

ConfigurationDesk/RTI

Compatibility with Toolboxes and Blocksets Provided by MathWorks

Version 1.0 – November 2019

How to Contact dSPACE

Mail:	dSPACE GmbH Rathenaustraße 26 33102 Paderborn Germany
Tel.:	++49 5251 1638-0
Fax:	++49 5251 16198-0
E-mail:	info@dspace.de
Web:	http://www.dspace.com

How to Contact dSPACE Support

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

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

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

Software Updates and Patches

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

Important Notice

This document contains proprietary information that is protected by copyright. All rights are reserved. The document may be printed for personal or internal use provided all the proprietary markings are retained on all printed copies. In all other cases, the document must not be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form, in whole or in part, without the prior written consent

© 2019 by:
dSPACE GmbH
Rathenaustraße 26
33102 Paderborn
Germany

This publication and the contents hereof are subject to change without notice.
CalDesk, ConfigurationDesk, ControlDesk, MicroLabBox, SCALEXIO, SYNECT, SystemDesk, and TargetLink are registered trademarks of dSPACE GmbH in the United States or other countries, or both. Other brand names or product names are trademarks or registered trademarks of their respective companies or organizations.

Contents

Introduction..... 5

Overview 7

Supported Blocksets with Known Issues..... 8

DSP System Toolbox..... 8

Model Predictive Control Toolbox..... 8

Parallel Computing Toolbox / MATLAB Parallel Server 9

*Simscape, Simscape Electrical, Simscape Driveline, Simscape Fluids, and Simscape
 Multibody 9*

Simscape Electrical Specialized Power Systems..... 11

Stateflow..... 12

Introduction

The compatibility information in this document covers dSPACE Release 2019-B and MathWorks® releases R2018a and newer.

For information on which dSPACE Releases support which MathWorks Releases, see:
<http://www.dspace.com/goto?Versions>

Compatibility of MathWorks blocksets and toolboxes with Configuration Desk/RTI

In addition to MATLAB® and Simulink®, MathWorks® offers a wide range of blocksets and toolboxes that are extensions to the basic MATLAB and Simulink software packages.

Blocksets and toolboxes provide additional Simulink blocks. To be used with Model Implementation Package for Simulink (MIPS), ConfigurationDesk or RTI, these blocks must support code generation with Simulink Coder™.



Only known compatibility issues specific to MIPS/ConfigurationDesk/RTI are listed in this document. For detailed information on which blocks do or do not support code generation with Simulink Coder, refer to the MATLAB help¹ or contact MathWorks.

We test the compatibility of blocksets and toolboxes that provide Simulink blocks with selected demo models taken from the MathWorks installation or with our own test models designed especially for this purpose. These tests do not cover the complete functionality range of the blocksets. The complexity resulting from the number of blocks and their possible parameterizations is far too large to guarantee tests with 100% coverage.



As a result, problems might occur even when we state that a certain blockset or toolbox is supported by MIPS/ConfigurationDesk/RTI. For information on the known problems, see the blockset-specific or toolbox-specific chapters below or contact support@dspace.de.

¹ A list of blocksets that support code generation can be found under “Supported Products and Block Usage” or “Blocks and Products Supported for C Code Generation” in the Simulink Coder help.

Blocksets and toolboxes not listed in this document

Blocksets and toolboxes that provide Simulink blocks but are not listed in this document have not been tested with MIPS/ConfigurationDesk/RTI. Therefore, we cannot make any compatibility statements concerning these blocksets and toolboxes.

Compatibility of blocksets and toolboxes not from MathWorks

We cannot make any statement on the compatibility of blocksets and toolboxes that were not developed by MathWorks.

Overview

Legend	Supported	The toolbox or blockset is supported (general limitations for use with Simulink Coder).
	Not supported	The toolbox or blockset is not supported.
	Supported, but known issues	The toolbox or blockset is supported, but there are restrictions or known problems specific to MIPS, ConfigurationDesk or RTI. Click the blockset or toolbox hyperlink to get more information.

