Compatibility with Toolboxes and Blocksets Provided by MathWorks

Version 1.0 – April 2013
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

There are different ways to contact dSPACE Support:

- Send an e-mail or phone:
  - General Technical Support:
    support@dspace.de
    +49 5251 1638-941
  - SystemDesk Support:
    support.systemdesk@dspace.de
    +49 5251 1638-996
  - TargetLink Support:
    support.tl@dspace.de
    +49 5251 1638-700
- Use the dSPACE Installation Manager:
  - On your dSPACE DVD at \Tools\InstallationManager.exe
  - Via Start – Programs – dSPACE Installation Manager (after installation of the dSPACE software)
  - At http://www.dspace.com/goto?im

You can always find the latest version of the dSPACE Installation Manager here.

dSPACE recommends that you use the dSPACE Installation Manager to contact dSPACE 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. Neither the documentation nor software may 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 of dSPACE GmbH.

© Copyright 2013 by:
dSPACE GmbH
Rathenaustraße 26
33102 Paderborn
Germany

This publication and the contents hereof are subject to change without notice.

AutomationDesk, CalDesk, ConfigurationDesk, ControlDesk, 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
  Parallel Computing Toolbox / MATLAB Distributed Computing Server ............... 8
  DSP System Toolbox .................................................................................................. 8
  Simscape, SimElectronics, SimDriveline, SimHydraulics and SimMechanics .......... 9
  SimPowerSystems ..................................................................................................... 10
  Stateflow .................................................................................................................. 11
Introduction

The compatibility information in this document covers dSPACE Release 2013-A and MATLAB® releases R2011b or higher.

For information on which dSPACE releases support which MATLAB 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 which are extensions to the basic MATLAB and Simulink software packages.

Blocksets and toolboxes provide additional Simulink blocks. To be used with ConfigurationDesk or RTI, these blocks must support code generation with Simulink Coder™.

Only known compatibility issues specific to 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 help or contact MathWorks.

We test the compatibility of blocksets and toolboxes that provide Simulink blocks with selected demo models taken from the MATLAB 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 ConfigurationDesk / RTI. For information on the known problems, see the blockset- or toolbox-specific chapters below or contact support@dspace.de.

1 A list of blocksets that support code generation can be found in “Supported Products” 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 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 RTI or ConfigurationDesk. Click the blockset or toolbox hyperlink to get more information.

## Blockset (Product Names as of R2013a) | Description
--- | ---
Aerospace Blockset™ | Supported
Communications System Toolbox™ | Supported
Control System Toolbox™ | Supported
DSP System Toolbox™ | Supported, but known issues. See DSP System Toolbox
Fixed Point Designer™ | Supported
Fuzzy Logic Toolbox™ | Supported
Neural Network Toolbox™ | Supported
Parallel Computing Toolbox™ | Supported, but known issues. See Parallel Computing Toolbox / MATLAB Distributed Computing Server
MATLAB Distributed Computing Server™ | Not supported. See Parallel Computing Toolbox / MATLAB Distributed Computing Server
Simscape™, SimElectronics®, SimDriveline®, SimHydraulics® and SimMechanics™ | Supported, but known issues. See Simscape, SimElectronics, SimDriveline, SimHydraulics and SimMechanics
SimPowerSystems | Supported, but known issues. See SimPowerSystems
Simulink Control Design™ | Supported
Stateflow® | Supported, but known issues. See Stateflow
System Identification Toolbox™ | Not supported

---

1. As of R2013a, Fixed-Point Toolbox and Simulink Fixed Point have been merged into Fixed-Point Designer.
Supported Blocksets with Known Issues

Parallel Computing Toolbox / MATLAB Distributed Computing Server

<table>
<thead>
<tr>
<th>Parallel building of model reference hierarchies</th>
<th>Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>• MATLAB Releases: All relevant</td>
<td></td>
</tr>
<tr>
<td>• dSPACE Platforms: All</td>
<td></td>
</tr>
<tr>
<td>• ConfigurationDesk, RTI and RTI-MP</td>
<td></td>
</tr>
</tbody>
</table>

**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 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.

DSP System Toolbox

<table>
<thead>
<tr>
<th>General limitations</th>
<th>Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>• MATLAB Releases: All relevant</td>
<td></td>
</tr>
<tr>
<td>• dSPACE Platforms: All</td>
<td></td>
</tr>
<tr>
<td>• ConfigurationDesk, RTI and RTI-MP</td>
<td></td>
</tr>
</tbody>
</table>

**Description**  
The UDP Send and UDP Receive blocks are not supported by ConfigurationDesk / RTI. These blocks need access to Microsoft® Windows®-dependent compiler library files, which are not available for dSPACE systems.

Trying to build a model containing UDP Send and UDP Receive blocks with a dSPACE target file will result in a compiler error.
**Supported Blocksets with Known Issues**

<table>
<thead>
<tr>
<th>Variable description file issues</th>
<th>Block parameter access via variable description file</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Relevance</strong></td>
<td>- MATLAB Releases: All relevant</td>
</tr>
<tr>
<td></td>
<td>- dSPACE Platforms: All</td>
</tr>
<tr>
<td></td>
<td>- ConfigurationDesk, RTI and RTI-MP</td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td>Depending on the MATLAB release in use, it is possible that some block parameters are not accessible from the variable description file.</td>
</tr>
</tbody>
</table>

