other additionally supported PDU types are treated as PDUs of *APPLICATION* type. Such PDUs can be accessed via the *Bus ISignal IPDU* element type in the ConfigurationDesk application. For more information, refer to *Supported PDU Types and Signal Data Types* ([📖 ConfigurationDesk Bus Manager Implementation Guide](#)).

**Support of end-to-end protected ISignal groups** The Bus Manager now supports end-to-end protection for ISignal groups according to the following AUTOSAR end-to-end protection profiles:

- Profile 01 (including the profile variants 1A, 1B, 1C)
- Profile 02
- Profile 05
- Profile 06

When the communication matrix defines end-to-end protection for an ISignal group, the Bus Manager can transmit the ISignal group including the required end-to-end protection information, and receive the end-to-end protected ISignal group. For more information, refer to *Aspects of Supported AUTOSAR Features* ([📖 ConfigurationDesk Bus Manager Implementation Guide](#)).

**New configurable communication matrix elements** The Bus Manager now lets you configure further communication matrix elements. You can now configure:

- The baud rate and data phase baud rate (only CAN FD) of communication clusters.
- The initial value, length, coded base data type, and physical base data type of ISignals.

The specified settings apply to the affected element and all its instances in the active ConfigurationDesk application. For more information, refer to *Specifying User-Defined Settings for*

*Communication Matrix Elements* ([📖 ConfigurationDesk Bus Manager Implementation Guide](#)).

**New bus configuration feature** The Bus Manager now provides the IPDU Enable bus configuration feature. When you add this feature to a TX IPDU of a bus configuration, you can enable and disable the transmission of the IPDU for the affected ECU during run time. For more information, refer to *Working with Bus Configuration Features* ([📖 ConfigurationDesk Bus Manager Implementation Guide](#)).

**Automatic assignment of bus accesses** The Bus Manager now lets you assign bus accesses to all the bus access requests of the active ConfigurationDesk application via one command. In this case, the Bus Manager adds new bus function blocks (CAN, LIN) to the application or uses already available bus function blocks and assigns them to the bus access requests automatically. For more information, refer to *Specifying the Hardware Access* ([📖 ConfigurationDesk Bus Manager Implementation Guide](#)).

**Mapping model ports to bus configuration function ports via table views** The Bus Manager now lets you map model ports to bus configuration function ports via bus configuration table views. For example, you can drag a model port from the Model Browser to a function port in the Bus Configuration Function Ports table view to map the ports. Various filter options in the browser and the table views can support you when you map the ports.

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### New features concerning hardware support

ConfigurationDesk supports the following new SCALEXIO hardware:

- DS6001 Processor Board

The DS6001 is a SCALEXIO processor board that can be integrated in a SCALEXIO LabBox with an on-board IOCNET infrastructure (IOCNET Link board and router), an Ethernet-based host, and I/O interface.

- DS6221 A/D Board

The DS6221 A/D Board is a high-performance analog-to-digital converter board. It provides 16 differential A/D input channels and 8 digital trigger inputs.

- DS6331-PE Ethernet Board

The DS6331 is an Ethernet board for a SCALEXIO Real-Time PC and provides four Ethernet adapters.

- DS6332-CS Ethernet Board

The DS6332 is an Ethernet board for a SCALEXIO LabBox and provides one Ethernet adapter with four Ethernet connectors that are switched to one Ethernet controller.

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### New features of the tool automation interface

ConfigurationDesk's automation interface supports further features of ConfigurationDesk. For more information, refer to *Changes to the Automation Interface for Release 2017-A* ([📖 ConfigurationDesk Automating Tool Handling](#)).

## Migrating to ConfigurationDesk 5.7

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### Changes to the tool automation interface

Some changes to the tool automation interface affect the data model and can cause code from previous Releases to malfunction. For more information, refer to *Changes to the Automation Interface for Release 2017-A* ([📖 ConfigurationDesk Automating Tool Handling](#)).

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### Inconsistency with Ethernet adapters

When you migrate a project of dSPACE Release 2016-A or earlier, the migration process adds the Ethernet adapter of the SCALEXIO Real-Time PC to the hardware topologies of the migrated project. The default name of the added Ethernet adapter might not match the Ethernet adapter name of the accessible platforms. Therefore, the status bar shows the status "No matching platform connected". This status prevents the automatic download of the real-time application after the build. However, you can build the real-time application and manually download it to the hardware.

To resolve the inconsistency, specify an identical name for the Ethernet adapter of the SCALEXIO Real-Time PC in the Hardware Resource Browser and in the Platform Manager, e.g., by replacing the hardware topology.

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### Changes in TRC file for Bus Manager elements

The paths of Bus Manager elements in the TRC file have changed from ConfigurationDesk 5.6 to ConfigurationDesk 5.7. When you build a real-time application with ConfigurationDesk 5.7, you might have to adapt projects that use the generated TRC file (e.g., generate new instrument layouts in ControlDesk).

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### Discontinuation in ConfigurationDesk

**SYNECT server connection** As of dSPACE Release 2017-A, ConfigurationDesk can no longer connect to the SYNECT server. As a result, exchanging data, such as build results required for ControlDesk, with the SYNECT server is no longer possible.

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# ControlDesk

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**Where to go from here**

Information in this section

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# New Features of ControlDesk 6.1

## Where to go from here

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## New General Features (ControlDesk 6.1)

### SCALEXIO platform: DS6001 support

ControlDesk supports the new DS6001 Processor Board.

The DS6001 is a SCALEXIO processor board that can be integrated in a SCALEXIO LabBox with an on-board IOCNET infrastructure (IOCNET Link board and router), an Ethernet-based host, and I/O interface.

### VEOS platform: Remote simulation support

ControlDesk's VEOS platform supports offline simulations on remote simulators. ControlDesk lets you register remote simulators, i.e., VEOS installations on remote PCs in the local network. For instructions, refer to *How to Register a Platform* ( *ControlDesk Platform Management*).

## New Features of Platform Management and Platforms/Devices (ControlDesk 6.1)

### Improved CAN FD support

ControlDesk now supports CAN FD for:

- CAN channels of VEOS
- CAN channels of Vector CAN interfaces (only if the interface supports CAN FD)

For CAN channels that support CAN FD, ControlDesk's Interface Selection dialog displays whether the ISO CAN FD mode (compliant with the ISO 11898-1:2015 standard) or non-ISO CAN FD mode is used.

### Improved selection of CAN/LIN channels of SCALEXIO and VEOS

The selection of CAN/LIN channels of SCALEXIO and VEOS as bus interfaces is improved.

For instructions, refer to:

- *How to Configure a CAN Bus Monitoring Device* ([📖 ControlDesk Platform Management](#))
- *How to Configure a LIN Bus Monitoring Device* ([📖 ControlDesk Platform Management](#))
- *How to Configure an XCP on CAN Device* ([📖 ControlDesk Platform Management](#))
- *How to Configure a CCP Device* ([📖 ControlDesk Platform Management](#))

### CCP, XCP and DCI-GSI2 devices: Measurement and recording of maps and curves in event rasters

ControlDesk now supports measurement and recording of maps and curves in event rasters for the following devices:

- CCP
- XCP on CAN
- XCP on Ethernet
- XCP on FlexRay
- DCI-GSI2

Keep in mind that *event rasters* are represented by *time-based measurement rasters* in ControlDesk.

### XIL API MAPort platform: Disabling/enabling timer synchronization


ControlDesk now lets you disable or enable timer synchronization for the XIL API MAPort platform. If enabled, ControlDesk performs initial synchronization on measurement start. If disabled, initial

synchronization on measurement start is not performed and timer resynchronization is also disabled.

Refer to *General Settings Properties* ([ControlDesk Platform Management](#)).

## New Variable Management Features (ControlDesk 6.1)

### Visualization of parameters tagged as INITONLY in TRC/SDF files

If an SDF/TRC variable description contains parameters tagged as INITONLY, ControlDesk's Variable Browser now visualizes them by an added pin, for example: . The INITONLY flag is used, for example, to mark *fixed parameters* ([ControlDesk Introduction and Overview](#)) in SDF/TRC files based on Functional Mock-up Units (FMUs).

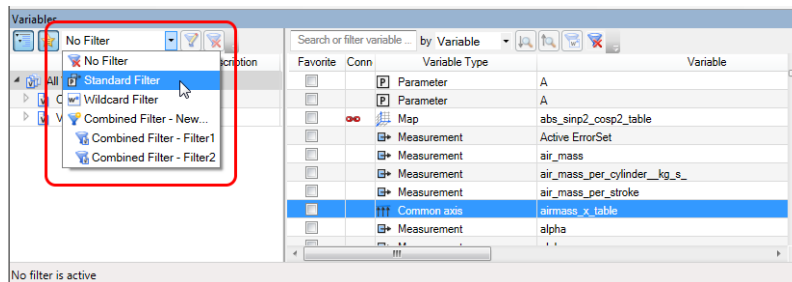
Refer to *Basics on Variable Types* ([ControlDesk Variable Management](#)).

### Combined filters in the Filter list

Via the Filter list of the Variable Browser, you can:

- Create new combined filters
- Select existing combined filters

The following illustration shows an example:



For instructions, refer to *How to Use the Function Buttons for Searching and Filtering Variables* ([ControlDesk Variable Management](#)).

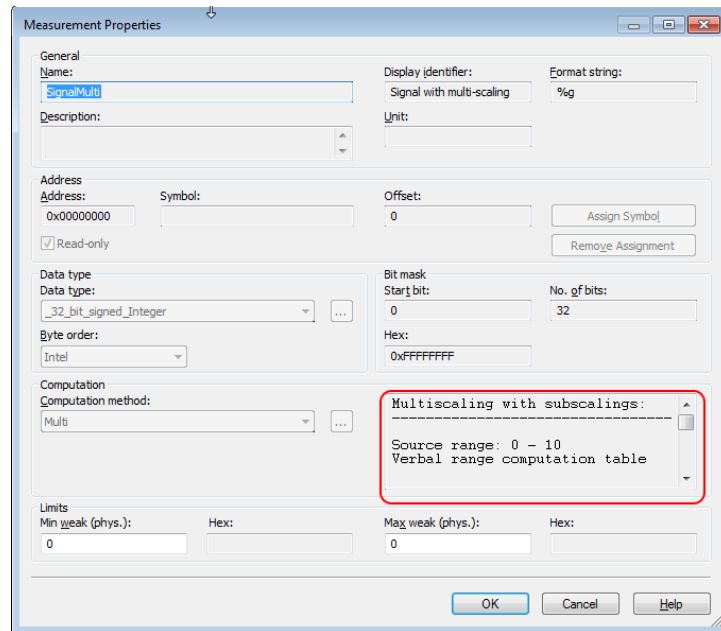
### Multiscaling tables: subscaling information

Some variable description files contain *multiscaling tables*. A multiscaling table maps numerical source values to different subscalings.

As of ControlDesk 6.1, the Properties dialog of a multiscaling table provides information on the subscalings.



The following illustration shows an example:



Refer to *Basics on Variables Using Conversion Tables* ([📖 ControlDesk Variable Management](#)).


### Structs, struct arrays: struct-specific information


As of ControlDesk 6.1, the Properties dialog of structs and struct arrays now also displays struct-specific information such as the struct dimensions.

Refer to *Variable Properties* ([📖 ControlDesk Variable Management](#)). For details on structs and struct arrays, refer to *Basics on Variable Types* ([📖 ControlDesk Variable Management](#)).


## New Layouting Features (ControlDesk 6.1)

### Enhanced Instrument Navigator

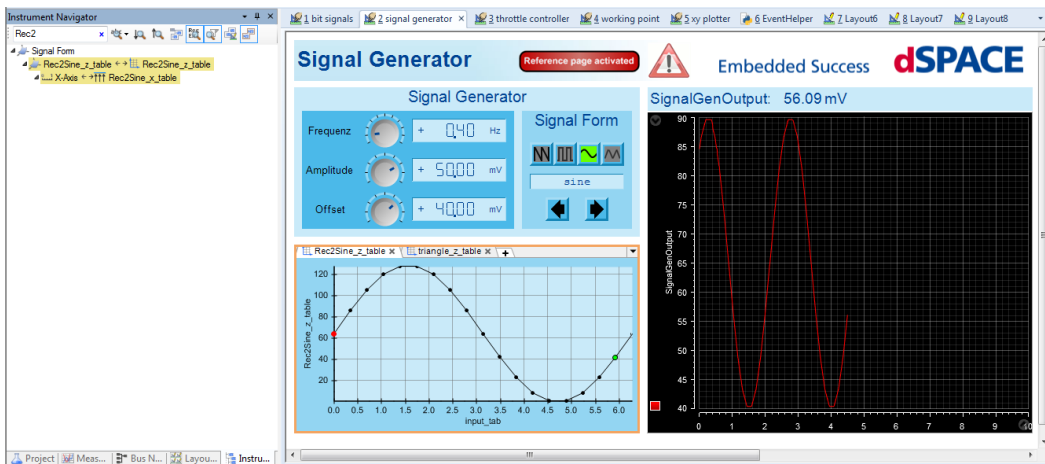
**Searching for instruments with invalid connections** The Instrument Navigator now provides the  function button, which lets you search for instruments with invalid connections. Refer to *Instrument Navigator* ([📖 ControlDesk Layouting](#)).

