

dSPACE Release

New Features and Migration

Release 2022-A – May 2022

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How to Contact dSPACE Support

If you encounter a problem when using dSPACE products, contact your local dSPACE representative:

- Local dSPACE companies and distributors: <http://www.dspace.com/go/locations>
- For countries not listed, contact dSPACE GmbH in Paderborn, Germany.
Tel.: +49 5251 1638-941 or e-mail: support@dspace.de

You can also use the support request form: <http://www.dspace.com/go/supportrequest>. If you are logged on to mydSPACE, you are automatically identified and do not have to add your contact details manually.

If possible, always provide the serial number of the hardware, the relevant dSPACE License ID, or the serial number of the CmContainer in your support request.

Software Updates and Patches

dSPACE strongly recommends that you download and install the most recent AUTERA RTLib version. Visit <https://www.dspace.com/go/auterartlib> for software updates.

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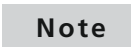



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About This Document

Content This document informs you about the new features of all the dSPACE software products in Release 2022-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.

Printed document A printed copy of this document is available on demand. You can order it free of charge by using the following link:
<https://www.dspace.com/go/requestreleasematerial>.

Symbols dSPACE user documentation 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.
	Indicates a hazard that, if not avoided, could result in property damage.
	Indicates important information that you should take into account to avoid malfunctions.
	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.

Naming conventions dSPACE user documentation 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 Windows folders

Windows-based software products use the following special folders:

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

`%PROGRAMDATA%\dSPACE\`

or

`%PROGRAMDATA%\dSPACE\`

Documents folder A standard folder for application-specific files that are used by the current user.

`%USERPROFILE%\Documents\dSPACE\`

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


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

Accessing dSPACE Help and PDF Files

After you install and decrypt Windows-based dSPACE software, the documentation for the installed products is available in dSPACE Help and as PDF files.

dSPACE Help (local) You can open your local installation of dSPACE Help:

- On its home page via Windows Start Menu
- On specific content using context-sensitive help via **F1**

PDF files You can access PDF files via the  icon in dSPACE Help. The PDF opens on the first page.

dSPACE Help (Web) Independently of the software installation, you can access the Web version of dSPACE Help at <https://www.dspace.com/go/help>.

To access the Web version, you must have a *mydSPACE* account.

For more information on the mydSPACE registration process, refer to www.dspace.com/faq?097.

Overview of dSPACE Release 2022-A

Introduction Gives you an overview of the new key features in Release 2022-A and information about unchanged products.

Where to go from here

Information in this section

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General Enhancements and Changes

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

Providing legal notes for using third-party software

Several dSPACE software products use or contain third-party software. The third-party components may be subject to additional terms and conditions or terms and conditions that deviate from the ones that apply to the dSPACE software. Copyright notices and license terms of third-party components must be adhered to. If the user is required to be explicitly informed of and to comply with the terms and conditions of third-party components, the relevant information on terms and conditions is stated in separate OSSAcknowledgements files for each dSPACE product.

You can find the OSSAcknowledgements files as follows:

- After you install the dSPACE software in the <main installation path of dSPACE Setup>\<subfolder of InstallationSet>\Legal folder.

Python distribution

dSPACE Release 2022-A contains a Python 3.9 distribution with the following components.

Package	Python 3.9 Release 2022-A
comtypes	1.1.10
Core	3.9.9
cycler	0.11.0
fonttools	4.28.5 (new)
future	0.18.2
grpcio	1.43.0
grpcio_tools	1.43.0
kiwisolver	1.3.2
lxml	4.7.1
matplotlib	3.5.1
numpy	1.22.0
packaging	21.3 (new)
pillow	9.0.0
pip	21.3.1
protobuf	3.19.3
pycparser	2.21
pyglet	1.5.21
yparsing	3.0.6
pypubsub	4.0.3
Python-dateutil	2.8.2
pythonnet	2.5.3
pytz	2021.3
pywin32	302.10
scipy	1.7.3
six	1.16.0
wxPython	4.1.1
yapsy	1.12.2

Platform support

SCALEXIO systems now have a 64-bit Linux operating system. This is supported by all related products.

**RCP and HIL software:
C/C++ compilers for building
MATLAB MEX files**

RCP and HIL software (such as RTI CAN MultiMessage Blockset, RTI LIN MultiMessage Blockset, or Automotive Simulation Models) now supports the following C/C++ compilers for building MATLAB MEX files:

- MinGW (GNU Compiler Collection (GCC 6.3.0))
- Microsoft Visual Studio 2019 Professional

New Features of dSPACE Help

Link dialog

The Link dialog has been enhanced. You can copy web links and send them via e-mail. This is now also possible for the home page and the search page. You can directly open local links via the Open Link button.

Refer to the following illustration.

The screenshot shows a dialog box titled "Link" with a close button (X) in the top right corner. It is divided into two sections: "Local Link" and "Web Link".

Local Link section: A text input field contains the URL `url:dSPACEhelp://dSPACEHelp#helpsetid=ControlDeskNewFeaturesAndMigration&externalid=Book_f3df78f0-7f34-42f0-969f-...`. Below the input field is the instruction "Enter a link to open a specific page." To the right of the input field are three buttons: "Share Link by E-Mail", "Copy Link", and "Open Link".

Web Link section: A text input field contains the URL `https://www.dspace.com/de/gmb/home/support/documentation.cfm?helpsetid=ControlDeskNewFeaturesAndMigration&ext...`. Below the input field is the instruction "You might be required to log on to your mydSPACE account to view this page on the web." To the right of the input field are three buttons: "Share Link by E-Mail", "Copy Link", and "Open Link".

A green notification box on the left side of the Web Link section says "Link copied."

Enhanced video player

If a tutorial video cannot be loaded, a dialog is displayed providing a link and a QR code to the video. For example, the tutorial video may not load because your device is not connected to the internet. You can use the link or the QR code to play the tutorial video on a different device. Refer to the following illustration.

The screenshot shows a video player interface with a title "Monitoring the Switching Behavior of the SCALEXIO Failure Simulation Hardware". Below the title is a "Description" section with a downward arrow icon. The description text reads: "This tutorial video shows you how to monitor the switching behavior of the SCALEXIO failure simulation hardware."

Below the description is a video player area. The video player shows a black screen with white text that reads: "Could not load the video. Either your device is not connected to the Internet or the video server is not available. To watch this video, visit <http://www.dspace.com/dspace-help/b8Lnx> or scan the QR code." A QR code is displayed in the center of the video player area.

Discontinuations

Introduction

The following discontinuations for software and hardware are relevant to the current Release or are planned for future Releases.

For more end-of-life announcements, refer to <https://www.dspace.com/go/discontinuation>.

Discontinuation of software support

Operating system

- As of dSPACE Release 2022-A, Windows LTSB 2016 is no longer supported.
- As of dSPACE Release 2022-A, Windows Server 2016 is no longer supported.

Variable Editor As of dSPACE Release 2022-A, the Variable Editor will no longer be available.

Planned discontinuation of software support

dSPACE CAN API and further bus-specific APIs As of dSPACE Release 2022-B, the dSPACE CAN API and further bus-specific APIs will no longer be available for 32-bit applications.

Support for the 64-bit versions of these APIs is not affected and will be continued.

SWC container exchange As of dSPACE Release 2022-B, exchanging SWC containers between TargetLink and SystemDesk will no longer be supported. However, you can still exchange software components using ARXML files. With dSPACE AUTOSAR Compare, you can compare and merge these files.

The discontinued software parts include:

- In SystemDesk, the Container File Explorer and the commands for preparing and exchanging SWC containers.
- In TargetLink, the Data Dictionary commands for exchanging SWC containers.
- The Container Manager, which is a stand-alone tool for managing the contents of SWC containers. It will no longer be available from TargetLink or SystemDesk.

MotionDesk and Sensor Simulation MotionDesk and Sensor Simulation are planned for discontinuation.

MotionDesk will be discontinued after [Release 2023-B](#).

Sensor Simulation based on MotionDesk will be discontinued for simulation with radar and lidar sensor after [Release 2022-A](#). Sensor Simulation with camera sensors will be discontinued with MotionDesk after Release 2023-B.

dSPACE AURELION is a new product and the successor of MotionDesk for the visualization of ADAS/AS simulations in realistic animations to validate driving functions. It is also a replacement for ADAS/AS simulations with camera, radar, and lidar sensors to validate sensor output and sensor algorithms.

For more information and to prepare for your migration to AURELION, refer to the following [dSPACE Support FAQ](#) or contact dSPACE Support.

Discontinuation of dSPACE hardware

With Release 2022-A, software support is discontinued for the following product:

- SCALEXIO Processing Unit with the Intel® Core™ i7-860 mainboard (Real-Time PC Version 1.0).

For new projects, we recommend that you use another variant of the SCALEXIO Processing Unit. Refer to [Variants of the SCALEXIO Processing Unit \(SCALEXIO Hardware Installation and Configuration !\[\]\(9dfdaff1d86ba3c1f8353b4d1b61b8c5_img.jpg\)](#)).

Planned discontinuation of dSPACE hardware

PHS-bus hardware In December 2021, the hardware components for PHS-bus-based systems, such as the DS1006 Processor Board, the DS1007 PPC Processor Board, and all the PHS-bus I/O boards, were discontinued. This also applies to the dSPACE Simulator Mid-Size and the dSPACE Simulator EcoLine. New Releases of dSPACE software will continue to support the PHS-bus hardware components until the end of 2023.

For new projects, we recommend that you use SCALEXIO as a modular real-time system.

Planned discontinuation of legacy licensing technologies

As of dSPACE Release 2023-A, dSPACE software will no longer support legacy licensing technologies (WibuKey from Wibu-Systems for dongle licenses and FlexNet from Flexera for floating network licenses). This means:

- dSPACE Release 2023-A and later will support only the CodeMeter licensing technology introduced with dSPACE Release 2017-B.
 - As of dSPACE Release 2023-A, the dSPACE Installation Manager will no longer provide the file download (keys.dsp and license.dsp) for legacy licensing based on CodeMeter licenses.
 - dSPACE Release 2023-A cannot be installed on the same PC as dSPACE Release 2017-A or earlier.
 - As of dSPACE Release 2023-A, dSPACE License Manager (Legacy) will no longer be shipped and installed with the dSPACE Installation Manager. The associated command line utilities are also discontinued, including in particular the `IMLicUtil.exe` and the `InstallationReporter.exe` utilities.
-

Planned discontinuation of the dongle migration with dSPACE Installation Manager

As of dSPACE Release 2023-A, dSPACE Installation Manager will no longer support migration from old dongles (delivered for dSPACE Release 2017-A and earlier) to currently delivered CmDongles.

Dongle migration via an older version of dSPACE Installation Manager (which can be downloaded from the dSPACE website) will still be technologically possible.

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			
	2020-B	2021-A	2021-B	2022-A
AutomationDesk	6.4	6.5	6.6	6.7 Refer to AutomationDesk on page 25.
Automotive Simulation Models	9.6	9.7	10.0	10.1 Refer to Automotive Simulation Models (ASM) on page 29.
Bus Manager (stand-alone)	6.6	6.7	6.8	22.1 Refer to Bus Manager (Stand-Alone) on page 39.
ConfigurationDesk for RapidPro	6.6	6.7	– ¹⁾	–
ConfigurationDesk	6.6	6.7	6.8	22.1 Refer to ConfigurationDesk on page 47.
Container Manager	5.2	5.2	5.2	5.2 ²⁾
ControlDesk	7.3	7.4	7.5	7.6 Refer to ControlDesk on page 65.
DCI Configuration Tool	3.12	3.13	3.13	3.13
dSPACE AUTOSAR Compare	1.0	1.0	1.1	1.1
dSPACE CAN API Package	4.0.5	4.0.6	4.0.7	4.0.8
dSPACE ECU Flash Programming Tool	2.7	2.8	2.8	2.8
dSPACE FlexRay Configuration Package	4.6	4.7	4.8	4.9 Refer to dSPACE FlexRay Configuration Package on page 83.
dSPACE Installation Manager	5.6	5.7	5.8	5.9 Refer to dSPACE Installation Manager on page 87
dSPACE Python Extensions	3.4	4.0	4.1	4.2 Refer to dSPACE Python Extensions on page 89.
dSPACE XIL API .NET	2020-B	2021-A	2021-B	2022-A Refer to dSPACE XIL API .NET on page 91.
ECU Interface Manager	2.8	2.9	2.10	2.11
Firmware Manager	3.2	3.3	3.4	3.5 Refer to Firmware Manager on page 95.
Model and Sensor Interface Blockset	1.0	1.1	1.2	1.3 Refer to Model and Sensor Interface Blockset on page 99.

Product	dSPACE Release			
	2020-B	2021-A	2021-B	2022-A
Model Compare	3.1	3.1	3.2	3.2
ModelDesk	5.4	5.5	5.6	5.7 Refer to ModelDesk on page 103.
Model Interface Package for Simulink	4.4	4.5	4.6	22.1 Refer to Model Interface Package for Simulink on page 107.
MotionDesk	4.7	4.8	4.9	4.10 Refer to MotionDesk on page 111.
MotionDesk Blockset	2.6.2	2.6.3	2.6.4	2.6.5 Refer to MotionDesk on page 111.
Real-Time Testing	4.4	5.0	5.1	5.2 Refer to Real-Time Testing on page 113.
RTI ³⁾	7.15	7.16	7.17	7.18 Refer to RTI/RTI-MP and RTLib on page 115.
RTI-MP ⁴⁾	7.15	7.16	7.17	7.18 Refer to RTI/RTI-MP and RTLib on page 115.
RTI Bypass Blockset	3.15	3.16	3.17	3.18 Refer to RTI Bypass Blockset on page 117.
RTI CAN Blockset	3.4.11	3.4.12	3.4.13	3.4.14
RTI CAN MultiMessage Blockset	5.5	5.6	5.7	5.8 Refer to RTI CAN MultiMessage Blockset on page 121.
RTI Electric Motor Control Blockset	1.4.2	1.4.3	1.4.4	1.4.5
RTI Ethernet Blockset	1.2.4	1.2.5	1.2.6	1.2.7
RTI Ethernet (UDP) Blockset	1.4.4	1.4.5	1.4.6	1.4.7
RTI FPGA Programming Blockset	3.10	3.11	3.12	3.13 Refer to RTI FPGA Programming Blockset on page 125.
RTI LIN MultiMessage Blockset	3.5	3.6	3.7	3.8 Refer to RTI LIN MultiMessage Blockset on page 129.
RTI RapidPro Control Unit Blockset	2.2.4	2.2.5	2.2.6	2.2.7
RTI Synchronized Time Base Manager Blockset	1.4.1	1.4.2	1.4.3	1.4.4
RTI USB Flight Recorder Blockset	1.2.3	1.2.4	1.2.5	1.2.6
RTI Watchdog Blockset	2.1.2	2.1.3	2.1.4	2.1.5
Sensor Simulation	1.4	1.5	1.6	1.7 Refer to Sensor Simulation on page 135.
SCALEXIO firmware	5.0	5.1	5.2	6.0 Refer to SCALEXIO Firmware on page 131.

Product	dSPACE Release			
	2020-B	2021-A	2021-B	2022-A
SYNECT	2.10	2.11	2.12	2.13 Refer to SYNECT on page 137.
SystemDesk	5.5	5.5	5.6	5.6
TargetLink	5.1	5.1	5.2	5.2
Variable Editor ^{5), 6)}	2.4	2.4	2.4	–
VEOS	5.1	5.2	5.3	5.4 Refer to VEOS on page 141.

1) As of dSPACE Release 2021-B, ConfigurationDesk for RapidPro ist no longer part of the dSPACE Release. You can download it from the dSPACE website as a separate software package with its own setup program. Refer to <https://www.dspace.com/go/CFDRP>.

2) Version 5.2 will be the last version of the Container Manager, which will be discontinued with dSPACE Release 2022-B.

3) Including the standard I/O blocksets.

4) Including the RTI Gigalink Blockset.

5) The Variable Editor is not part of the dSPACE Release DVD. It is available at <https://www.dspace.com/go/requestreleasedownload>.

6) As of dSPACE Release 2022-A, the Variable Editor will no longer be available.

If you have not performed regular updates, refer to the *New Features and Migration* documents for the dSPACE Releases listed above for information about the new features and required migration steps.

New Key Product Features

Introduction

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

AutomationDesk

The new key features of AutomationDesk are:

- Support of ASAM XIL API 2.2.0
- Enhanced Find dialog
- New tutorial videos

For more information on the new features, refer to [New Features of AutomationDesk 6.7](#) on page 25.

Bus Manager (stand-alone)

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

- Transmitting PDUs according to event-controlled timings
- Using minimum delay times for the transmission of PDUs
- Support of RX masks according to AUTOSAR

- Support of ISignals and ISignal groups with missing sending and/or receiving ECU
- Enhanced bus configuration features
- Selecting communication matrix elements by their direction
- New Bus Manager SecOC demo
- Video introducing the Bus Manager (stand-alone)

For more information, refer to [New Features of the Bus Manager \(Stand-Alone\) 22.1](#) on page 39.

ConfigurationDesk

The new key features of ConfigurationDesk are:

- New SCALEXIO 64-bit support
- New connection between ConfigurationDesk and MATLAB
- New and enhanced function block types to support data replay in a HIL environment.
- New project cache folder for temporary project files such as build artifacts.
- Various enhancements of the Bus Manager for configuring bus communication for simulation, inspection, and manipulation purposes.

For more information, refer to [ConfigurationDesk](#) on page 47.

ControlDesk

The new key features of ControlDesk are:

General enhancements

- Modernized user interface framework and improved handling of panes and pages

For more information, refer to [New User Interface Handling Features \(ControlDesk 7.6\)](#) on page 67.

Platform/device enhancements

- XIL API MAPort platform: Support of XIL API version 2.2.0

For more information, refer to [New Features of Platform Management and Platforms/Devices \(ControlDesk 7.6\)](#) on page 67.

Measurement and recording enhancements

- Measuring and recording high-frequent FPGA signals

For more information, refer to [New Measurement and Recording Features \(ControlDesk 7.6\)](#) on page 69.

Bus Navigator enhancements

- Ethernet: Display of decoded PDUs and signals in the Decoding view
- Ethernet SOME/IP: Display of decoded item names in the Monitoring list
- Display of Bus Navigator element properties



For more information, refer to [New Bus Navigator Features \(ControlDesk 7.6\)](#) on page 69.

Electrical error simulation (failure simulation) enhancements

- Support of XIL API version 2.2.0

For more information, refer to [New Electrical Error Simulation Features \(ControlDesk 7.6\)](#) on page 70.

Additional enhancements

- New video that shows you how to configure the Hierarchy Array and connect it to variables.
Refer to [Handling the Hierarchy Array \(4:15\)](#)  in dSPACE Help.
- New video that shows you how to register the DS6001 Processor Board and update its firmware.
Refer to [SCALEXIO LabBox Getting Started: Registering the DS6001 and Updating its Firmware \(3:36\)](#)  in dSPACE Help.

dSPACE FlexRay Configuration Package

The new key features of the dSPACE FlexRay Configuration Package are:

- Simulating partial networking.
- Data replay.
- Support of AUTOSAR Classic Platform R21-11.

The new key features of the dSPACE FlexRay Configuration Tool are:

- Working with FRCFG configuration files.
- Automating the FlexRay Configuration Tool.
- Generating missing ECUs.
- Specifying the synchronization range of the FlexRay synchronization task.
- Raw data access for cryptographic IPDUs.
- SWEnable support for cryptographic IPDUs.

For more information on the new features, refer to [New Features of dSPACE FlexRay Configuration Package 4.9](#) on page 83.

dSPACE XIL API

The new key features of dSPACE XIL API are:

- Support of ASAM XIL API 2.2.0
- XIL API on Linux: Support of Ubuntu Linux 20.04

For more information on the new feature, refer to [New Features of dSPACE XIL API .NET 2022-A](#) on page 91.

Firmware Manager

The Firmware Manager has no new feature, but the 64-bit SCALEXIO firmware archive is now the default archive for the Linux-based software components.

For more information, refer to [New Features of Firmware Manager 3.5](#) on page 95.

MicroAutoBox III firmware

The new key features of the MicroAutoBox III firmware are:

- Extended DS1403 Processor Board support.

For more information on the new features, refer to [New Features of the MicroAutoBox III Firmware 6.0](#) on page 97.

Model and Sensor Interface Blockset

The new key features of the Model and Sensor Interface Blockset are:

- Improved usability when copying blocks.
- Improved copying of subsystems to avoid connection collisions.
- Improved usability when working with library linked blocks.
- Addition of block parameter `get` and `set` commands for the Automation API.
- Improved `dsmis_analyze` function to provide information on the execution order of the model and interface blocks.

For more information on the new features, refer to [New Features of Model and Sensor Interface Blockset 1.3](#) on page 99.

ModelDesk

The new key features of ModelDesk are:

- V2X support: Specifying signal phases and timings for traffic lights to simulate SPaT messages.

For more information on the new features, refer to [New Features of ModelDesk 5.7](#) on page 103.

Model Interface Package for Simulink

The new key features of Model Interface Package for Simulink are:

- New SCALEXIO 64-bit support
- New unified dsrt.tlc system target file
- New Target architecture property
- New target architecture suffix in SIC file names
- New connection between the Model Interface Package for Simulink and ConfigurationDesk
- Support of MATLAB R2022a

For more information on the new features, refer to [Model Interface Package for Simulink](#) on page 107.

RTI, RTI-MP, and RTLib

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

- Support of MATLAB R2022a.

For more information, refer to [New Features of RTI/RTI-MP and RTLib](#) on page 115.

RTI Bypass Blockset

The new key feature of the RTI Bypass Blockset is:

- Extension of compiler configuration in on-target bypassing models.

For more information on the new features, refer to [New Features of the RTI Bypass Blockset 3.18](#) on page 117.

RTI CAN MultiMessage Blockset

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

- Support of AUTOSAR Classic Platform R21-11.

For more information on the new features, refer to [New Features of the RTI CAN MultiMessage Blockset 5.8](#) on page 121.

RTI FPGA Programming Blockset

The new key features of the RTI FPGA Programming Blockset 3.13 are:

- Extended Xilinx® software support.
- Enhancements to the FPGA framework for SCALEXIO.
- Enhancements to the FPGA Build Monitor.

For more information on the new features, refer to [New Features of the RTI FPGA Programming Blockset 3.13](#) on page 125.

RTI LIN MultiMessage Blockset

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

- Support of AUTOSAR Classic Platform R21-11.

For more information on the new feature, refer to [New Features of the RTI LIN MultiMessage Blockset 3.8](#) on page 129.

SCALEXIO firmware

The new key features of the SCALEXIO firmware are:

- Support of the DS6330M3 Automotive Ethernet Module.
- 64-bit Linux as operating system.
- License-protected Hypervisor Extension.

For more information on the new features, refer to [New Features of the SCALEXIO Firmware 6.0](#) on page 131.

VEOS

The new key features of VEOS are:

- Support of the FMI 3.0-beta.3 pre-release
- Enabling bus data replay
- Building FMUs on Linux (VEOS Build Console)
- Specifying simulation targets (VEOS Target Console)
- Enabling/disabling experimentation services
- VEOS on Linux: Support of Ubuntu Linux 20.04

For more information on the new features, refer to [New Features of VEOS 5.4](#) on page 141.

Aspects of Migrating from Previous Releases

Introduction

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

Migrating to dSPACE Release 2022-A

Introduction

After you install Release 2022-A, some additional steps might be required.

Migrating from dSPACE Release 2021-B

Product-specific migration steps Product-specific migration steps are generally performed automatically. For exceptions, refer to the product-specific migration descriptions.

Migrating from dSPACE Release 2021-A or earlier

To migrate from dSPACE Release 2021-A or earlier to Release 2022-A, you also have to perform the migration steps of the intervening dSPACE Releases. All of the required migration steps can be performed using software from dSPACE Release 2022-A.

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 represents the Release number.

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

- In the installation folder of the current dSPACE Help. Refer to **C:\Program Files\Common Files\dSPACE\Help 2022-A\Print\PreviousReleases**.
- On the dSPACE DVDs. Refer to **\Doc\PreviousReleases**.

- At <https://www.dspace.com/go/migration> for download. Here, you can also find *New Features and Migration* documents for very early Releases.

AutomationDesk

Where to go from here

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New Features of AutomationDesk 6.7

General enhancements

Support of ASAM XIL API 2.2.0 AutomationDesk can now also be used with XIL API .NET servers based on ASAM XIL API version 2.2.0. This affects the XIL API library and the XIL API Convenience library.

The dSPACE XIL API .NET implementation provides the same functionality as before. The new features of ASAM XIL API 2.2.0 are not supported yet. For the required migration steps, refer to [Migrating to AutomationDesk 6.7](#) on page 26.

The Mapping Editor works with framework configurations based on XIL API 2.0.1, 2.1.0, and 2.2.0. The default file format is 2.2.0. If you load a framework configuration based on XIL API 2.0.1 or 2.1.0, the data is automatically migrated and stored in the 2.2.0 file format. However, you can explicitly save the current framework configuration in the 2.0.1 and 2.1.0 file format.

For more information, refer to [XIL API \(Model Access\) \(AutomationDesk Accessing Simulation Platforms !\[\]\(cf531ed27e91483460120fcc057b3901_img.jpg\)\)](#) and [XIL API Convenience \(Model Access\) \(AutomationDesk Accessing Simulation Platforms !\[\]\(34fde9b7c74442c0438f550a41236260_img.jpg\)\)](#).

Enhanced Find dialog The Find dialog now provides the Implementation State setting to include the values of the SYNECT Implementation State property of sequence and test case elements in a search.

Tutorial videos New tutorial videos are available in dSPACE Help, which show how to use the SYNECT interface and the Test Builder library.