**Simscape, SimElectronics, SimDriveline, SimHydraulics and SimMechanics**

<table>
<thead>
<tr>
<th>General limitations</th>
<th>SimElectronics, SimDriveline, SimHydraulics, SimMechanics, Simscape’s Foundation Library Blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RTI-MP limitation</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Relevance</strong></td>
<td>- MATLAB Releases: All relevant</td>
</tr>
<tr>
<td></td>
<td>- dSPACE Platforms: RTI1005 RTI1006</td>
</tr>
<tr>
<td></td>
<td>- RTI-MP</td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td>For RTI-MP, the following limitation applies:</td>
</tr>
<tr>
<td></td>
<td>Simscape, SimDriveline, SimElectronics, SimHydraulics and SimMechanics blocks must not be inserted at the root level of a model. Otherwise one of the following problems will occur:</td>
</tr>
<tr>
<td></td>
<td>- The RTI-MP Multiprocessor Setup dialog cannot be opened.</td>
</tr>
<tr>
<td></td>
<td>- Connection lines are not copied during model separation.</td>
</tr>
<tr>
<td></td>
<td>- Model separation is aborted with an error message.</td>
</tr>
<tr>
<td></td>
<td>These problems do not occur if these blocks are contained in subsystems.</td>
</tr>
</tbody>
</table>

**SimMechanics Second Generation**

| **Relevance** | - MATLAB Releases: R2012a                                                                         |
|               | - dSPACE Platforms: All                                                                             |
|               | - ConfigurationDesk, RTI and RTI-MP                                                                 |
| **Description**| In MATLAB R2012a SimMechanics Second Generation blocks do not support code generation.            |

<table>
<thead>
<tr>
<th>Variable description file issues</th>
<th>Special ports and parameters not available in the variable description file</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Relevance</strong></td>
<td>- MATLAB Releases: All relevant</td>
</tr>
<tr>
<td></td>
<td>- dSPACE Platforms: All</td>
</tr>
<tr>
<td></td>
<td>- ConfigurationDesk, RTI and RTI-MP</td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td></td>
</tr>
</tbody>
</table>
Most Simscape, SimDriveline, SimElectronics, SimHydraulics and SimMechanics blocks are not connected by regular Simulink signals but by physical connection lines. These signals are not available in the variable description file.

### Supported Blocksets with Known Issues

<table>
<thead>
<tr>
<th>Compiler issues</th>
<th>PowerPC compiler warnings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Relevance</strong></td>
<td>MATLAB Releases: All relevant</td>
</tr>
<tr>
<td></td>
<td>dSPACE Platforms: RTI1005 RTI1103 RTI1104 RTI1401</td>
</tr>
<tr>
<td></td>
<td>RTI and RTI-MP</td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td>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.</td>
</tr>
</tbody>
</table>

**SimPowerSystems**

<table>
<thead>
<tr>
<th>General limitations</th>
<th>RTI-MP limitation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Relevance</strong></td>
<td>MATLAB Releases: All relevant</td>
</tr>
<tr>
<td></td>
<td>dSPACE Platforms: RTI1005 RTI1006</td>
</tr>
<tr>
<td></td>
<td>RTI-MP</td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td>The SimPowerSystems Blockset makes extensive use of From and Goto tags with global scope to exchange simulation data. The use of these blocks can circumvent the multiprocessor data exchange mechanism implemented by interprocessor communication (IPC) blocks of the RTI-MP Blockset. This is why all parts of a multiprocessor Simulink model using the Power System Blockset should be assigned to one single processor.</td>
</tr>
</tbody>
</table>

**SimPowerSystems blocks must not be inserted at the root level of an RTI-MP model**

| Relevance | MATLAB Releases: All relevant |
|-----------| dSPACE Platforms: RTI1005 RTI1006 |
|           | RTI-MP |
| **Description** | SimPowerSystems blocks must not be inserted at the root level of an RTI-MP model. Otherwise one of the following problems will occur: |
|            | The RTI-MP Multiprocessor Setup dialog cannot be opened. |
|            | Connection lines are not copied during model separation. |
|            | Model separation is aborted with an error message. |
|            | These problems do not occur if the SimPowerSystems blocks are contained in subsystems. |

**Supercapacitor block**

| Relevance | MATLAB Releases: R2013a |


- **dSPACE Platforms**: All
- **ConfigurationDesk, RTI and RTI-MP**

**Description** The Supercapacitor block introduced with MATLAB R2013a is not supported by ConfigurationDesk / RTI. This block contains a trigonometric function block (asinh) which, according to the MathWorks Documentation, is not supported by all compilers.

### Variable description file issues

**Special ports and parameters not available in variable description file**

**Relevance**
- MATLAB Releases: All relevant
- dSPACE Platforms: All
- ConfigurationDesk, RTI and RTI-MP

**Description** SimPowerSystems uses Physical Modeling ports and connection lines. As a result, the output variables of most SimPowerSystems blocks are not available in the variable description file.

### Run-time issues

**Parameter access**

**Relevance**
- MATLAB Releases: All relevant
- dSPACE Platforms: All
- ConfigurationDesk, RTI and RTI-MP

**Description** Due to the structure of SimPowerSystems blocks, they cannot be treated like standard Simulink blocks with respect to instrument layouts in ControlDesk. SimPowerSystems blocks do not contain visible functional information. The simulation data can be accessed with Measurement blocks, which receive data using From / GoTo blocks. The data are sent from a Powergui block.

### Stateflow

**General limitations**

**Using RTLib functions with Stateflow**

**Relevance**
- MATLAB Releases: All relevant
- 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, we recommend handling 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 parameters via variable description file**

**Relevance**
- MATLAB Releases: R2011b R2012a R2012b
- dSPACE Platforms: All
Supported Blocksets with Known Issues

- ConfigurationDesk, RTI and RTI-MP

**Description**  There is no propagation of parameter names to code generation. As such, parameters cannot be resolved by their parameter names but are serially numbered (P1, P2, ...).

**Accessible states via variable description file**

**Relevance**
- MATLAB Releases: All relevant
- 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.