**Automatic layout scrolling** The Instrument Navigator now provides the  function button, which lets you enable automatic scrolling. If automatic scrolling is enabled, ControlDesk automatically scrolls the layout to the item that is selected in the Instrument Navigator if necessary.

Refer to *Instrument Navigator* ( *ControlDesk Layouting*).


**Highlighting search results in the layout** The Instrument Navigator now provides the  function button, which lets you enable the highlighting of search results in the layout.

The following illustration shows an example:



Refer to *Instrument Navigator* ( *ControlDesk Layouting*).

### Enhanced selection of multiple instruments on a layout

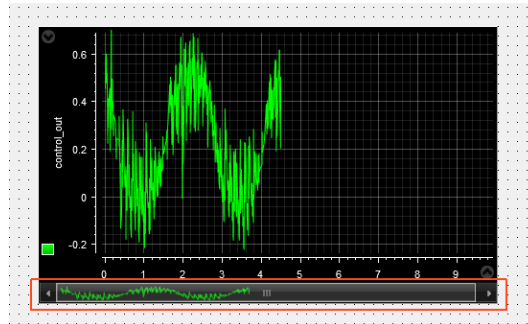
The selection of multiple instruments on a layout has been enhanced. Refer to *Selecting and Positioning Instruments on a Layout* ( *ControlDesk Layouting*).

## New Instrument Features (ControlDesk 6.1)

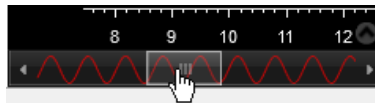
### Time Plotter, Index Plotter: Scroll bar

The Time Plotter and the Index Plotter now let you enable a scroll bar below the x-axis.

The following illustration shows the Time Plotter with the enabled scroll bar. The scroll bar shows a preview of the measured signal.



- The scroll bar lets you navigate through a measurement:



- The scroll bar lets you specify the zoom settings:



Refer to *Zooming and Moving the Chart (Time Plotter)* ([ControlDesk Instrument Handling](#)) and *Zooming and Moving the Chart (Index Plotter)* ([ControlDesk Instrument Handling](#)).

## New Data Set Management Features (ControlDesk 6.1)

### Import of CDFX 2.1 files

ControlDesk now lets you import CDFX 2.1 files.

Refer to *Import Data Set(s)* ([ControlDesk Calibration and Data Set Management](#)).

### Adding parameters to a sub data set

ControlDesk now lets you add parameters to a sub data set via drag & drop from the Variable Browser.

For instructions, refer to *How to Add or Remove Parameters to or from a Data Set* ([ControlDesk Calibration and Data Set Management](#)).

---

**Removing parameters from a sub data set**

ControlDesk now lets you remove parameters from a (sub) data set. For instructions, refer to *How to Add or Remove Parameters to or from a Data Set* ([📖 ControlDesk Calibration and Data Set Management](#)).

---

**Importing data sets with the same name**

ControlDesk now lets you import a data set even if it has the same name as one that is already available in the active experiment. In this case, you can either rename the data set to be imported or overwrite the data set in the experiment.

Refer to *Import Data Set(s)* ([📖 ControlDesk Calibration and Data Set Management](#)).

---

**Grouping data sets**

ControlDesk now lets you group data sets. Groups in a project are structuring elements that are only displayed in the project tree but not stored in the file system.

Refer to *Data Set Grouping* ([📖 ControlDesk Calibration and Data Set Management](#)).

## New Measurement and Recording Features (ControlDesk 6.1)

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**Disabling/Enabling variable observation**

ControlDesk now lets you disable or enable variable observation globally for all platforms and devices.

Refer to *Data Acquisition Page* ([📖 ControlDesk Measurement and Recording](#)).

---

**Adding reduction data to MF4 files**

ControlDesk's DSSIGCONV tool now lets you add *reduction data* to MF4 files.


Reduction data is additional content in an MF4 file that allows for visualizing the MF4 file data depending on the visualization resolution. Reduction data therefore improves the visualization and postprocessing of measurement data.

For instructions, refer to *How to Add Reduction Data to a Measurement Data File* ([📖 ControlDesk Measurement and Recording](#)).

---

**Enabling the time cursor even during a running measurement**

You can now enable the time cursor even if online calibration was started, and even during a running measurement.

Refer to *How to View Values at a Specific Point in Time (Time Cursor)* ( *ControlDesk Measurement and Recording*).

---

**No loss of recording data in offline simulations executed as fast as possible**

You can let VEOS execute offline simulations *as fast as possible* by specifying 0 as the offline simulation's real-time acceleration factor. If VEOS generates more simulation data than ControlDesk can sample, the simulation run is automatically decelerated accordingly to avoid the loss of simulation data.

## New Bus Navigator Features (ControlDesk 6.1)

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**Improved CAN FD support for VEOS**

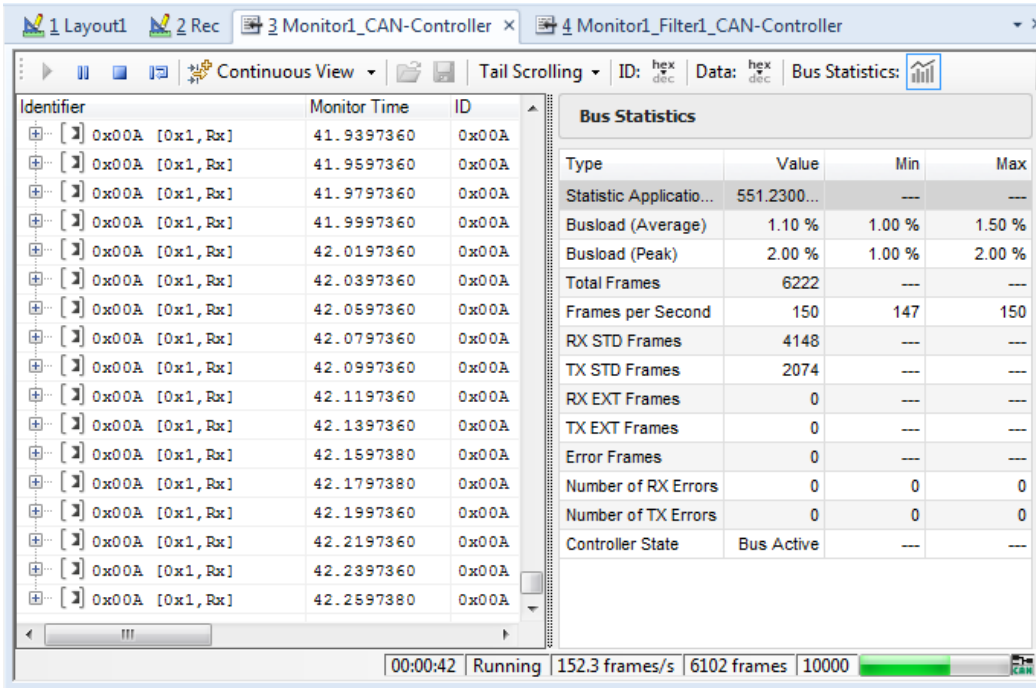
ControlDesk's Bus Navigator now supports CAN FD on VEOS. This includes:

- Layout generation
  - Bus monitoring and logging
- 

**Monitoring: Displaying bus statistics**

The **Monitoring List** now lets you enable the display of bus statistics during bus monitoring. Displaying bus statistics is possible for CAN and CAN FD in connection with CAN interfaces of a SCALEXIO system and VEOS.

The following illustration shows an example:

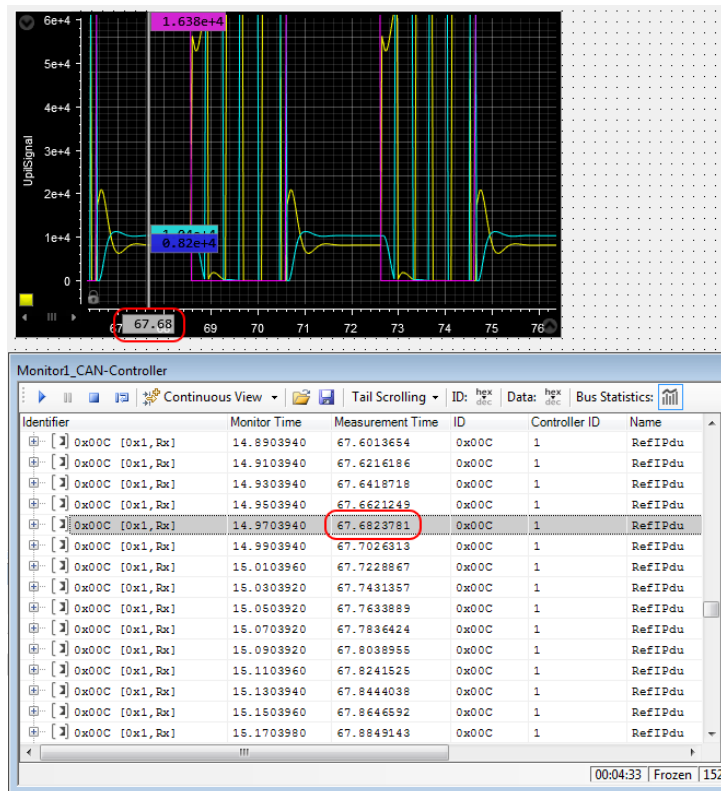


For details, refer to *How to Display Bus Statistics* ([ControlDesk Bus Navigator](#)).

### Monitoring: Time cursor support

ControlDesk's time cursor allows you to view variable values at a specific point in time. If enabled, it is visible at the same time position in different instruments, such as the Time Plotter.

ControlDesk's Monitoring List now also supports the time cursor: Depending on the time cursor position, the monitored value with the same measurement time is highlighted in the Monitoring List, as shown in the following illustration:



For instructions, refer to *How to View Values at a Specific Point in Time (Time Cursor)* ([ControlDesk Measurement and Recording](#)).

### Support for bus communication inspection

For bus communication modeled with the Bus Manager, ControlDesk now supports bus communication inspection. If configured in the bus configuration, you can inspect the bus communication of communication clusters independently from the involved ECUs and for each cluster and channel separately.

ControlDesk provides new Bus instruments for bus inspection.

For more information, refer to:

- *Bus Instrument (Inspection Type for CAN)* ([ControlDesk Bus Navigator](#))
- *Bus Instrument (Inspection Type for LIN)* ([ControlDesk Bus Navigator](#))

---

**Bus Instrument (TX Type for CAN/LIN, TX Status Type for CAN/LIN): Enabling IPDU transmission**

For bus communication modeled with the Bus Manager, ControlDesk now lets you enable or disable the transmission of the substitute value of an IPDU.

For more information, refer to:

- TX Type for CAN (refer to *Instrument elements (bus communication modeled with the Bus Manager)* ([📖 ControlDesk Bus Navigator](#)))
- TX Type for LIN (refer to *Instrument elements (bus communication modeled with the Bus Manager)* ([📖 ControlDesk Bus Navigator](#)))
- TX Status Type for CAN (refer to *Instrument elements (bus communication modeled with the Bus Manager)* ([📖 ControlDesk Bus Navigator](#)))
- TX Status Type for LIN (refer to *Bus Instrument (TX Status Type for LIN)* ([📖 ControlDesk Bus Navigator](#)))

---

**Support of IPDU containers**

For bus communication modeled with the Bus Manager, ControlDesk now supports IPDU containers.

## New Electrical Error Simulation Features (ControlDesk 6.1)

---

**Support of the DS5355/DS5390 high current FIU system**

ControlDesk now supports the *DS5355/DS5390 High Current FIU System* ([📖 dSPACE XIL API Implementation Guide](#)).

---

**Lock scrolling**

ControlDesk's working area is usually too small to display all the error sets of an error configuration. That is why ControlDesk scrolls the view to the currently active error set by default when you trigger errors. If you do not want ControlDesk to change the view automatically, you can now use the Lock Scrolling command to lock the error sets that are displayed. ControlDesk proceeds with the triggering, but the currently active error set is then outside the working area until you revoke the command.

Refer to *Lock Scrolling* ([📖 ControlDesk Electrical Error Simulation via XIL API EESPort](#)).