Refer to:

- [Basics on Using AutomationDesk with SYNECT \(AutomationDesk Basic Practices !\[\]\(95b42f0077faf7439a26242a54e021ec_img.jpg\)](#))
- [Test Builder Demo Projects and Videos \(AutomationDesk Basic Practices !\[\]\(e097ab4c08b8186dd0908330bbc2dc28_img.jpg\)](#))

Migrating to AutomationDesk 6.7

General migration aspects

If you open an AutomationDesk project with a later AutomationDesk version, the software automatically detects whether migration is required. You must click OK in the message dialog to start the migration. Save the migrated project to another path or name.

An AutomationDesk project loaded and saved with AutomationDesk 6.3 and later can be opened in AutomationDesk 6.2. The different schema versions are then displayed in a warning message. It might not be possible to execute the project with the earlier AutomationDesk version.

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 properly.

If you use a version control system, there are some preconditions for successful migration. Refer to [How to Migrate Projects or Custom Libraries Under Version Control \(AutomationDesk Basic Practices !\[\]\(c50c8b7b2cc2cf9ff925edec0ee94c0d_img.jpg\)](#)).

For more information, refer to [Migrating AutomationDesk \(AutomationDesk Introduction And Overview !\[\]\(6a9b39b98eb945faa14c645ec99e4eaa_img.jpg\)](#)).

Migration to the new serialization format introduced with AutomationDesk 6.2

If you open an AutomationDesk project or a custom library created with AutomationDesk 6.1 (Release 2019-A) or earlier, the data is automatically migrated to the new XML format. The migration considers the standard serialization format, exported projects and custom libraries in ZIP format, and exported projects and custom libraries in the legacy XML format.

If you use a version control system, you can get and open projects and custom libraries in the legacy formats. They are automatically migrated to the new serialization format and lose their connections to the version control system. You must add the migrated projects and custom libraries to new version control projects to avoid mixing the formats in the repository. For more information, refer to [How to Migrate Projects or Custom Libraries Under Version Control \(AutomationDesk Basic Practices !\[\]\(f60b7a900783ac3fd531bfd9c111be6d_img.jpg\)](#)).

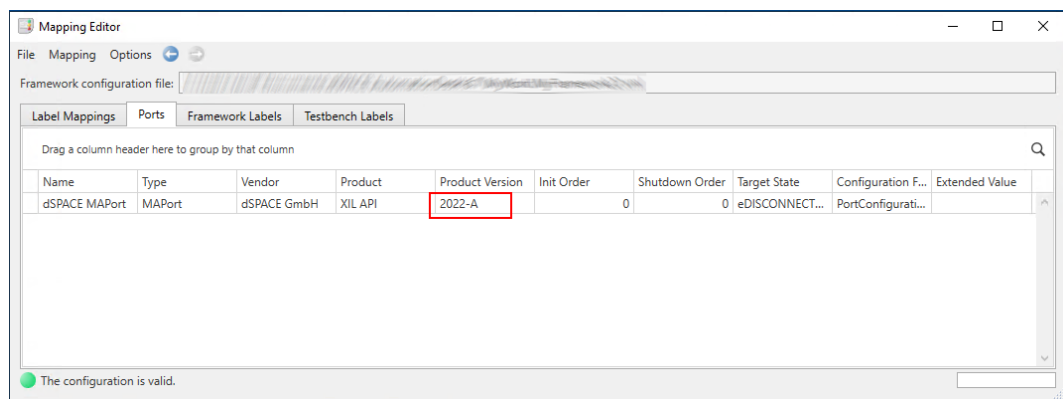
Project import restricted since Release 2021-A

Since dSPACE Release 2021-A, AutomationDesk has supported the direct import only of projects last saved with one of the previous seven AutomationDesk versions.

Migrating to XIL API 2.2.0

When you use blocks from the XIL API library or the XIL API Convenience library, you have to adapt some configurations.

Using the XIL API framework If you have not used the default vendor *dSPACE*, you have to migrate the port definition in the Mapping Editor. You have to specify the dSPACE implementation of Release 2022-A to switch the XIL API version to 2.2.0.



Using the XIL API testbench If you use the XIL API testbench, you have to migrate the Vendor data object to the new vendor identifier *dSPACE GmbH_XIL API_2022-A*.

Using STZ files

If you work with STZ files, no manual migration is required. If you execute the stimulus signals, the signal description is automatically temporarily converted to XIL API 2.2.0. The STZ file is saved in the new format only if the stimulus definition has been modified.

Planned discontinuations

Automation Server In December 2022, the *Automation Server* will be discontinued. New Releases of the AutomationDesk Automation Server will only be available for customers with a Software Maintenance Service Contract until June 2022.

The *AutomationDesk Basic* license provides the technical equivalent to the Automation Server.

For more information, refer to <https://www.dspace.com/go/discontinuation>.

Automotive Simulation Models (ASM)

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All ASM Products

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New Features of All ASM Blocksets

External interfaces

The ASM modules now contain prepared input interfaces with model port blocks, wherever this is required. You can now easily connect an external component using VEOS or ConfigurationDesk without re-compiling the model.

Videos

There is a new ASM video. It describes using the Testing component in ModelDesk.

The ASM videos are available in dSPACE Help and on the dSPACE website.

- To access the videos in dSPACE Help, go to [ASM Videos \(ASM User Guide\)](#).
- To access the videos on dSPACE website, go to <https://www.dspace.com/en/pub/home/medien/videos.cfm>.

Changes in All ASM Demo Models

Model port blocks

On the output side of every ASM module, relevant signals are selected inside the Signal Interface subsystem and sent to external components via model port blocks. These signals usually represent either the simulated sensors or ECU commands and are connected to the inputs of external components.

ASM Diesel Engine

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New Features of ASM Diesel Engine Blockset 2.8.3

CYLINDER_INLET block

The relative air mass calculation now supports other gas compositions than air.

Migrating to ASM Diesel Engine Blockset 2.8.3

CYLINDER_INLET_7_0 block

This block contains the structure and equations of a former block version.

Related topics

Basics

[Migrating ASM Models \(ASM User Guide !\[\]\(0d7ca0919e6c47bbd874bfa0189fe22e_img.jpg\)\)](#)

ASM Electric Components

Where to go from here

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New Features of ASM Electric Components Blockset 3.12.1

Compressor block

The current is now calculated based on the ratio between voltage and DC link voltage.

Migrating to ASM Electric Components Blockset 3.12.1

COMPRESSOR_6_0 block

This block contains the structure and equations of a former block version.

Related topics

Basics

[Migrating ASM Models \(ASM User Guide !\[\]\(e9474ce1d70442456f8fe9c393ea149c_img.jpg\)\)](#)

ASM Fuel Cell

Where to go from here

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New Features of ASM Fuel Cell Blockset 1.0.1

HYDROGEN_SUPPLY_ CONTROL block

The start-up and shut-down are now controlled by a state machine including a leakage test and a pressure release procedure.

FLOW_ELEMENT block

The block now contains a new ModelDesk processing function to calculate the conductivity coefficient.

THROTTLE_VALVE block

The block now contains new ModelDesk processing functions to calculate the maximum flow area, the reduced area factor map, and the flow function map.

Migrating to ASM Fuel Cell Blockset 1.0.1

Introduction

Note

The changes to the following library blocks can lead to small deviations when comparing simulation results before and after migration. In contrast to ASM migration policy, this is accepted here, since the expected deviations are minor.

ELECTROCHEMISTRY_ PHYSICAL block

The calculations of current densities and voltages were improved.

GAS_DIFFUSION_LAYER block

The hydrogen gas fraction is now directly calculated instead of nitrogen.

HYDROGEN_VALVE block

There is a new block inport to support back flow through the valve.

**HYDROGEN_SUPPLY_
CONTROL block**

There were structural changes to the control of the start-up and shut-down procedure.

INTERCOOLER block

There is a new block outport for specific enthalpy of liquid water at intercooler input side.

MANIFOLD block

There are small changes to avoid divisions by zero.

Related topics

Basics

[Migrating ASM Models \(ASM User Guide !\[\]\(6059a5aa8b4ca7bb793408023d6c6e42_img.jpg\)\)](#)

ASM Gasoline Engine

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New Features of ASM Gasoline Engine Blockset 4.2.3

CYLINDER_INLET block

The relative air mass calculation now supports other gas compositions than air.

Migrating to ASM Gasoline Engine Blockset 4.2.3

CYLINDER_INLET_7_0 block

This block contains the structure and equations of a former block version.

COMBUSTION_TORQUE_CI block

The size of the Map_phi_opt parameter was changed from [22,20] to [50,40] values.

Related topics

Basics

[Migrating ASM Models \(ASM User Guide !\[\]\(2bae76de5ebbd5c4d7d47162f1673734_img.jpg\)\)](#)

ASM Traffic

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New Features of ASM Traffic Blockset 4.4

TRAFFIC_SCHEDULER block

The TRAFFIC_SCHEDULER block now supports simulation of a lateral deviation between a fellow and a reference object based on reference points. You can choose between a pre-set of reference points in ModelDesk. The reference points can be located either on the bounding box or on the main point of the fellow and the reference object.

FELLOW_POS_VEL block

The FELLOW_POS_VEL block has been extended by a new inport: Angle_Yaw_Fellows_RoadRefline[deg]. This signal is used, if the yaw angle correction is deactivated by a fellow user signal. As a result, the fellow yaw angle equals the yaw angle of the road reference line at the fellow position.

Changes in the ASM Traffic Demo Model

Yaw angle correction

The handling of yaw angle correction has been changed. The Constant block that was used to feed the use_yaw_road[0|1] inport of the FELLOW_POS_VEL block inside the FellowMovement subsystem has been removed. Now, there is a logic inside the ObjectParameters_Modified block that feeds the inport depending on the MoveCharacteristic fellow user signal.

Migrating to ASM Traffic Blockset 4.4

TRAFFIC_SCHEDULER block

The scenario vector is migrated so that older scenarios that use the relative lateral deviation feature are extended by the reference point information.

FELLOW_PARAMETERS block The PosVec_MainPnt_Fellows[x;y;z][m] signal is changed from a *matrix* into a *vector* signal.

Related topics

Basics

[Migrating ASM Models \(ASM User Guide !\[\]\(e2376d476d06eb31946dc01a69a4403a_img.jpg\)\)](#)

Bus Manager (Stand-Alone)

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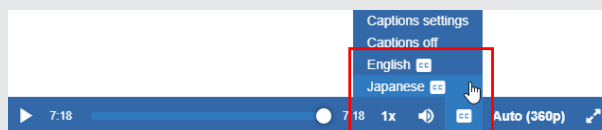
New Features of the Bus Manager (Stand-Alone) 22.1

Video introducing the Bus Manager (stand-alone)

A new video is available that introduces you to the Bus Manager (stand-alone). It shows the basic steps for configuring CAN and LIN communication, working with a behavior model, and generating bus simulation containers. You can access the video in dSPACE Help, on the Start Page of the Bus Manager (stand-alone), and on the dSPACE website.

Tip

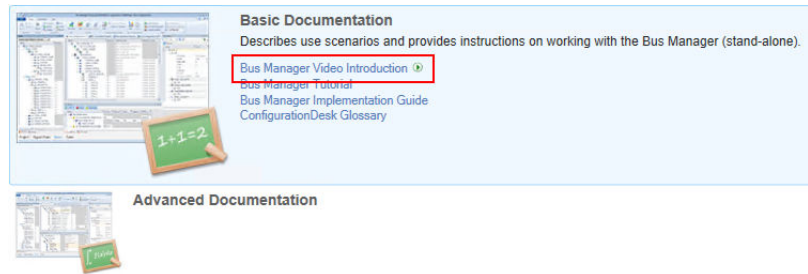
In dSPACE Help, you can switch between English and Japanese video subtitles. You can switch the subtitle language on the controlbar of the video player.



Refer to:

- dSPACE Help: [Introduction to the Bus Manager \(Stand-Alone\) \(6:22\)](#) in dSPACE Help

- Start Page of the Bus Manager (stand-alone): Basic Documentation - Bus Manager Video Introduction



- dSPACE website: www.dspace.com/go/BusManagerStandAlone_Introduction

Bus Manager SecOC demo

The Bus Manager (stand-alone) now provides the Bus Manager SecOC demo. The Bus Manager SecOC demo introduces you to the basic steps of implementing secure onboard communication (SecOC) in the ConfigurationDesk application. The demo uses a simple communication matrix to show the handling of secured bus communication in user code files, such as implementing keys. It also uses bus configuration features for manipulating and inspecting the state of the secured bus communication. The Bus Manager SecOC demo is based on a Python script that uses automation to execute all required steps, including generating bus simulation containers (BSC files).

Refer to [Working with the Bus Manager SecOC Demo \(Bus Manager \(Stand-Alone\) Implementation Guide !\[\]\(fa6f3af6bfa46c5d4a2d362681095beb_img.jpg\)](#)).

New supported AUTOSAR Release

The Bus Manager (stand-alone) now supports AUTOSAR system description files based on AUTOSAR Classic Platform Release R21-11.

Transmitting PDUs according to event-controlled timings

The Bus Manager (stand-alone) now supports event-controlled timings according to AUTOSAR. With event-controlled timings, ISignals and ISignal groups that are included in a PDU can trigger the transmission of this PDU. For this purpose, the Bus Manager can evaluate the setting of the transfer property of ISignals/ISignal groups. The setting of the transfer property determines if and how an ISignal/ISignal group can trigger the transmission. However, you must enable the evaluation of the transfer property for each bus configuration. Moreover, you can configure settings of event-controlled timings and the transfer property.

For more information, refer to [Using Event-Controlled Timings for Transmitting PDUs \(Bus Manager \(Stand-Alone\) Implementation Guide !\[\]\(d8ab143e904bfa3467271eec5af75a9b_img.jpg\)](#)).

Using minimum delay times for the transmission of PDUs

The Bus Manager (stand-alone) now observes minimum delay times. If the communication matrix specifies a minimum delay time for a PDU, the Bus Manager ensures that the time span between two transmissions of the PDU is equal to or greater than the minimum delay time. If required, you can change the specified minimum delay time.

For more information, refer to [Configurable Settings of PDUs \(Bus Manager \(Stand-Alone\) Implementation Guide !\[\]\(c8d96c8885d3000a912c2582004aed63_img.jpg\)](#)).

Using RX masks to define the relevant bits of received CAN identifiers

The Bus Manager (stand-alone) now supports RX masks of CAN frame triggerings according to AUTOSAR. An RX mask defines the relevant bits for a received CAN identifier: A received CAN identifier must match only the relevant bits to be handled as a matching CAN identifier by the receiver. The bits that are not relevant can differ. If required, you can change the specified RX mask.

For more information, refer to [Configurable Settings of Frames \(Bus Manager \(Stand-Alone\) Implementation Guide !\[\]\(c3d993ca47bfe2a953c700506ce31fa0_img.jpg\)](#)).

Selecting communication matrix elements by their direction

The Bus Manager (stand-alone) now lets you select communication matrix elements that are displayed in the Buses Browser by their direction. When you select one or more elements, such as two ECUs or a communication cluster, you can select all the related TX or RX PDUs at once by using the **Select Elements by Direction** context menu command. The PDUs are selected regardless of their specific PDU type. However, PDUs that are not displayed in the Buses Browser, e.g., because of an active filter, are not selected.

Enhanced bus configuration features

The following bus configuration features are enhanced:

PDU RX Status feature The PDU RX Status feature now provides a Loopback function port. The function port value indicates whether the PDU is received as a loopback PDU, i.e., whether the PDU is transmitted and received by the same bus access (CAN or LIN function block).

For more information, refer to [Observing the Status of Received PDUs \(Bus Manager \(Stand-Alone\) Implementation Guide !\[\]\(cf531ed27e91483460120fcc057b3901_img.jpg\)](#)).

PDU User Code feature The PDU User Code feature now lets you specify user-defined function ports. You can use these user ports to exchange data with the user code. For example, you can provide data that is received from a mapped behavior model to the user code or provide user code data to the behavior model. For this purpose, the Bus Custom Code interface provides new functions that let you access the user ports in the user code.

For more information, refer to [Applying User Code to PDUs \(Bus Manager \(Stand-Alone\) Implementation Guide !\[\]\(4b7a79268f6ba26c1471d4232fffa85a_img.jpg\)](#)).

PDU Length feature The PDU Length feature is now supported for further PDU types. The newly supported PDU types are the following:

- RX container IPDUs
- Contained IPDUs that are included in TX or RX container IPDUs with a dynamic container layout.

For more information, refer to [Accessing the Payload Length of CAN PDUs \(Bus Manager \(Stand-Alone\) Implementation Guide !\[\]\(4f6bf54ae7e4144a72d78316053e412d_img.jpg\)](#)).

Position of LIN schedule tables in the communication matrix identifiable

The position of LIN schedule tables in the communication matrix is now displayed in the Properties Browser. The position is displayed as a comma-separated index behind the name of each LIN schedule table. This helps you specify an initial LIN schedule table via the LIN Schedule Table feature.

Refer to [Working with LIN Schedule Tables \(Bus Manager \(Stand-Alone\) Implementation Guide !\[\]\(99f58673407353e96a019fbca558fd72_img.jpg\)](#)).

Support of ISignals and ISignal groups with missing sending and/or receiving ECU

The Bus Manager (stand-alone) now supports ISignals and ISignal groups for which the communication matrix does not specify a sending and/or receiving ECU. If a communication matrix does not specify a sending and/or receiving ECU for an ISignal or ISignal group that is assigned to a PDU, the affected ISignal/ISignal group is imported and available in the Buses Browser when you add the communication matrix to the ConfigurationDesk application. In the ConfigurationDesk application, you can use this ISignal/ISignal group like any other ISignal/ISignal group.

However, existing ConfigurationDesk applications are not updated automatically. Refer to [Migrating to the Bus Manager \(Stand-Alone\) 22.1](#) on page 43.

Enhanced connection to MATLAB

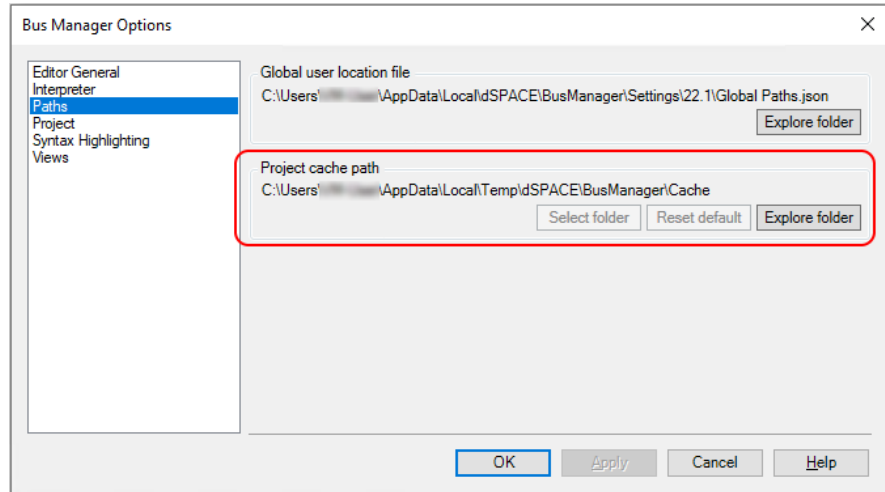
The connection between the Bus Manager (stand-alone) and MATLAB was enhanced to improve the capability of the Bus Manager (stand-alone) to interact with MATLAB. The Bus Manager (stand-alone) can now better handle scenarios in which more than one MATLAB version is installed and more than one MATLAB instance is running. The following table shows possible use scenarios:

Use Case	dSPACE Release 2022-A	dSPACE Release 2021-B and Earlier
No MATLAB process is running.	The Bus Manager (stand-alone) starts the preferred MATLAB Release.	Same behavior
One MATLAB process is running, and it is the preferred connection.	The Bus Manager (stand-alone) connects to this MATLAB process.	Same behavior
One MATLAB process other than the preferred one was started before the Bus Manager (stand-alone).	The Bus Manager (stand-alone) connects to this MATLAB process.	The Bus Manager (stand-alone) cannot connect to MATLAB.
Multiple MATLAB processes are running.	The Bus Manager (stand-alone) connects to one of the running MATLAB processes. You can select the MATLAB process in MATLAB.	The startup sequence of the MATLAB processes determines whether the Bus Manager (stand-alone) can connect to a MATLAB process.

New project cache folder

There is a new project cache folder where the Bus Manager (stand-alone) stores temporary data of projects and ConfigurationDesk applications such as temporary artifacts resulting from the generation of bus simulation containers.

You can change the project cache folder on the Paths page of the Bus Manager Options dialog, which is accessible on the File ribbon. Any data will be moved to the new project cache folder and the old project cache folder will be deleted.



Updated C and C++ code standard

As of dSPACE Release 2022-A, the following code standards are used:

- gnu11 (C)
- gnu++14 (C++)

Therefore, you can remove the following lines that might be included in your source files or header files to activate the C++11 standard:

```
#pragma GCC diagnostic warning "-std=c++11"
```

or

```
#if defined(__GNUC__) && (__GNUC__ > 5)
```

```
#pragma GCC diagnostic warning "-std=c++11"
```

```
#endif
```

Migrating to the Bus Manager (Stand-Alone) 22.1

Opening projects created with previous Bus Manager (stand-alone) versions

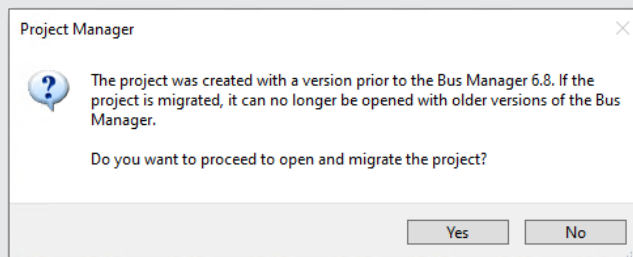
You can open a project created with a previous Bus Manager (stand-alone) version in the same way as a project from the current Bus Manager (stand-alone) version. The Bus Manager (stand-alone) migrates the project when opening it.

Note

- As of dSPACE Release 2021-A, the Bus Manager (stand-alone) supports the direct import only of projects last saved with one of the previous seven the Bus Manager (stand-alone) versions.
- After you have migrated and saved a project, you can no longer open it with an earlier Bus Manager (stand-alone) version.

Note the following specifics regarding the changed project and application file formats with the Bus Manager (stand-alone) 6.8 (dSPACE Release 2021-B):

- You can still open project and application files and backups from earlier Bus Manager (stand-alone) versions. The Bus Manager (stand-alone) prompts you to confirm the migration when you open a project:



Click Yes to migrate the project and all its applications to the new file formats. Afterwards, you can no longer open them with earlier Bus Manager (stand-alone) versions.

- The new project and application files are stored in the respective project and application folders. They are identified via a GUID. Do not move or rename them.
- If you are using version control software for ConfigurationDesk projects, be aware that the old project and application files are deleted and the new files might not automatically be known to your version control software when you check in your local copy.

If you checked in and deleted your local copy after the migration, you can recreate the new project and application files by checking out the project with the old project and application files again and repeating the migration. Only the project and application files will be replaced, no other migration steps will be repeated.

Note the following specifics regarding the new project cache folder introduced with the Bus Manager (stand-alone) 22.1 (dSPACE Release 2022-A):

- Because of a Windows path length restriction, the path of project and application elements must not exceed 260 characters. Refer to [Limitations Concerning Projects and Applications \(ConfigurationDesk Real-Time Implementation Guide\)](#).

Elements that are moved to the new project cache folder during project migration might exceed the character limit afterwards. To avoid this, you can change the project cache folder to a shorter path. Refer to [Paths Page \(ConfigurationDesk User Interface Reference\)](#).

ISignals/ISignal groups with missing sending and/or receiving ECU not available in existing ConfigurationDesk applications

ISignals and ISignal groups with missing sending and/or receiving ECU are not available in ConfigurationDesk applications that were created with the Bus Manager (stand-alone) 6.8 or earlier. To make such ISignals/ISignal groups available, you have to add another version of the related communication matrix, i.e., a communication matrix whose Content hash value differs, to the affected ConfigurationDesk application. Then, you have to replace the old communication matrix in the related bus configurations and manually assign the newly available ISignals/ISignal groups, if required.

For more information on replacing communication matrices, refer to [Replacing Assigned Communication Matrices \(Bus Manager \(Stand-Alone\) Implementation Guide !\[\]\(bd1a142de767a21e5362c595f844a4ff_img.jpg\)](#)).

Changed parameter element values of some Bus Custom Code interface functions

The values of some parameter elements of the `DsBusCustomCodePdu_getCanFrameTriggering` and `DsBusCustomCodePdu_getLinFrameTriggering` functions are changed from numeric values to enumeration values. If you use the values of these parameter elements in your user code, you might have to adapt the user code to the changed values.

Obsolete Numeric Values of Parameter Element	New Enumeration Values of Parameter Element
<p><code>DsBusCustomCodePdu_getCanFrameTriggering</code> function:</p> <ul style="list-style-type: none"> ▪ <code>DsBusCustomCodeCanFrameTriggering(.AddressingMode):</code> <ul style="list-style-type: none"> ▪ 1 = standard identifier format (11-bit) ▪ 2 = extended identifier format (29-bit) ▪ <code>DsBusCustomCodeCanFrameTriggering(.FrameBehavior):</code> <ul style="list-style-type: none"> ▪ 1 = classic CAN frame ▪ 2 = CAN FD frame 	<p><code>DsBusCustomCodePdu_getCanFrameTriggering</code> function:</p> <ul style="list-style-type: none"> ▪ <code>DsBusCustomCodeCanFrameTriggering(.AddressingMode):</code> <ul style="list-style-type: none"> ▪ <code>Standard</code> = standard identifier format (11-bit) ▪ <code>Extended</code> = extended identifier format (29-bit) ▪ <code>DsBusCustomCodeCanFrameTriggering(.FrameBehavior):</code> <ul style="list-style-type: none"> ▪ <code>Can20</code> = classic CAN frame ▪ <code>CanFd</code> = CAN FD frame
<p><code>DsBusCustomCodePdu_getLinFrameTriggering</code> function: <code>DsBusCustomCodeLinFrameTriggering(.ChecksumType):</code></p> <ul style="list-style-type: none"> ▪ 1 = classic checksum calculation type ▪ 2 = enhanced checksum calculation type 	<p><code>DsBusCustomCodePdu_getLinFrameTriggering</code> function: <code>DsBusCustomCodeLinFrameTriggering(.ChecksumType):</code></p> <ul style="list-style-type: none"> ▪ <code>Classic</code> = classic checksum calculation type ▪ <code>Enhanced</code> = enhanced checksum calculation type

Changes to the tool automation interface that might cause code malfunctions

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 [New Features and Changes to the Automation Interface for Release 2022-A \(ConfigurationDesk Automating Tool Handling !\[\]\(0b5e7e25e8775f7e7e80906ada4f0021_img.jpg\)](#)).