Product Name (according to R2019b)	Description
Aerospace Blockset™	Supported
Communications Toolbox™	Supported
Control System Toolbox™	Supported
Deep Learning Toolbox™	Supported
DSP System Toolbox™	Supported, but known issues. See <i>DSP System Toolbox</i> .
Fixed-Point Designer™	Supported
Fuzzy Logic Toolbox™	Supported
Model Predictive Control Toolbox™	Supported, but known issues. See <i>Model Predictive Control Toolbox</i> .
Parallel Computing Toolbox™	Supported, but known issues. See <i>Parallel Computing Toolbox / MATLAB Parallel Server</i> .
MATLAB Parallel Server™	Not supported. See <i>Parallel Computing Toolbox / MATLAB Parallel Server</i> .
Simscape™, Simscape Driveline™, Simscape Electrical™, Simscape Fluids™ and Simscape Multibody™	Supported, but known issues. See <i>Simscape, Simscape Electrical, Simscape Driveline, Simscape Fluids, and Simscape Multibody</i> .
Simscape Electrical Specialized Power Systems™	Supported, but known issues. See <i>Simscape Electrical Specialized Power Systems</i> .
Simulink Check™	Not Supported
Simulink Control Design™	Supported
Stateflow®	Supported, but known issues. See <i>Stateflow</i> .
System Identification Toolbox™	Not supported

Supported Blocksets with Known Issues

DSP System Toolbox

General limitations

System dependent blocks

Relevance

- MathWorks Releases: All supported
- dSPACE platforms: All
- MIPS, ConfigurationDesk, RTI, and RTI-MP

Description

Some of the Simulink blocks provided by the DSP blocksets require system dependent header files for accessing hardware, like network adapters or audio devices.

Trying to build a model containing such blocks with a dSPACE target results in a compiler error.

Model Predictive Control Toolbox

General limitations

Variable access via variable description file

Relevance

- MathWorks Releases: All supported
- dSPACE platforms: All
- MIPS, ConfigurationDesk, RTI, and RTI-MP

Description

It is possible to design a model predictive controller with specific Simulink blocks. Using this toolbox is supported by MIPS, ConfigurationDesk, RTI, and RTI-MP.

The variables used in the MPC Controller block are not accessible via the variable description file.

Parallel Computing Toolbox / MATLAB Parallel Server

Parallel building of model reference hierarchies using MATLAB Distributed Computing Server

Relevance

- MathWorks Releases: All supported
- dSPACE platforms: All
- MIPS, ConfigurationDesk, RTI, and RTI-MP

Description

Simulink Coder can accelerate code generation for models containing large model reference hierarchies by building referenced models in parallel whenever possible. This parallel build feature is supported by MIPS, ConfigurationDesk, RTI, and RTI-MP.

The parallel building of model reference hierarchies using MATLAB Distributed Computing Server is not supported.

For details on the parallel build feature, refer to the RTI Implementation Guide and the Simulink Coder User's Guide from MathWorks.

Simscape, Simscape Electrical, Simscape Driveline, Simscape Fluids, and Simscape Multibody

General limitations

Simscape, Simscape Driveline, Simscape Electrical, Simscape Fluids, and Simscape Multibody

Model separation limitation

Relevance

- MathWorks Releases: All supported
- dSPACE platforms: RTI1005, RTI1006, RTI1007, RTI1202 and DSRT
- MIPS, RTI-MP

Description

Most blocks of the Simscape product family are not connected by regular Simulink signals but by physical connection lines.

For MIPS and RTI-MP model separation the following limitations apply:

- Physical signals cannot be forwarded using MIPS Data Inport and Outport blocks or RTI-MP IPC blocks. Therefore, all blocks of a physical modeling system must be assigned to the same target model.
- Physical connection lines must not be located at the root level of a model but must be placed in subsystems.