## New Signal Editor Features (ControlDesk 6.1)

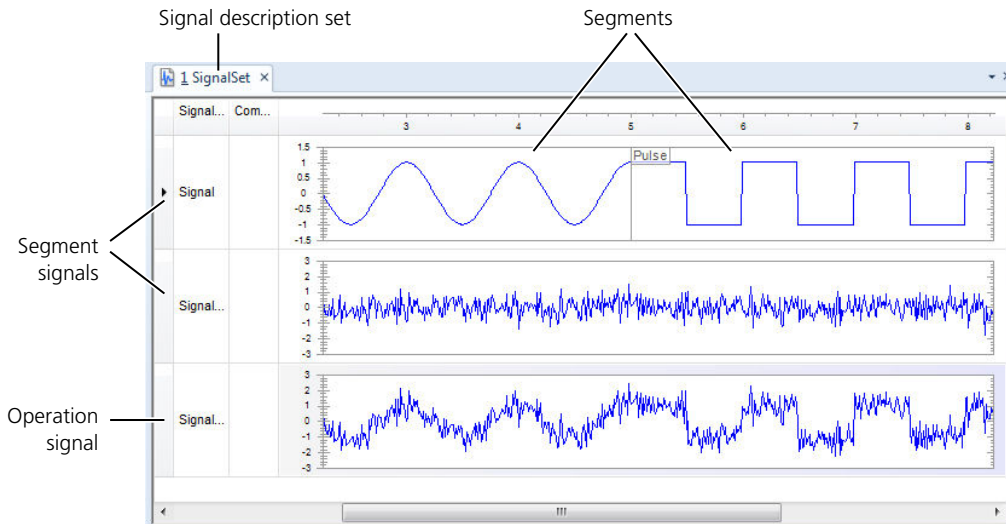
### Enhanced graphical user interface

**New Signal Editor ribbon** ControlDesk's graphical user interface now has the Signal Editor ribbon, providing quick access to the most important Signal Editor commands.



**Visualization of signal description sets** The visualization of signal description sets is improved.

The following illustration shows an example of an open signal description set and the elements it contains:



### More export formats supported

As of ControlDesk 6.1, you can export signal generators and signal description sets to the following file formats:

- CSV
- IDF
- MAT
- MF4
- STZ

Up to and including ControlDesk 6.0, export was possible only to the STZ and CSV file formats.

Refer to *Export/Export Generator* ( *ControlDesk Signal Editor*).

---

### **Defining conditions more comfortably**

When you define a condition to specify a segment's stop trigger, you can now use the **Value Editor**. The editor allows you to define a trigger condition in the ASAM General Expression Syntax (GES) as a string, and supports syntax checking.

Refer to *Value Editor – Condition* ( *ControlDesk Signal Editor*).

---

### **Data File segment: Support of stop trigger**

The Data File segment supports the definition of a stop trigger.

For more information on the segment and its properties, refer to *Data File (Segment)* ( *ControlDesk Signal Editor*).

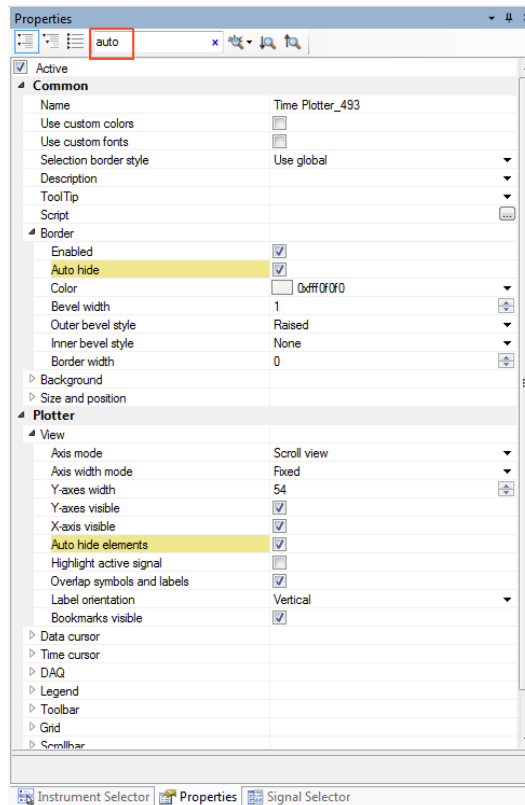
## **Further Enhancements with ControlDesk (ControlDesk 6.1)**

---

### **Searching items in the Properties controlbar**

ControlDesk's **Properties** controlbar now lets you search items by name and/or value. Search results are highlighted.

The following illustration shows an example:



Refer to *Properties (Controlbar)* ([ControlDesk User Interface Handling](#)).

### New tutorial videos

The dSPACE website provides new tutorial videos that show you how to handle the different plotter types. Refer to: [https://www.dspace.com/go/tutorial\\_cd\\_plotters](https://www.dspace.com/go/tutorial_cd_plotters)

# Migrating to ControlDesk 6.1

## Where to go from here

Information in this section

<i>Discontinuations in ControlDesk</i>	100
<i>Migrating to ControlDesk 6.1</i>	101

## Discontinuations in ControlDesk

### Information in this topic

*Discontinuations as of ControlDesk 6.1* on page 100

*PAR file import* on page 100

*SYNECT server connection* on page 100

*Discontinuations for ControlDesk as of dSPACE Release 2017-B*  
on page 100

*Global platforms/devices* on page 100

### Discontinuations as of ControlDesk 6.1

**PAR file import** As of version 6.1, ControlDesk no longer supports the import of PAR files created with ControlDesk 3.x.

**SYNECT server connection** As of version 6.1, ControlDesk can no longer connect to the SYNECT server. As a result, exchanging data, such as build results provided by ConfigurationDesk, with the SYNECT server is no longer possible.

### Discontinuations for ControlDesk as of dSPACE Release 2017-B

**Global platforms/devices** As of dSPACE Release 2017-B, you can no longer specify a platform/device as a *project-global platform/device*.

## Migrating to ControlDesk 6.1

### Introduction

To migrate from ControlDesk 6.0 to ControlDesk 6.1 and reuse existing experiments, you might have to carry out the following migration steps.

#### Note

To migrate to ControlDesk 6.1 from versions earlier than 6.0, you might also have to perform the migration steps of the intervening ControlDesk versions.

### Information in this topic

*Tool automation changes* on page 101

Change to the *SignalMappings* interface on page 101

Change to the *FlashDriveSize* property on page 102

Change to the *IPInterpreter* interface on page 102

*Migrating from prior ControlDesk versions* on page 102

### Tool automation changes

**Change to the SignalMappings interface** In ControlDesk 6.1, the return value of the `Variable` property of the `SignalGeneratorMapping / IXaSignalGeneratorMapping <<Interface>>` interface has been changed. Via the `Variable` property, you can get or set the variable mapped to a signal generator.

- As of ControlDesk 6.1, the `Variable` property returns the `Path` value for multiprocessor systems.

Up to and including ControlDesk 6.0, the `SPPath` value was returned for multiprocessor systems.

Unlike the `SPPath` value, the `Path` value represents the fully qualified connection string that can also be used in other dSPACE automation APIs.

- As of ControlDesk 6.1, the `Variable` property returns `None` for an unmapped symbol.

Up to and including ControlDesk 6.0, an empty string was returned for an unmapped symbol.

Refer to *SignalGeneratorMapping / IXaSignalGeneratorMapping <<Interface>>* ([📖 ControlDesk Automation](#)).

**Change to the FlashDriveSize property** As of ControlDesk 6.1, the `FlashDriveSize` property of the following interfaces has the *Long* type:

- `DS1007HardwareInformation / IPmDS1007HardwareInformation <<Interface>>`
- `DS1202HardwareInformation / IPmDS1202HardwareInformation <<Interface>>`
- `SCALEXIOHardwareInformation / IPmSCALEXIOHardwareInformation <<Interface>>`

Up to and including ControlDesk 6.0, the `FlashDriveSize` property of these interfaces had the *Signed 32 Bit Integer* type.

Refer to:

- `DS1007HardwareInformation / IPmDS1007HardwareInformation <<Interface>>` ([📖 ControlDesk Automation](#))
- `DS1202HardwareInformation / IPmDS1202HardwareInformation <<Interface>>` ([📖 ControlDesk Automation](#))
- `SCALEXIOHardwareInformation / IPmSCALEXIOHardwareInformation <<Interface>>` ([📖 ControlDesk Automation](#))

**Change to the IPiInterpreter interface** In ControlDesk 6.1, the `Macros` property of the `Interpreter / IPiInterpreter <<Interface>>` interface has been removed.

Refer to `Interpreter / IPiInterpreter <<Interface>>` ([📖 ControlDesk Automation](#)).

---

### Migrating from prior ControlDesk versions

To migrate from prior ControlDesk versions and reuse existing experiments, you might have to carry out additional migration steps. For more information on the migration steps, refer to *Migrating from Prior Versions of ControlDesk* ([📖 ControlDesk Introduction and Overview](#)).

---

### Related topics

Basics

- *Basics on Migrating from Prior Versions of ControlDesk* ([📖 ControlDesk Introduction and Overview](#))

---

# DCI Configuration Tool

## New Features of the DCI Configuration Tool 3.7.1

---

### Improved A2L file adaptation

The DCI Configuration Tool comes with improvements related to the adaptation of an existing A2L file for use with a DCI-GSI2. You can now specify whether to import calibration settings into the device configuration.

Refer to *A2L File Page* ([📄 DCI Configuration](#)).

---

### Firmware versions for DCI-GSI1 and DCI-GSI2 interfaces

The following firmware versions for the DCI-GSI1 and DCI-GSI2 interfaces are delivered with the DCI Configuration Tool 3.7.1:

- DCI-GSI1 firmware version 1.6.7p1
- DCI-GSI2 firmware version 1.4.7

#### Note

The firmware version delivered with the DCI Configuration Tool is not always the latest firmware version available. If you encounter problems, contact dSPACE Support to check if a later firmware version is available.





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# dSPACE CAN API Package

## New Features of dSPACE CAN API Package 3.0.1

---

### Support of Vector Informatik's VN5610A

The dSPACE CAN API 2.0 included in dSPACE CAN API Package 3.0.1 supports Vector Informatik's VN5610A.

---

### Support of CAN bus statistics

The dSPACE CAN API 2.0 supports CAN bus statistics. Refer to *DSCAN\_EnableBusStatistics* ([📄 dSPACE CAN API 2.0 C Reference](#)).

---

### Detection of the CAN FD mode

For CAN channels that support CAN FD, the dSPACE CAN API 2.0 lets you determine whether the ISO CAN FD mode (compliant with the ISO 11898-1:2015 standard) or non-ISO CAN FD mode is used. Refer to *CAN Channel Capabilities* ([📄 dSPACE CAN API 2.0 C Reference](#)).



# dSPACE ECU Flash Programming Tool

## New Features of the dSPACE ECU Flash Programming Tool 2.3.2

---

### Support of more CAN interfaces

The dSPACE ECU Flash Programming Tool supports dSPACE CAN API 2.0. This means that the dSPACE ECU Flash Programming Tool supports all those CAN interfaces that are supported by dSPACE CAN API 2.0. Thus, the dSPACE ECU Flash Programming Tool now supports Vector Informatik's VN5610A.

Refer to *Supported ECU Interface Types* ( *ECU Flash Programming*).

---

### XCP connect mode


When you configure an XCP flash project, the dSPACE ECU Flash Programming Tool lets you specify the mode parameter to be transmitted to the XCP slave upon establishing a connection.

Refer to *Configure Protocol Settings Dialog* ( *ECU Flash Programming*).

---

### Sequence numbers for erasing and programming physical memory segments

When you configure a physical memory segment of the ECU flash memory, the dSPACE ECU Flash Programming Tool lets you specify sequence numbers for erasing and for programming the physical memory segment. With this, you can influence the order in which physical memory segments are erased and programmed.

Refer to *Configure Physical Memory Dialog* ( *ECU Flash Programming*).



---

# dSPACE FlexRay Configuration Package

## Migrating to dSPACE FlexRay Configuration Package 3.9

---

### **Discontinuation as of dSPACE FlexRay Configuration Package 3.9**

**Signal-based modeling** Signal-based modeling with the RTI FlexRay Configuration Blockset was supported for the last time with the RTI FlexRay Configuration Blockset 3.8 of dSPACE Release 2016-B. As of dSPACE Release 2017-A, the RTI FlexRay Configuration Blockset supports only PDU-based modeling.

As a consequence, you must switch from the signal-based modeling concept to PDU-based modeling with the RTI FlexRay Configuration Blockset. From the Simulink configuration data, created by the FlexRay Configuration Tool, you have to generate configured RTI FlexRay blocks for PDU-based modeling. The automatically generated FlexRay model has RTI blocks for each configured PDU that comprises several signals, i.e., PDU-based modeling handles multiple signals with one Simulink block. You can access the single signals via the PDU blocks.

PDU-based modeling with the RTI FlexRay Configuration Blockset offers more functionality than signal-based modeling.