Bus Manager (Stand-Alone) Discontinuations

Generate Simulink Model Interface/Extend Signal Chain commands removed

The following ConfigurationDesk commands were removed:

- The Generate Simulink Model Interface command group in the context menu of a Simulink model in the Model Browser
- The Extend Signal Chain - Create Suitable Model Port Blocks context menu command of function blocks in the Signal Chain Browser

You can use the Propagate to Simulink Model and the Generate New Simulink Model Interface commands instead.

The associated commands for tool automation (GenerateModelInterfaces, CreateSuitableModelPortBlock, and CreateTaskAndRunnableFunctionBlockForIOEvent) are still available but are deprecated. It is recommend to use the PropagateToConfigurationDeskModelInterface and PropagateToSimulink methods instead.

Planned discontinuation of Excel export of ConfigurationDesk applications

The Export Configuration command for exporting the configuration data of the active ConfigurationDesk application to an Excel™ file (XLSX file) will be removed with dSPACE Release 2023-B.

The corresponding tool automation API command `ICaAlgorithms:ExportConfiguration` will also be removed.

ConfigurationDesk

Introduction

With ConfigurationDesk, you can implement real-time applications for the SCALEXIO hardware or the MicroAutoBox III hardware.

Where to go from here

Information in this section

New General Features of ConfigurationDesk 22.1.....	47
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New General Features of ConfigurationDesk 22.1

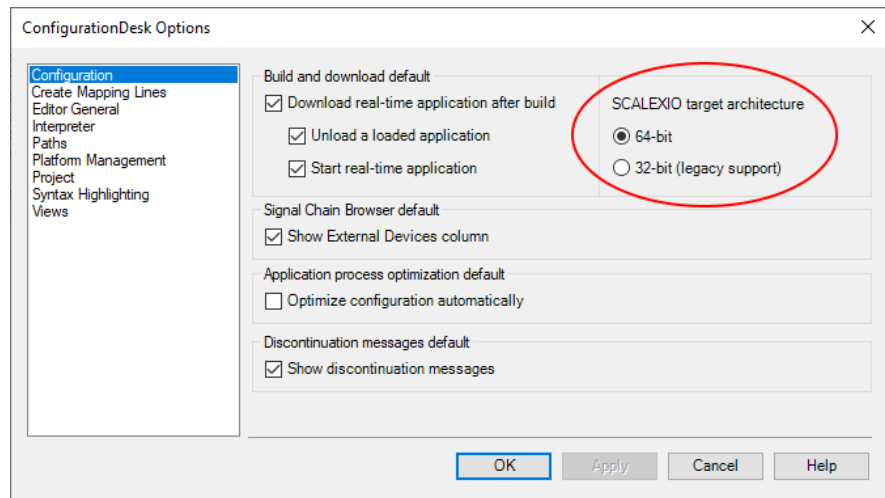
New default target architecture

The 64-bit Linux-based real-time operating system (RTOS) is now the default RTOS for a SCALEXIO system and the DS6001 Processor Board. The 32-bit Linux-based RTOS is still supported as legacy support. To use a 32-bit RTOS on the SCALEXIO system, you have to load the 32-bit Linux-based firmware components.

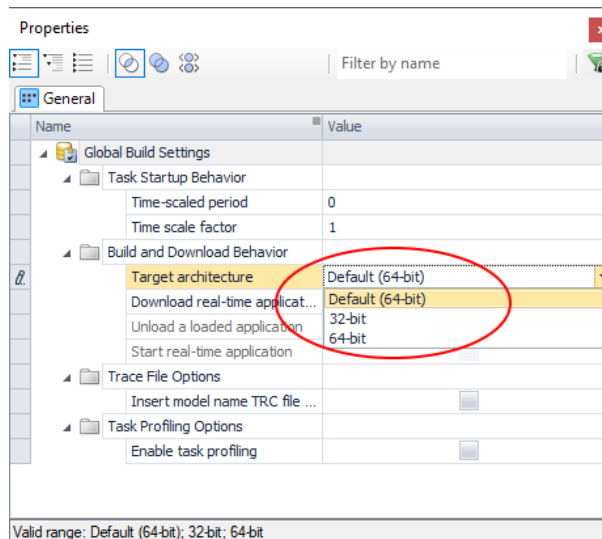
Note

The QNX-based RTOS is no longer available.

Configurable target architecture ConfigurationDesk provides options that let you configure the SCALEXIO target architecture. You can specify the default target architecture in the ConfigurationDesk Options dialog:



You can also specify the target architecture of a SCALEXIO system or a DS6001 Processor Board individually for each ConfigurationDesk application via the Target architecture property in the Global Build Settings.



Note

- SIC files that were generated with an earlier dSPACE Release are no longer compatible with the Linux 64-bit target architecture and have to be generated again with the appropriate Target architecture setting in the Simulink Configuration Parameters dialog, Refer to [New Features of the Model Interface Package for Simulink 22.1](#) on page 107.
- For MicroAutoBox III, only the 32-bit target architecture is available (read-only).

For more information, refer to [Specifying Options for the Build Process \(ConfigurationDesk Real-Time Implementation Guide\)](#).

Support of 64-bit SIC files ConfigurationDesk now supports SIC files that were built for 64-bit target platforms. You can use the SIC files in real-time applications running on a SCALEXIO Real-Time PC and on a DS6001 Processor Board.

Enhanced connection to MATLAB The connection between ConfigurationDesk and MATLAB was enhanced to improve the capability of ConfigurationDesk to interact with MATLAB. ConfigurationDesk can now better handle scenarios in which more than one MATLAB version is installed and more than one MATLAB instance is running. The following table shows possible use scenarios:

Use Case	dSPACE Release 2022-A	dSPACE Release 2021-B and Earlier
No MATLAB instance is running.	ConfigurationDesk starts the preferred MATLAB Release.	Same behavior
One MATLAB instance is running, and it is the preferred connection.	ConfigurationDesk connects to this MATLAB instance.	Same behavior
One MATLAB instance other than the preferred one was started before ConfigurationDesk.	ConfigurationDesk connects to this MATLAB instance.	ConfigurationDesk cannot connect to MATLAB.
Multiple MATLAB instances are running.	ConfigurationDesk connects to one of the running MATLAB installations. You can select the MATLAB installation in MATLAB.	The startup sequence of the MATLAB instances determines whether ConfigurationDesk can connect to a MATLAB installation.

Note

When ConfigurationDesk starts a MATLAB instance, it no longer changes the working directory. MATLAB now starts with the last used working directory.

More than 3000 signals per model port block allowed for propagate operations The limit of 3000 signals per model port block for propagate operations was removed.

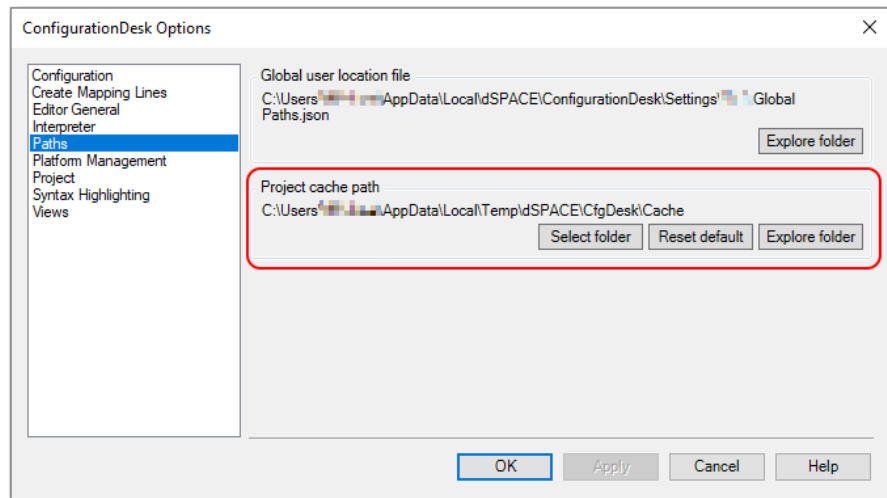
New option to add artifacts to an application You can now use search paths to add artifacts to a ConfigurationDesk application, for example custom function files. Search paths let you use repositories to manage artifacts.

Search paths are specified in user location files. Depending on the use case, you can use application-specific user location files or the global user location file. For more information, refer to [Managing Search Paths \(ConfigurationDesk Custom I/O Function Implementation Guide\)](#).

New project cache folder

There is a new project cache folder where ConfigurationDesk stores temporary data of projects and ConfigurationDesk applications, such as temporary build artifacts.

You can change the project cache folder on the Paths page of the ConfigurationDesk Options dialog when no project is open. The old project cache folder will be deleted.

**Updated C and C++ code standard**

As of dSPACE Release 2022-A, the following code standards are used:

- gnu11 (C)
- gnu++14 (C++)

Therefore, you can remove the following lines that might be included in your source files or header files to activate the C++11 standard:

```
#pragma GCC diagnostic warning "-std=c++11"
```

or

```
#if defined(__GNUC__) && (__GNUC__ > 5)
```

```
#pragma GCC diagnostic warning "-std=c++11"
```

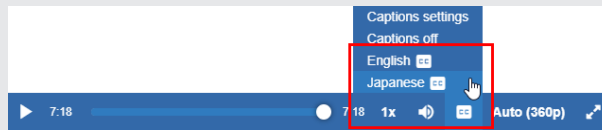
```
#endif
```

Video introducing the rapid control prototyping workflow

A new video is available introducing the workflow for rapid control prototyping. It illustrates the principal of getting your model to run on the MicroAutoBox III by starting from your Simulink model, building the real-time application in ConfigurationDesk, and loading it to the MicroAutoBox III. You can access the video in dSPACE Help, on the ConfigurationDesk Start Page, and on the dSPACE website.

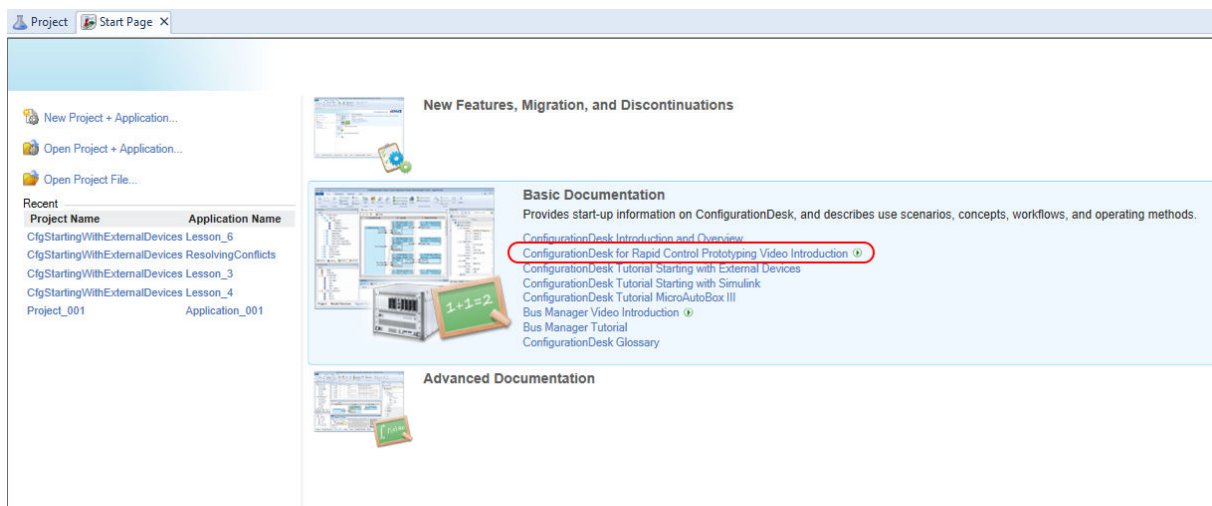
Tip

In dSPACE Help, you can switch between English and Japanese video subtitles. You can switch the subtitle language on the controlbar of the video player.



Refer to:

- dSPACE Help: [Introduction to ConfigurationDesk for Rapid Control Prototyping \(4:03\)](#) in dSPACE Help
- ConfigurationDesk Start Page:



- dSPACE website: www.dspace.com/go/ConfigurationDesk_RCP_Introduction

New demo project for USB access with the MicroAutoBox III

The ModelUsbDemo project provides a custom function for accessing data on a USB mass storage device from a real-time application on the MicroAutoBox III. It also contains a Simulink model that uses this data at run time with the help of a Data Store Memory block.

Refer to [Using the ModelUsbDemo Application \(ConfigurationDesk Using Demo Projects\)](#).

New features of the tool automation interface

The ConfigurationDesk automation interface supports additional ConfigurationDesk features. For more information, refer to [New Features and Changes to the Automation Interface for Release 2022-A \(ConfigurationDesk Automating Tool Handling\)](#).

New Features Concerning I/O Functionality and Hardware Support

Support of data replay in a HIL environment

You can use a SCALEXIO system and a PC with RTMaps to replay Ethernet and CAN data streams to test a sensor ECU, for example. To replay raw data, you can expand the system with an Environment Sensor Interface Unit. For more information, refer to [Data Replay in a HIL Environment \(ConfigurationDesk Real-Time Implementation Guide\)](#).

The enhanced Ethernet Setup and CAN function block types and the new Data Streaming Ethernet Setup function block type now support data streaming functionalities to support data replay.

Note

Implementing the bus communication between SCALEXIO and the device under test usually requires a communication matrix and a bus simulation container. The Ethernet Configuration Package that can generate bus simulation containers for ConfigurationDesk will be available soon. For information on the current versions, refer to <http://www.dspace.com/go/EthCPversions>.

Ethernet Setup and CAN The Ethernet Setup and the CAN function block types are enhanced with the following features:

- Timing control to control the data stream from the behavior model. The timing control lets you specify the point in time when the function block starts and stops the output of the provided data stream.

For more information on timing control, refer to [Basics on Replaying Data with SCALEXIO and RTMaps \(ConfigurationDesk Real-Time Implementation Guide\)](#).

- Accessing a high-speed data stream. If enabled, you can reference a Data Streaming Ethernet Setup function block that receives the high-speed data stream.

Data Streaming Ethernet Setup The new Data Streaming Ethernet Setup function block type lets you configure and initialize an Ethernet controller to receive a data stream, for example, to replay recorded data. The function block works as a provider: Other function blocks can use it to access the data stream.

For more information, refer to [Implementing High-Speed Data Streaming \(ConfigurationDesk Real-Time Implementation Guide\)](#).

Enhanced function block types

Multi-Channel PWM Out The Multi-Channel PWM Out function block type now supports the following new features:

- Shifting the phase of each PWM signal to control multi-level converters, for example.
- Disabling the output of PWM signals at run time by enabling the use of output pattern.

For more information, refer to [Configuring the Basic Functionality \(Multi-Channel PWM Out\) \(ConfigurationDesk I/O Function Implementation Guide\)](#).

New Features of the Bus Manager in ConfigurationDesk

Bus Manager SecOC demo

The Bus Manager now provides the Bus Manager SecOC demo. The Bus Manager SecOC demo introduces you to the basic steps of implementing secure onboard communication (SecOC) in the ConfigurationDesk application. The demo uses a simple communication matrix to show the handling of secured bus communication in user code files, such as implementing keys. It also uses bus configuration features for manipulating and inspecting the state of the secured bus communication. The Bus Manager SecOC demo is based on a Python script that uses automation to execute all required steps, including building a real-time application and generating bus simulation containers (BSC files).

Refer to [Working with the Bus Manager SecOC Demo \(ConfigurationDesk Bus Manager Implementation Guide\)](#).

New supported AUTOSAR Release

The Bus Manager now supports AUTOSAR system description files based on AUTOSAR Classic Platform Release R21-11.

Transmitting PDUs according to event-controlled timings

The Bus Manager now supports event-controlled timings according to AUTOSAR. With event-controlled timings, ISignals and ISignal groups that are included in a PDU can trigger the transmission of this PDU. For this purpose, the Bus Manager can evaluate the setting of the transfer property of ISignals/ISignal groups. The setting of the transfer property determines if and how an ISignal/ISignal group can trigger the transmission. However, you must enable the evaluation of the transfer property for each bus configuration. Moreover, you can configure settings of event-controlled timings and the transfer property.

For more information, refer to [Using Event-Controlled Timings for Transmitting PDUs \(ConfigurationDesk Bus Manager Implementation Guide\)](#).

Using minimum delay times for the transmission of PDUs

The Bus Manager now observes minimum delay times. If the communication matrix specifies a minimum delay time for a PDU, the Bus Manager ensures that the time span between two transmissions of the PDU is equal to or greater than the minimum delay time. If required, you can change the specified minimum delay time.

For more information, refer to [Configurable Settings of PDUs \(ConfigurationDesk Bus Manager Implementation Guide\)](#).

Using RX masks to define the relevant bits of received CAN identifiers

The Bus Manager now supports RX masks of CAN frame triggerings according to AUTOSAR. An RX mask defines the relevant bits for a received CAN identifier: A received CAN identifier must match only the relevant bits to be handled as a matching CAN identifier by the receiver. The bits that are not relevant can differ. If required, you can change the specified RX mask.

For more information, refer to [Configurable Settings of Frames \(ConfigurationDesk Bus Manager Implementation Guide\)](#).

Selecting communication matrix elements by their direction

The Bus Manager now lets you select communication matrix elements that are displayed in the Buses Browser by their direction. When you select one or more elements, such as two ECUs or a communication cluster, you can select all the related TX or RX PDUs at once by using the Select Elements by Direction context menu command. The PDUs are selected regardless of their specific PDU type. However, PDUs that are not displayed in the Buses Browser, e.g., because of an active filter, are not selected.

Enhanced bus configuration features

The following bus configuration features are enhanced:

PDU RX Status feature The PDU RX Status feature now provides a Loopback function port. The function port value indicates whether the PDU is received as a loopback PDU, i.e., whether the PDU is transmitted and received by the same bus access (CAN or LIN function block).

For more information, refer to [Observing the Status of Received PDUs \(ConfigurationDesk Bus Manager Implementation Guide !\[\]\(5a132f13505a6571904d622757b7a8f0_img.jpg\)](#)).

PDU User Code feature The PDU User Code feature now lets you specify user-defined function ports. You can use these user ports to exchange data with the user code. For example, you can provide data that is received from a mapped behavior model to the user code or provide user code data to the behavior model. For this purpose, the Bus Custom Code interface provides new functions that let you access the user ports in the user code.

For more information, refer to [Applying User Code to PDUs \(ConfigurationDesk Bus Manager Implementation Guide !\[\]\(e1d6102fe77919492c04879c8450f1f5_img.jpg\)](#)).

PDU Length feature The PDU Length feature is now supported for further PDU types. The newly supported PDU types are the following:

- RX container IPDUs
- Contained IPDUs that are included in TX or RX container IPDUs with a dynamic container layout.

For more information, refer to [Accessing the Payload Length of CAN PDUs \(ConfigurationDesk Bus Manager Implementation Guide !\[\]\(35dc653d59570f8f891c312eeece91a2_img.jpg\)](#)).

Position of LIN schedule tables in the communication matrix identifiable

The position of LIN schedule tables in the communication matrix is now displayed in the Properties Browser. The position is displayed as a comma-separated index behind the name of each LIN schedule table. This helps you specify an initial LIN schedule table via the LIN Schedule Table feature.

Refer to [Working with LIN Schedule Tables \(ConfigurationDesk Bus Manager Implementation Guide !\[\]\(aab88c0d099e5d18d6533a97b13ec28d_img.jpg\)](#)).

Support of ISignals and ISignal groups with missing sending and/or receiving ECU

The Bus Manager now supports ISignals and ISignal groups for which the communication matrix does not specify a sending and/or receiving ECU. If a communication matrix does not specify a sending and/or receiving ECU for an ISignal or ISignal group that is assigned to a PDU, the affected ISignal/ISignal group is imported and available in the Buses Browser when you add the communication matrix to the ConfigurationDesk application. In the

ConfigurationDesk application, you can use this ISignal/ISignal group like any other ISignal/ISignal group.

However, existing ConfigurationDesk applications are not updated automatically. Refer to [Migrating to ConfigurationDesk 22.1](#) on page 58.

Information for former users of the RTI CAN MultiMessage Blockset and RTI LIN MultiMessage Blockset

The user documentation of the Bus Manager now provides information for former users of the RTI CAN MultiMessage Blockset and RTI LIN MultiMessage Blockset. The documentation provides recommended starting points and a mapping between features of the RTI CAN MultiMessage Blockset and RTI LIN MultiMessage Blockset and features of the Bus Manager.

For more information, refer to [Information for Former Users of the RTI CAN MultiMessage Blockset and RTI LIN MultiMessage Blockset \(ConfigurationDesk Bus Manager Implementation Guide\)](#).


Supported Container File Versions

Supported SIC file versions

ConfigurationDesk 22.1 supports SIC file versions as listed below:

SIC Files Created With ...	MATLAB Release
dSPACE Release 2022-A: ▪ Model Interface Package for Simulink 22.1	R2022a, R2021b, R2021a, R2020b
dSPACE Release 2021-B: ▪ Model Interface Package for Simulink 4.6 ▪ TargetLink 5.2	R2021b, R2021a, R2020b, R2020a
dSPACE Release 2021-A: ▪ Model Interface Package for Simulink 4.5	R2021a, R2020b, R2020a, R2019b
dSPACE Release 2020-B: ▪ Model Interface Package for Simulink 4.4 ▪ TargetLink 5.1	R2020b, R2020a, R2019b, R2019a
dSPACE Release 2020-A: ▪ Model Interface Package for Simulink 4.3	R2020a, R2019b, R2019a, R2018b
dSPACE Release 2019-B: ▪ Model Interface Package for Simulink 4.2	R2018a
dSPACE Release 2019-A: ▪ Model Interface Package for Simulink 4.1	R2017b
dSPACE Release 2018-B: ▪ Model Interface Package for Simulink 4.0	R2017a
dSPACE Release 2018-A: ▪ Model Interface Package for Simulink 3.6	R2016b
dSPACE Release 2017-B: ▪ Model Interface Package for Simulink 3.5	R2016a
dSPACE Release 2017-A: ▪ Model Interface Package for Simulink 3.4	R2015b

Target platform compatibility of SIC files The following table shows the compatibility of SIC files and target platforms, and indicates which system target file you have to select for the generation of an SIC file:

SIC File Created With	System Target File	Target Platform
dSPACE Release 2022-A	dsrt.tlc	<ul style="list-style-type: none"> ▪ SCALEXIO Linux 64-bit ▪ SCALEXIO 32-bit (legacy support) ▪ MicroAutoBox III <p>You have to select the target architecture for which the SIC file is generated depending on the target platform. Refer to Basics on Simulink Implementation Containers (Model Interface Package for Simulink - Modeling Guide ).</p>
dSPACE Release 2021-B and earlier	dsrt64.tlc	SCALEXIO 64-bit (available as of dSPACE Release 2019-B)
	dsrt.tlc	<ul style="list-style-type: none"> ▪ SCALEXIO 32-bit (legacy support) ▪ MicroAutoBox III

Limitations for earlier SIC file versions in ConfigurationDesk scenarios

SIC files created with the Model Interface Package for Simulink version 3.4 ... 4.1 are not supported in the following ConfigurationDesk scenarios:

- In multimodel application processes.
- For building real-time applications that use Real-Time Testing.

Limitations for Simulink behavior models underlying earlier SIC files versions

The following limitations apply to Simulink behavior models underlying SIC files created with the Model Interface Package for Simulink version 3.4 ... 4.2:

- The Simulink behavior model must not contain blocks from the following blocksets:
 - Blocks of ASM
 - Real-time applications that contain such SIC files cannot be used with ModelDesk.
 - RTI FPGA Programming Blockset
 - MotionDesk Blockset
 - Real-time applications that contain such SIC files cannot be used with MotionDesk.
 - Blocks of any dSPACE Solution.
- Compiled objects contained in SIC files must match the target platform. SIC files with compiled objects that were created at a time when the current target platforms did not exist are not supported. In this case, it is not possible to use compiled objects.

Supported BSC file versions

ConfigurationDesk 22.1 supports BSC files that were generated with the Bus Manager of the current Release, i.e., BSC file version 1.10.

Supported V-ECU implementation container versions

ConfigurationDesk 22.1 supports V-ECU implementation container versions as listed below:

V-ECU Implementations Created With...	V-ECU Implementation Version
dSPACE Release 2022-A: ▪ SystemDesk 5.7	3.0
dSPACE Release 2021-B: ▪ SystemDesk 5.6 ▪ TargetLink 5.2	3.0
dSPACE Release 2021-A: ▪ SystemDesk 5.5	3.0
dSPACE Release 2020-B: ▪ SystemDesk 5.5 ▪ TargetLink 5.1	3.0 As of version 3.0, <i>VECU</i> is the new V-ECU implementation file format.

