

**ConfigurationDesk/RTI**

# **Compatibility with Toolboxes and Blocksets Provided by MathWorks**

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## How to Contact dSPACE

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

## How to Contact dSPACE Support

There are different ways to contact dSPACE Support:

- Visit our Web site at <http://www.dspace.com/goto?support>
- Send an e-mail or phone:
  - General Technical Support:  
[support@dspace.de](mailto:support@dspace.de)  
+49 5251 1638-941
  - SystemDesk Support:  
[support.systemdesk@dspace.de](mailto:support.systemdesk@dspace.de)  
+49 5251 1638-996
  - TargetLink Support:  
[support.tl@dspace.de](mailto: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.

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dSPACE GmbH  
Rathenaustraße 26  
33102 Paderborn  
Germany

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# Introduction

The compatibility information in this document covers dSPACE Release 2015-B and MathWorks® releases R2014a or higher.

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 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<sup>1</sup> 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 ConfigurationDesk / RTI. For information on the known problems, see the blockset- or toolbox-specific chapters below or contact [support@dspace.de](mailto:support@dspace.de).

<sup>1</sup> A list of blocksets that support code generation can be found under "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.

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### **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.

Product Name (according to R2015b)	Description
Aerospace Blockset™	Supported
Communications System Toolbox™	Supported
Control System Toolbox™	Supported
DSP System Toolbox™	Supported, but known issue. See <i>DSP System Toolbox</i>
Fixed Point Designer™	Supported
Fuzzy Logic Toolbox™	Supported
Neural Network Toolbox™	Supported
Parallel Computing Toolbox™	Supported, but known issue. See <i>Parallel Computing Toolbox / MATLAB Distributed Computing Server</i>
MATLAB Distributed Computing Server™	Not supported. See <i>Parallel Computing Toolbox / MATLAB Distributed Computing Server</i>
Simscape™, SimElectronics®, SimDriveline™, SimHydraulics® and SimMechanics™	Supported, but known issue. See <i>Simscape, SimElectronics, SimDriveline, SimHydraulics and SimMechanics</i>
SimPowerSystems™	Supported, but known issue. See <i>SimPowerSystems</i>
Simulink Control Design™	Supported
Stateflow®	Supported, but known issue. See <i>Stateflow</i>
System Identification Toolbox™	Not supported

# Supported Blocksets with Known Issues

## Parallel Computing Toolbox / MATLAB Distributed Computing Server

### Parallel building using MATLAB Distributed Computing Server of model reference hierarchies

#### Relevance

- MathWorks Releases: All relevant
- dSPACE Platforms: All
- 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 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.

### Parallel code generation for referenced models

#### Relevance

- MathWorks Releases: R2014b, R2015a
- dSPACE Platforms: All
- ConfigurationDesk, RTI and RTI-MP

**Description** While using the parallel build feature with referenced models, the parallel code generation might be error-prone for the indicated MathWorks Releases.

To overcome this situation, MathWorks made the following patches available (list might not be extensive):

<http://mathworks.com/support/bugreports/1216312>

<http://mathworks.com/support/bugreports/1203076>



<http://mathworks.com/support/bugreports/1199590>

## DSP System Toolbox

### General limitations

#### UDP Send and UDP Receive blocks

##### Relevance

- MathWorks Releases: All relevant
- dSPACE Platforms: All
- ConfigurationDesk, RTI and RTI-MP

**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.

#### FFT block

##### Relevance

- MathWorks Releases: All relevant
- dSPACE Platforms: All
- ConfigurationDesk, RTI and RTI-MP

**Description** Trying to build a model containing a FFT block, whose input signal's dimension is not a  $2^n$  power, will result in a compiler error. In this scenario, a header file (dlfcn.h) used for dynamic loading, only present in UNIX-based Operating Systems, is included, which causes the build process to abort.

### Variable description file issues

#### Block parameter access via variable description file

##### Relevance

- MathWorks Releases: All relevant
- dSPACE Platforms: All
- ConfigurationDesk, RTI and RTI-MP

**Description** Depending on the MathWorks release in use, it is possible that some block parameters are not accessible from the variable description file.

## Simscape, SimElectronics, SimDriveline, SimHydraulics and SimMechanics

### General limitations

**SimElectronics, SimDriveline, SimHydraulics, SimMechanics, Simscape's Foundation Library Blocks**

#### RTI-MP limitation

##### Relevance

- MathWorks Releases: All relevant
- dSPACE Platforms: RTI1005 RTI1006 RTI1007 RTI1202
- RTI-MP

**Description** For RTI-MP, in particular, for a model including the all the master and slave(s) blocks and connections, before model separation, the following limitation applies:

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:

- 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 these blocks are contained in subsystems.

### Variable description file issues

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

#### Relevance

- MathWorks Releases: All relevant
- dSPACE Platforms: All
- ConfigurationDesk, RTI and RTI-MP

**Description** 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.

### Compiler issues

**PowerPC compiler warnings**

#### Relevance

- MathWorks Releases: All relevant
- dSPACE Platforms: RTI1005 RTI1103 RTI1104 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****Memory and performance constraints****Relevance**

- MathWorks Releases: All relevant
- dSPACE Platforms: All
- ConfigurationDesk, RTI and RTI-MP

**Description** Some models including SimMechanics 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 Configurations might help minimize the risk of triggering Task Overruns.

## SimPowerSystems

**General limitations****RTI-MP limitation****Relevance**

- MathWorks Releases: All relevant
- dSPACE Platforms: RTI1005 RTI1006 RTI1007 RTI1202
- RTI-MP

**Description** 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.

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

**Relevance**

- MathWorks Releases: All relevant
- dSPACE Platforms: RTI1005 RTI1006 RTI1007 RTI1202
- 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**

- MathWorks Releases: All relevant
- dSPACE Platforms: All
- ConfigurationDesk, RTI and RTI-MP

**Description** The Supercapacitor block 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.

Trying to build a model containing Supercapacitor block with a dSPACE target file will result in a compiler error.

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#### Variable description file issues

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

##### Relevance

- MathWorks 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.

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#### Run-time issues

#### Parameter access

##### Relevance

- MathWorks 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.

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#### Build issues

#### Duplicate typedefs in code generated models

##### Relevance

- MathWorks Releases: R2015b
- dSPACE Platforms: All
- RTI and RTI-MP

**Description** When building a model containing SimMechanics components, it might be the case that an error is thrown due to the duplicated type definition for identifiers "PMValue" and "ConstPMValue". More information regarding the bug report and the already released patch from MathWorks can be found under the following link:

<http://www.mathworks.com/support/bugreports/1286394>

## Stateflow

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#### General limitations

#### Using RTLib functions with Stateflow

**Relevance**

- MathWorks 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 states via variable description file****Relevance**

- MathWorks 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.

**Messages objects via variable description file****Relevance**

- MathWorks Releases: R2015b
- dSPACE Platforms: All
- RTI, RTI-MP and ConfigurationDesk

**Description** Message objects, forwarded from Simulink charts to other charts, are illustrated in Simulink and described in the variable description file as signals of data type double. These objects cannot be evaluated by using Scope blocks in Simulink. Furthermore, even though the variable description file entry is accessible, e.g. via ControlDeskNG, the value returned by the corresponding variable might not be coherent.