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# dSPACE Python Extensions

---

## Where to go from here

Information in this section

<i>New Features of dSPACE Python Extensions 2.3</i>	111
<i>Migrating to dSPACE Python Extensions 2.3</i>	111

---

## New Features of dSPACE Python Extensions 2.3

---

### New features

Python Extensions 2.3 provides no new features.

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## Migrating to dSPACE Python Extensions 2.3

---

### Discontinuation of software contained in dSPACE Python Extensions

As of dSPACE Release 2016-B, dSPACE Python Extensions no longer provides:

- dSPACE HIL API Python Implementation
- `rtplib2`

You can migrate your test automation projects to ASAM XIL API as the HIL API successor.

For information on migrating from HIL API Python or `rtplib2` to XIL API .NET, refer to the Test Automation Tools Support Center: <http://www.dspace.com/go/pscta>.





# dSPACE XIL API .NET

---

## Where to go from here

Information in this section

<i>New Features of dSPACE XIL API .NET 2017-A</i>	113
<i>Migrating to dSPACE XIL API .NET 2017-A</i>	114

---

## New Features of dSPACE XIL API .NET 2017-A

---

### Enhanced platform support

The dSPACE Platform Management API and the XIL API (MAPort) now provide:

- Support of the DS6001 Processor Board as a new platform.

The DS6001 is a SCALEXIO processor board that can be integrated in a SCALEXIO LabBox with an on-board IOCNET infrastructure (IOCNET Link board and router), an Ethernet-based host, and I/O interface.

- Support of remote access to VEOS as a platform.

For more information, refer to *Basics on the Platform Management API* ([📖 dSPACE Platform Management API Reference](#)) and [📖 dSPACE XIL API Implementation Guide](#).

---

### Enhanced EESPort functionality

**New FIU hardware support** The EESPort now supports DS5355/DS5390 High Current FIU systems.

For more information, refer to *Hardware for Failure Simulation* ([📖 dSPACE XIL API Implementation Guide](#)).

## Migrating to dSPACE XIL API .NET 2017-A

---

**Migrating applications from dSPACE HIL API .NET to dSPACE XIL API .NET**

dSPACE HIL API .NET was discontinued with dSPACE Release 2016-B. For information on the required migration steps, refer to *Migrating HIL API Applications to XIL API Applications* ([📖 dSPACE XIL API Implementation Guide](#)).

---

**Changes in the EESPort configuration file**

For a SCALEXIO system, the value of the `Name` attribute in the `PotentialMapping` element now also contains the pin name, and not only the ECU name of the SCALEXIO Power Switch. For example, if the pin name is VBAT and the power switch 1 is used, the name is `Power Switch 1\VBAT`.

# ECU Interface Manager

---

## Where to go from here

Information in this section

<i>New Features of ECU Interface Manager 2.1</i>	115
Gives an overview of the new features of ECU Interface Manager 2.1.	
<i>Migrating to ECU Interface Manager 2.1</i>	116

---

## New Features of ECU Interface Manager 2.1

### Support of ECU interfacing with SCALEXIO systems

In connection with ConfigurationDesk 5.6, the ECU Interface Manager 2.1 now lets you perform ECU interfacing with SCALEXIO systems.

**ECU interface container (EIC) file** To perform ECU interfacing with SCALEXIO systems, you must do the following:

1. Export an ECU interface container (EIC) file with the ECU Interface Manager.

EIC files describe an ECU application that is prepared for ECU interfacing.

2. Import the EIC file to a ConfigurationDesk application.

In ConfigurationDesk, you can integrate the prepared parts of the ECU application in the signal chain and build a real-time application for the SCALEXIO system.

**Supported ECU interfaces** To perform ECU interfacing with SCALEXIO, the target ECU must be connected to an Ethernet adapter of the SCALEXIO system via one of the following ECU interfaces:

- DCI-GSI2
- XCP on Ethernet

For the workflow in the ECU Interface Manager, refer to *Preparing ECU Interfacing* (📖 [ECU Interface Manager Guide](#)).

For the workflow in ConfigurationDesk, refer to *ECU Interfacing with SCALEXIO Systems* (📖 [ConfigurationDesk Real-Time Implementation Guide](#)).

## Migrating to ECU Interface Manager 2.1

### No migration of projects last saved with a former version of the ECU Interface Manager

In ECU Interface Manager 2.1, you cannot reuse projects that were last saved with a former version of the ECU Interface Manager.

### New software module description file schema

As of ECU Interface Manager 1.6, ECU suppliers can use a generic schema to create a software module description file.

You can also import software module description files based on the dSPACE-specific schema, which was originally introduced with ECU Interface Manager 1.0.

#### Note

- The dSPACE-specific schema is supported only for downward compatibility reasons. It will be replaced by the generic schema in the next dSPACE Releases.
- Multicore support, function access configuration, and further developments are not available with the dSPACE-specific schema.

Use the *generic schema* (refer to *Using the Generic Schema to Create Software Module Description Files* (📖 [ECU Interface Manager Reference](#))) instead.

For more information on the generic schema, refer to *Using the Generic Schema to Create Software Module Description Files* (📖 [ECU Interface Manager Reference](#)).

---

# Firmware Manager

## New Features of Firmware Manager 2.3

---

### Enhanced platform support

The Firmware Manager supports the following new SCALEXIO hardware:

- DS6001 Processor Board

The DS6001 is a SCALEXIO processor board that can be integrated in a SCALEXIO LabBox with an on-board IOCNET infrastructure (IOCNET Link board and router), an Ethernet-based host, and I/O interface.

- DS6221 A/D Board

---

### New online help

The Firmware Manager comes with dSPACE Help as the new online help. For more information, refer to *Features of the New dSPACE Help* on page 19.



# ModelDesk

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## Where to go from here

Information in this section

<i>New Features of ModelDesk 4.5</i>	119
<i>Migration to ModelDesk 4.5</i>	122

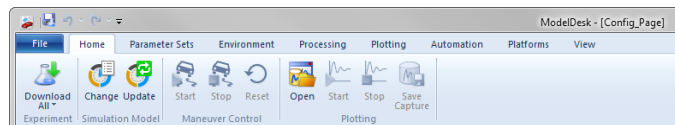
---

## New Features of ModelDesk 4.5

### More intuitive user interface

ModelDesk's user interface is more intuitive: Its menu bar and toolbars have been replaced by ribbons and the Backstage view used in ControlDesk, Microsoft Office, etc.

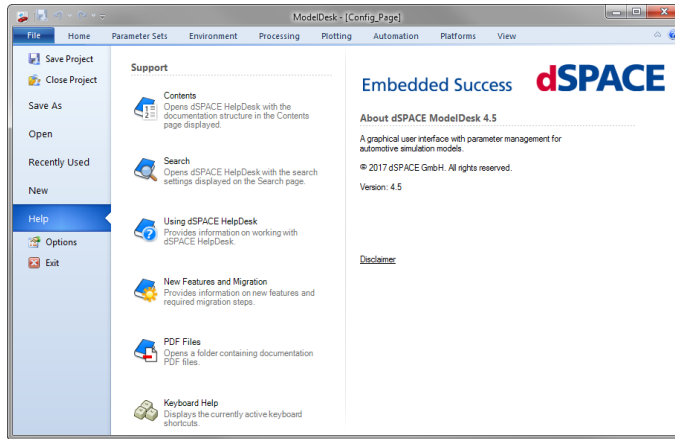
**Ribbons** ModelDesk's ribbons organize and group commands belonging together. They are located at the top of the user interface. Refer to the following illustration:



Each ribbon has ribbon groups, each of which provides a set of related commands. For example, the Home ribbon contains the Experiment, Simulation Model, Maneuver Control and Plotting ribbon groups.

**Backstage view** ModelDesk's Backstage view provides basic commands, for example, for opening, importing and saving projects. It also provides quick access to the recently used projects and experiments.

The following illustration shows the Backstage view with the Help ribbon group:



**Start page** ModelDesk's Start page provides quick access to the most recently opened projects and to the user documentation of ModelDesk.



**New supported platforms**

**DS6001** ModelDesk supports the new DS6001 Processor Board.

The DS6001 is a SCALEXIO processor board that can be integrated in a SCALEXIO LabBox with an on-board IOCNET infrastructure (IOCNET Link board and router), an Ethernet-based host, and I/O interface.



**VEOS** ModelDesk supports VEOS even if it runs on a remote PC.

---

### Alias support

The alias support lets you define and manage alias names for scalar maneuver and traffic scenario parameters for easier access.

In the ModelDesk user interface, you can assign properties to alias variables so that an alias variable references one or more properties. In automation scripts, you can modify the values of these alias variables and, therefore, the values of the property references at the same time.

This feature can be used only for scalar properties.

---

### Road generation

**OpenDRIVE import** The import of roads in the OpenDRIVE format is improved. You can map ModelDesk's traffic objects to signs and objects specified in the OpenDRIVE file. During import, the signs and objects are automatically assigned to the mapped traffic objects.

---

### Tool automation

The tool automation is extended:

**Application object** When you use tool automation in ModelDesk's Interpreter, an Application object is already available. You can use it to access the running ModelDesk application via the `Application` interface.

**Road generation** The API for road generation is completed, so you can:




- Access road segments (reference line)
- Handle position markers of road elements and junctions
- Handle shapes of road elements and junctions
- Handle the scenery of road elements








---

### Improved user documentation

**Subject-oriented user documentation** As of ModelDesk 4.5, the structure of the user documentation is subject-oriented, i.e., you can find the entire documentation for a specific subject, such as Platform Management or Road Generation, under a single node in dSPACE HelpDesk. Up to and including ModelDesk 4.4, the structure of the user documentation was document-oriented, i.e., information on a specific subject was spread over different documents, such as the ModelDesk Guide, ModelDesk Reference, etc.

The new documents in a subject-oriented structure:

-  ModelDesk Basics
-  ModelDesk Project and Experiment Management
-  ModelDesk Platform Management

-  ModelDesk Parameterizing
-  ModelDesk Processing
-  ModelDesk Traffic Object Management
-  ModelDesk Road Creation
-  ModelDesk Scene Synchronization
-  ModelDesk Maneuver Creation
-  ModelDesk Traffic Scenario Creation
-  ModelDesk Plotting
-  *ModelDesk Automation*

## Migration to ModelDesk 4.5

---

### **Tool automation for plotting**

As of ModelDesk 4.4, ModelDesk has new plotters and the tool automation for plotting has been changed. To reuse scripts for plotting, you must adapt scripts written for ModelDesk 4.3 and earlier.

---

# Model Interface Package for Simulink

## New Features of the Model Interface Package for Simulink 3.4

---

### Limitations when using MATLAB R2017a

The following new feature introduced with MATLAB R2017a is not supported by the Model Interface Package for Simulink:

- Dynamic memory allocation in MATLAB Function blocks is not supported. Thus, the following options are unavailable:
  - Dynamic memory allocation in MATLAB Function blocks
  - Dynamic memory allocation threshold in MATLAB Function blocks



# MotionDesk

---

## Where to go from here

Information in this section

<i>New Features of MotionDesk 4.0</i>	125
<i>Migrating to MotionDesk 4.0</i>	128

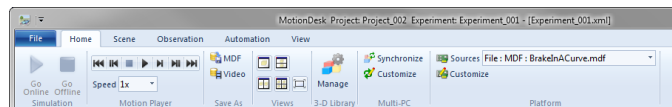
---

## New Features of MotionDesk 4.0

### More intuitive user interface

MotionDesk's user interface is more intuitive: Its menu bar and toolbars have been replaced by ribbons and the Backstage view used in ControlDesk, Microsoft Office, etc.

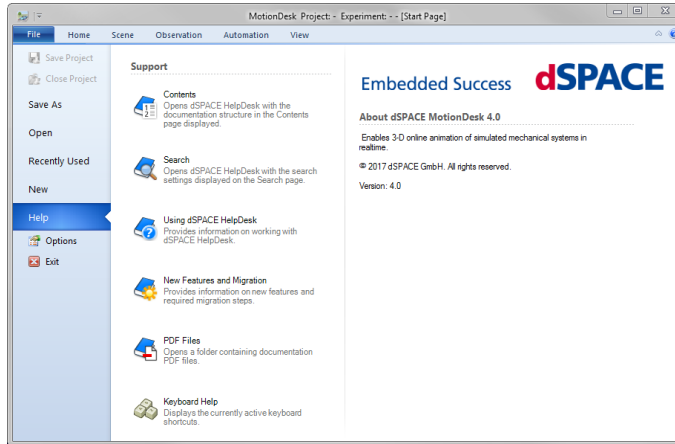
**Ribbons** MotionDesk's ribbons organize and group commands belonging together. They are located at the top of the user interface. Refer to the following illustration:



Each ribbon has ribbon groups, each of which provides a set of related commands. For example, the Home ribbon contains the Simulation, Motion Player, Save As, Views, 3-D Library, Multi PC and Platform ribbon groups.