Supported Functional Mock-up Unit versions

ConfigurationDesk 22.1 supports Functional Mock-up Units (FMUs) that comply with the following versions of the FMI standard:

- 2.0
- 2.0.1

Supported EIC file versions

ConfigurationDesk 22.1 supports EIC file versions as listed below:

EIC Files Created With ...	EIC Version
dSPACE Release 2022-A (ECU Interface Manager 2.11)	5.0.0
dSPACE Release 2021-B (ECU Interface Manager 2.10)	4.0.0
dSPACE Release 2021-A (ECU Interface Manager 2.9)	4.0.0
dSPACE Release 2020-B (ECU Interface Manager 2.8)	4.0.0
dSPACE Release 2020-A (ECU Interface Manager 2.7)	4.0.0
dSPACE Release 2019-B (ECU Interface Manager 2.6)	4.0.0
dSPACE Release 2019-A (ECU Interface Manager 2.5)	3.0.0
dSPACE Release 2018-B (ECU Interface Manager 2.4)	3.0.0
dSPACE Release 2018-A (ECU Interface Manager 2.3)	2.0.0
dSPACE Release 2017-B (ECU Interface Manager 2.2)	1.0.0
dSPACE Release 2017-A (ECU Interface Manager 2.1)	1.0.0

EIC Files Created With ...	EIC Version
dSPACE Release 2016-B (ECU Interface Manager 2.0p1)	1.0.0

Note

- For 64-bit target architectures, only EIC files as of version 5.0.0 are supported.
- For MicroAutoBox III systems, only EIC files as of version 4.0.0 are supported.

Migrating to ConfigurationDesk 22.1

**Opening projects
created with previous
ConfigurationDesk versions**

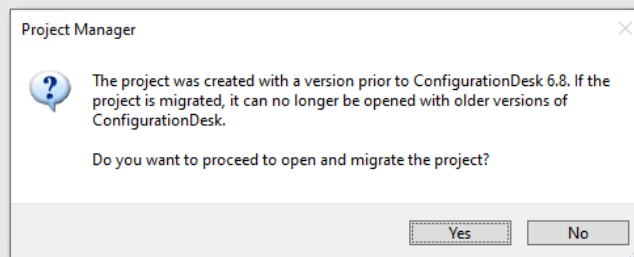
You can open a project created with a previous ConfigurationDesk version in the same way as a project from the current ConfigurationDesk version. ConfigurationDesk migrates the project when opening it.

Note

- As of dSPACE Release 2021-A, ConfigurationDesk supports the direct import only of projects last saved with one of the previous seven ConfigurationDesk versions.
- After you have migrated and saved a project, you can no longer open it with a previous ConfigurationDesk version.

Note the following specifics regarding the changed project and application file formats with ConfigurationDesk 6.8 (dSPACE Release 2021-B):

- You can still open project and application files and backups from previous ConfigurationDesk versions. ConfigurationDesk prompts you to confirm the migration when you open a project:



Click Yes to migrate the project and all its applications to the new file formats. Afterwards, you can no longer open them with previous ConfigurationDesk versions.

- The new project and application files are stored in the respective project and application folders. They are identified via a GUID. Do not move or rename them.
- If you are using version control software for ConfigurationDesk projects, be aware that the old project and application files are deleted and the new files might not automatically be known to your version control software when you check in your local copy.
If you checked in and deleted your local copy after the migration, you can recreate the new project and application files by checking out the project with the old project and application files again and repeating the migration. Only the project and application files will be replaced, no other migration steps will be repeated.

Note the following specifics regarding the new project cache folder introduced with ConfigurationDesk 22.1 (dSPACE Release 2022-A):

- Because of a Windows path length restriction, the path of project and application elements must not exceed 260 characters. Refer to [Limitations Concerning Projects and Applications \(ConfigurationDesk Real-Time Implementation Guide\)](#).

Elements such as build artifacts that are moved to the new project cache folder during project migration might exceed the character limit afterwards. To avoid this, you can change the project cache folder to a shorter path. Refer to [Paths Page \(ConfigurationDesk User Interface Reference\)](#).

SCALEXIO target architecture compatibility of model implementation containers

Model implementation containers that include 32-bit compatible binaries are no longer compatible with the SCALEXIO 64-bit target architecture. You must regenerate the model implementation container with 64-bit compatible binaries, or specify a 32-bit target architecture.

SIC files must be regenerated with the appropriate Target architecture setting in the Simulink Configuration Parameters dialog,

Changes to serial communication

The following changes affect serial communication.

SENT communication The SENT communication is changed as follows:

- As of dSPACE Release 2022-A, the SENT Out function block changes the behavior for event generation when signal generation is disabled. To enable the behavior model to re-enable signal generation, the function block outputs the I/O events as if SENT messages were generated. Until Release 2021-B, the SENT Out function block generates I/O events with a fixed period of 1 ms when the signal generation is disabled.
- As of dSPACE Release 2021-A, an invalid value at the Sequence port for selecting sequence definitions from the application-specific protocol stops the transmission/receipt of SENT messages. Until Release 2020-B, invalid values were ignored and the function block used the last valid value.

SPI communication As of dSPACE Release 2021-A, the new Word separation property lets you select the method for separating consecutive data words within an SPI cycle. Until Release 2020-A, you selected the method by setting the Time between words property to 0 s (chip select inactive between words) or to a value greater than 0 s (transmission pause between words).

For more information on the property, refer to [Configuring SPI Cycles \(SPI Master\) \(ConfigurationDesk I/O Function Implementation Guide !\[\]\(aa53ad6fea213b8b2226d3077e30533a_img.jpg\)\)](#).

Changes to I/O Ethernet communication

The following changes in dSPACE Release 2020-B affect I/O Ethernet communication.

Receiving UDP messages The Received Bytes function port of the UDP Receive function block now continuously provides the number of valid data bytes that are provided by the Data Vector function port. Until Release 2020-A, the Received Bytes function port provided the number of valid data bytes only during the model step in which the function block provides new data.

Unsupported I/O Ethernet feature A SCALEXIO real-time application can suppress Internet group management protocol (IGMP) messages for I/O Ethernet communication.

With dSPACE Release 2020-B, dSPACE introduced a Linux-based operating system for the SCALEXIO Processing Unit and DS6001 Processor Board. The Linux-based operating system does not support the suppression of IGMP messages.

Changes to the Bus Manager

ISignals/ISignal groups with missing sending and/or receiving ECU not available in existing ConfigurationDesk applications ISignals and

ISignal groups with missing sending and/or receiving ECU are not available in ConfigurationDesk applications that were created with ConfigurationDesk 6.8 or earlier. To make such ISignals/ISignal groups available, you have to add another version of the related communication matrix, i.e., a communication matrix whose Content hash value differs, to the affected ConfigurationDesk application. Then, you have to replace the old communication matrix in the related bus configurations and manually assign the newly available ISignals/ISignal groups, if required.

For more information on replacing communication matrices, refer to [Replacing Assigned Communication Matrices \(ConfigurationDesk Bus Manager Implementation Guide !\[\]\(2e897e890e69d81eae4503a8342c36b0_img.jpg\)](#)).

Changed parameter element values of some Bus Custom Code interface functions

The values of some parameter elements of the `DsBusCustomCodePdu_getCanFrameTriggering` and `DsBusCustomCodePdu_getLinFrameTriggering` functions are changed from numeric values to enumeration values. If you use the values of these parameter elements in your user code, you might have to adapt the user code to the changed values.

Obsolete Numeric Values of Parameter Element	New Enumeration Values of Parameter Element
<p><code>DsBusCustomCodePdu_getCanFrameTriggering</code> function:</p> <ul style="list-style-type: none"> ▪ <code>DsBusCustomCodeCanFrameTriggering(.AddressingMode)</code>: <ul style="list-style-type: none"> ▪ 1 = standard identifier format (11-bit) ▪ 2 = extended identifier format (29-bit) ▪ <code>DsBusCustomCodeCanFrameTriggering(.FrameBehavior)</code>: <ul style="list-style-type: none"> ▪ 1 = classic CAN frame ▪ 2 = CAN FD frame 	<p><code>DsBusCustomCodePdu_getCanFrameTriggering</code> function:</p> <ul style="list-style-type: none"> ▪ <code>DsBusCustomCodeCanFrameTriggering(.AddressingMode)</code>: <ul style="list-style-type: none"> ▪ Standard = standard identifier format (11-bit) ▪ Extended = extended identifier format (29-bit) ▪ <code>DsBusCustomCodeCanFrameTriggering(.FrameBehavior)</code>: <ul style="list-style-type: none"> ▪ Can20 = classic CAN frame ▪ CanFd = CAN FD frame
<p><code>DsBusCustomCodePdu_getLinFrameTriggering</code> function:</p> <p><code>DsBusCustomCodeLinFrameTriggering(.ChecksumType)</code>:</p> <ul style="list-style-type: none"> ▪ 1 = classic checksum calculation type ▪ 2 = enhanced checksum calculation type 	<p><code>DsBusCustomCodePdu_getLinFrameTriggering</code> function:</p> <p><code>DsBusCustomCodeLinFrameTriggering(.ChecksumType)</code>:</p> <ul style="list-style-type: none"> ▪ Classic = classic checksum calculation type ▪ Enhanced = enhanced checksum calculation type

Changes to the Power On Signal In function block type

With dSPACE Release 2021-B, the Power On Signal In function block type was renamed Shutdown Request to better express the functionality of the block.

After migrating an existing ConfigurationDesk application containing a Power On Signal In function block, you have to observe the following points:

- After migrating a project, existing function block names are not changed. For example: Even if you use the former default name for the function block (Power On Signal In (1)), this name is still used in the migrated ConfigurationDesk application.
- After you build a real-time application with ConfigurationDesk 22.1, you might have to update your ControlDesk experiment manually. This means that if you use the tunable properties of the Shutdown Request function block in the ControlDesk layout (via a TRC file), you have to manually reassign the updated variables to the instruments in the layout.

Changes to the tool automation interface that might cause code malfunctions

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 [New Features and Changes to the Automation Interface for Release 2022-A \(ConfigurationDesk Automating Tool Handling !\[\]\(5eb1325dfdc3f1cad8426726c0db51cd_img.jpg\)](#)).

Changes to custom function folders

As of dSPACE Release 2022-A, ConfigurationDesk does not automatically add the project-specific custom function folder `<ProjectLocation>\<ProjectFolder>\CustomFunctions` to a new project. The lack of the project-specific custom function folder might affect the execution of automation scripts that copy custom functions to that folder.

For new projects, it is recommended to use search paths to add custom functions. Search paths let you use repositories and version control software, for example. For more information, refer to [Managing Search Paths \(ConfigurationDesk Custom I/O Function Implementation Guide !\[\]\(950a62bbddad88d64435fd35607dfc42_img.jpg\)](#)).

However, ConfigurationDesk still supports project-specific custom function folders.

ConfigurationDesk Discontinuations

Generate Simulink Model Interface/Extend Signal Chain commands removed

The following ConfigurationDesk commands were removed:

- The Generate Simulink Model Interface command group in the context menu of a Simulink model in the Model Browser
- The Extend Signal Chain - Create Suitable Model Port Blocks context menu command of function blocks in the Signal Chain Browser

You can use the Propagate to Simulink Model and the Generate New Simulink Model Interface commands instead.

The associated commands for tool automation (`GenerateModelInterfaces`, `CreateSuitableModelPortBlock`, and `CreateTaskAndRunnableFunctionBlockForIOEvent`) are still available but are deprecated. It is recommended to use the `PropagateToConfigurationDeskModelInterface` and `PropagateToSimulink` methods instead.

QNX operating system no longer supported

The QNX operating system is no longer supported for SCALEXIO systems.

Planned discontinuation of V-ECU implementation container support.

ConfigurationDesk 22.1 (Release 2022-A) is the last version that supports V-ECU implementation containers (VECU files). The V-ECU implementation container support will be removed from ConfigurationDesk with Release 2022-B.

**Planned discontinuation
of Excel export
of ConfigurationDesk
applications**

The Export Configuration command for exporting the configuration data of the active ConfigurationDesk application to an Excel™ file (XLSX file) will be removed with dSPACE Release 2023-B.

The corresponding tool automation API command ICaAlgorithms:ExportConfiguration will also be removed.

ControlDesk

Where to go from here

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New Features of ControlDesk 7.6

Where to go from here

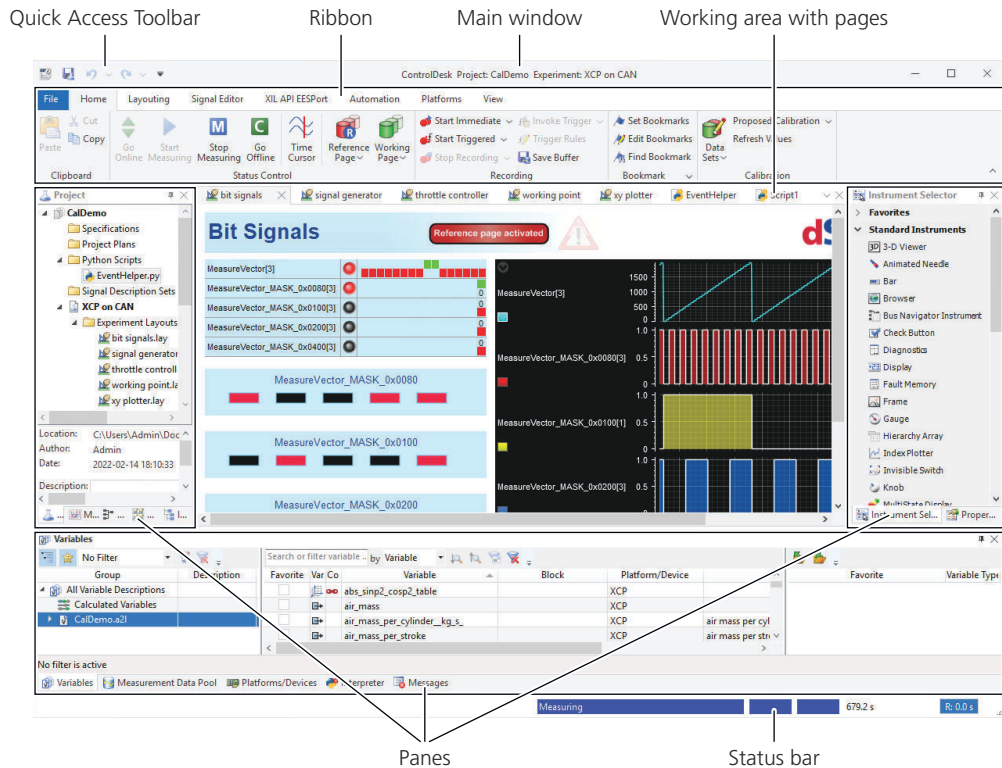
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Provides an overview of new features of platform management and platforms/devices in ControlDesk 7.6.	
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New User Interface Handling Features (ControlDesk 7.6)

Modernized user interface framework and improved handling of panes and pages

The following illustration shows the modernized ControlDesk user interface.



For more information, refer to [User Interface of ControlDesk \(ControlDesk User Interface Handling\)](#).

For information on the migration aspects due to the modernized ControlDesk user interface, refer to [Migrating from ControlDesk 7.5 to 7.6 \(ControlDesk New Features and Migration\)](#).

New Features of Platform Management and Platforms/Devices (ControlDesk 7.6)

XIL API MAPort platform: Support of XIL API version 2.2.0

The XIL API MAPort platform now also supports XIL API version 2.2.0 for MAPort implementations. For MAPort implementations according to XIL API version 2.2.0, the platform supports the same features as for MAPort implementations according to XIL API version 2.1.0.

For more information, refer to [Compatibility with XIL API \(ControlDesk Introduction and Overview\)](#).

Related topics

Basics

[Compatibility with XIL API \(ControlDesk Introduction and Overview\)](#)

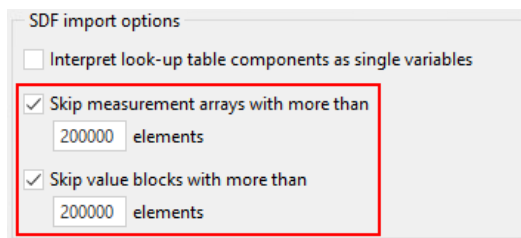
New Variable Management Features (ControlDesk 7.6)

Option to skip the import of measurement arrays and value blocks in SDF files

In some cases, the SDF variable description file can contain measurement arrays and value blocks with a large number of elements. Importing such SDF files can take a long time.

If you do not need these variables in your experiment, you can now skip their import, which speeds up the import process.

The following illustration shows the new options:



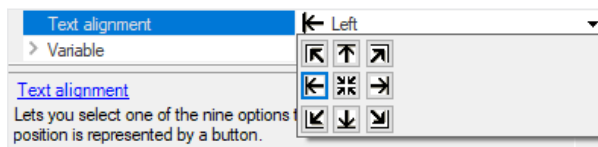
For more information, refer to [Variables Page \(ControlDesk Variable Management\)](#).

New Instrument Features (ControlDesk 7.6)

Hierarchy Array: Specifying text alignment

You can now specify the alignment of text in selected cells of the Hierarchy Array introduced with ControlDesk 7.5.

The following illustration shows the available alignment settings:

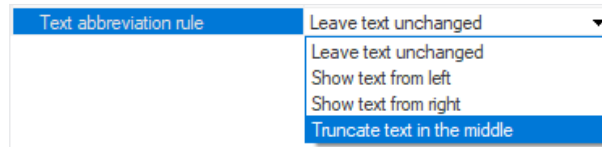


For more information on the instrument, refer to [Basics of Handling the Hierarchy Array \(ControlDesk Instrument Handling\)](#).

Variable Array: Specifying text abbreviation

You can now select a rule for abbreviating text if it is too long to be displayed in the cell of a Variable Array. This replaces the options of the Variable Abbreviation Rules page, which is no longer available.

The following illustration shows the available rules:



For more information, refer to [Selected Column Properties \(ControlDesk Instrument Handling\)](#).

New Measurement and Recording Features (ControlDesk 7.6)

Measuring and recording high-frequent FPGA signals

ControlDesk now lets you perform measurement and recording of high-frequent FPGA signals in connection with FPGA-based real-time applications on SCALEXIO systems.

Refer to [Measuring FPGA Signals \(ControlDesk Measurement and Recording\)](#).

New Bus Navigator Features (ControlDesk 7.6)

Ethernet: Display of decoded PDUs and signals in the Decoding view

The Ethernet decoding view, which is part of the monitoring list, now also displays the following PDU information:

- Header ID
- PDU length
- PDU raw data
- Signal values (in source mode)

Refer to [Decoding View \(ControlDesk Bus Navigator\)](#).

Ethernet SOME/IP: Display of decoded item names in the Monitoring list

For Ethernet SOME/IP, the monitoring list now also displays decoded names of services, methods, and events.


The following illustration shows an example:

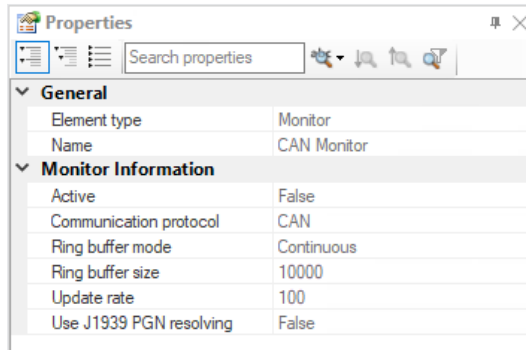
Application Time	Monitor Time	IPv4 Protocol	IPv4 Version	IPv4 Source Address	UDP/IP Sour.	IPv4 Destination Address	UDP/IP Dest.	Method ID / Event ID	Message Ty.	Service ID
1511856436.23...	20.0304039	UDP / User Da...	4	192.0.1.100	30491	192.0.2.100	30492	Method_AB1 (1238)	RESPONSE...	Service_AB (1001)
1511856437.20...	21.0063179	UDP / User Da...	4	192.0.2.100	30492	192.0.1.100	30491	Method_AB1 (1238)	REQUEST (...)	Service_AB (1001)
1511856437.82...	21.6233029	UDP / User Da...	4	192.0.2.100	30492	192.0.1.100	30491	Method_AB1 (1238)	REQUEST (...)	Service_AB (1001)
1511856438.66...	22.4703209	UDP / User Da...	4	192.0.1.100	30491	192.0.2.100	30492	Method_AB1 (1238)	RESPONSE...	Service_AB (1001)
1511856416.19...	0.0000000	UDP / User Da...	4	192.0.2.100	30490	239.10.10.100	30490	SOME/IP-SD messages/event...	NOTIFICAT...	SOME/IP and SOME/IP-SD spe...

Refer to [Monitoring List \(ControlDesk Bus Navigator\)](#).

Display of Bus Navigator element properties

The ControlDesk Properties pane now displays information on the element selected in the Bus Navigator pane.

The following illustration shows the properties of a  monitor node as an example:



For more information, refer to [Properties Related to Bus Navigator Elements \(ControlDesk Bus Navigator !\[\]\(950a62bbddad88d64435fd35607dfc42_img.jpg\)](#)).

Related topics

References

- [Decoding View \(ControlDesk Bus Navigator !\[\]\(661ad2fdbe8fa1392f2b194cfa45d124_img.jpg\)](#))
- [Monitoring List \(ControlDesk Bus Navigator !\[\]\(4193cdf1061c98ac39c3073e7f9019f2_img.jpg\)](#))

New Electrical Error Simulation Features (ControlDesk 7.6)

Support of XIL API version 2.2.0

Electrical error simulation with ControlDesk now also supports XIL API version 2.2.0 for EESPort implementations.

For more information, refer to [Compatibility with XIL API \(ControlDesk Introduction and Overview !\[\]\(ab4e2b3fc7e7887b7a72f548aa6f5e60_img.jpg\)](#)).

Related topics

Basics

- [Compatibility with XIL API \(ControlDesk Introduction and Overview !\[\]\(ec6be8583b2c424584fcf21004c5fb12_img.jpg\)](#))

New Automation Features (ControlDesk 7.6)

Layout name available from instrument

The automation interface of instruments now provides the **LayoutName** property that provides the name of the layout on which the instrument is located. The **LayoutName** property is helpful, for example, in instrument scripts and event handlers.

Migrating to ControlDesk 7.6

Where to go from here

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Gives you an overview of the discontinuations in ControlDesk.	
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To migrate from ControlDesk 7.5 to ControlDesk 7.6 and reuse existing experiments, you might have to carry out the following migration steps.	

Discontinuations in ControlDesk

Discontinuations as of dSPACE Release 2022-A

Variable Editor As of dSPACE Release 2022-A, the Variable Editor will no longer be available.

End of software support for discontinued dSPACE hardware

For information on the end of software support for discontinued dSPACE hardware, refer to [Discontinuations](#) on page 14.

Migrating to ControlDesk 7.6

Introduction

To migrate from ControlDesk 7.5 to ControlDesk 7.6 and reuse existing experiments, you might have to carry out the following migration steps.

Note

To migrate to ControlDesk 7.6 from versions earlier than 7.5, you also have to perform the migration steps of the intervening ControlDesk versions.

Migrating Map instruments

If your experiment was created with ControlDesk 7.5 or earlier and if it contains a Map instrument, you have to adapt the related instrument script to reuse the experiment in ControlDesk 7.6 or later.

The script adaptation removes measurements that are no longer required.

To adapt the instrument script, perform the following steps:

1. Open the experiment to be migrated in ControlDesk 7.5.

- From the context menu of the Map instrument, select Instrument Script. ControlDesk opens the instrument script in the Code Editor.
- In the `def get_variable_data(data_file_name, variable_path)` method definition, replace the `measurement = BrowserEvents.get_measurement(data_file_path)` statement with the following lines:

```

"""Load the measurement data file using the measurement data API.
"""
measurements = measurementdataapilib.Measurements()
try:
    measurement = measurements.Load(data_file_path)
except:
    # file might have already been loaded
    ok = False
    for measurement in measurements:
        if measurement.FilePath == data_file_path:
            ok = True
            break
    if not ok:
        return None

```

- Delete the entire `def get_measurement(data_file_path)` method definition.
- In the `def get_variable_data(data_file_name, variable_path)` method definition, add the following lines before the `return data` statement:

```

measurements.Remove(measurement.Name)
del measurements
del measurement
del signal

```

As a result, the `def get_variable_data(data_file_name, variable_path)` method definition should read as follows unless you modified it in ControlDesk 7.5 or earlier:

```

@staticmethod
def get_variable_data(data_file_name, variable_path):
    """Return the variable values from the measurement data file.
    """
    data_file_path = BrowserEvents.get_data_file_path(data_file_name)
    if data_file_path is None or not os.access(data_file_path, os.F_OK):
        return None

```

```

"""Load the measurement data file using the measurement data API.
"""
measurements = measurementdataapilib.Measurements()

try:
    measurement = measurements.Load(data_file_path)
except:
    # file might have already been loaded
    ok = False
    for measurement in measurements:
        if measurement.FilePath == data_file_path:
            ok = True
            break

    if not ok:
        return None

if measurement is None:
    return None

signal = BrowserEvents.get_signal(measurement, variable_path)
if signal is None:
    return None

if len(signal.Data) == 0:
    return None

data = signal.Data

if isinstance(data[0], str):
    data_ok = False

    if signal.NumberOfBits <= 8 and len(data[0]) == 1:
        # values might have been interpreted as ASCII chars
        try:
            data = [ord(v) for v in data]
            data_ok = True
        except:
            # probably found a string with length > 1
            data = None

    if not data_ok and signal.Type == measurementdataapilib.constants.stWithSourceData:
        # check source values
        data = signal.SourceData

    if isinstance(data[0], str):
        data_ok = False

        if signal.NumberOfBits <= 8 and len(data[0]) == 1:
            try:
                data = [ord(v) for v in data]
                data_ok = True
            except:
                data = None
        else:
            data = None

measurements.Remove(measurement.Name)
del measurements
del measurement
del signal

return data

```

You have adapted the instrument script of your Map instrument for use in ControlDesk 7.6 and later.

Changes to the ControlDesk Options dialog

The ControlDesk Options dialog was changed in ControlDesk 7.6:

- The Editor General and Syntax Highlighting pages were united to the new Python Editor page.
For more information, refer to [Python Editor Page \(ControlDesk Automation !\[\]\(aca6fcc8bd95e8255b9ea1b1d08ef300_img.jpg\)\)](#).
- The Interpreter page was renamed to Python Interpreter.
For more information, refer to [Python Interpreter Page \(ControlDesk Automation !\[\]\(0083087c61cec498ac803a4aec5bb1bd_img.jpg\)\)](#).
- The Variable Abbreviation Rules page is no longer available. You can now select a text abbreviation rule for the Variable Array.
For more information, refer to [Selected Column Properties \(ControlDesk Instrument Handling !\[\]\(2e94242fda9f31152eb2b29146bfce46_img.jpg\)\)](#).
- The Views page is no longer available.