Variable description file issues

Physical ports not available in the variable description file

Relevance

- MathWorks Releases: All supported
- dSPACE platforms: All

- MIPS, ConfigurationDesk, RTI, and RTI-MP

Description

Most blocks of the Simscape product family are not connected by regular Simulink signals but by physical connection lines. These signals are not available in the variable description file.

Run-time parameters

Online change of parameter values in Simscape blocks

Relevance

- MathWorks Releases: All supported
- dSPACE platforms: All
- MIPS, ConfigurationDesk, RTI, and RTI-MP

Description

Many Simscape blocks can contain run-time parameters in the generated code. These parameters can be accessed and modified via the variable description file. If a Simscape parameter is designated as run-time, you can modify its value between simulation runs without the need to recompile the model. Therefore, if the simulation is stopped and the value of the parameter is changed, a new simulation can be started afterwards, and the new value will be used. However, changing the value of the parameter during execution has no effect on the running simulation.

Compiler issues

PowerPC compiler warnings

Relevance

- MathWorks Releases: All supported
- dSPACE platforms: RTI1005, RTI1104, and RTI1401
- RTI and RTI-MP

Description

Applications with Simscape blocks can be built for dSPACE platforms based on a PowerPC processor. Even though the Microtec PowerPC compiler issues some warnings, the application can be loaded to the real-time hardware.

Real-time execution

Performance constraints

Relevance

- MathWorks Releases: All supported
- dSPACE platforms: All
- MIPS, ConfigurationDesk, RTI, and RTI-MP

Description

Some models containing Simscape blocks might cause task overruns when loaded to the real-time hardware, due to the size of the generated application.

Reducing the size of the model and adjusting the Solver and Task Configuration can minimize the risk of triggering task overruns.

Simscape Local Solver for Simscape, Simscape Electrical, Simscape Driveline, and Simscape Fluids

Relevance

- MathWorks Releases: All supported
- dSPACE platforms: All
- MIPS, ConfigurationDesk, RTI, and RTI-MP

Description

When simulating a Simscape model (except for Simscape Multibody), it is recommended to enable the Simscape local solver, from the Solver Configuration block, and to enable the fixed-cost option.

Increased stack size required for simulating Simscape models

Relevance

- MathWorks Releases: All supported
- dSPACE platforms: ConfigurationDesk
- ConfigurationDesk

Description

Depending on the model, the code generated by the Simscape product family requires a stack size that exceeds the default limits for ConfigurationDesk tasks. It is therefore recommended to increase the stack size in ConfigurationDesk if the model contains Simscape blocks.

Simscape Electrical Specialized Power Systems

General limitations

Compiler Issues

Relevance

- MathWorks Releases: All supported
- dSPACE platforms: RTI1005, RTI1104, RTI1401
- RTI, and RTI-MP

Description

Some components of the Simscape Electrical Specialized Power Systems blockset use functions or defines, which are not supported by all compilers.

Trying to build a model containing these components with a dSPACE target using the Microtec PowerPC compiler results in a compiler error.

Stateflow

General limitations

Using RTLib functions with Stateflow

Relevance

- MathWorks Releases: All supported
- dSPACE platforms: All
- RTI and RTI-MP

Description

Calling RTLib functions (e.g., I/O access) in states and transitions of a Stateflow chart is not recommended. If I/O access is required from within a state chart, it is recommended to handle this via S-functions, that are placed in function-call subsystems, and triggering these subsystems by event outputs of the state charts.

Variable description file issues

Accessible states via variable description file

Relevance

- MathWorks Releases: All supported
- dSPACE platforms: All
- RTI-MP

Description

Block groups for Stateflow charts contain the outputs to Simulink/Stateflow test points and parameters. The states of Stateflow charts are not accessible via the variable description file. If you need to trace the state activity for a state chart, you can use the Output State Activity option for the states you need to observe. Global data of all Stateflow charts is available in the State Machine Data group.