**Backstage view** MotionDesk's Backstage view provides basic commands, for example, for opening, importing and saving projects. It also provides quick access to the recently used projects and experiments.

The following illustration shows the Backstage view with the Help ribbon group:



**Start page** MotionDesk's Start page provides quick access to the most recently opened projects and to the user documentation of MotionDesk.



**New supported platforms**

**DS6001** MotionDesk supports the new DS6001 Processor Board.

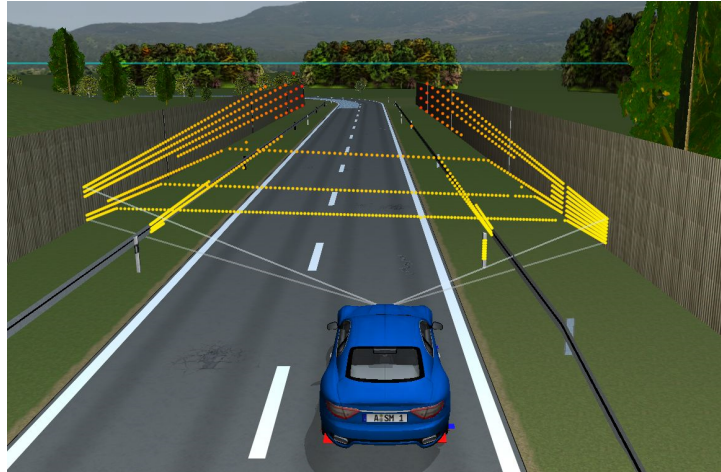
The DS6001 is a SCALEXIO processor board that can be integrated in a SCALEXIO LabBox with an on-board IOCNET infrastructure (IOCNET Link board and router), an Ethernet-based host, and I/O interface.

**VEOS** MotionDesk supports VEOS even if it runs on a remote PC.

**Sensor simulation**









**Camera sensor** You can create various camera sensors in MotionDesk.

**Laser sensor** You can create laser sensors in MotionDesk. Laser sensors are point cloud sensors. When they are used, a cloud of points is displayed in the scene of MotionDesk, refer to the following example.

**Improved user documentation**

**Subject-oriented user documentation** As of MotionDesk 4.0, the structure of the user documentation is subject-oriented, i.e., you can find the entire documentation for a specific subject, such as Platform Management or Road Generation, under a single node in dSPACE HelpDesk. Up to and including MotionDesk 3.9, the structure of the user documentation was document-oriented, i.e., information on a specific subject was spread over different documents, such as the MotionDesk Guide, MotionDesk Reference, etc.

The new documents in a subject-oriented structure:

-  MotionDesk Tutorial
-  MotionDesk Basics
-  MotionDesk Calculating and Streaming Motion Data
-  MotionDesk Project and Experiment Management
-  MotionDesk Custom Object Library Management
-  *MotionDesk Scene Creation*
-  *MotionDesk Scene Animation*
-  *MotionDesk Automation*

## Migrating to MotionDesk 4.0

---

### **Migrating from MotionDesk version 2.2.1 and earlier**

The current MotionDesk version cannot read old MotionDesk experiments in the MDX file format (used in MotionDesk 2.1.6 and earlier) or scenes stored in ESD format (used in MotionDesk 2.2.1 and earlier). It is therefore not possible to migrate from MotionDesk projects and experiments of these versions.

If you want to use such old projects and experiments, you can migrate them by using MotionDesk 3.0 up to MotionDesk 3.6 and open them in the current MotionDesk version afterwards.

---

### **Migrating 3-D custom objects**

If you want to use 3-D custom objects in VRML2 format which you used in MotionDesk 2.2.1 or earlier, you have to convert the VRML2 files into COLLADA format files. You can convert the files at any time using the 3-D Library Manager.

---

### **Flat and Gouraud render mode**

The Flat and Gouraud render modes are removed. When old experiments which uses these render modes are opened, they are automatically migrated to the Mixed render mode. If the Flat and Gouraud render modes are used in tool automation, the Mixed render mode is visualized.



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# Real-Time Testing

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## Where to go from here

Information in this section

<i>New Features of Real-Time Testing 3.2</i>	129
<i>Migrating to Real-Time Testing 3.2</i>	130

---

## New Features of Real-Time Testing 3.2

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### New supported platforms

**DS6001** Real-Time Testing supports the new DS6001 Processor Board.

The DS6001 is a SCALEXIO processor board that can be integrated in a SCALEXIO LabBox with an on-board IOCNET infrastructure (IOCNET Link board and router), an Ethernet-based host, and I/O interface.

**VEOS** Real-Time Testing supports VEOS even if it runs on a remote PC.

---

### Data streaming

The `rttlib.datastream` module supports files in MDF4 format.

---

### CAN FD support

The `rttlib.dscanapilib` module supports CAN FD messages for VEOS.

## Migrating to Real-Time Testing 3.2

---

### Incompatible BCG files

The BCG files that are generated with Real-Time Testing 2.6 and earlier cannot be used for Real-Time Testing 3.2. You must create the BCG file of the Real-Time Testing sequence again. Refer to *Creating and Starting RTT Sequences in Python Scripts* ([📖 Real-Time Testing Guide](#)).

# RTI/RTI-MP and RTLib

---

## Where to go from here

Information in this section

<i>New Features of RTI/RTI-MP and RTLib</i>	131
<i>Migration Aspects of RTI/RTI-MP and RTLib</i>	133

## New Features of RTI/RTI-MP and RTLib

---

### MicroLabBox

**Enhanced software support** The following features are now supported:

- Enhanced support of electric motor control.  
For more information, refer to *New Features of RTI Electric Motor Control Blockset 1.4* on page 139.
- Configurable task modes to optimize the task execution times for different use cases. The task mode can be set on the RTI simulation options page for single-core models or on the Build Options page of a Multiprocessor Setup block for multicore models before you start the build process. The Task Configuration page on the board's web interface lets you overwrite the setting of the generated real-time application. For more information, refer to *RTI Task Configuration Dialog* ([📖 RTI and RTI-MP Implementation Reference](#)).

For more information on the board's features, refer to [📖 MicroLabBox Features](#).

---

**DS1007**

**Enhanced software support** The following feature is now supported:

- Configurable task modes to optimize the task execution times for different use cases. The task mode can be set on the RTI simulation options page for single-core models or on the Build Options page of a Multiprocessor Setup block for multicore models before you start the build process. The Task Configuration page on the board's web interface lets you overwrite the setting of the generated real-time application. For more information, refer to *RTI Task Configuration Dialog* ([📖 RTI and RTI-MP Implementation Reference](#)).

For more information on the board's features, refer to [📖 DS1007 Features](#).

---

**MicroAutoBox**

**Enhanced safety functions** The RTI Watchdog Blockset that is supported by MicroAutoBox now provides the Memory Integrity and Extras sublibrary.

For more information, refer to *Features of RTI Watchdog Blockset 2.1* on page 147.

---

**Unsupported new features of MATLAB R2017a**

The following new feature introduced with MATLAB R2017a is not supported by RTI/RTI-MP:

- Dynamic memory allocation in MATLAB Function blocks is not supported. Thus, the following options are unavailable:
    - Dynamic memory allocation in MATLAB Function blocks
    - Dynamic memory allocation threshold in MATLAB Function blocks
- 

**Limitations when using MATLAB R2017a**

Note the following limitation when you use RTI/RTI-MP with MATLAB R2017a:

- RTI-MP single-point line problem with Simulink R2017a  
Because of the way Simulink handles single-point lines in MATLAB R2017a, RTI-MP is unable to separate the MP Simulink model, if the main model contains single-point lines. RTI-MP then stops the model separation and issues an error. A single-point line is a line that consists of two points that have the same coordinates. For example, the signal line then consists of only the arrowhead or the dot for connection points. To avoid this problem, you have to only increase the length of the affected signal line, e.g., by moving the connected blocks further apart.

For the latest information on how to fix this problem, refer to <http://www.dspace.com/go/RTIMPwithSimulinkR2017aProblem>.

#### New features in RTI/RTIMP

The following features in RTI/RTI-MP are introduced with dSPACE Release 2017-A:

- If you use RTI/RTI-MP from dSPACE Release 2017-A and MATLAB R2017a, the Simulink model templates contain a graphical representation of the selected platform.
- The RTI and RTI-MP Task Configuration API now provides a new method to specify the priority of a task group. If you use the existing `SetTaskPriority` method this is still possible, but with the new `SetTaskGroupPriority` method this action is more transparent in your script.

## Migration Aspects of RTI/RTI-MP and RTLib

#### Modified features in later MATLAB versions

**Switching to a later MATLAB version** If you install a new MATLAB version, some settings are adopted from already installed MATLAB versions. To prevent unexpected behavior of your Simulink models when switching to a later MATLAB version or dSPACE Release, always reset the MATLAB and Simulink preferences to their defaults before you start working.

#### Discontinued features

The following features are discontinued as of MATLAB R2015b and are no longer supported with dSPACE Release 2017-A:

- The `rti_usrtrcmerge` command is no longer available, because it does not support the currently supported TRC file features.
- The Data Stores group is no longer available in the TRC file.
- The `rti_assertionmode` variable is no longer available in the TRC file.
- The `_application` variable is no longer available in the TRC file.
- For the `_model` variable, the file extension is no longer generated into the TRC file.
- The following flags are deprecated for the `flags` variable in the TRC file:
  - BLOCK
  - COLLAPSED

- DERIV
- DSM
- LABEL
- MARKED
- MASKED
- RESERVED
- SINK
- SYSTEM
- WS
- XCONT
- XDISC

# RTI Bypass Blockset

---

## Where to go from here

Information in this section

<i>New Features of the RTI Bypass Blockset 3.8</i>	135
<i>Migrating to RTI Bypass Blockset 3.8</i>	135

---

## New Features of the RTI Bypass Blockset 3.8

---

### RTI Bypass Blockset

#### **On-target bypassing with TargetLink: Support of Function**

**block** The RTI Bypass Blockset now supports the RTIBYPASS\_FUNCTION\_BLx block when you use TargetLink for code generation. This means that you can add an RTIBYPASS\_FUNCTION\_BLx block to your model if you use the TargetLink Code Generator for code generation.

---

## Migrating to RTI Bypass Blockset 3.8

---

### Working with models from earlier RTI Bypass Blockset versions 3.x and 2.x

The current Release contains RTI Bypass Blockset 3.8, which is compatible with earlier blockset versions 3.x and 2.x. However, there are some points to note:

- *Working with models from RTI Bypass Blockset 2.5 or earlier*  
Data management was changed in comparison to the prior RTI Bypass Blockset versions. If you have a Simulink model built with

RTI Bypass Blockset 2.5 or earlier and you open it with RTI Bypass Blockset 3.8, the old data dictionary file (with the file name extension .dd) is replaced by a new data dictionary file (.vdb) using the information stored in the Setup block. This happens as soon as you open and close the Setup block dialog by clicking OK, or you open the Read, Write, Upload or Download block dialog and click Fill Variable Selector on the Variables page.

If you have a model that was saved with RTI Bypass Blockset 3.8 and want to use it with RTI Bypass Blockset 2.5 or earlier, the model's data dictionary file required for blockset version 2.5 or earlier (file name extension .dd) is created. This happens as soon as you update the A2L files in the Setup block, or you open the Read, Write, Upload or Download block and click Fill Variable Selector on the Variables page. The data dictionary file created under RTI Bypass Blockset 3.8 (.vdb) remains on the disk.

To enable the RTI Bypass Blockset to recreate the data dictionary, the database files specified in the Setup block must be accessible at the specified location and must be unchanged.

■ *Working with models from RTI Bypass Blockset 2.6 up to and including RTI Bypass Blockset 3.7*

If you have a Simulink model built with RTI Bypass Blockset 2.6 up to RTI Bypass Blockset 3.7, and you open it with RTI Bypass Blockset 3.8, the old data dictionary file is replaced by a new data dictionary file. However, the new data dictionary file cannot be used in earlier RTI Bypass Blockset versions. If you want to reuse the model with RTI Bypass Blockset 2.6 up to RTI Bypass Blockset 3.7, you have to create a suitable database in the earlier RTI Bypass Blockset version by reimporting the database files (A2L files) specified in the Setup block.



---

# RTI CAN MultiMessage Blockset

---

## Where to go from here

Information in this section

<i>New Features of the RTI CAN MultiMessage Blockset 4.5</i>	137
<i>Migrating to RTI CAN MultiMessage Blockset 4.5</i>	137

---

## New Features of the RTI CAN MultiMessage Blockset 4.5

---

### New supported platform

The RTI CAN MultiMessage Blockset supports the DS6001 Processor Board.

The DS6001 is a SCALEXIO processor board that can be integrated in a SCALEXIO LabBox with an on-board IOCNET infrastructure (IOCNET Link board and router), an Ethernet-based host, and I/O interface.

