

**ConfigurationDesk/RTI**

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

**Version 1.0 – March 2012**

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## How to Contact dSPACE Support

There are different ways to contact dSPACE Support:

- Visit our Web site at <http://www.dspace.com/goto?support>
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- 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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# Introduction

The compatibility information in this document covers dSPACE Release 7.3 and MATLAB® releases R2009b 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™ / Real-Time Workshop®<sup>1</sup>.



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 / Real-Time Workshop, refer to the MATLAB help<sup>2</sup> 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](mailto:support@dspace.de).

<sup>1</sup> As of R2011a, Real-Time Workshop and Stateflow Coder have been merged into Simulink Coder.

<sup>2</sup> A list of blocksets that support code generation can be found under "Tools for Algorithm Development" in the Real-Time Workshop help (R2009b to R2010b) or "Related Products" in the Simulink Coder help (R2011a to R2012a).

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**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 / Real-Time Workshop to be taken into account).

**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 R2012a)	Description
Aerospace Blockset™	Supported
Communications System Toolbox™ <sup>1</sup>	Supported
Control System Toolbox™	Supported
DSP System Toolbox™ <sup>2</sup>	Supported, but known issue. See <i>DSP System Toolbox</i>
Simulink Fixed Point™	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

<sup>1</sup> As of R2011a, Communications Blockset and Communications Toolbox have been merged into Communications System Toolbox.

<sup>2</sup> As of R2011a, Signal Processing Blockset and Filter Design Toolbox have been merged into DSP System Toolbox.

# Supported Blocksets with Known Issues

## Parallel Computing Toolbox / MATLAB Distributed Computing Server

### Parallel building of model reference hierarchies

#### Relevance

- MATLAB 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 was introduced with Real-Time Workshop R2009a and requires the Parallel Computing Toolbox. It 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



In MATLAB R2011a, the DSP System Toolbox replaces the Signal Processing Blockset and the Filter Design Toolbox.

### General limitations

#### Relevance

- MATLAB Releases: R2010a to R2012a
- dSPACE Platforms: All
- ConfigurationDesk, RTI and RTI-MP

**Description** The UDP Send and UDP Receive blocks introduced with MATLAB R2010a 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.

#### Variable description file issues

#### Block parameter access via variable description file

##### Relevance

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

**Description** Depending on the MATLAB 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

- MATLAB Releases: All relevant
- dSPACE Platforms: RTI1005 RTI1006
- RTI-MP

**Description** For RTI-MP, 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.

#### SimMechanics Second Generation

##### Relevance

- MATLAB Releases: R2012a
- dSPACE Platforms: All
- ConfigurationDesk, RTI and RTI-MP

**Description** SimMechanics Second Generation blocks do not currently support code generation.

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### Variable description file issues

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

#### Relevance

- MATLAB 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.

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### Compiler issues

#### PowerPC compiler warnings

#### Relevance

- MATLAB Releases: All relevant
- dSPACE Platforms: RTI1005 RTI1006 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.

## SimPowerSystems

### General limitations

#### RTI-MP limitation

##### Relevance

- MATLAB Releases: All relevant
- dSPACE Platforms: RTI1005 RTI1006
- RTI-MP

**Description** The equivalent systems that are generated into Measurement blocks of the Power System Blockset make 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

- 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.

### 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 actual information is generated into Measurement blocks in the form of State-Space blocks.

## 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 variables via variable description file

##### Relevance

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

**Description** Block groups for Stateflow charts contain the outputs to Simulink, Stateflow test points and parameters.

The following limitations apply:

- Parameters cannot be resolved by their parameter names but are serially numbered (P1, P2, ...).
- 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.