Getting Started with the MapleSim Connector for JMAG-RT

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Introduction

The MapleSim™ Connector for JMAG-RT simulation package provides all of the tools you need to import JMAG®-RT motor files into your MapleSim model and then use them as a component in your simulations.

Scope of Model Support

MapleSim is a comprehensive modeling tool where it is possible to create models that could go beyond the scope of this Connector. In general, the MapleSim Connector for JMAG-RT supports systems of any complexity, including systems of DAEs of any index, in any mix of domains.

Requirements

Requires JMAG-Designer version 12.0.

Also requires Microsoft Visual Studio 2013, 2015, or 2017.

For installation instructions and system requirements, see the **Install.html** file on the product disc or visit the Maplesoft System Requirements website at **http://www.maplesoft.com/products/system_requirements.aspx**.

Library Requirements for Other Connectors

You can export your model with a JMAG-RT component to other systems using other MapleSim connectors. For example, you can export your model to Simulink® as an S-function block using the MapleSim™ Connector or you can export your model as an FMU archive file using the MapleSim FMI Connector.

In order to do this, you first need to add the directory that contains the JMAG-RT library file (either RTTCalculator.dll or libRTTCalculator.so) to your search path. This involves appending this directory to either your PATH environment variable (for Windows) or your LD_LIBRARY_PATH environment variable (for Linux).

To add the JMAG-RT library directory to your search path

1. Determine your Maple installation directory.

   If you are not sure where Maple is installed, perform the following steps.

   a. Start Maple.

   b. At the command prompt, enter the following command:

      kernelopts(mapledir);

   The output of **kernelopts(mapledir)** is the installation directory for Maple. We will refer this directory as *$MAPLE* for this procedure.

2. Determine the directory that contains the JMAG-RT library file for your operating system from the table below.

Operating System	Directory
32-bit Windows	*$MAPLE*\toolbox\JMAGRTConnector\bin.win
64-bit Windows	*$MAPLE*\toolbox\JMAGRTConnector\bin.X86_64_WINDOWS
64-bit Linux	*$MAPLE*/toolbox/JMAGRTConnector/bin.X86_64_LINUX

   Note: *$MAPLE* is your Maple installation directory, found in step 1.

3. Add the library directory found in step 2 to the appropriate environment variable for your operating system.
   - For Windows, add the library directory to your PATH environment variable.
   - For Linux, add the library directory to your LD_LIBRARY_PATH environment variable.

Consult the help for your operating system for instructions on how to edit these environment variables.

4. Restart your computer.

1 Getting Started

This chapter describes how to use the MapleSim Connector for JMAG-RT. With this connector you configure a JMAG-RT component with a motor file created in JMAG-RT (that is, an .rtt file) and then use the component in your simulations. This is accomplished by performing the following steps.

1. *Generating a JMAG-RT Motor File (page 1)*
2. *Configuring MapleSim to Use the JMAG-RT Motor File (page 1)*
3. *Running Your Simulation (page 2)*

For information about the JMAG-RT components, refer to the MapleSimJMAGRTConnector,Overview help page.

1.1 Generating a JMAG-RT Motor File

After you have configured your motor in JMAG-RT, save the model as an .rtt file. The MapleSim Connector for JMAG-RT works directly with this file.

1.2 Configuring MapleSim to Use the JMAG-RT Motor File

The code in the .rtt file is used by the JMAG-RT component to model your motor. In order for MapleSim to use this code, the .rtt file must first be attached to the model, and then the JMAG-RT component has to be configured to use the file.

To configure MapleSim to use the JMAG-RT motor file:

1. Open or build the MapleSim model in which you want to use the JMAG-RT motor file.
2. Select the **Attached Files** tab ( ).
3. Right-click **Documents**, and then select **Attach File**.
4. Browse to the location of the .rtt motor file, select it, and then click **Attach...**.

   The motor file is attached to your MapleSim model in the **Documents** palette.
5. Select the **Library Components** tab ( ), expand the **JMAG** palette, open either the **Rotational** or **Translational** sub-palette, and then drag the desired JMAG-RT component on to the **Model Workspace**.
6. Select the JMAG-RT component.
7. Select the **Properties** tab ( ), open the **Parameters > General** section, and then select the attached .rtt file from the **rtt_filename** list.
8. Connect the JMAG-RT component to the other components in your model.

   The JMAG-RT component is configured to simulate your motor in MapleSim using the attached motor file. To have the motor file available for future simulations, save your MapleSim model.

Note:

All JMAG-RT components have an optional **support** connection which provides a second 1D mechanical flange so that the torque/force generated by the component is applied between the two flanges.

- To enable the **support** connection, select the JMAG-RT component, select the **Properties** tab ( ), open the **Parameters > General** section, and then select **use support**.

1.3 Running Your Simulation

After you have built your model with the JMAG-RT component connected, you can run your simulation.

To run your simulation

1. Select the **Settings** tab ().
2. Select **Fixed** from the **Solver Type** list.
3. Click **Run Simulation** () in the **Main Toolbar**.

   When the simulation is complete, a graph for each specified quantity is displayed in the **Simulation Results** tab of the **Analysis** window.

For more information on MapleSim, building MapleSim models, attaching files to MapleSim models, and simulating a model with MapleSim, see the MapleSim Help system.

Note: If you plan to export your MapleSim model using another MapleSim connector, see *Library Requirements for Other Connectors (page iv)* for instructions on how to add the path to the JMAG-RT library file to your search path.