---

## Migrating to RTI CAN MultiMessage Blockset 4.5

---

### Working with models from earlier RTI CAN MultiMessage Blockset versions

To reuse a model created with an earlier RTI CAN MultiMessage Blockset version, you must update the S-functions for all the RTICANMM blocks and save the model before modifying the CAN configuration.

To create new S-functions for all the RTICANMM blocks in your model in one step, you can perform one of the following actions after opening the model:

- In the MATLAB Command Window, enter `rtimmsu_update('System', gcs)`.  
For more information on the command and its options, enter `help rtimmsu_update` in the MATLAB Command Window.
- Select the **Create S-Function for all CAN Blocks** command from the Options menu of the RTICANMM GeneralSetup block.

For more information, refer to *Limitations with RTICANMM* ([RTI CAN MultiMessage Blockset Reference](#)).

---

### Compiler messages when using code generated by an RTI CAN MultiMessage Blockset version < 4.0

If you use code that was generated by an RTI CAN MultiMessage Blockset version < 4.0, several compiler warning messages containing the phrase `<<argument of type "can_tpl_canChannel *" is incompatible with parameter of type "DsTCanCh">>` will be displayed during the build process of your simulation model. This is due to a modified data type. These warnings can be ignored and disappear after you regenerate the RTICANMM code by using the current blockset version.

---

### Using existing checksum algorithms

Checksum algorithms originally developed for an application containing CAN messages cannot be reused for applications containing CAN FD messages, because CAN FD includes new message types and longer data fields. Existing checksum algorithms can still be used for applications that contain only classic CAN messages. For CAN FD applications, you must adapt the checksum algorithms.

# RTI Electric Motor Control Blockset

## New Features of RTI Electric Motor Control Blockset 1.4

---

### New setting for the EMC\_ENCODER block

You can now specify the minimum value to be used for angle measurement and position measurement. When the velocity falls below the specified minimum speed, the encoder speed is interpreted as a standstill and the value is set to 0 rpm or 0 lines/s.

For more information, refer to *EMC\_ENCODER\_BLx* ([RTI Electric Motor Control Blockset Reference](#)).

---

### New settings for the EMC\_MC\_PWM block

You can now specify the state of the PWM outputs via a block inport. This lets you switch the PWM outputs to high-impedance state during runtime.

For more information, refer to *EMC\_MC\_PWM\_BLx* ([RTI Electric Motor Control Blockset Reference](#)).

---

### New settings for the EMC\_BC\_PWM block

- You can now specify the generation of signal patterns that you can activate via a block inport independently of the motor position.
- You can now specify the state of the PWM outputs via a block inport. This lets you switch the PWM outputs to high-impedance state during runtime.

For more information, refer to *EMC\_BC\_PWM\_BLx* ([RTI Electric Motor Control Blockset Reference](#)).



# RTI FPGA Programming Blockset

---

## Where to go from here

Information in this section

<i>New Features of the RTI FPGA Programming Blockset 3.3</i>	141
<i>Migrating to RTI FPGA Programming Blockset 3.3</i>	143

## New Features of the RTI FPGA Programming Blockset 3.3

---

### Extended Xilinx® support

The RTI FPGA Programming Blockset now supports the following products and versions of the Xilinx design tools.

<b>Xilinx Design Tools Version</b>	<b>MATLAB Version <sup>1)</sup></b>	<b>Operating System</b>
64-bit version of Vivado 2016.4	64-bit versions of: <ul style="list-style-type: none"><li>■ MATLAB R2015b</li><li>■ MATLAB R2016a</li><li>■ MATLAB R2016b</li></ul>	All PC operating systems that are supported by RCP and HIL software from dSPACE Release 2017-A. Refer to <i>Operating System</i> on page 167.

<sup>1)</sup> The Processor Interface sublibrary of the RTI FPGA Programming Blockset also supports MATLAB R2017a.

---

### Enhancements to the frameworks of the DS2655 FPGA Base Board

The frameworks for the DS2655 FPGA Base Board and for the I/O modules provide the following enhancement.

**Supporting multicore processor applications** The DS2655 FPGA Base Board framework lets you model FPGA applications that support multicore processor applications. Refer to *Modeling FPGA Applications Supporting Multicore Processor Applications* ([RTI FPGA Programming Blockset Guide](#)).

Handcoded FPGA applications do not support multicore real-time applications.

**New Inter-FPGA Interface framework** The Inter-FPGA Interface framework lets you directly exchange data between DS2655 FPGA Base Boards if your SCALEXIO system supports inter-FPGA communication. The FPGA communication is realized directly between the connected FPGA applications without using buffers or registers of IOCNET. The inter-FPGA bus can be configured using the related block dialogs or functions.

For modeling the inter-FPGA communication, refer to *Basics on Inter-FPGA Communication* ([RTI FPGA Programming Blockset Guide](#)).

For handcoding the inter-FPGA communication, refer to *Handcoding Inter-FPGA Communication* ([RTI FPGA Programming Blockset Handcode Interface Guide](#)).

---

### Tracing FPGA signals of MicroLabBox

You can now make FPGA signals of MicroLabBox traceable. This lets you access FPGA signals directly with your experiment software, for example, with ControlDesk. Refer to *Making FPGA Signals Traceable* ([RTI FPGA Programming Blockset Guide](#)).

---

### Improved handling

**Copying of interface blocks** You can now copy and paste previously configured interface blocks of the RTI FPGA Programming Blockset. The blockset automatically analyzes the FPGA model, reassigns new hardware resources, and avoids conflicts due to multiple assignments.

**Selecting FPGA signals for tracing** You can now select FPGA subsystems to be traced by clicking the subsystem's name in a tree-view. Refer to *How to Make FPGA Signals Traceable* ([RTI FPGA Programming Blockset Guide](#)).

Tracing of FPGA signals is supported for DS2655 FPGA Base Boards and MicroLabBox.

---

### Related topics

Basics

- *Migrating to RTI FPGA Programming Blockset 3.3* on page 143

## Migrating to RTI FPGA Programming Blockset 3.3

---

### Introduction

There are various ways to migrate an existing model, depending on the blockset version used.

---

### Migrating from RTI FPGA Programming Blockset 1.1 and higher to 3.3

If you implemented your FPGA application using RTI FPGA Programming Blockset Version 1.1 and later, and want to use it with RTI FPGA Programming Blockset 3.3, the framework automatically updates itself to the current framework version.

The update handles all the subsystems in the model/subsystem. The parameters of the blocks stay the same after updating to the current framework version.

---

### ConfigurationDesk custom functions incompatible with dSPACE Release 2017-A

#### Note

Relevant for SCALEXIO systems with a DS2655 FPGA Base Board and a DS2655M1 Multi-I/O Module

An FPGA custom function block generated by using RTI FPGA Programming Blockset 2.5 from dSPACE Release 2013-A and the real-time applications (\*.rta) containing the FPGA custom function block are incompatible with the current dSPACE Release. To produce a usable custom function, you have to rebuild the FPGA model by using the current RTI FPGA Blockset.

---

### Using different dSPACE hardware

Using an FPGA model on different dSPACE hardware requires some model modifications. Refer to *Migrating to Another dSPACE Hardware* ([📖 RTI FPGA Programming Blockset Guide](#)).





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# RTI LIN MultiMessage Blockset

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## Where to go from here

Information in this section

<i>New Features of the RTI LIN MultiMessage Blockset 2.8</i>	145
<i>Migrating to RTI LIN MultiMessage Blockset 2.8</i>	145

---

## New Features of the RTI LIN MultiMessage Blockset 2.8

---

### New supported platform

The RTI LIN MultiMessage Blockset supports the DS6001 Processor Board.

The DS6001 is a SCALEXIO processor board that can be integrated in a SCALEXIO LabBox with an on-board IOCNET infrastructure (IOCNET Link board and router), an Ethernet-based host, and I/O interface.

---

## Migrating to RTI LIN MultiMessage Blockset 2.8

---

### Working with models from earlier RTI LIN MultiMessage Blockset versions

To reuse a model created with an earlier RTI LIN MultiMessage Blockset version, you must update the S-functions for all the RTILINMM blocks and save the model before modifying the LIN configuration.

To create new S-functions for all the RTILINMM blocks in your model in one step, you can perform one of the following actions after opening the model:

- In the MATLAB Command Window, enter `rtimmsu_update('System', gcs)`.  
For more information on the command and its options, enter `help rtimmsu_update` in the MATLAB Command Window.
- Select the **Create S-Function for all LIN Blocks** command from the Options menu of the RTILINMM GeneralSetup block.

For more information, refer to *Limitations of RTI LIN MultiMessage Blockset* ([RTI LIN MultiMessage Blockset Reference](#)).

---

# RTI Watchdog Blockset


## Features of RTI Watchdog Blockset 2.1

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### Memory Integrity and Extras

The RTI Watchdog Blockset has been enhanced with the Memory Integrity and Extras sublibrary supporting:

- Monitoring of different memory sections, such as ROM, heap and stack memory.
- Monitoring of the hardware's supply voltage.
- Triggering a failure action for a functionality implemented by the user.

For more information, refer to *Memory Integrity And Extras* ( *RTI Watchdog Blockset Reference*).



# SCALEXIO Firmware

## New Features of the SCALEXIO Firmware 4.0

---

### New supported hardware

The SCALEXIO firmware supports the following new hardware:

- DS6001 Processor Board

The DS6001 is a SCALEXIO processor board that can be integrated in a SCALEXIO LabBox with an on-board IOCNET infrastructure (IOCNET Link board and router), an Ethernet-based host, and I/O interface.

- DS6221 A/D Board

The board is a standard SCALEXIO I/O board. It provides 16 analog channels and 8 digital trigger input channels. It can be installed in a SCALEXIO LabBox or an I/O slot unit using a SCALEXIO Board Retainer.

- DS6331-PE Ethernet Board

The board has a PCI Express interface. It provides 4 Ethernet ports. It can be installed in the Real-Time PC of a SCALEXIO Processing Unit.

- DS6332-CS Ethernet Board

The board has a Compact PCI Serial interface. It provides 5 Ethernet ports. It can be installed in a PCI Express slot of the LabBox (version 2).



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# SystemDesk

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**Where to go from here**

Information in this section

<i>New Features of SystemDesk 4.8</i>	152
<i>Migrating to SystemDesk 4.8</i>	158

# New Features of SystemDesk 4.8

## Where to go from here

Information in this section

<i>New General Features</i>	152
Provides information on general new features.	
<i>Modeling Software Architectures</i>	152
Provides information on new features of modeling software architectures.	
<i>Configuring ECUs</i>	155
Provides information on new features of configuring ECUs.	
<i>Creating Simulation Systems for Virtual Validation</i>	156
Provides information on new features of creating simulation systems for virtual validation.	

## New General Features

### Introduction

SystemDesk 4.8 has the following new general features.

### AUTOSAR Releases supported by SystemDesk 4.8

**Modeling support** SystemDesk supports the modeling of software and system architectures according the AUTOSAR 4.3.0 Release.

**Data exchange support** SystemDesk supports AUTOSAR 4.3.0, 4.2.2, 4.2.1, 4.1.3, 4.1.2, 4.1.1, 4.0.3, and 4.0.2 for data exchange.

### New online help

SystemDesk comes with dSPACE Help as the new online help.

**Further reading** Refer to *Features of the New dSPACE Help* on page 19.

## Modeling Software Architectures

### Support for port interface mappings

SystemDesk now provides support for port interface mappings that you can use to connect ports.



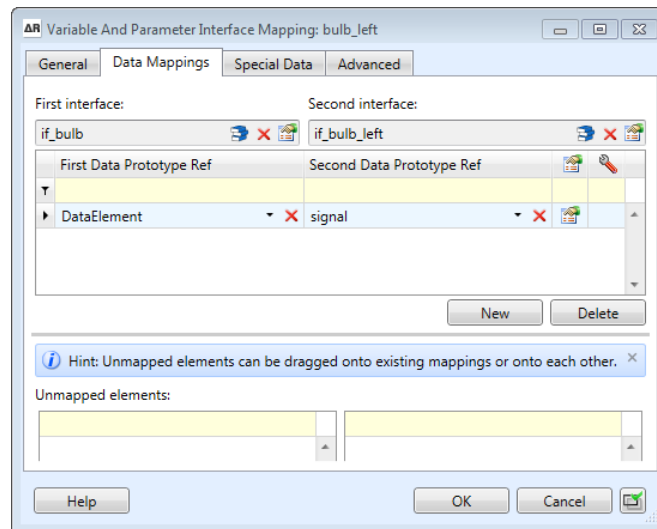
In line with AUTOSAR, you can connect compatible ports if one of the following options applies:

- Matching pairs of port interface elements are found on the basis of their short names. Interface elements are data elements, operations, etc. This option is fulfilled if you connect ports with interfaces of the same type.
- A port interface mapping is used for the port connection.