Changed docking behavior of panes

The docking behavior of panes was changed in ControlDesk 7.6:

- Up to and including ControlDesk 7.5, when you double-clicked the caption of a floating pane, ControlDesk docked the pane to the position where it was docked last.
- As of ControlDesk 7.6, when you double-click the caption of a floating pane, ControlDesk maximizes the pane. When you double-click the caption again, ControlDesk restores the previous pane size.

Changed behavior of the Split Horizontally/Vertically commands

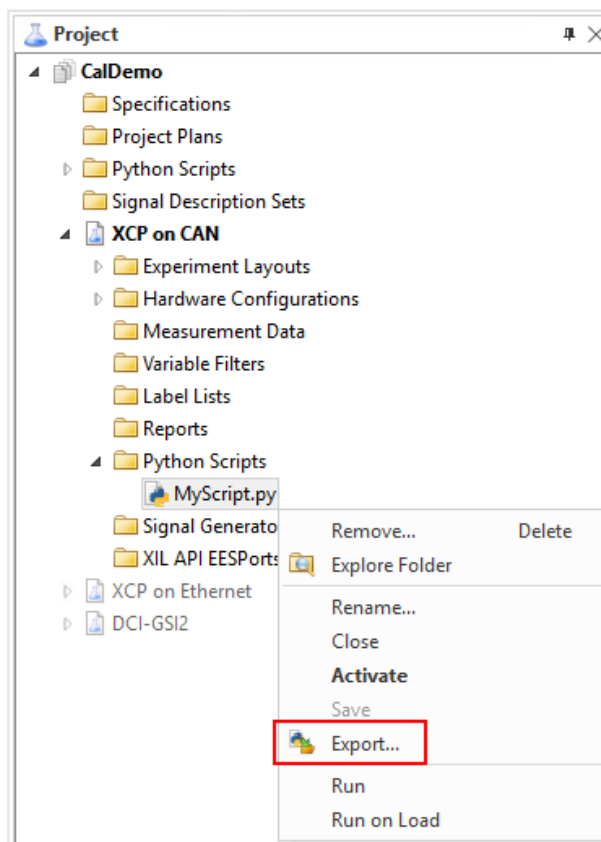
The behavior of the Split Horizontally and Split Vertically commands was changed in ControlDesk 7.6:

- Up to and including ControlDesk 7.5:
 - All open pages, such as layouts and Python scripts, were arranged horizontally in the working area when you executed the Tile Horizontally command.
 - All open pages, such as layouts and Python scripts, were arranged vertically in the working area when you executed the Tile Vertically command.
- As of ControlDesk 7.6:
 - The active page is displayed in a new working area below the current one when you execute the Split Horizontally command.
 - The active page is displayed in a new working area to the right of the current one when you execute the Split Vertically command.

Refer to [Split Horizontally \(ControlDesk User Interface Handling !\[\]\(4fe57c3593bf1b21d272ae7ac8dfaf77_img.jpg\)\)](#) and [Split Vertically \(ControlDesk User Interface Handling !\[\]\(67b4b7a7e28d2fb85c0437cda45ea068_img.jpg\)\)](#).

Change to the Export Script command

As of ControlDesk 7.6, the Export Script command is no longer accessible via the Python Scripts ribbon group in the Automation ribbon. Instead, you can access it via the context menu of scripts in the Project pane.



Refer to [Export Script \(ControlDesk Automation\)](#).

Changed instrument-specific keyboard shortcuts

The following keyboard shortcuts were changed in ControlDesk 7.6:

Instrument	Command	Keyboard Shortcut as of ControlDesk 7.6
Table Editor	Paste Value(s) (ControlDesk Instrument Handling)	Shift+Ctrl+V
Bar, Gauge, Knob, and Slider	Indicators - Reset Max (ControlDesk Instrument Handling)	Alt+R
Fault Memory Instrument and Diagnostics Instrument	Select and switch instrument splitter.	Alt+S
Various instruments	Assign Value (refer to Adjust Value(s) (ControlDesk Instrument Handling))	Alt+E

Alt+W+<index> keyboard shortcut no longer supported

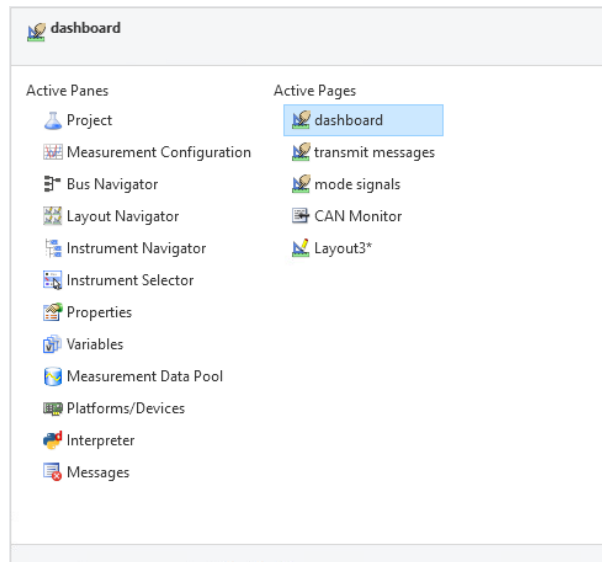
As of ControlDesk 7.6, the **Alt+W+<Index>** keyboard shortcut to activate an indexed window, such as a layout, is no longer supported.

Alt+<index> keyboard shortcut no longer supported

As of ControlDesk 7.6, the **Alt+<Index>** keyboard shortcut to activate another page in the working area is no longer supported.

As an alternative, press **Ctrl+Tab** to open a dialog that lets you activate another page or pane.

The following illustration shows an example.

**Commands removed from the View ribbon**

As of ControlDesk 7.6, the following View ribbon commands are no longer available:

- Arrange Icons
- Cascade
- Workbook Mode

Date expressions according to ISO 8601

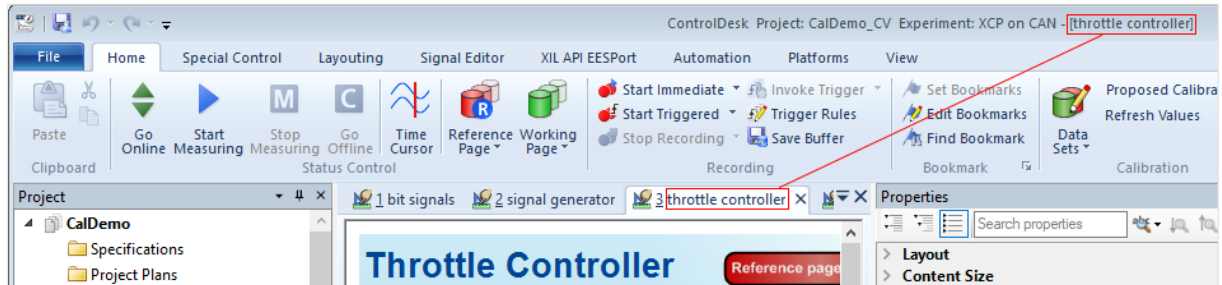
Date expressions were changed in ControlDesk 7.6:

- Up to and including ControlDesk 7.5, dates were expressed in the following way:
`02/08/2022 11:08:43`
- As of ControlDesk 7.6, dates are expressed according to ISO 8601, which is an international standard covering the worldwide exchange and communication of date- and time-related data.
`2022-02-08 11:08:43.4281202+01:00`

Changed caption


The caption of the ControlDesk user interface was changed in ControlDesk 7.6:

- Up to and including ControlDesk 7.5, the caption displayed the name of the page active in the working area:

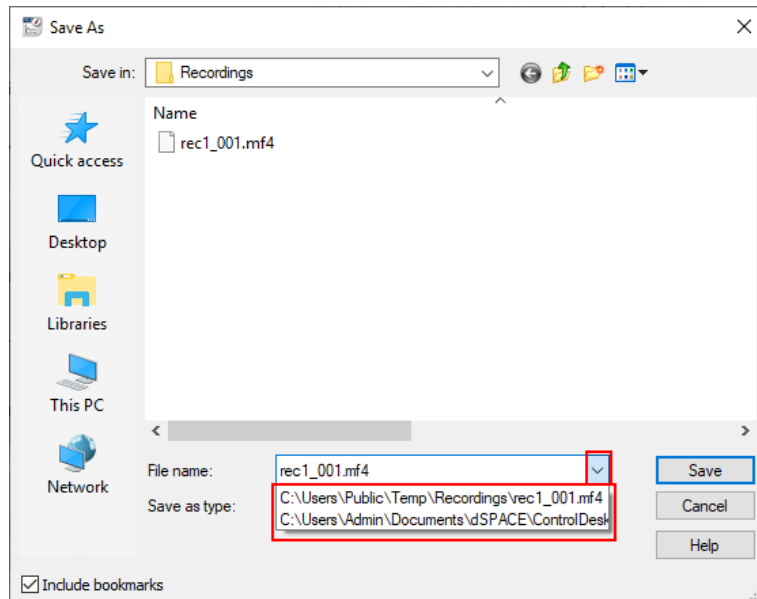


- As of ControlDesk 7.6, the caption no longer displays the name of the page active in the working area:

**Recent Folders button removed from Save As and Open dialogs**

As of ControlDesk 7.6, the Recent Folders () button is no longer available. The button was available in Save As and Open dialogs to provide quick access to recently used folders.

As an alternative, use the drop-down menu next to the File name field of these dialogs as shown in the following illustration:



Button Editor removed from the User Functions dialog

In ControlDesk 7.6, the Button Editor for editing icons for user functions was removed from the User functions dialog. As an alternative, you can load an icon created externally.

Refer to [Customize \(User Functions\) \(ControlDesk Automation !\[\]\(83f22ed94ec5517769dd76d702c6bfd8_img.jpg\)](#)).

Change to the Import Python Script dialog

As of ControlDesk 7.6, you can no longer select to import a Python script into the project or to the active experiment in the Import Python Script dialog.

Instead, you can do the following:

- To import a script to the project, use the Import Script from the Python Scripts folder context menu.
- To import a script to the active experiment, use the Import Script from the Automation – Python Scripts ribbon group.

Refer to [Import Script \(ControlDesk Automation !\[\]\(d0262bbe9d2356661a2e89321dfcc781_img.jpg\)](#)).

Position and state of pages not restored correctly

When your experiment was last saved with ControlDesk 7.5 or earlier, and you open it in ControlDesk 7.6 or later for the first time, the position and floating/docked state of pages is not restored correctly.

This is due to the modernized user interface in ControlDesk 7.6.

Tool automation changes

Discontinued Interpreter-related interfaces ControlDesk 7.6 provides a new implementation of the Interpreter and its automation interface.

- A number of Interpreter-related automation interfaces, properties, and methods have been discontinued in ControlDesk 7.6.

For a list of the discontinued interfaces, refer to [Automation Interfaces Discontinued in ControlDesk 7.6 \(ControlDesk Automation 📖\)](#).

- Using C#:

Up to and including ControlDesk 7.5, the definitions of the Interpreter-related automation interface were located in the `dSPACE.PythonIDE.Automation<Version>.dll` library.

As of ControlDesk 7.6, the definitions are located in the `PythonInterpreterAutomationInterfaces<Version>.dll` library.

As a consequence:

- If you did not add all the assemblies from the `./Main/bin/AutomationAssemblies` folder of your ControlDesk installation to your C# project, you have to add the `PythonInterpreterAutomationInterfaces<Version>.dll` library to your project.
- Adapt your C# program code to the namespace and signature of the new Interpreter automation interface.

Change to the IXaWindow interface As of ControlDesk 7.6, the following properties of the `Window / IXaWindow <<Interface>>` interface are read-only, and no longer writable:

- `Left`
- `Height`
- `Top`
- `Width`

Refer to [Window / IXaWindow <<Interface>> \(ControlDesk Automation 📖\)](#).

Changes to the IXaMainWindow interface As of ControlDesk 7.6, the following properties of the `MainWindow / IXaMainWindow <<Interface>>` interface are no longer available:

- `AnimateAutoHiding`
- `ControlbarTabsLayout`
- `LargeToolbarIconsEnabled`
- `ShortcutKeysVisible`
- `WorkbookModeEnabled`
- `WorkbookTabPosition`

Refer to [MainWindow / IXaMainWindow <<Interface>> \(ControlDesk Automation 📖\)](#).

The following changes apply when the `Application.MainWindow.State` is set to `MainWindowState.Maximized` or when `MainWindow.FullScreenModeEnabled` is set to true:

- You can no longer set the following properties of the `MainWindow / IXaMainWindow <<Interface>>` interface:
 - `Height`
 - `Left`
 - `Top`
 - `Width`

If you try to set the above properties in these cases, an exception occurs.

- The properties of the `MainWindow / IXaMainWindow <<Interface>>` interface listed above now return the current value. Up to and including ControlDesk 7.5, the properties returned the value in the `MainWindowState.Restored` state.

Refer to [MainWindow / IXaMainWindow <<Interface>>](#) (ControlDesk Automation )

Change to the WindowState enumeration In ControlDesk 7.6, the following changes were made to the values of the `WindowState <<Enumeration>>` enumeration:

Value Name ¹⁾	Value	Change
None	-1	New.
Minimized	0	Discontinued.
Maximized	1	Discontinued.
Restored	2	Discontinued.
Docked	3	None.
AutoHiding	4	Renamed to AutoHidden.
Floated	5	Renamed to Floating.
Closed	6	None.
DockedAsDocument	7	New.

¹⁾ Up to and including ControlDesk 7.5

Refer to [WindowState <<Enumeration>>](#) (ControlDesk Automation )

Change to the IPInteractiveInterpreterControl interface As of ControlDesk 7.6, an exception occurs when you call the `RunScript` method without parameters:

```
Application.Interpreter.InteractiveWindow.RunScript("")
```


Up to and including ControlDesk 7.5, `False` was returned in this case.

Refer to [InteractiveInterpreterControl / IPInteractiveInterpreterControl <<Interface>>](#) (ControlDesk Automation )

Change to the behavior of modal dialogs As of ControlDesk 7.6, if you have implemented modal dialogs, these dialogs open in the background of the ControlDesk main window if the dialog parent is not specified.

To open modal dialogs in the foreground, specify the ControlDesk main window as the parent of the modal dialog. To get the handle of the ControlDesk main window, you can use the `Application.MainWindow.WindowHandle` property.

Change to the IXaApplicationEvents interface As of ControlDesk 7.6, the `Selection` parameter of the `ContextMenuOpening` and `CommandExecuted` `ApplicationEvents / IXaApplicationEvents <<EventInterface>>` events may contain entries containing `NULL` or `None`, depending on the programming language. You have to take this into account when you use the `GetComIdentity` function, for example.

Refer to [ApplicationEvents / IXaApplicationEvents <<EventInterface>>](#) (ControlDesk Automation )

Migrating from earlier ControlDesk versions

To migrate from earlier 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 \(ControlDesk New Features and Migration 📖\)](#).

Related topics

Basics

[Basics on Migrating from Prior Versions of ControlDesk \(ControlDesk New Features and Migration 📖\)](#)

dSPACE FlexRay Configuration Package

Where to go from here

Information in this section

[New Features of dSPACE FlexRay Configuration Package 4.9..... 83](#)

[Migrating to dSPACE FlexRay Configuration Package 4.9..... 85](#)

New Features of dSPACE FlexRay Configuration Package 4.9

FlexRay Configuration Package

Simulating partial networking The FlexRay Configuration Package supports partial networking according to AUTOSAR 4.3. If a communication matrix specifies partial networking settings, you can implement partial networking and include the partial network clusters in a real-time application. When the partial networking feature is enabled, the automatically generated FlexRay model contains the FLEXRAYCONFIG PNC CONTROL block, which lets you enable and disable the partial network clusters at run time. However, to simulate partial networking, you also have to use blocks from the AUTOSAR Network Management Solution.

Refer to [Aspects of Miscellaneous Supported AUTOSAR Features \(FlexRay Configuration Tool Guide !\[\]\(5361750c22c4e047a52f4eac1ec2d4cc_img.jpg\)](#)).

Data replay For SCALEXIO platforms, the FlexRay Configuration Package supports the data replay feature. Data replay means that you can play back previously recorded real FlexRay data streams.

The recorded data is read by RTMaps from an MDF4 file and transmitted to a SCALEXIO system. There, you can manipulate the data before the FlexRay data stream is provided to the ECU.

In the FlexRay Configuration Tool, you must configure the TX PDUs that are to use the data replay feature accordingly. For TX PDUs with enabled data replay feature, the automatically generated FlexRay model contains a FLEXRAYCONFIG

PDU REPLAY block that is connected to the PDU block. This FLEXRAYCONFIG PDU REPLAY block provides the replay data to the PDU at run time.

Refer to [Replaying Data \(FlexRay Configuration Tool Guide !\[\]\(2bdfe261b986065ee0ac76460d6528c9_img.jpg\)](#)).

New supported AUTOSAR Release The FlexRay Configuration Package supports the format of AUTOSAR System Templates based on AUTOSAR Classic Platform Release R21-11 for describing FlexRay networks. However, no new features of AUTOSAR Classic Platform Release R21-11 are supported.

Refer to [Communication Cluster Files Usable for Configuration \(FlexRay Configuration Tool Guide !\[\]\(e78f798d4ea5c530c9db49e7d26e6b95_img.jpg\)](#)).

FlexRay Configuration Tool

Working with FRCFG configuration files An FRCFG configuration file can be used to automate the configuration process in the FlexRay Configuration Tool. It can contain parts of the project configuration that are required for the complete configuration of a project, such as the simulation, monitoring and/or task configurations, and the configurable settings of the General Properties dialog.

You can import an FRCFG configuration file to a project, so manual configuration with the graphical user interface of the FlexRay Configuration Tool is optional. An FRCFG configuration file can be created manually or exported from an existing project.

Refer to [Working with FRCFG Configuration Files \(FlexRay Configuration Tool Guide !\[\]\(05be7c7a8995decd503647c99211f7c2_img.jpg\)](#)).

Automating the FlexRay Configuration Tool You can operate the FlexRay Configuration Tool via command line, i.e., access several functions of the FlexRay Configuration Tool without using the graphical user interface. There are several command line options to let the FlexRay Configuration Tool carry out specific tasks.

Refer to [Using the Command Line Interface of the FlexRay Configuration Tool \(FlexRay Configuration Tool Guide !\[\]\(dd161862f9164df98f62b726e9846241_img.jpg\)](#)).

Generating missing ECUs If a communication matrix contains FlexRay PDUs for which no sending or receiving ECU is specified and/or a required ECU is not part of the communication cluster file, the FlexRay Configuration Tool can generate the missing ECUs during the import.

Refer to [General Page \(FlexRay Configuration Tool Reference !\[\]\(fe3aebe81acea8d45108cd2768939da7_img.jpg\)](#)).

Specifying the synchronization range of the FlexRay synchronization task For configurations to be used with a SCALEXIO or MicroAutoBox III system, the FlexRay Configuration Tool lets you change the synchronization range of the FlexRay synchronization task. The synchronization range determines the range in which the synchronization algorithm tries to synchronize the FlexRay configuration with the FlexRay cluster.

Refer to [Create Task \(FlexRay Configuration Tool Reference !\[\]\(a8f9309f944226d1420f5fed22e2b6e6_img.jpg\)](#)).

Raw data access for cryptographic IPDUs The FlexRay Configuration Tool now supports raw data access for cryptographic IPDUs.

SWEnable support for cryptographic IPDUs The FlexRay Configuration Tool now lets you enable or disable the sending of cryptographic IPDUs via software.

Migrating to dSPACE FlexRay Configuration Package 4.9

Working with projects and models from earlier FlexRay Configuration Package versions that do not support data replay

As of FlexRay Configuration Package 4.9, data replay is supported for SCALEXIO systems. To migrate from an earlier version of the dSPACE FlexRay Configuration Package that does not support data replay and reuse existing projects and models, you must perform the following migration steps to prevent compilation errors in ConfigurationDesk:

- Generate the C files again. To do so, open the project in the FlexRay Configuration Tool 4.9 and start code generation. Refer to [Generating Code \(FlexRay Configuration Tool Guide !\[\]\(ce77bba2916ff045bdb9f4584b191293_img.jpg\)](#)).
- Create the Simulink model again by using the `dsfr_modelgenerate` command. Refer to [dsfr_modelgenerate \(FlexRay Configuration Blockset Reference !\[\]\(b31d4eff00ee94d2cc889725763ab186_img.jpg\)](#)).

Working with projects from earlier FlexRay Configuration Package versions that do not support SWEnable for cryptographic IPDUs

As of FlexRay Configuration Package 4.9, the FlexRay Configuration Package allows you to manipulate the transmission of static cryptographic IPDUs, i.e., disable the transmission of a cryptographic IPDU at run time even if sending the related authentic IPDU is enabled. To migrate from an earlier version of the dSPACE FlexRay Configuration Package that does not support SWEnable for cryptographic IPDUs and reuse existing projects and models containing configured static cryptographic IPDUs, you must perform the following migration steps:

- After you open an existing project with configured cryptographic PDUs in the FlexRay Configuration Tool, the `SW enable static frame after model start` property is configurable for the cryptographic IPDUs. It is set to `True` by default. The TRC variables for transmission manipulation are available for selection in the Element Selection dialog, but they are not yet selected for the TRC file. In the Element Selection dialog, the cryptographic IPDUs are displayed as available elements and you have to drag all the elements that you want to control via TRC file to the Selected Elements list.
- After the automatically generated FlexRay model is updated, the TX blocks of the cryptographic IPDUs have the new `SW Enable` input. You have to assign valid signal outputs to them.

dSPACE Installation Manager

Where to go from here

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New Features of dSPACE Installation Manager 5.9.....87

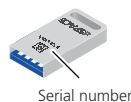
Migrating to dSPACE Installation Manager 5.9.....87

New Features of dSPACE Installation Manager 5.9

Support of new CmDongles

As of January 2022-A, dSPACE delivers new CmDongles . They have a metal housing and the CmDongle serial number is printed on the housing as shown below:

CmDongle Type 7



Serial number

dSPACE Installation Manager 5.9 supports the migration of dongles delivered up to dSPACE Release 2017-A to the new CmDongle. Dongles delivered up to dSPACE Release 2017-A are not prepared to use the CodeMeter licensing technology.

Migrating to dSPACE Installation Manager 5.9

Using CmDongles

If you want to work with licenses on CmDongles in combination with dSPACE Installation Manager 5.9, for example, to activate, deactivate, or update licenses, the dongles must have at least firmware version 4.10.

To use CmDongles shipped for Releases earlier than dSPACE Release 2019-A, a firmware update is required. CmDongles shipped for dSPACE Release 2019-A and later contain the required minimum firmware version.

dSPACE Installation Manager checks if the firmware of a connected dongle matches the required minimum firmware version and displays if an update is necessary.

For instructions on updating the firmware, refer to [How to Update the Firmware of a CmDongle \(Working with CodeMeter Licensing Technology !\[\]\(3d8c13c92b853674f749aac6fa869926_img.jpg\)\)](#).

dSPACE Python Extensions

New Features of dSPACE Python Extensions 4.2

New features

The dSPACE Python Extensions do not have new features.

dSPACE XIL API .NET

Where to go from here

Information in this section

[New Features of dSPACE XIL API .NET 2022-A.....](#) 91

[Migrating to dSPACE XIL API .NET 2022-A.....](#) 91

New Features of dSPACE XIL API .NET 2022-A

New features

The dSPACE XIL API.NET 2022-A has the following new features:

- Support of ASAM XIL API 2.2.0
The dSPACE XIL API .NET implementation is now based on the ASAM XIL API 2.2.0 standard. The dSPACE implementation provides the same functionality as before. The new features of ASAM XIL API 2.2.0 are not supported yet.
- XIL API on Linux: Support of Ubuntu Linux 20.04 LTS 64-bit distribution.

Migrating to dSPACE XIL API .NET 2022-A

Migrating to XIL API 2.2.0

Changes in the source code To migrate your applications to the ASAM XIL API 2.2.0 standard, you have to modify the references:

- C#: In the Solution Explorer, open the Add Reference dialog to replace the DLL references by the references from version 2.2.
Then, recompile your C# client application.
- Python: Modify the version string and the public key tokens. With ASAM XIL API 2.2.0, all assemblies have the same public key token.

The updated references should look like the following example.

```
# Load ASAM assemblies from the global assembly cache (GAC)
clr.AddReference("ASAM.XIL.Implementation.TestbenchFactory, Version=2.2.0.0, Culture=neutral,
PublicKeyToken=bf471dff114ae984")
clr.AddReference("ASAM.XIL.Interfaces, Version=2.2.0.0, Culture=neutral, PublicKeyToken=bf471dff114ae984")
```

Changes in the framework configuration The framework configurations for XIL API 2.1.0 and 2.2 are not compatible. If an incorrect XML schema is used, an exception occurs, displaying that the XML file is not valid.

Because there is now a different way to configure the target state, the following examples show the entire framework configurations for the SCALEXIO platform. The modifications are marked.