With a port interface mapping, you can connect ports with interfaces that have the following characteristics:

- Different short names of interface element pairs  
This can occur if a software component is used by multiple vendors that have different naming conventions.
- Different numbers of interface elements  
This can occur if certain elements of an interface are not required for a connection. For example, a software component can be designed for front-wheel and all-wheel drive, and can be used in a software architecture for front-wheel drive.
- Different interface element structures  
This can occur if interface elements are of struct or array type.

The following illustration shows the mapping of interface elements in SystemDesk.



**Further reading** Refer to *Basics on Port Interface Mappings* (SystemDesk Manual).

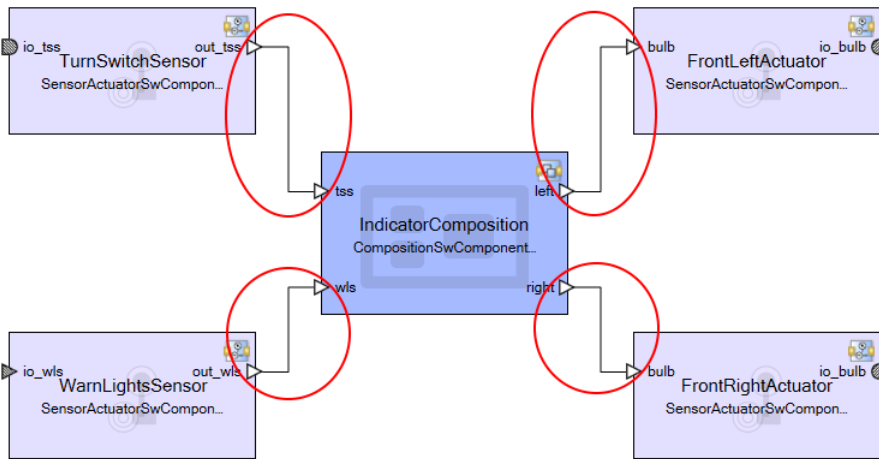
**Connecting ports automatically**

SystemDesk now provides the Port Connector wizard that lets you automatically connect ports of software components in a composition.

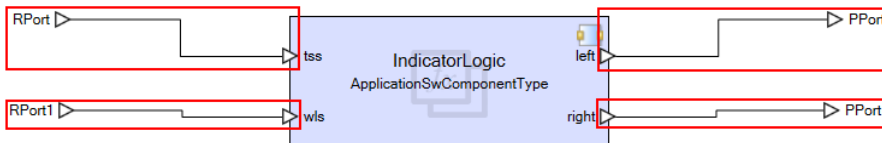
This helps you to integrate software components in a software architecture or basic software components in an ECU configuration.

You can perform the following tasks by using the Port Connector wizard:

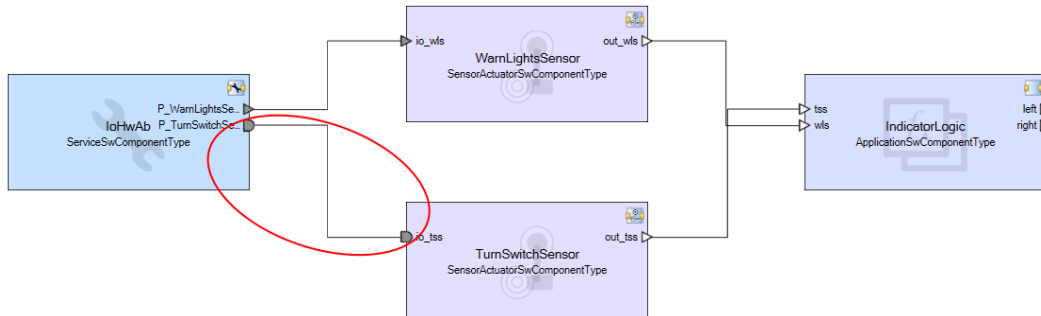
- You can connect software components in a composition software component with assembly connections.



- You can connect a software composition to its inner software components with delegation connections and create delegation ports if required.



- You can connect basic software and application software that is mapped to an ECU.



**Further reading** Refer to *Basics on Connecting Ports Automatically* ([SystemDesk Manual](#)).

### Variant binding time

You can now bind variants with respect to the specified binding time of variants.

**Further reading** Refer to *Basics on Variant Handling* ([SystemDesk Manual](#)).

## Configuring ECUs

### BSW Module editor

You can now specify the numeral system, such as decimal, hexadecimal, etc., for the values of BSW module configuration parameters.

This lets you specify, e.g., hexadecimal values where required without converting them from decimal values beforehand.

### Using dSPACE basic software modules for virtual validation

SystemDesk lets you auto configure and generate V-ECUs for virtual validation. With this version, SystemDesk's basic software support has been improved.

**CanIf module** You can now also auto configure the CanIf module for network communication according to the CAN FD protocol.

**DIO driver module** SystemDesk provides support for auto configuring the digital I/O driver module and generating code.

The digital I/O driver is part of the microcontroller abstraction layer and provides functions to read/write the digital I/O of the microcontroller, i.e., the pins of a digital I/O port.

The digital I/O driver references port pins that are configured and initialized by the port driver.

**Port driver module** SystemDesk provides support for configuring the port driver module.

The port driver provides functionality for initializing and configuring the ports and pins of the microcontroller.

The digital I/O driver uses the port and pin configuration of the port driver.

#### Further reading

Refer to *Configuring ECUs* (📖 *SystemDesk Manual*).

## Creating Simulation Systems for Virtual Validation

#### Configuring module configurations

You can now use SystemDesk's ECU configuration framework for configuring module configurations of code-based V-ECUs.


You can use the following features of the ECU configuration framework:

Framework Component	Purpose
BSW Module editor	To configure parameters of a module configuration.
Plug-in command interface for module configurations	To execute plug-in commands for module configurations to perform tasks such as deriving parameters of module configurations from the system description, generating code, etc. You can access the plug-in commands from the context menu of a module configuration in the V-ECU Manager.
Build tool	To execute a group of plug-in commands. SystemDesk supports build tools as described by AUTOSAR, i.e., build action manifests and build actions.
API for module configurations	To access module configurations and, e.g., program plug-in commands.
Support for creating plug-in methods	To develop custom plug-in commands. You can use an IronPython development environment for this.

Framework Component	Purpose
Support for converting module configurations	To convert module configurations between parameter definitions of different vendors.

---

**Further reading**

Refer to *Creating Simulation Systems for Virtual Validation* ( *SystemDesk Manual*).

# Migrating to SystemDesk 4.8

## Migrating to SystemDesk 4.8

### Automatic migration

SystemDesk 4.8 automatically migrates SystemDesk 4.6, and 4.7 SDP project files during the loading process.

#### Note

You are recommended to install the most recent patch for SystemDesk 4.6 or 4.7. Then, save the SDP project files you want to migrate before opening them in SystemDesk 4.8.

### Migrating scripts for automating SystemDesk

SystemDesk's API was changed with this version of SystemDesk. Few interfaces were removed or added with respect to SystemDesk 4.7. However, several interfaces were changed.

For details, refer to *API Changes from SystemDesk 4.7 to SystemDesk 4.8* ([📄 SystemDesk API Reference](#)).

# VEOS

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## Where to go from here

Information in this section

<i>New Features of VEOS 4.0</i>	159
Gives an overview of the new features of VEOS 4.0.	
<i>Compatibility of VEOS 4.0</i>	160
<i>Migrating to VEOS 4.0</i>	163
<i>Discontinuations in VEOS</i>	164

---

## New Features of VEOS 4.0


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### Information in this topic

*Running an offline simulation on a remote simulator* on page 159  
*Support of blocking communication* on page 159  
    | *Non-blocking communication* on page 160  
    | *Blocking communication* on page 160  
*CAN FD support* on page 160  
*No loss of recording data in offline simulations executed as fast as possible* on page 160

---

### Running an offline simulation on a remote simulator

VEOS now lets you run an offline simulation on a remote simulator. For instructions, refer to *How to Load and Run an Offline Simulation Application* ( VEOS Guide).

---

### Support of blocking communication

Up to and including VEOS 3.7, communication between interconnected VPU ports was always *non-blocking*.

As of VEOS 4.0, you can specify whether communication between interconnected VPU ports should be *non-blocking* or *blocking*.

**Non-blocking communication** A communication protocol type in which the VEOS Simulator transfers VPU port data after a (virtual) sampling step.

**Blocking communication** A communication protocol type in which the VEOS Simulator transfers VPU port data in the same (virtual) sampling step. If the VPU that provides the data has not calculated the data yet, the VPU that receives the data must wait until the other provides the data.

For more information, refer to *Specifying Blocking or Non-Blocking VPU Port Communication* ([📖 VEOS Guide](#)).

**CAN FD support**

VEOS now supports the simulation of CAN FD buses.

Refer to *Bus Communication Features for Virtual Validation* ([📖 VEOS Guide](#)).

**No loss of recording data in offline simulations executed as fast as possible**

You can let VEOS execute offline simulations *as fast as possible* by specifying 0 as the offline simulation's real-time acceleration factor. If VEOS generates more simulation data than ControlDesk can sample, the simulation run is automatically decelerated accordingly to avoid the loss of simulation data.

## Compatibility of VEOS 4.0

**Information in this topic**

<a href="#">Compatibility overview</a> on page 160
<a href="#">Compatibility in general</a> on page 160
<a href="#">CTLGZ compatibility</a> on page 161
<a href="#">SIC compatibility</a> on page 161
<a href="#">BSC compatibility</a> on page 161
<a href="#">FMU compatibility</a> on page 161
<a href="#">OSA compatibility</a> on page 161
<a href="#">Real-Time Testing compatibility</a> on page 162

**Compatibility overview**

**Compatibility in general** dSPACE recommends using only software products from the same dSPACE Release. This provides maximum run-time compatibility.



**CTLGZ compatibility** The following table shows the compatibility between VEOS 4.0 and CTLGZ files (V-ECU implementations):

V-ECU Implementations Created With...	V-ECU Implementation Version
dSPACE Release 2017-A: ■ SystemDesk 4.8	2.5
dSPACE Release 2016-B: ■ SystemDesk 4.7 ■ TargetLink 4.2	2.4.1
dSPACE Release 2016-A: ■ SystemDesk 4.6	2.4
dSPACE Release 2015-B: ■ SystemDesk 4.5 ■ TargetLink 4.1	2.3

**SIC compatibility** The following table shows the compatibility between VEOS 4.0 and Simulink implementation container (SIC) files:

SIC Files Created with Model Interface Package for Simulink of ...	SIC Version
dSPACE Release 2017-A (Model Interface Package for Simulink 3.4)	1.3
dSPACE Release 2016-B (Model Interface Package for Simulink 3.3)	1.2
dSPACE Release 2016-A (Model Interface Package for Simulink 3.2)	1.1
dSPACE Release 2015-B (Model Interface Package for Simulink 3.1)	1.0.1

**BSC compatibility** VEOS 4.0 is compatible with bus simulation container (BSC) files created with the Bus Manager of dSPACE Release 2017-A (BSC version 1.2).

**FMU compatibility** VEOS supports:

- Functional Mock-up Units (FMUs) that comply with the FMI 2.0 standard
- Only the FMI for Co-Simulation interface, but not the FMI for Model Exchange interface

For detailed and up-to-date compatibility information on dSPACE's FMI support, refer to:

<http://www.dspace.com/go/FMI-Compatibility>.

**OSA compatibility** The following table shows the compatibility between VEOS 4.0 and offline simulation application (OSA) files:

OSA Files Created with Products Of ...	OSA Version
dSPACE Release 2017-A	4.0
dSPACE Release 2016-B	3.7 <sup>1)</sup>

OSA Files Created with Products Of ...	OSA Version
dSPACE Release 2016-A	3.6 <sup>1)</sup>
dSPACE Release 2015-B	3.5 <sup>1), 2)</sup>

<sup>1)</sup> See the following note.

<sup>2)</sup> OSA files created or modified with VEOS 3.5 can be loaded and simulated in VEOS 4.0 if they do not contain bus communication elements.

**Note**

- You cannot modify the properties of VPUs contained in an OSA file when you open the OSA file in a later VEOS version than the version the OSA file was originally created with. However, port and network connections can be edited. As a consequence, it is recommended to rebuild the binary OSA files from existing model implementation container (CTLGZ, SIC, BSC, FMU) files when you migrate from one VEOS version to another.
- OSA files created or modified with VEOS 4.0 cannot be loaded in earlier VEOS versions.

**Real-Time Testing compatibility** To use RTT in connection with VEOS and ControlDesk, the Real-Time Testing (RTT) version used by the VEOS Simulator running the simulation system and the RTT version active on the PC must be identical.