XIL API 2.1.0

```
<?xml version="1.0" encoding="utf-8"?>
<FrameworkConfiguration xmlns="http://www.asam.net/XIL/FrameworkConfiguration/2.0">
  <MappingFileList>
    <MappingFile Name="DemoFrameworkLabels">..\FrameworkMappings\FrameworkLabels.xml</MappingFile>
    <MappingFile Name="DemoLabelMapping_SCALEXIO">..\FrameworkMappings\LabelMapping_SCALEXIO.xml</MappingFile>
    <MappingFile Name="DemoUnits">..\FrameworkMappings\Units.xml</MappingFile>
  </MappingFileList>
  <PortDefinitionList>
    <MAPortDefinition InstanceName="dSPACE SCALEXIO MAPort" InitOrder="0" ShutdownOrder="0" TargetState="eSIMULATION_RUNNING">
      <VendorName>dSPACE GmbH</VendorName>
      <ProductName>XIL_API</ProductName>
      <ProductVersion>2021-B</ProductVersion>
      <PortConfigurationFile>..\..\..\MAPort\Common\PortConfigurations\MAPortConfigSCALEXIO.xml</PortConfigurationFile>
    </MAPortDefinition>
  </PortDefinitionList>
</FrameworkConfiguration>
```

XIL API 2.2.0

```
<?xml version="1.0" encoding="utf-8"?>
<FrameworkConfiguration xmlns="http://www.asam.net/XIL/FrameworkConfiguration/2.2.0">
  <MappingFileList>
    <MappingFile Name="DemoFrameworkLabels">..\FrameworkMappings\FrameworkLabels.xml</MappingFile>
    <MappingFile Name="DemoLabelMapping_SCALEXIO">..\FrameworkMappings\LabelMapping_SCALEXIO.xml</MappingFile>
    <MappingFile Name="DemoUnits">..\FrameworkMappings\Units.xml</MappingFile>
  </MappingFileList>
  <PortDefinitionList>
    <MAPortDefinition InstanceName="dSPACE SCALEXIO MAPort" InitOrder="0" ShutdownOrder="0">
      <VendorName>dSPACE GmbH</VendorName>
      <ProductName>XIL_API</ProductName>
      <ProductVersion>2022-A</ProductVersion>
      <TargetState>
        <eSIMULATION_RUNNING>
          <PortConfigurationFile>..\..\..\MAPort\Common\PortConfigurations\MAPortConfigSCALEXIO.xml</PortConfigurationFile>
          <ForceConfig>false</ForceConfig>
        </eSIMULATION_RUNNING>
      </TargetState>
    </MAPortDefinition>
  </PortDefinitionList>
</FrameworkConfiguration>
```

Changes in the mapping file The mapping files for XIL API 2.1.0 and 2.2 are not compatible. If an incorrect XML schema is used, an exception occurs, displaying that the XML file is not valid.

You only have to change the following entry.

XIL API 2.1.0

```
<Mapping xmlns="http://www.asam.net/XILAPI/Mapping/2.1.0">
```

XIL API 2.2.0

```
<Mapping xmlns="http://www.asam.net/XIL/Mapping/2.2.0">
```

ECU Interface Manager

Where to go from here

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Provides information on the compatibility of ECU Interface Manager 2.11.

[Migrating to ECU Interface Manager 2.11](#)..... 94

Information on how to migrate to ECU Interface Manager 2.11.

Compatibility of ECU Interface Manager 2.11

Compatibility in general

dSPACE recommends using only software products from the same dSPACE Release. This ensures maximum run-time compatibility.

Compatibility between EIC files and ConfigurationDesk

The following table shows the compatibility between EIC files and ConfigurationDesk:

	EIC Files Created with ECU Interface Manager ...			
	Version 2.8 ¹⁾	Version 2.9 ²⁾	Version 2.10 ³⁾	Version 2.11 ⁴⁾
ConfigurationDesk 22.1 ⁴⁾	✓ ⁵⁾	✓ ⁵⁾	✓ ⁵⁾	✓ ⁶⁾
ConfigurationDesk 6.8 ³⁾	✓	✓	✓	—
ConfigurationDesk 6.7 ²⁾	✓	✓	✓	—

	EIC Files Created with ECU Interface Manager ...			
	Version 2.8 ¹⁾	Version 2.9 ²⁾	Version 2.10 ³⁾	Version 2.11 ⁴⁾
ConfigurationDesk 6.6 ¹⁾	✓	✓	✓	-

1) dSPACE Release 2020-B

2) dSPACE Release 2021-A

3) dSPACE Release 2021-B

4) dSPACE Release 2022-A

5) For 32-bit target architecture only.

6) For 32- and 64-bit target architectures.

Compatibility between EIC files and RTMaps

RTMaps supports EIC files created with the ECU Interface Manager 2.10 and later.

Related topics

Basics

[Compatibility of Products in the ECU Interfacing Tool Chain \(ECU Interfacing Overview !\[\]\(ab4e2b3fc7e7887b7a72f548aa6f5e60_img.jpg\)](#))

Migrating to ECU Interface Manager 2.11

Automatic migration of projects

You can reuse projects in the ECU Interface Manager 2.11 if the projects were last saved with the ECU Interface Manager 2.0 p1 or later.

When you open the projects in the ECU Interface Manager 2.11, they are migrated automatically.

Note

In the ECU Interface Manager 2.11, you cannot reuse projects that were last saved with ECU Interface Manager 2.0 or earlier.

Additional migration steps in some cases

To migrate to the ECU Interface Manager 2.11 from versions earlier than the ECU Interface Manager 2.7, you might also have to perform the migration steps of the intervening ECU Interface Manager versions.

Firmware Manager

New Features of Firmware Manager 3.5

Changed default firmware archive for SCALEXIO

The default SCALEXIO firmware archive now contains the 64-bit Linux-based firmware components. To load the 32-bit Linux-based firmware components, you have to explicitly select the 32-bit firmware archive.

MicroAutoBox III Firmware

New Features of the MicroAutoBox III Firmware 6.0

DS1403 Processor Board

The firmware now supports the following new features and improvements:

- The NVDATA page and the FLASH page have been removed from the web interface. Instead, the web interface provides more functions on the CONTROL page, and it also displays the new STORAGE page. Refer to [Web Interface Reference \(MicroAutoBox III Hardware Installation and Configuration !\[\]\(30a147af384f9f71632c2ff17bc706c8_img.jpg\)\)](#).
- The USB port B that is connected to the real-time processor is now enabled by default.

The ModelUsbDemo ConfigurationDesk project provides a custom function for accessing data on a USB mass-storage device from a real-time application. For more information on the project, refer to [Using the ModelUsbDemo Application \(ConfigurationDesk Using Demo Projects !\[\]\(e3f8612927870f2e0f9f5989e6dd3064_img.jpg\)\)](#).

Model and Sensor Interface Blockset

Where to go from here

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New Features of Model and Sensor Interface Blockset 1.3

Model and Sensor Interface Blockset

As of dSPACE Release 2020-B, the Model and Sensor Interface Blockset (MSI Blockset) must be used for simulation with sensors in a software-in-the-loop (SIL) or in a hardware-in-the-loop (HIL) test environment.

In Sensor Simulation, the blockset is required to calculate simulation data and transmit it to the MotionDesk PC for visualization and to the SensorSim applications that produce the sensor composition and raw data for connected sensors.

The data is transmitted in data streams of sequenced data elements using the TCP/IP protocol. In the Simulink model, the blockset must be connected to Ethernet functions to communicate with the selected supported simulation platform and to Sensor Simulation systems and applications using the TCP/IP protocol.

For each of the moving objects in the simulation, simulation data objects can be defined in kinematic chains in single object blocks using a parent-child relationship. Blocks can also be added to retrieve status and statistical information on the connected system.

You can connect an Environment Sensor Interface Unit. The unit splits the sensor raw data coming from the SensorSim application and inserts it into the relevant sensor hardware, for example, into imaging sensor interfaces of camera sensors. You can add blocks to the Simulink model to receive feedback on the connected

sensors from the Environment Sensor Interface Unit. You can also configure sensor failures for specific sensors, for example, a pixel error on a camera sensor.

If you adapted ASM models using the Model and Sensor Interface Solution, you can migrate these models to use the Model and Sensor Interface Blockset.

For detailed information on the features of the Model and Sensor Interface Blockset, refer to [Features of the Model and Sensor Interface Blockset \(Model and Sensor Interface Blockset Manual !\[\]\(dfbd6b3763a6d1d9afaa974f64e2e4b5_img.jpg\)](#)).



New features

The following new features for the Model and Sensor Interface Blockset 1.3 are available:

- Improved usability when copying blocks.
All block connections are internal. Therefore, when you copy all of blocks together, they maintain their internal connections. However, if you copy the blocks one at a time, the connections are lost. You have to manually connect them again in the parameters dialogs.
- Improved copying of subsystems to avoid connection collisions.
- Improved usability when working with library linked blocks.
- Addition of block parameter `get` and `set` commands for the Automation API.
- Improved `dsmis_analyze` function to provide information on the execution order of the model and interface blocks.

Related topics

Basics

Adapting Simulink Models (Model and Sensor Interface Blockset Manual )	
Features of the Model and Sensor Interface Blockset (Model and Sensor Interface Blockset Manual )	
Model and Sensor Interface Blockset Manual	
New Features of MotionDesk 4.10.....	111

Migrating to Model and Sensor Interface Blockset 1.3

MicroAutobox III

The MicroAutobox III platform is not supported by the Model and Sensor Interface Blockset.

For more information on using MicroAutobox III with the blockset, contact dSPACE Support.

Migrating from previous Releases

Migration from previous Releases as of dSPACE Release 2020-B Models created with previous Releases of the Model and Sensor Interface Blockset as of version 1.0 in dSPACE Release 2020-B are migrated automatically when you

open the model. Messages are displayed in the MATLAB Command Window and in the migration log to confirm successful migration or notify you of failures.

Migration from the Model and Sensor Interface Blockset

Solution Models created with the Model and Sensor Interface Blockset Solution that was available prior to dSPACE Release 2020-B must be manually migrated. When you open a model that uses blocks from the blockset solution, a message is displayed with instructions on how to migrate the model to use the blocks of the latest Release of the Model and Sensor Interface Blockset.

ModelDesk

Where to go from here

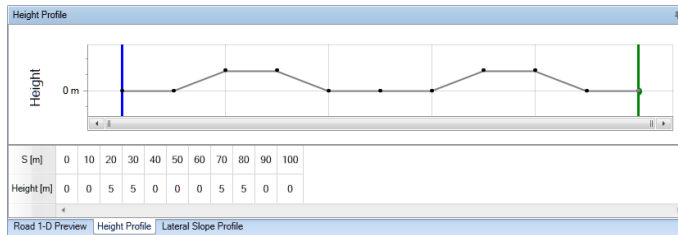
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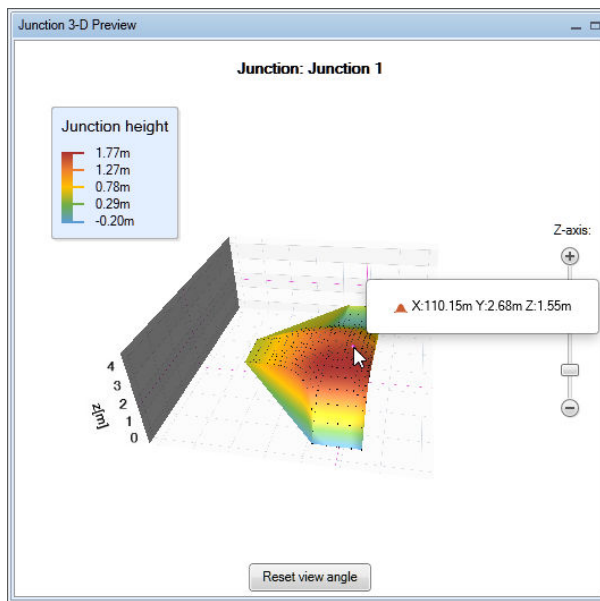
New Features of ModelDesk 5.7

Road Generator

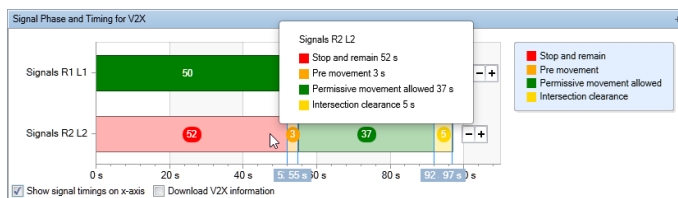
Table editor The 2-D table editor has been revised. You can use the table editor to edit the height points of the height profile and the angles of the lateral slope profile of road elements. The table editor is displayed below the profile.



Height profile of junctions You can open a preview that displays the height profile of a junction.

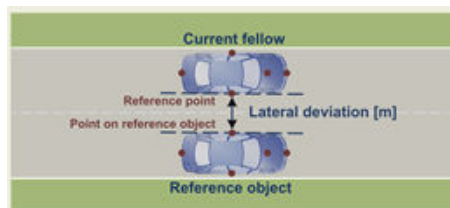


V2X Traffic Light Controller You can now specify signal groups and signals to implement a V2X traffic light controllers via the user interface.



Scenario Editor

Lateral deviation of fellows You can specify the distance between a fellow and a referenced object in the lateral direction. You can specify the distance in relation to selectable points of the objects (right, left, front, rear, or main (front axle center)). Refer to the following illustration.



This is useful if you want to simulate an overtaking maneuver where the distance between vehicles during overtaking is a certain length.

Related topics

HowTos

[How to Parameterize a V2X Traffic Light Controller \(ModelDesk Road Creation 📄\)](#)

Migration to ModelDesk 5.7

Project migration

As of ModelDesk 5.7, you can migrate only projects created with ModelDesk version 4.7 (dSPACE Release 2018-A) and later.

Using an ASM of Release 2020-B in a migrated project

When you migrate a ModelDesk project and the corresponding ASM model, all signals in the layouts used for plotting are still connected. If you replace the migrated ASM model with an ASM model created with Release 2020-B, you must connect the signals again. ASM models created with Release 2020-B use `ASMSignalInterface` blocks that can be used in different parts of the model.

Triggering plots

As of ModelDesk 4.6, plotting is triggered by the simulation model. Previously, ModelDesk triggered plotting. The plots are usually identical but can differ in some cases.

Tip

To compare measurements, it is useful to use the XY Plotter and use the maneuver time as a signal for the x-axis.

ASM project

Creating new ModelDesk projects on the basis of ASM projects is no longer supported for DS1006 target platforms. However, DS1006 platforms are still supported by ModelDesk. You can still parameterize real-time applications running on DS1006 platforms.

Model Interface Package for Simulink

Where to go from here

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[Migrating to the Model Interface Package for Simulink 22.1..... 109](#)

New Features of the Model Interface Package for Simulink 22.1

Unified system target file

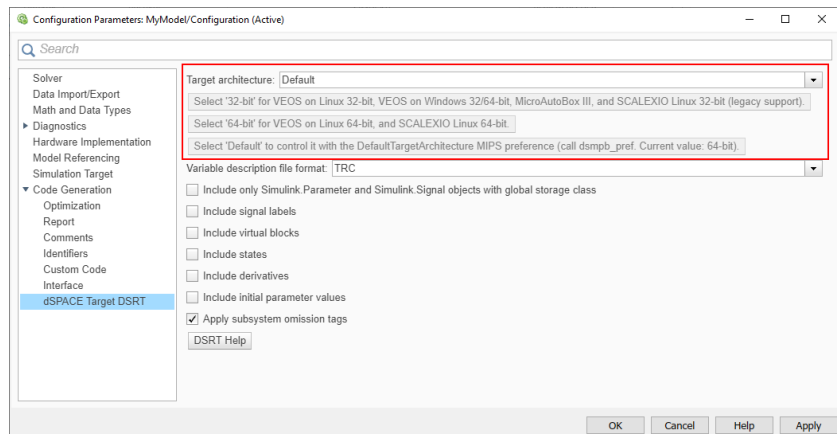
The Model Interface Package for Simulink now provides the unified dsrt.tlc system target file for the generation of SIC files and for code generation for Simulink models used in ConfigurationDesk. As a benefit, the model configuration is preserved when you switch between 32-bit and 64-bit target platform architectures.

Note

The dsrt64.tlc system target file is still available, but is deprecated and will be removed in a future Release.

New target architecture property

To specify the target architecture for code generation, you now have to use the new Target architecture property, which is available on the dSPACE Target DSRT page (former name: *DSRT variable description file options page*) of the Configuration Parameters dialog:



New SCALEXIO_LNX64 identifier

SIC files that were generated for a 64-bit target architecture can now be used in ConfigurationDesk real-time applications running on 64-bit SCALEXIO systems. The `dsrt_addfiles()` API command now provides the `SCALEXIO_LNX64` identifier that lets you add external files to an SIC file used in real-time applications for 64-bit SCALEXIO Linux systems.

New dsmpb_pref() preferences

The `dsmpb_pref()` API command provides the following new parameters:

- **DefaultTargetArchitecture**
The `DefaultTargetArchitecture` parameter lets you adapt the target platform of a model without explicitly changing the model configuration. This simplifies the generation of SIC files for different platforms from the same Simulink model, or building model referencing hierarchies.
- **AddTargetArchToSICFilename**
The `AddTargetArchToSICFileName` parameter allows you to specify that a generated SIC file has to have a name suffix indicating which target architecture the SIC file is compatible with. For example, `<sicfilename>_64-bit.sic`.

For more information, refer to [dsmpb_pref \(Model Interface Package for Simulink API Reference\)](#).

New API command for the execution of ConfigurationDesk commands

The Model Interface Package for Simulink now provides the `dsmips_configurationdesk()` API command. The API command provides parameters for:

- Controlling the connection between ConfigurationDesk and MATLAB
- Automating ConfigurationDesk operations

Controlling the connection between ConfigurationDesk and MATLAB

The `dsmips_configurationdesk()` API command provides the `ActivateMatlabInstance` parameter. To connect a specific MATLAB instance to ConfigurationDesk when multiple MATLAB instances are running, run the

`dsmips_configurationdesk('ActivateMatlabInstance')` function in that MATLAB instance.

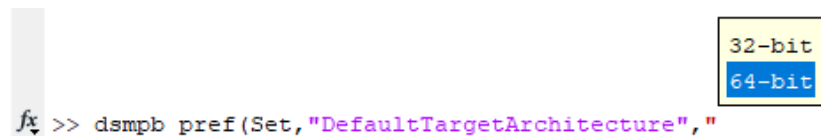
Automating ConfigurationDesk operations The `dsmips_configurationdesk()` API command provides parameters for automating the following ConfigurationDesk operations:

- Start a build process with the active ConfigurationDesk application
- Save the active project in ConfigurationDesk
- Analyze a model in ConfigurationDesk (including task information)
- Analyze a model in ConfigurationDesk (model topology only)
- Add a model to the model topology of the active ConfigurationDesk project
- Open a ConfigurationDesk project from a project backup archive

You can use this API command in combination with the ConfigurationDesk automation interface to execute ConfigurationDesk commands via script. This might be necessary to prevent unresolvable blocking situations between the MATLAB instance and ConfigurationDesk. For more information, refer to [dsmips_configurationdesk \(Model Interface Package for Simulink API Reference\)](#).

MATLAB compatibility

Support of code suggestions and completions for API functions The Model Interface Package for Simulink now supports code suggestions and completions via the Tab key in the MATLAB Command Window and in the Editor for all of its API functions. Refer to the following illustration, which shows an example for the `dsmpb_pref()` API command:



The code suggestions and completions also include workspace variables.


Migrating to the Model Interface Package for Simulink 22.1

Compatibility of SIC files with the 64-bit Linux-based RTOS

SIC files that were generated with an earlier dSPACE Release are no longer compatible with the 64-bit Linux-based target architecture of SCALEXIO. They must be generated again using the appropriate Target architecture value in the Simulink Configuration Parameters dialog. For more information, refer to [Basics on Simulink Implementation Containers \(Model Interface Package for Simulink - Modeling Guide\)](#).

Migrating to the new ConfigurationDesk automation commands

If you use ConfigurationDesk COM automation commands in scripts to automate ConfigurationDesk from MATLAB, you have to replace the relevant COM automation commands with the corresponding `dsmips_configurationdesk()` API command with the appropriate

parameters. For more information, refer to [dsmips_configurationdesk](#) (Model Interface Package for Simulink API Reference .

MotionDesk

Where to go from here

Information in this section

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[Migrating to MotionDesk 4.10.....](#) 111

New Features of MotionDesk 4.10

MotionDesk

There are no new features in MotionDesk 4.10.

Migrating to MotionDesk 4.10

Discontinuations

There are no new discontinuations in MotionDesk 4.10. Development has focused on a number of user interface and background fixes and improvements.

Planned discontinuations

MotionDesk will be discontinued after [Release 2023-B](#).

dSPACE AURELION is a new product and the successor of MotionDesk for the visualization of ADAS/AS simulations in realistic animations to validate driving functions and sensors.

For more information and to prepare for your migration to AURELION, refer to the following [dSPACE Support FAQ](#) or contact dSPACE Support.

Using endless ground plate and horizon

In MotionDesk 4.0 and earlier, the virtual world of a scene was built using ground plate and dome 3-D objects.

If you want to use the endless ground plate and endless sky in an old scene, you first have to delete these 3-D objects.

In advanced lighting mode, the static objects used for domes are not suitable for building the virtual world. You have to use the endless sky.

Migrating 3-D custom objects

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

Migrating from previous Releases

MotionDesk supports experiments from the previous four versions of MotionDesk.

Real-Time Testing

Where to go from here

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[New Features of Real-Time Testing 5.2..... 113](#)

[Migrating to Real-Time Testing 5.2..... 113](#)

New Features of Real-Time Testing 5.2

Platform support

Real-Time Testing supports SCALEXIO systems with a 64-bit Linux-based distribution.

RTT on Linux

Real-Time Testing on Linux now also supports the Ubuntu Linux 20.04 LTS 64bit distribution on a host PC.

Migrating to Real-Time Testing 5.2

Incompatible BCG files

BCG files generated on a Windows PC cannot be used on a Linux PC and vice versa. Generate the BCG files under the operating system that you want to use to manage real-time tests.

The BCG files generated with Real-Time Testing 4.0 or earlier cannot be used for Real-Time Testing 5.2. You must create the BCG file of the RTT sequence again.

Only for SCALEXIO as of Real-Time Testing 4.4 and VEOS as of Real-Time Testing 4.2: The internal Python interpreter version changed from 2.7.11 to 3.6.4. To use older scripts in the syntax of Python 2.7.11, you must migrate them to the

syntax of Python 3.6.4. For more information on migrating Python scripts, refer to <http://www.dspace.com/go/Python36Migration>.

RTI/RTI-MP and RTLib

Where to go from here

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Migration Aspects of RTI/RTI-MP and RTLib.....	115

New Features of RTI/RTI-MP and RTLib

New features of RTI/RTI-MP

RTI and RTI-MP has the following new feature:

- Support of MATLAB R2022a.

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 previously installed MATLAB versions. To prevent unexpected behavior by the Simulink models when you switch to a later MATLAB version or dSPACE Release, always reset the MATLAB and Simulink preferences to their default values before you start using the models.

If you change the MATLAB version and/or the dSPACE Release, configuration sets stored in a MAT file of an earlier version might cause problems. Therefore, you are recommended to create these configuration sets again when you change the Release version.

Note

Simulink.ConfigSet objects that were saved in MAT files using dSPACE Release 2013-B or older cannot be migrated to Release 2022-A.

RTI Bypass Blockset

Where to go from here

Information in this section

[New Features of the RTI Bypass Blockset 3.18](#)..... 117

[Migrating to RTI Bypass Blockset 3.18](#)..... 118

New Features of the RTI Bypass Blockset 3.18

RTI Bypass Blockset

Compiler configuration in on-target bypassing models The compiler configuration in on-target bypassing models has been extended. The RTI Bypass Blockset now lets you specify compiler and linker option sets for configured compilers.

Refer to [Build Page \(RTIBYPASS_SETUP_BLx for INTERNAL\)](#) (RTI Bypass Blockset Reference .

RTI Bypass Blockset MATLAB API

Compiler configuration handling in on-target bypassing models The RTI Bypass Blockset MATLAB API now lets you add target-specific compiler configurations to a compiler configuration file. The new compiler configurations are then available to the Setup blocks across models. The RTI Bypass Blockset MATLAB API also allows you to export compiler configurations to a compiler configuration file.

Refer to [Compiler Configuration Handling \(RTI Bypass Blockset MATLAB API Reference !\[\]\(bd3b31712ad9bab5a241210fa6925cdd_img.jpg\).](#)

Support of changes made to RTI Bypass Blockset The RTI Bypass Blockset MATLAB API supports all changes made to the RTI Bypass Blockset.

Refer to the [RTI Bypass Blockset MATLAB API Reference !\[\]\(799877f5c2f906134441300079881630_img.jpg\).](#)

Migrating to RTI Bypass Blockset 3.18

Models containing a DCI-GSI1-based interface

Since dSPACE Release 2020-A, the DCI-GSI1 has no longer been supported. As a consequence, the RTI Bypass Blockset no longer supports the following DCI-GSI1-based bypass interface types:

- DCI_GSI1
- dSPACE_on_JTAG_NEXUS
- dSPACE_on_JTAG_OCDS
- dSPACE_on_JTAG_SDI
- dSPACE_on_NBD_AUD
- dSPACE_on_NEXUS_READI
- cPATCH_on_JTAG_NEXUS
- cPATCH_on_JTAG_OCDS
- cPATCH_on_JTAG_SDI
- cPATCH_on_NBD_AUD
- cPATCH_on_NEXUS_READI

When you open a model with one or more of these DCI-GSI1-based bypass interfaces specified in the imported database files in the RTI Bypass Blockset 3.14 or later, a message informing you about the discontinued support is displayed, and the DCI-GSI1-based interfaces are removed from the Setup block. You can then continue working with the model as follows:

- If you did not select any of the listed interfaces in the model, you can continue working with the model as usual. No migration steps are required.
- If you selected one of the above interfaces, you must select a different bypass interface type offered in the Setup block and reconfigure all affected blocks accordingly.
- If you selected one of the above interfaces but no bypass interface type is offered for selection in the Setup block, you must import another database file with suitable interface definitions (**IF_DATA** entries) in the Setup block.

For more information, refer to [Migrating Models for DCI-GSI1-Based Interfaces \(RTI Bypass Blockset Reference !\[\]\(10f8862fc183b400327470ea85afe9ae_img.jpg\)](#)).

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

The current Release contains RTI Bypass Blockset 3.18, 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 from the prior RTI Bypass Blockset versions. If you have a Simulink model that was built with RTI Bypass Blockset 2.5 or earlier and you open it with RTI Bypass Blockset 3.18, 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 step is performed automatically when you open and close the Setup block dialog by clicking OK, or when 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 3.18 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 step is performed when you update the A2L files in the Setup block, or when 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 3.18 (.vdb) remains on the disk.

To enable the RTI Bypass Blockset to create the Data Dictionary again, the database files specified in the Setup block must be unchanged and accessible at the specified location.

- *Working with models from RTI Bypass Blockset 2.6 up to and including RTI Bypass Blockset 3.17*

If a Simulink model was built with RTI Bypass Blockset 2.6 up to RTI Bypass Blockset 3.17 and you open it with RTI Bypass Blockset 3.18, 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 and including RTI Bypass Blockset 3.17, 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

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[New Features of the RTI CAN MultiMessage Blockset 5.8](#)..... 121

[Migrating to RTI CAN MultiMessage Blockset 5.8](#)..... 121

New Features of the RTI CAN MultiMessage Blockset 5.8

Support of AUTOSAR Classic Platform R21-11

The RTI CAN MultiMessage Blockset supports the AUTOSAR System Template based on AUTOSAR Classic Platform Release R21-11 for describing CAN networks. However, no new features of AUTOSAR Classic Platform Release R21-11 are supported.

Refer to [General Settings Page \(RTICANMM MainBlock\)](#) (RTI CAN MultiMessage Blockset Reference )

Migrating to RTI CAN MultiMessage Blockset 5.8

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 a 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', bdroot)`.

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 \(RTI CAN MultiMessage Blockset Reference\)](#).

Changed data type in RTICANMMMsgStruct

In RTI CAN MultiMessage Blockset 5.8, the data type for the RAW_DATA array in the RTICANMMMsgStruct parameter used in checksum header files and custom code header files changed from UInt32 to UInt8.

Signal name changes for big endian byte order

As of RTI CAN MultiMessage Blockset 5.8, signals defined in the communication matrix that are larger than 32 bits are split in a certain way. This ensures a uniform behavior for all use cases, i.e., all signals behave in the same way for byte-aligned, non-byte-aligned, little endian, and big endian. Signal splitting is done as follows:

- The signals are split uniformly starting from the least significant bit.
- The signals are split into 8-bit signals until the remaining length is less than 8 bits.
- The remaining signal, which has a size of less than 8 bits, always contains the most significant bit.
- The signal that contains the least significant bit is always 8 bits long. This applies to both: little endian and big endian.
- After the signal is split, the signal with the least significant bit has the lowest index in the signal name.

If you are working with big endian (Motorola format), you must reverse the order for reconstructing the signals in Simulink.

Changed parameter element values in Bus Custom Code interface function

As of dSPACE Release 2022-A (RTI CAN MultiMessage Blockset 5.8), the values of some parameter elements of the DsBusCustomCodePdu_getCanFrameTriggering function are changed from numeric values to enumeration values. If you use the values of these parameter elements in your user code, you might have to adapt the user code to the changed values.

Obsolete Numeric Values of Parameter Element	New Enumeration Values of Parameter Element
DsBusCustomCodeCanFrameTriggering(.AddressingMode): <ul style="list-style-type: none"> ▪ 1 = standard identifier format (11-bit) ▪ 2 = extended identifier format (29-bit) 	DsBusCustomCodeCanFrameTriggering(.AddressingMode): <ul style="list-style-type: none"> ▪ Standard = standard identifier format (11-bit) ▪ Extended = extended identifier format (29-bit)
DsBusCustomCodeCanFrameTriggering(.FrameBehavior): <ul style="list-style-type: none"> ▪ 1 = classic CAN frame ▪ 2 = CAN FD frame 	DsBusCustomCodeCanFrameTriggering(.FrameBehavior): <ul style="list-style-type: none"> ▪ Can20 = classic CAN frame ▪ CanFd = CAN FD frame

Additional migration steps in some cases

To migrate to the RTI CAN MultiMessage Blockset 5.8 from versions earlier than the RTI CAN MultiMessage Blockset 5.7 and reuse existing models, you might have to carry out additional migration steps. For more migration information,

refer to [History of Migration Steps \(RTI CAN MultiMessage Blockset Reference !\[\]\(1d3a1175dd4902218e694b9c098adb83_img.jpg\)\)](#).

RTI FPGA Programming Blockset

Where to go from here

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[Migrating to the RTI FPGA Programming Blockset 3.13..... 126](#)

New Features of the RTI FPGA Programming Blockset 3.13

Extended Xilinx® support

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

Xilinx Design Tools Version	MATLAB Version ¹⁾	Operating System
Vivado 2021.2 ²⁾	<ul style="list-style-type: none"> ▪ MATLAB R2020b ▪ MATLAB R2021a 	<p>Windows operating system that is supported by the RCP and HIL software of the current Release.</p> <p>For a list of supported operating systems, refer to Operating System on page 150. The listed Windows Server operating systems are not officially supported by Xilinx, but tested by dSPACE.</p>

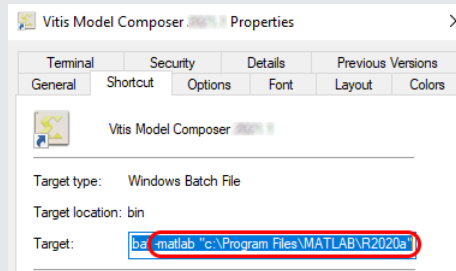
¹⁾ The Processor Interface sublibrary of the RTI FPGA Programming Blockset also supports MATLAB R2021b and R2022a.

²⁾ In general, Vivado ML Enterprise edition and the Xilinx® Vitis™ Model Composer are needed. The Vivado ML Standard edition with Xilinx Vitis Model Composer can also be used for the DS2655 (7K160) and DS6601 FPGA base boards. The Xilinx Vitis Model Composer is required only for modeling FPGA applications with the RTI FPGA Programming Blockset.

As of Vivado 2021.1 the Xilinx System Generator for DSP is part of the Vitis Model Composer. This is the unified Xilinx add-on for MATLAB Simulink. For licensing issues related to this change, refer to <https://xilinx.com/support/answers/76039.html>.

Tip

To use the Vitis Model Composer with a specific MATLAB version, the `-matlab "<matlabdir>"` parameter must be specified. You can add this parameter to the Vitis Model Composer icon on the desktop, for example.

**General enhancement for the SCALEXIO FPGA base boards**

The FPGA Scope block now lets you connect up to 16 FPGA signals that can be captured. Nevertheless, only 8 FPGA signals can be displayed in ControlDesk at the same time. You can select the signals to be displayed in ControlDesk.

For more information, refer to [Displaying FPGA Signals in ControlDesk \(RTI FPGA Programming Blockset Guide\)](#).

Enhancement to the FPGA Build Monitor

The FPGA Build Monitor 1.2 now supports the following features:

- A Reset button to reset defective builds.
- A Clear Caches button to clear the build caches.
- A sort functionality to display the monitored build processes by date, name, or state.

For more information, refer to [FPGA Build Monitor Reference \(RTI FPGA Programming Blockset Guide\)](#).

Migrating to the RTI FPGA Programming Blockset 3.13

Migrating from previous RTI FPGA Programming Blocksets

If you implemented an FPGA application with the RTI FPGA Programming Blockset Version 1.1 and later and want to use it with the RTI FPGA Programming Blockset 3.13, the framework automatically updates to the current framework version.


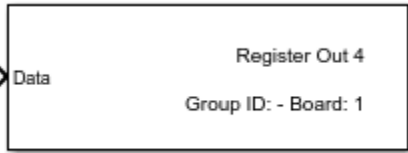
The update affects all subsystems in the model/subsystem. The parameters of the blocks stay the same after updating to the current framework version.

You can also use a script to migrate processor interface blocks, for example, to migrate RTI processor models without the FPGA model. For more information, refer to [MigrateToModelPortBlocks \(RTI FPGA Programming Blockset Script Interface Reference\)](#).

Bus In blocks replace Buffer64 blocks As of RTI FPGA Programming Blockset 3.12, the Bus In/Bus Out blocks for the MicroAutoBox III/SCALEXIO frameworks replace the transfer mode of the Buffer64 In/Buffer64 Out blocks. The update process automatically replaces the Buffer64 In/Buffer64 Out blocks that use the bus transfer mode with Bus In/Bus Out blocks.

Display of migrated processor interfaces With the RTI FPGA Programming Blockset 3.4 ... 3.8, you modeled the processor interface of a SCALEXIO system/MicroAutoBox III with processor interface blocks of the Processor Interface sublibrary.

If you migrate a model with processor interface blocks of the Processor Interface sublibrary, the update process migrates these blocks to the model port blocks of the Model Interface Package for Simulink. The following illustrations provide an example.

Display After Migration	Display Before Migration
 <p>Board number: 1 Type: Register Channel number: 4 Subchannel number: 1</p>	 <p>PROC_XDATA_WRITE_BL</p>

ConfigurationDesk custom functions incompatible with current dSPACE Release

FPGA custom function block types that are not built with the RTI FPGA Programming Blockset 3.13 might be incompatible with the current ConfigurationDesk version.

RTI FPGA Programming Blockset 3.5 or earlier With dSPACE Release 2018-B, the angle range handling of the angular processing unit (APU) changed. FPGA custom function blocks that use the APU in the 360° angle range are incompatible if they are built with the FPGA Programming Blockset 3.5 or earlier. To resolve the incompatibility, use the FPGA model/code of the incompatible FPGA custom function block and build a new FPGA custom function block with the RTI FPGA Programming Blockset 3.6 or later. The RTI FPGA Programming Blockset automatically migrates the framework of the FPGA model/code to the current version.

Related topics

Basics

[Migrating and Updating Existing FPGA Models \(RTI FPGA Programming Blockset Guide\)](#)

RTI LIN MultiMessage Blockset

Where to go from here

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[New Features of the RTI LIN MultiMessage Blockset 3.8.....](#) 129

[Migrating to RTI LIN MultiMessage Blockset 3.8.....](#) 129

New Features of the RTI LIN MultiMessage Blockset 3.8

Support of AUTOSAR Classic Platform R21-11

The RTI LIN MultiMessage Blockset supports the AUTOSAR System Template based on AUTOSAR Classic Platform Release R21-11 for describing LIN networks. However, no new features of AUTOSAR Classic Platform Release R21-11 are supported.

Refer to [General Settings Page \(RTILINMM MainSetup\)](#) (RTI LIN MultiMessage Blockset Reference .

Migrating to RTI LIN MultiMessage Blockset 3.8

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 a 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', bdroot)`.

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 !\[\]\(3dfb8d66e81160ad61421a3452093d1b_img.jpg\)](#)).

SCALEXIO Firmware

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New Features of the SCALEXIO Firmware 6.0

New supported hardware

The SCALEXIO firmware supports the following new hardware:

- DS6330M3 Automotive Ethernet Module

The DS6330M3 module has two ports for connecting an Ethernet network with the automotive Ethernet standard 10BASE-T1S. You can use up to two modules on the DS6333-CS, DS6333-PE, and DS6335-CS Ethernet board.

The 10BASE-T1S standard allows a connection of several nodes with one bus line. The DS6330M3 supports the physical layer collision avoidance (PLCA) . For each port, you can configure whether it is connected at the end of the bus line. If it is not connected at the end of a bus line, you can use feed-through pins to connect a further node. You can make all settings in the web interface of the processing hardware.

Basic operating system

The SCALEXIO firmware now uses a 64-bit Linux-based distribution as the operating system. This is the default operation system. You can switch to the previous 32-bit Linux-based distribution in the ConfigurationDesk Options dialog. Refer to [New General Features of ConfigurationDesk 22.1](#) on page 47.

Hypervisor Extension

Starting with dSPACE Release 2022-A, the Hypervisor Extension on SCALEXIO Processing Units with Intel® Xeon® Gold Processor 6208U is license-protected.

This lets you install the Hypervisor Extension without changing the boot medium (SSD). You can order the required license ticket from dSPACE and activate the license via dSPACE Installation Manager. For detailed information, refer to [Handling Licenses for the SCALEXIO Hypervisor Extension \(SCALEXIO Hypervisor Extension Guide !\[\]\(21199eb166cc97331a0c54c649195dcc_img.jpg\)](#)).

Related topics

Basics

[Ethernet Board Configuration Page \(SCALEXIO Hardware Installation and Configuration !\[\]\(e78f798d4ea5c530c9db49e7d26e6b95_img.jpg\)](#))

[Ethernet Board Configuration Page \(SCALEXIO Hardware Installation and Configuration !\[\]\(034433b90593e82e5460e34e3ed48e9b_img.jpg\)](#))

Migrating to SCALEXIO Firmware 6.0

Migrating to the 64-bit Linux-based operating system

With dSPACE Release 2022-A, the default SCALEXIO firmware is a 64-bit Linux-based distribution. The following items built for dSPACE Release 2021-B and earlier are no longer compatible with the SCALEXIO system and must be (re-)built from source code based on dSPACE Release 2022-A or later:

- Real-time applications
- Binary libraries contained in model containers (i.e., SIC, BSC, FMU, and CTLGZ files)
- SIC and BSC files
- Binary libraries referenced by Simulink models
- Binary libraries referenced by ConfigurationDesk applications via custom code settings or custom I/O functions

Source code is expected to be reusable in most cases. Cases that might require an adaptation of C code are related to custom code that uses special features (e.g., OS-specific functions) created by your company or third-party suppliers.

Hypervisor Extension

If the new SCALEXIO Hypervisor Extension is installed, SCALEXIO real-time applications as well as Linux real-time and non-real-time applications created for dSPACE Release 2020-A and older can no longer be used. You must rebuild the SCALEXIO real-time applications and adapt Linux real-time and non-real-time applications to the new hypervisor, especially regarding interrupts, shared memory, and the assignment of hardware resources.

Discontinuations in SCALEXIO Firmware

Processing Unit

The SCALEXIO Processing Unit with the Intel® Core™ i7-860 mainboard (Real-Time PC Version 1.0) is not supported by the SCALEXIO firmware.

Sensor Simulation

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New Features of Sensor Simulation 1.7

SensorSim application

There are no new features in the SensorSim application for Sensor Simulation 1.7.

Related topics

Basics

[MotionDesk Sensor Simulation Control](#)
[Sensor Simulation Manual](#)
[Sensor Simulation Overview](#)

Migrating to Sensor Simulation 1.7

Planned discontinuations

Sensor Simulation based on MotionDesk will be discontinued for simulation with radar and lidar sensor after [Release 2022-A](#). Sensor Simulation with camera sensors will be discontinued with MotionDesk after Release 2023-B.

dSPACE AURELION is a new product and the successor of MotionDesk and Sensor Simulation for ADAS/AS simulations with camera, radar, and lidar sensors to validate driving functions and sensor output.

For more information and to prepare for your migration to AURELION, refer to the following [dSPACE Support FAQ](#) or contact dSPACE Support.

SYNECT

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

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Migrating to SYNECT 2.13.....	140

New Features of SYNECT 2.13

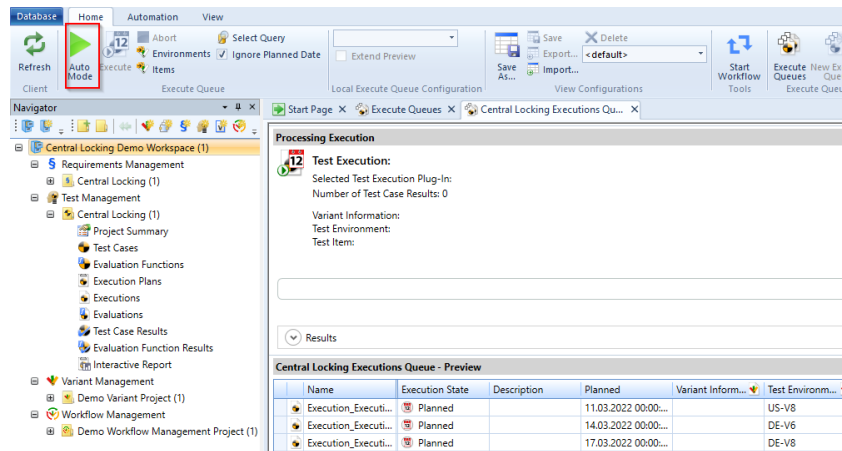
New Features

Introduction

SYNECT provides the following new features.

New client API events

The SYNECT client API now provides events that let you respond to starts and stops of the automatic execution of execute queues. You can, e.g., stop the processing of execute queues when they are switched to Auto Mode. This can be useful to validate contained executions or evaluations before automatic execution.



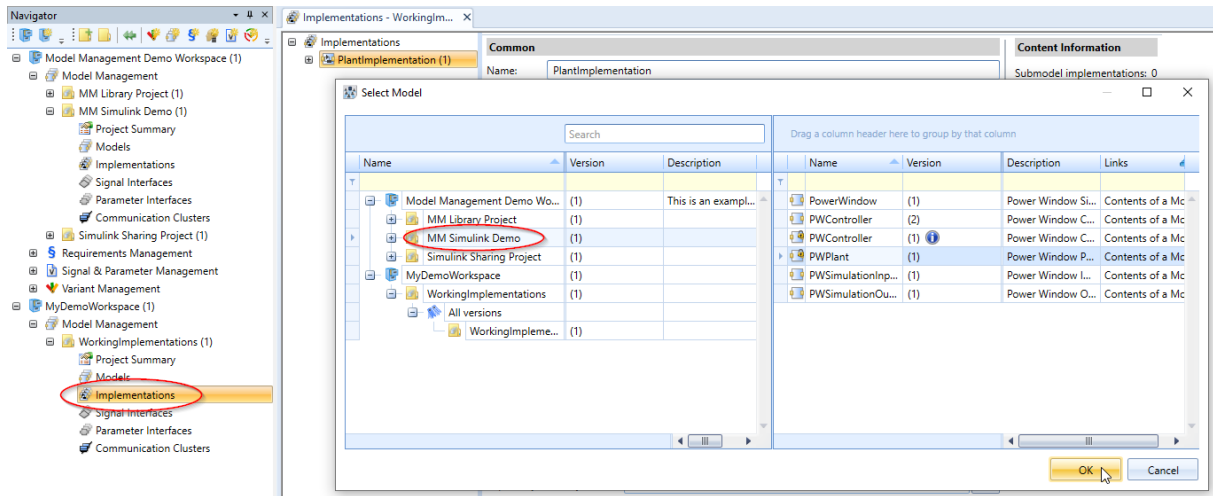
For reference information on the events for execute queues, refer to [Test Management Client Events \(SYNECT Client API Reference\)](#).

Flexible storage of model management items

You can now reference model and implementation items across workspaces. The referenced items can be draft and released.

This lets you define roles and permissions in model management more precisely.

Refer to the following illustration that shows the referencing of a model for a submodel.



If you select a model, you can now choose from all the workspaces of the connected database. The list contains all model versions.

Migrating to SYNECT 2.13

Where to go from here

Information in this section

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To use the data from previous SYNECT versions with SYNECT 2.13, you have to migrate the SYNECT database.	
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Migration steps for update to a new SYNECT version.	
Data Model Changes from SYNECT 2.12 to SYNECT 2.13	140
The data model did not change from SYNECT 2.12 to SYNECT 2.13.	

Migrating Databases

Introduction

To use the data from previous SYNECT versions with SYNECT 2.13, you have to migrate the SYNECT database.

To migrate databases from SYNECT Versions 2.0 - 2.12 to SYNECT 2.13, use the Database Migrator of SYNECT 2.13.

Note

Contact dSPACE Support if you want to migrate SYNECT versions earlier than SYNECT 2.0. Refer to www.dspace.com/go/supportrequest.

For basic information and instructions on migrating databases, refer to [Migrating Databases from Previous SYNECT Versions \(The SYNECT Server Guide !\[\]\(758ebdf4629c903da74c2e079717ae32_img.jpg\)](#)).

Migrating from SYNECT 2.12

Introduction

You do not have to migrate scripts, queries, views, etc. when updating to the new SYNECT version.

Data Model Changes from SYNECT 2.12 to SYNECT 2.13

Introduction

The data model did not change from SYNECT 2.12 to SYNECT 2.13.

VEOS

Where to go from here

Information in this section

New Features of VEOS 5.4	141
Provides an overview of the new features of VEOS 5.4.	
Compatibility of VEOS 5.4	144
Provides information on the compatibility of VEOS 5.4.	
Migrating to VEOS 5.4	147
To migrate from VEOS 5.3 to VEOS 5.4, you might have to perform certain migration steps.	

New Features of VEOS 5.4

Support of the FMI 3.0-beta.3 pre-release

VEOS 5.4 now also supports FMUs implemented according to the FMI 3.0-beta.3 pre-release.

With regard to FMI 3.0-beta.3, VEOS supports the same functionalities as for FMI 2.0. Furthermore, it supports the following concepts and features introduced with FMI 3.0:

- Support for all newly-introduced data types. The *clock* data type is an exception.
VEOS also supports the *binary* data type for handling non-numeric data, such as sensor data.
- Support for array variables.

For more information on the FMI 3.0-beta.3 prerelease, refer to <https://fmi-standard.org/news/2022/01/12/fmi3.0beta.3-prerelease.html>.

For more information on the VEOS support for the FMI 3.0-beta.3 pre-release, refer to [Basics on Integrating Functional Mock-Up Units \(FMUs\) \(VEOS Manual !\[\]\(47734e4656765d20df4fdbd5b7aff048_img.jpg\)](#)).

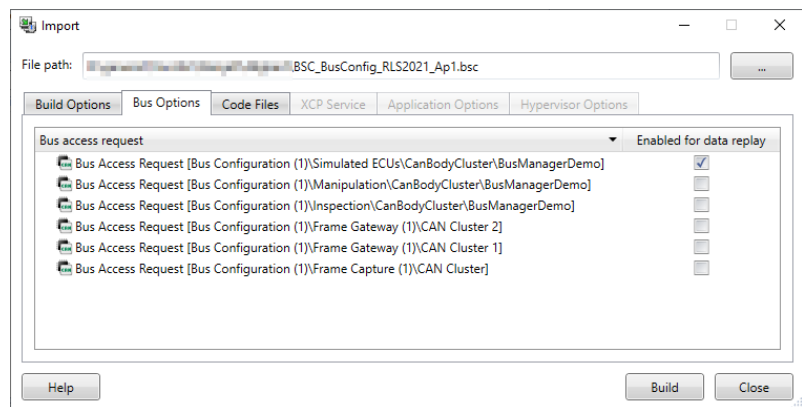
Tip

A patch for VEOS 5.4 is planned that will support the release version of the FMI 3.0 standard when available.

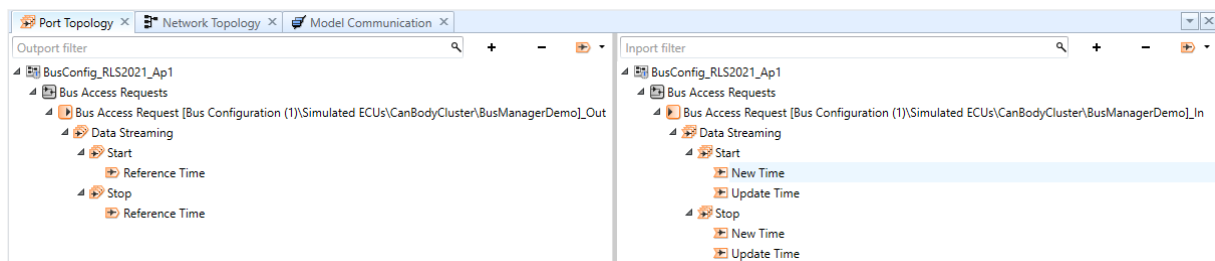
Enabling CAN/Ethernet data replay

You can now enable the replay of CAN/Ethernet data when you import a BSC file. You can enable data replay individually for each bus access request in the BSC file.

1. As an example, the following illustration shows the new Bus Options page of the Import dialog, with one CAN bus access request enabled for data replay.



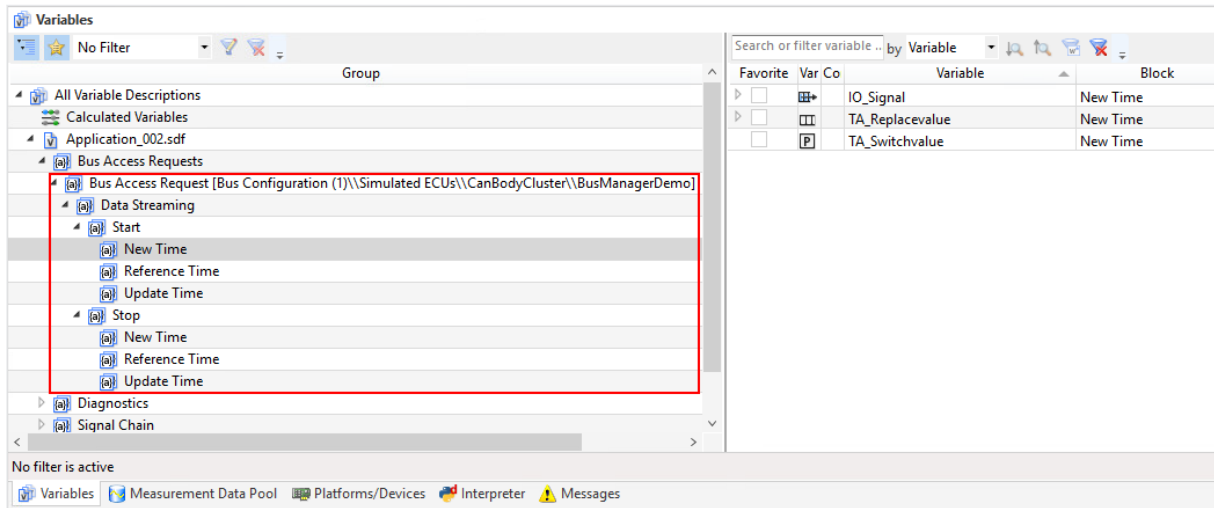
2. For each bus access request for which data replay is enabled, the Port Topology (refer to [Port Topology Pane \(VEOS Manual\)](#)) pane provides the following structure of incoming and outgoing signals:



To control data replay, you can connect these signals to signals of an SIC or FMU, for example.