The following table shows the VEOS Simulator version and the corresponding RTT version:

VEOS Simulator	Real-Time Testing Version
... from VEOS 4.0	Real-Time Testing Version 3.2
... from VEOS 3.7	Real-Time Testing Version 3.1
... from VEOS 3.6	Real-Time Testing Version 3.0
... from VEOS 3.5	Real-Time Testing Version 2.6
... from VEOS 3.4	Real-Time Testing Version 2.5
... from VEOS 3.3	Real-Time Testing Version 2.4
... from VEOS 3.2	Real-Time Testing Version 2.3
... from VEOS 3.1	Real-Time Testing Version 2.2
... from VEOS 3.0	Real-Time Testing Version 2.0

ControlDesk 6.1 automatically uses the VEOS Simulator from VEOS 4.0. You can therefore use RTT in connection with VEOS and ControlDesk if RTT 3.2 is active on the PC.

## Migrating to VEOS 4.0

### Introduction

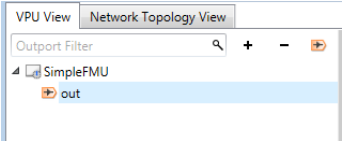
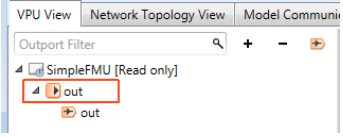
To migrate from VEOS 3.7 to VEOS 4.0, you might have to carry out the following migration steps.

#### Note

To migrate to VEOS 4.0 from versions earlier than 3.7, you might also have to perform the migration steps of the intervening VEOS versions.

### Changed hierarchy for VPU ports

The display of VPU ports has changed from VEOS 3.7 to VEOS 4.0 in some cases.

Up to and Including VEOS 3.7	As of VEOS 4.0
<p>Up to and including VEOS 3.7, it was possible for VPU ports to be located <i>directly below a VPU</i>.</p> <p>The following illustration shows an example:</p> 	<p>As of VEOS 4.0, VEOS Player automatically adds one <i>VPU port group</i> (📁 <a href="#">VEOS Guide</a>) to each VPU port if the VPU port is originally located directly below a VPU. The VPU port group gets the name of the VPU port.</p> <p>This change was necessary because with VEOS 4.0 it is possible to block communication between VPU ports. Specifying blocking/non-blocking communication between VPU ports, however, requires superordinate VPU port groups.</p> <p>The following illustration shows an example:</p> 

### Migrating from prior VEOS versions

To migrate from prior VEOS versions and reuse existing offline simulation applications, you might have to carry out additional migration steps. For more information on the migration steps, refer to *Migrating from Prior Versions of VEOS* (📁 [VEOS Guide](#)).

## Discontinuations in VEOS

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### Discontinuations as of VEOS 4.0

**Discontinuation of processor-in-the-loop (PIL) simulation with VEOS and SystemDesk** As of dSPACE Release 2017-A, VEOS and SystemDesk no longer support processor-in-the-loop (PIL) simulation. This includes the generation of V-ECUs for PIL simulation and the simulation of these V-ECUs on evaluation boards.

**Discontinuation of the import of CTLGZ 1.0 files** As of dSPACE Release 2017-A, VEOS no longer supports the import of version 1.0 V-ECU implementation (CTLGZ) files created with products from dSPACE Release 2013-B and earlier.

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# Compatibility Information

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## Where to go from here

Information in this section

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<i>Limitations for Using Windows Features</i>	171

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## Supported MATLAB Releases

### MATLAB®

Working with various dSPACE products requires that you have installed MATLAB.

#### Tip

For system requirements of MathWorks® software, refer to <http://www.mathworks.com/support/sysreq.html>.

MATLAB Release...	...Is Supported by dSPACE Release 2017-A					
	RCP and HIL Software	AutomationDesk 5.4 <sup>1)</sup>	TargetLink 4.2	Model Compare 2.7	dSPACE Python Extensions 2.4 <sup>2)</sup>	XIL API .NET MAPort 2017-A
R2017a (64-bit)	✓ <sup>3)</sup>	✓	–	–	✓	✓
R2016b (64-bit)	✓	✓	✓	✓	✓	✓
R2016a (64-bit)	✓	✓	✓	✓	✓	✓
R2015b (64-bit)	✓	✓	✓	✓	✓	✓
R2015a SP1 (64-bit)	–	–	✓	✓	–	–

<sup>1)</sup> AutomationDesk's MATLAB Access library requires MATLAB.

<sup>2)</sup> matlablib2 of dSPACE Python Extensions requires MATLAB.

<sup>3)</sup> R2017a is not supported by the RTI FPGA Programming Blockset – FPGA Interface.

### Note

As of dSPACE Release 2016-A, dSPACE software supports only 64-bit MATLAB variants. 32-bit MATLAB variants are no longer supported.

For up-to-date information on additional MATLAB releases that can be used in combination with dSPACE software, refer to <http://www.dspace.com/go/MATLABCompatibility>.

**Restricted MAT file support** The Signal Editor of ControlDesk only supports reading and writing MAT files of file format version 5.0. MAT files of this version can be created in MATLAB by using the `save` command with the option `'-v6'`.

**Limitations for ModelDesk** When you use MATLAB R2016a for Simulink simulation and the simulation is running, a download requires at least one minute.

There is no limitation when the simulation is stopped or paused.

## Operating System

### Operating system on host PC

The dSPACE products of dSPACE Release 2017-A support the following operating systems:

- Windows 7 Professional, Ultimate, and Enterprise with Service Pack 1 (64-bit versions)

Only the listed editions are supported. The Windows 7 Home and Starter editions are not supported.

- Windows 10 with the following editions and servicing options:

- Windows 10 Professional, Education and Enterprise (64-bit versions)

The Windows 10 Home and Mobile editions are not supported.

- The following servicing branch versions are used during the Long-Term Servicing Branch: LTSB 2016
- Current Branch for Business with the compatibility statement of Microsoft for the Current Branch. The tests were executed with CBB version 1511.

Some limitations apply when you use dSPACE software in conjunction with features of Windows. Refer to *Limitations for Using Windows Features* on page 171.

#### Note

As of dSPACE Release 2016-A, dSPACE software supports only 64-bit operating systems. 32-bit operating systems are not supported any longer.

### Using MicroAutobox Embedded PC as host PC

ControlDesk can also be installed on MicroAutoBox Embedded PC (with Intel® Core™ i7-3517UE Processor) running under Windows 7 Professional, Ultimate, and Enterprise, 64-bit version.

### Allowing communication via additional firewall rules

Additional Windows firewall rules are installed during the installation of various dSPACE software products. For example, one rule allows communication with a dSPACE expansion box such as AutoBox. Another rule allows MotionDesk to receive motion data from a network channel. These example rules are created by the following commands:

- `netsh advfirewall firewall add rule name="dSPACE Net Service"`

```
service=any dir=in action=allow profile=any
protocol=icmpv4:0, any description="Allow the dSPACE Net
Service to connect to a dSPACE expansion box via network."
```

- netsh advfirewall firewall add rule name="dSPACE MotionDesk" program="%dSPACE\_root%\MotionDesk\Bin\MotionDesk.exe" dir=in action=allow profile=any description="Allow dSPACE MotionDesk to receive motion data via network."

If you are running third-party firewall software on your host PC, ensure that the TCP/IP communication of dSPACE software is not blocked:

- VEOS requires the following open TCP/IP network ports: 111 (TCP and UDP), 3702 (UDP), 7214 (TCP and TCP6), 9923 (UDP), 15000 (UDP), 49152 ... 65535 (TCP, TCP6 and UDP)

### Operating system on dSPACE License Server

If you purchased floating network licenses, you have to install and configure one of the network PCs as the dSPACE License Server.

The operating system of the dSPACE License Server must be one of the following:

- Windows Vista Business, Ultimate, or Enterprise (64-bit version) with the latest Service Pack
- Windows 7 Professional, Ultimate, or Enterprise (64-bit version) with the latest Service Pack
- Windows Server 2008 R2
- Windows Server 2012, Windows Server 2012 R2

#### Note

The dSPACE License Server does not support non-Windows operating systems.



## Notes on 64-bit Compatibility of dSPACE Products

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### Notes

As of dSPACE Release 2016-B, all products are available only as 64-bit variants. As a consequence, dSPACE Release 2016-B and later supports only the 64-bit variants of the following software:

- Windows operating systems
- MATLAB
- Python

In general, the 64-bit technology lets you handle more complex models and layouts as well as larger amounts of data than the 32-bit technology.

However, keep in mind the following points:

- Product extensions, e.g., ConfigurationDesk custom I/O function blocks, must be available in 64-bit versions.
- Python:
  - No support of 32-bit third-party extensions in the 64-bit Python installation from dSPACE.
  - No support of 64-bit dSPACE Python extensions in a parallel 32-bit Python installation.
- For some products, migration tasks are necessary. For instructions, refer to the product-specific chapters in the *New Features and Migration Guide* or to the user documentation of the relevant dSPACE product.

## Run-Time Compatibility of dSPACE Software

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### Definition

Run-time compatibility means that:

- dSPACE products can be used in parallel after software installation, even if they are installed in different folders.
- dSPACE products without interaction can run independently of each other.

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### Compatibility of products in dSPACE Release 2017-A

dSPACE recommends using only software products from the same dSPACE Release. This provides maximum run-time compatibility.

Note that:

- Limitations regarding run-time compatibility in the dSPACE tool chain might occur if products from different dSPACE Releases are mixed.

If dSPACE products interact directly (through automation interfaces) or indirectly (through common file types like A2L), limitations might apply. For minor limitations, refer to the relevant product documentation. The major limitations are described in the following.

In rare cases, an additional patch must be installed for a product to achieve run-time compatibility. For more information on the patch and whether a patch is necessary, refer to <http://www.dspace.com/go/CompPatch>.

- RCP and HIL software products (on Release 2017-A) cannot be used in combination with RCP and HIL software products from earlier dSPACE Releases.

**Major limitation for working with a SCALEXIO system** The products for working with a SCALEXIO system must be compatible. This is guaranteed only for products delivered with the same dSPACE Release. Contact dSPACE for more information if you have any questions.

**Compatibility of real-time applications loaded to a DS1005, DS1006, DS1103, DS1104 or MicroAutoBox platform** If a real-time application is loaded to one of these platforms with a software product of dSPACE Release 2016-B or later, software products of dSPACE Release 2016-A (and earlier) do not detect that the loaded real-time application is the same as the real-time application stored on your host PC.

This also applies if you load a real-time application with a software product of dSPACE Release 2016-A (and earlier) and use software products of dSPACE Release 2016-B and later, for example, for experimenting.

---

### Combining dSPACE products from earlier Releases

For more information and notes on the combined use of different products from and with earlier Releases, refer to [http://www.dspace.com/go/ds\\_sw\\_combi](http://www.dspace.com/go/ds_sw_combi).

## Limitations for Using Windows Features

<b>Introduction</b>	Some limitations apply using dSPACE software in conjunction with features of Windows.
<b>Fast user switching not supported</b>	dSPACE software does not support the fast user switching feature of Windows.
<b>Closing dSPACE software before PC shutdown</b>	The shutdown procedure of Windows operating systems might cause some required processes to be aborted although they are still being used by dSPACE software. To avoid data loss, it is recommended to terminate the dSPACE software manually before shutting down the PC.
<b>User Account Control</b>	It is recommended to disable Windows' User Account Control (UAC) during the installation of dSPACE software. If you cannot disable UAC, note the following Windows behavior: If UAC is enabled, the setup programs run with the administrator account instead of the user account. Therefore, it is important that the administrator account has access to the required drives, particularly the required network drives.
<b>USB devices</b>	The first time that dSPACE USB devices using cables with optoisolation are connected to the PC, there might be a message that the device driver software was not installed successfully. The dSPACE device will nevertheless work properly later on.
<b>Long path names</b>	dSPACE software does not support the long path name syntax of the Windows API. If a path name that exceeds 260 characters is used directly or indirectly, the behavior of the dSPACE software is not defined.
<b>Windows' 8dot3name creation option must be enabled</b>	<div data-bbox="508 1265 588 1295" data-label="Section-Header"> <p><b>Note</b></p> </div> <div data-bbox="508 1317 1175 1439" data-label="Text"> <p>It is strongly recommended that Windows' 8dot3name creation option is enabled for all drives (drives used for installation and drives used for working) before you install third-party software (such as MATLAB®/Simulink®) and the dSPACE software.</p> </div>

If the option is disabled during software installation, serious errors can occur when you run the dSPACE software. For example, the build process might be aborted. To repair an installation that has been

installed with the disabled 8dot3name creation option, you have to reinstall the dSPACE software and the required third-party software. Using the dSPACE Maintenance Setup does not solve this problem.

For instructions on checking the setting and enabling the option, refer to <http://www.dspace.com/faq?346> or to the Microsoft Windows documentation.

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