3. Additional variables are generated into the SDF variable description file that you can use in ControlDesk.

The following illustration shows the ControlDesk Variables pane with the related variables.



To control data replay and switch from plant model behavior to data replay, you can use these variables interactively.

For more information, refer to [Replaying Bus Data with VEOS \(VEOS Manual\)](#).

Building FMUs on Linux (VEOS Build Console)

You can now use the VEOS Build Console *on Linux* to build Functional Mock-up Unit (FMU) container files for VEOS.

For more information, refer to [VEOS Build Console Command Reference \(VEOS Manual\)](#).

Specifying simulation targets (VEOS Target Console)

Both the Windows and Linux versions of VEOS now provide the VEOS Target Console. It lets you list and configure installed simulation targets, remove them, or add new ones.

The VEOS Target Console is the successor of the `VeosSimulationTargetManager.exe`, which is deprecated.

For more information, refer to [VEOS Target Console Command Reference \(VEOS Manual\)](#).

Enabling/disabling experimentation services

You can now enable/disable the experimentation services of VPUs, such as the DsDAQ service or the Real-Time Testing (RTT) service.

This is useful when you want to simulate systems with more than 100 VPUs for which an SDF/TRC variable description is generated during the build process, for example. In this case, you can disable the DsDAQ service of those VPUs on which you do not want to perform measurements during offline simulation.

The following illustration lists the experimentation services of such a VPU as an example:

Experimentation services	
DsDaq service	<input type="checkbox"/>
Rtt service	<input checked="" type="checkbox"/>
DsModelAccess service	<input checked="" type="checkbox"/>

For more information, refer to [Enabling/Disabling Experimentation Services \(VEOS Manual !\[\]\(3d8c13c92b853674f749aac6fa869926_img.jpg\)](#)).

VEOS on Linux: Support of Ubuntu Linux 20.04

VEOS on Linux now also supports the Ubuntu Linux 20.04 LTS 64-bit distribution. For more information, refer to [Introduction to VEOS on Linux \(VEOS Manual !\[\]\(96cc62f861fdd6e50510c0224a756dff_img.jpg\)](#)).

Compatibility of VEOS 5.4

General compatibility

dSPACE recommends using only software products from the same dSPACE Release. This ensures maximum run-time compatibility.

Supported compiler versions

For information on supported compiler versions, refer to [Basics on Integrating the Simulation System \(VEOS Manual !\[\]\(e1c624d4757f08486e89482c18364c17_img.jpg\)](#)).

Supported operating systems

Windows For information on the Windows operating systems supported by VEOS, refer to [Operating System](#) on page 150.

Linux For information on the Linux distribution recommended for VEOS, refer to [Introduction to VEOS on Linux \(VEOS Manual !\[\]\(e9474ce1d70442456f8fe9c393ea149c_img.jpg\)](#)).

Virtualizing VEOS For information on virtualizing VEOS for cloud/cluster environments, refer to [Virtualization of VEOS \(VEOS Manual !\[\]\(e3f255517d37bb309a3a931ec4849e6a_img.jpg\)](#)).

BSC file compatibility

VEOS 5.4 is compatible with bus simulation container (BSC) files created with the Bus Manager of dSPACE Release 2021-A, dSPACE Release 2021-B, and Release 2022-A (BSC version 1.10).

- If a BSC file was generated *with an SIC file*, the target architecture selected for SIC file generation specifies the simulation targets available to the VEOS build process.

Refer to [Basics on Simulink Implementation Containers \(Model Interface Package for Simulink - Modeling Guide !\[\]\(bcece9a353e60caece619217f5c1ea39_img.jpg\)](#)).

- If a BSC file was generated *without an SIC file*, you can select any simulation target supported by the Simulation Target Manager.

CTLGZ/VECU file compatibility

The following table shows the compatibility between VEOS 5.4 and V-ECU implementation container (CTLGZ/VECU) files:

V-ECU Implementations Created With...	V-ECU Implementation Version
dSPACE Release 2022-A and 2021-B: <ul style="list-style-type: none"> SystemDesk 5.6 TargetLink 5.2 	3.1
dSPACE Release 2021-A and 2020-B: <ul style="list-style-type: none"> SystemDesk 5.5 TargetLink 5.1 	3.0
dSPACE Release 2020-A and 2019-B: <ul style="list-style-type: none"> SystemDesk 5.4 TargetLink 5.0 	2.10

FMU file compatibility

VEOS supports Functional Mock-up Units (FMUs) that comply with the following FMI standard versions:

- FMI 2.0
- FMI 3.0-beta.3 prerelease

For more information on the FMI 3.0-beta.3 prerelease, refer to <https://fmi-standard.org/news/2022/01/12/fmi3.0beta.3-prerelease.html>.

Tip

A patch for VEOS 5.4 is planned that will support the release version of the FMI 3.0 standard when available.

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

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

OSA file compatibility

The following table shows the compatibility between VEOS 5.4 and offline simulation application (OSA) files:

OSA Files Created with Products Of ...	OSA Version
dSPACE Release 2022-A	5.4
dSPACE Release 2021-B	5.3 ¹⁾
dSPACE Release 2021-A	5.2 ¹⁾
dSPACE Release 2020-B	5.1 ¹⁾

¹⁾ You cannot modify the properties of VPUs contained in an OSA file if you open the OSA file in a later VEOS version than the version with which the OSA file was originally created. However, you can edit port and network connections, and enable/disable experimentation services. It is recommended that you rebuild the binary OSA files from existing model implementation container files (CTLGZ/VECU, SIC, BSC, FMU) when you migrate from one VEOS version to another.

SIC file compatibility

The following table shows the compatibility between VEOS 5.4 and Simulink implementation container (SIC) files:

SIC Files Created With ...	SIC Version ¹⁾
dSPACE Release 2022-A: <ul style="list-style-type: none"> ▪ Model Interface Package for Simulink 4.7 ▪ TargetLink 5.2 	1.10
dSPACE Release 2021-B: <ul style="list-style-type: none"> ▪ Model Interface Package for Simulink 4.6 ▪ TargetLink 5.2 	1.10 ²⁾
dSPACE Release 2021-A: <ul style="list-style-type: none"> ▪ Model Interface Package for Simulink 4.5 ▪ TargetLink 5.1 	1.10 ²⁾
dSPACE Release 2020-B: <ul style="list-style-type: none"> ▪ Model Interface Package for Simulink 4.4 ▪ TargetLink 5.1 	1.9 ²⁾

- 1) The target architecture selected for SIC file generation specifies the simulation targets available to the VEOS build process. Refer to [Basics on Simulink Implementation Containers \(Model Interface Package for Simulink - Modeling Guide\)](#).
- 2) If the SIC file is created with a previous dSPACE Release and if the SIC file contains an ASM model, you cannot simulate the model in VEOS 5.4 (dSPACE Release 2022-A). For more information, refer to [Migrating ASM Models \(VEOS Manual\)](#).

SMC file compatibility

The following table shows the compatibility between VEOS 5.4 and system model container (SMC) files:

SMC Files Created With ...	SMC Version
dSPACE Release 2022-A: <ul style="list-style-type: none"> ▪ SYNECT 2.13 ▪ VEOS 5.4 	1.2
dSPACE Release 2021-B: <ul style="list-style-type: none"> ▪ SYNECT 2.12 ▪ VEOS 5.3 	1.2
dSPACE Release 2021-A: <ul style="list-style-type: none"> ▪ SYNECT 2.11 ▪ VEOS 5.2 	1.2
dSPACE Release 2020-B: <ul style="list-style-type: none"> ▪ SYNECT 2.10 ▪ VEOS 5.1 	1.2

You also have to consider the following compatibility restrictions of the individual container files contained in the SMC file to be imported: If the SMC file contains a container of an unsupported version, VEOS 5.4 imports neither the unsupported container nor the connections to the application process based on the unsupported container.

Real-Time Testing compatibility

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

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

VEOS Simulator	RTT Version
... of VEOS 5.3	Real-Time Testing Version 5.1
... of VEOS 5.2	Real-Time Testing Version 5.0
... of VEOS 5.1	Real-Time Testing Version 4.4
... of VEOS 5.0	Real-Time Testing Version 4.3
... of VEOS 4.5	Real-Time Testing Version 4.2
... of VEOS 4.4	Real-Time Testing Version 4.1
... of VEOS 4.3	Real-Time Testing Version 4.0
... of VEOS 4.2	Real-Time Testing Version 3.4
... of VEOS 4.1	Real-Time Testing Version 3.3
... of VEOS 4.0	Real-Time Testing Version 3.2

ControlDesk 7.6 automatically uses the VEOS Simulator of VEOS 5.4. You can therefore use RTT in connection with VEOS and ControlDesk if RTT 5.0 is active on the PC.

AUTOSAR Adaptive Platform compatibility

For the simulation of AUTOSAR adaptive V-ECUs, VEOS 5.4 is compatible with the following release of the AUTOSAR Adaptive Platform:

- R20-11

Related topics

Basics

[Hypervisor Configuration for Adaptive V-ECU Simulation on Windows \(VEOS Manual !\[\]\(5361750c22c4e047a52f4eac1ec2d4cc_img.jpg\)\)](#)

Migrating to VEOS 5.4

Introduction

To migrate from VEOS 5.3 to VEOS 5.4, you might have to perform certain migration steps.

Note

To migrate to VEOS 5.4 from versions earlier than 5.3, you might also have to perform the migration steps of the intervening VEOS versions.

Changed usage of initial values in SIC and BSC files

The usage of initial values in SIC and BSC files, i.e., values used to initialize the incoming signals of the related VPUs when simulation starts, was changed in VEOS 5.4:

- Up to and including VEOS 5.3, when you imported a BSC or an SIC file, initial values for model port blocks that were set during generation in ConfigurationDesk or the Model Interface Package for Simulink were ignored and set to 0. You could not change this behavior.
- As of VEOS 5.4, when you import a BSC or an SIC file, the initial values specified in the model container *are no longer overwritten by default*. After the file import, you can specify which values are used for initializing the incoming signals of the selected VPU when simulation starts.


For more information, refer to [VPU \(V-ECU / Environment VPU / Controller VPU / Bus VPU\)](#) (VEOS Manual )

Migrating ASM models

You cannot simulate an ASM model on VEOS if the model is contained in an OSA or SIC file that was created with a dSPACE Release earlier than the one to which your VEOS installation belongs.

To simulate an ASM model that was last saved with a dSPACE Release earlier than the dSPACE Release to which your VEOS version belongs, perform the following steps:

1. Migrate the ASM model to the dSPACE Release to which your VEOS version belongs.

For information on migrating ASM models, refer to [Migrating ASM Models](#) (ASM User Guide )


2. Generate a Simulink implementation container (SIC) file on the basis of the ASM model by using the *Model Interface Package for Simulink*.

For instructions, refer to [Generating Simulink Implementation Containers](#) (Model Interface Package for Simulink - Modeling Guide )

3. Import the SIC file to the VEOS Player of your VEOS version.

For instructions, refer to [How to Import Simulink Implementations](#) (VEOS Manual )

Migrating from earlier VEOS versions

To migrate from earlier 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 Manual )

Compatibility Information

Where to go from here

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Run-Time Compatibility of dSPACE Software.....	155
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Supported MATLAB Releases

MATLAB®/Simulink®

Various dSPACE products require a MATLAB installation on the host PC.

Tip

For system requirements of MathWorks® software, refer to <https://www.mathworks.com/support/sysreq.html>.

MATLAB Release...	...Is Supported by dSPACE Release 2022-A					
	RCP and HIL Software ^{1), 2)}	AutomationDesk 6.7 ³⁾	TargetLink 5.2	Model Compare 3.2	dSPACE Python Extensions 4.2 ⁴⁾	XIL API .NET MAPort 2022-A
R2022a	✓ ⁵⁾	✓	—	—	✓	✓
R2021b	✓ ⁵⁾	✓	✓	✓	✓	✓
R2021a	✓	✓	✓	✓	✓	✓
R2020b	✓	✓	✓	✓	✓	✓
R2020a	—	—	✓	✓	—	—

- 1) 'RCP and HIL software' is a generic term for a software package containing several dSPACE software products, for example, ASM, RTI, ConfigurationDesk, and ModelDesk. These software products are installed in a common folder.
- 2) MATLAB/Simulink Student Suite is not supported by Automotive Simulation Models (ASM).
- 3) The AutomationDesk MATLAB Access Library requires MATLAB.
- 4) matlplib2 of dSPACE Python Extensions requires MATLAB.
- 5) R2022a and R2021b are not supported by the RTI FPGA Programming Blockset – FPGA Interface.

For up-to-date information on additional MATLAB releases that can be used in combination with dSPACE software, refer to <https://www.dspace.com/go/MATLABCompatibility>.

Operating System

Windows operating system on host PC

The dSPACE products of dSPACE Release 2022-A support the following operating systems:

- The following editions, channels, and servicing options of Windows 10:
 - Windows 10 Professional, Education, and Enterprise (64-bit versions)

The Windows 10 Home, Mobile, and Windows 10 S editions are not supported.

- Long-Term Servicing Channel: LTSC 2019
- General Availability Channel (replaces the previous Semi-Annual Channel): The compatibility statement of Microsoft applies. This means that newer versions released in this channel should be compatible with all previous versions. dSPACE used the 21H2 version of the General Availability Channel for testing.
- Windows Server 2019 Standard and Datacenter editions, each with the Desktop Experience installation option
Only the listed editions are supported. The Windows Server 2019 Essentials edition is not supported.

Some limitations apply when you use dSPACE software in conjunction with features of Windows. Refer to [Limitations for Using Windows Features](#) on page 156.

Support of Windows Docker You can also run some dSPACE products in a Windows Docker container. For more details, contact dSPACE Support (<https://www.dspace.com/go/supportrequest>).

Linux operating system on host PC

The dSPACE products of dSPACE Release 2022-A with Linux compatibility support the following operating systems:

- Ubuntu 18.04 LTS with the General Availability Kernel in the Desktop, Server, and Cloud version
- Ubuntu 20.04 LTS with the General Availability Kernel in the Desktop, Server, and Cloud version

Some limitations apply when you use dSPACE software in conjunction with features of Linux. Refer to [Limitations for Using Linux Features](#) on page 158.

Support of Linux Docker You can also run the dSPACE products with Linux compatibility in a Linux Docker container. For more details, refer to <https://www.dspace.com/go/ProductsForLinux>.

Using MicroAutoBox Embedded PC as host PC

ControlDesk can also be installed on:

- MicroAutoBox Embedded PC 6th Gen. Intel® Core™ i7-6822EQ Processor, running on Microsoft® Windows® 10 IOT Enterprise, LTSB 2016, 64-bit version
- MicroAutoBox III Embedded PC, running on Microsoft® Windows® 10 IoT Enterprise LTSC 2019, 64-bit version

Operating system on SYNECT server

The SYNECT server supports the following operating systems:

- The same operating systems as listed above for all dSPACE products of dSPACE Release 2022-A.
- Windows Server 2016

Operating system on server for floating network licenses

If you purchased floating network licenses, you have to specify one of the network PCs as a license server. Any PC with CodeMeter Runtime software can be used as a license server.

Valid for servers without dSPACE software dSPACE tests license servers only with Microsoft Windows operating systems in combination with protected dSPACE software.

Note

Non-Windows operating systems, such as Ubuntu Linux, are not tested. You can use them at your own risk. dSPACE does not provide support in this case.

Valid for servers with dSPACE Installation Manager dSPACE Installation Manager supports the same operating systems as the other dSPACE software products described above.

Allowing communication

Installing of 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=<main installation path>\dSPACE MotionDesk 2022-A\MotionDesk\Bin\MotionDesk.exe" dir=in action=allow profile=any description="Allow dSPACE MotionDesk to receive motion data via network."`

Required open TCP/IP network ports If you are using 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:
 - For Windows: 111 (TCP and UDP), 3702 (UDP), 7214 (TCP and TCP6), 7215 (TCP and UDP), 7216 (TCP), 8090 (TCP), 9923 (UDP), 49152 ... 65535 (TCP, TCP6 and UDP)
 - For Linux: 111 (TCP and UDP), 7215 (TCP and UDP), 7216 (TCP), 8090 (TCP), 9923 (UDP), 32768 ... 60999 (TCP, TCP6 and UDP)
- MotionDesk requires the following open TCP/IP network port: 15000 (UDP)
- ConfigurationDesk used together with one or more connected MATLAB installations require up to 10 open TCP/IP network ports in the range 49196 ... 49205 (TCP):
 - Whenever a connected MATLAB installation is started, the first available port from the specified range is taken.

- When ConfigurationDesk is started, it also uses the first free port from the specified range.
- If ConfigurationDesk is not running or no MATLAB installation is running, then no ports from the specified range are used.
- dSPACE Installation Manager and CodeMeter licensing software require the following open TCP/IP network ports:
 - 22350 (TCP and UDP) for communication in a LAN network (if not changed from the default setting).
 - 22352 (TCP and UDP): To access CodeMeter WebAdmin via http.
 - 22353 (TCP and UDP): To access CodeMeter WebAdmin via https.
- dSPACE Help requires an open TCP/IP network port for interprocess communication between its components. The default port number is 11000. If this port number is already being used, another free port is used automatically. The related processes can be identified via the following prefixes: `HelpAbsLayer<xxx>`, `HelpInstaller<xxx>`.

Using dSPACE Software on Virtual Machines (VMs)

Introduction

You can operate several dSPACE products installed on virtual machines. However, some dSPACE products support VMs only with limitations, and other dSPACE products cannot be operated on VMs at all.

Usage restrictions

Note

The dSPACE End User License Agreement (EULA) prohibits:

- Using a virtual machine for circumventing license protection mechanisms, for multiple use of an acquired license or for use outside the use determined by the license type.

If you have any questions or encounter any problems, contact dSPACE Support (www.dspace.com/go/supportrequest).

Recommended virtual machine software

dSPACE tests the functionality of dSPACE software products with current VMware products and VM hardware compatibility version 10 and version 13.

You can use Windows, Linux, or macOS® as the host operating system.

Required knowledge for setting up a virtual machine

To set up a virtual machine, you must have knowledge about the technology of VMs.

In virtual environments, significantly higher latencies and lower network performance (network throughput) must be expected compared to physical PCs. dSPACE has no influence on this.

Using virtual machines in parallel If you use multiple VMs simultaneously on one PC, sharing of host resources such as CPU, network, and disk I/O bandwidth can cause timing issues. dSPACE recommends using a physical PC if high performance is required by an application.

Using a virtual machine on the host PC

System requirements PCs that host virtual machines with dSPACE software, must meet at least the requirements listed in [Appendix: System Requirements \(Installing dSPACE Software\)](#). You are recommended to use a PC with more resources so that the software runs smoothly on a VM, because the VM software itself uses up some of the resources:

- The CPU speed and RAM size must be sufficient to run the operating system and the software on the host PC as well as the guest operating system and the application software on the VM.
- You also require sufficient free disk space to install the VM software and the software you want to run, just as you would if you were installing it directly on your PC.

Connecting dongle-based devices If you use dongle-based single-user licenses to use dSPACE software, you first have to connect the CmDongle to the host PC. Then you have to connect the WIBU-Systems CodeMeter-Stick device to the virtual machine on the host PC. For instructions, refer to the documentation of the VM software you use.

Using floating network licenses If you use floating network licenses, the virtual machine requires access to the dSPACE License Server. For further instructions, refer to [How to Set up a Connection Between Client and Server \(Working with CodeMeter Licensing Technology\)](#).

Optimal display of dSPACE Help For an optimal display of the content in dSPACE Help, you have to activate the ClearType setting in the VM (= default setting).

You can access this setting via the Windows Start menu (Start – Control Panel – Appearance and Personalization – Display – Adjust ClearType text).

Using the 'Revert to snapshot' feature

NOTICE

Using the 'Revert to snapshot' feature causes licenses to become invalid.

If you use the 'Revert to snapshot' feature in a VM, all software-based CmContainers on your host PC (dSPACE Activation Container and/or dSPACE Borrow Container) become invalid and the contained licenses are lost.

- Do not use the 'Revert to snapshot' feature for VMs that contain software-based CmContainers with activated licenses.
- Store the license information on CmDongles. There, the CmContainers do not become invalid after use the 'Revert to snapshot' feature.

Moving the virtual machine to a host PC with a different hardware configuration

NOTICE

Moving the virtual machine to a PC with a different hardware configuration causes licenses to become invalid.

If you move your virtual machine to a host PC with a different hardware configuration, all software-based CmContainers on your host PC (dSPACE Activation Container and/or dSPACE Borrow Container) become invalid and the contained licenses are lost. This happens, for example, if the CPU type of the physical PC changes.

- Do not move a virtual machine that contains software-based CmContainers with activated licenses to a host PC with a different hardware configuration.
- Store the license information on CmDongles. There, the CmContainers do not become invalid after the virtual machine is moved.
- However, if moving the virtual machine is absolutely necessary, contact dSPACE Support (www.dspace.com/go/supportrequest) beforehand to find solutions that can avoid major downtimes.

Run-Time Compatibility of dSPACE Software

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.

Compatibility of products in dSPACE Release 2022-A

dSPACE recommends using only software products from the same dSPACE Release. This ensures maximum run-time compatibility.

Observe the following points:

- Limitations regarding run-time compatibility in the dSPACE tool chain might occur if products from different dSPACE Releases are used together.

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 required, refer to <https://www.dspace.com/go/CompPatch>.

- RCP and HIL software products (of Release 2022-A) cannot be used in combination with RCP and HIL software products from earlier dSPACE Releases.

Recommendation for working with a SCALEXIO system and with MicroAutoBox III

The products for working with a SCALEXIO system and with MicroAutoBox III must be compatible. This is guaranteed only for products delivered with the same dSPACE Release. Contact dSPACE for more information.

Compatibility of real-time applications loaded to a DS1006, DS1104 or MicroAutoBox II 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. In this case, you cannot work with the related software product without restrictions.

This also applies if you load a real-time application with a software product of dSPACE Release 2016-A or earlier and use software products of dSPACE Release 2016-B or 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 https://www.dspace.com/go/ds_sw_combi.

Limitations for Using Windows Features

Motivation Some limitations apply to using dSPACE software in conjunction with features of Windows.

Installing and running dSPACE software within the Windows service accounts Non-service-based dSPACE software is not designed to be installed or run in the context of any predefined Windows service account (LocalService, NetworkService, LocalSystem).

Fast user switching not supported dSPACE software does not support the fast user switching feature of Windows.

Closing dSPACE software before PC shutdown The shutdown process of Windows operating systems might cause some required processes to be aborted although they are still being used by dSPACE software. To avoid a loss of data, it is recommended to close the dSPACE software manually before shutting down the PC.

User Account Control It is recommended to disable the 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 use 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.

USB devices

If you connect dSPACE USB devices that use cables with optoisolation to the PC for the first time, there might be a message that the device driver software was not installed successfully. However, the dSPACE device will work properly later on.

Using high-DPI monitors

The following dSPACE software products have limitations for working with high-DPI monitors:

- SYNECT: If you use high-DPI monitors, the SYNECT graphical user interface might not be displayed properly in some cases, but this does not cause functional limitations.
- Real-Time Testing: The Real-Time Test Manager, the user interface for handling RTT sequences, does not support working with high-DPI monitors.
- FlexRay Configuration Package: The FlexRay Configuration Tool does not support working with high-DPI monitors.

High-contrast mode not supported

dSPACE software was not developed for or tested against the Windows high-contrast mode. You are recommended to disable the high-contrast mode when working with dSPACE software. Otherwise, the visualization of the user interfaces might be impaired.

FIPS support

dSPACE software was not developed for or tested against the FIPS PUB 140-2 U.S. government computer security standard (Security Requirements for Cryptographic Modules). For more information on FIPS, refer to <https://docs.microsoft.com/en-us/windows/security/threat-protection/fips-140-validation>.

Long paths

dSPACE software does not support the long path syntax of the Windows API. If a path that exceeds 260 characters is used directly or indirectly, the behavior of the dSPACE software is not defined.

Enabling Windows 8dot3name creation option**Note**

It is strongly recommended that the Windows 8dot3name creation option is enabled for all drives (drives used for installation and drives used for work) before you install third-party software, such as MATLAB®/Simulink®, and the dSPACE software.

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 was installed while the 8dot3name creation option was disabled, you have to install dSPACE software and required third-party software again.

For instructions on checking the setting and enabling the option, refer to <https://www.dspace.com/faq?346> or to the Microsoft Windows documentation.

Settings in Windows for user locale and system locale must match

MATLAB reads the user locale and system locale settings that are specified in Windows operating systems. The user locale and the system locale must match. If these settings are not the same, the system might not behave as expected when working with MATLAB and dSPACE software.

For instructions on checking and changing the settings, refer to https://www.mathworks.com/help/matlab/matlab_env/setting-locale-on-windows-platforms.html?s_tid=gn_loc_drop.

This affects all MATLAB versions and all Windows operating systems, that are supported by dSPACE.

Limitation for using single-user licenses

If you use a PC with a Windows Server operating system, for example, Windows Server 2019, and you want to work with dSPACE software on this PC via Microsoft Remote Desktop Connection, you have to use a floating network license to activate license-protected software. Single-user licenses are not supported in this case.

Limitations for Using Linux Features

FIPS support

dSPACE software was not developed for or tested against the FIPS PUB 140-2 U.S. government computer security standard (Security Requirements for Cryptographic Modules). For more information on FIPS, refer to <https://ubuntu.com/blog/fips-certification-ubuntu-18-04-lts>.

Long paths

dSPACE software does not support the available path length of 4,096 characters. If a path that exceeds 260 characters is used directly or indirectly, the behavior of the dSPACE software is not defined.

Locale

dSPACE software was tested only on a system with a US English locale.

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