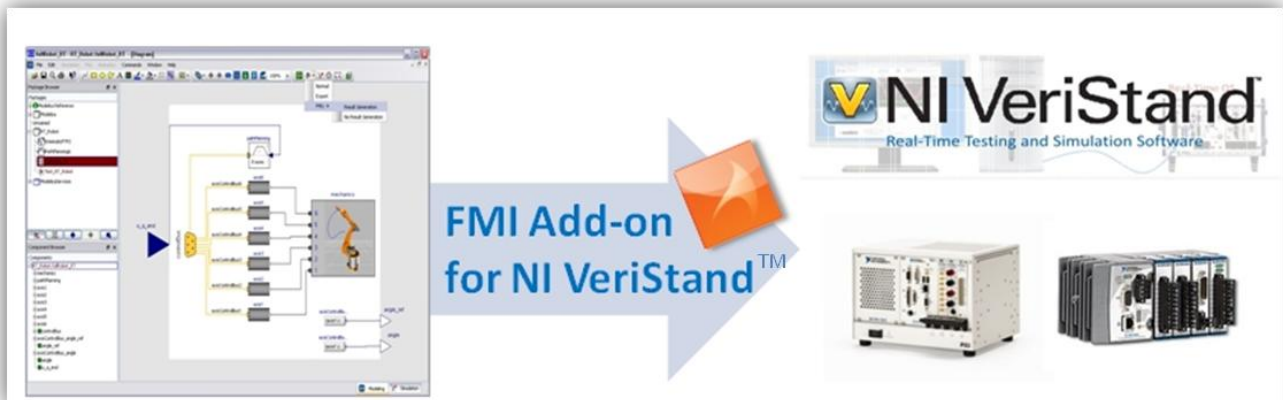




**FMI to
NI VeriStand™
Add-on**

User Guide



FMI To NI VeriStand™

Import FMU Model in NI VeriStand™

FMI To NI VeriStand™

Add-on

Release 1.5.1

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1. Introduction

1.1. FMI Connection for NI VeriStand

The FMI Connection for NI VeriStand allows you to use FMU model on NI VeriStand.

2. Installation

2.1. Supported Platforms

The FMI Connection for NI VeriStand is supported on Windows XP(32 bit), Windows Vista (32 bit) and Windows 7 (32 bit).

2.2. Installation Procedure

1. Run the installer by double-clicking *FMItO NIVS_x.x.x.exe* , and click *Next* on welcome page.

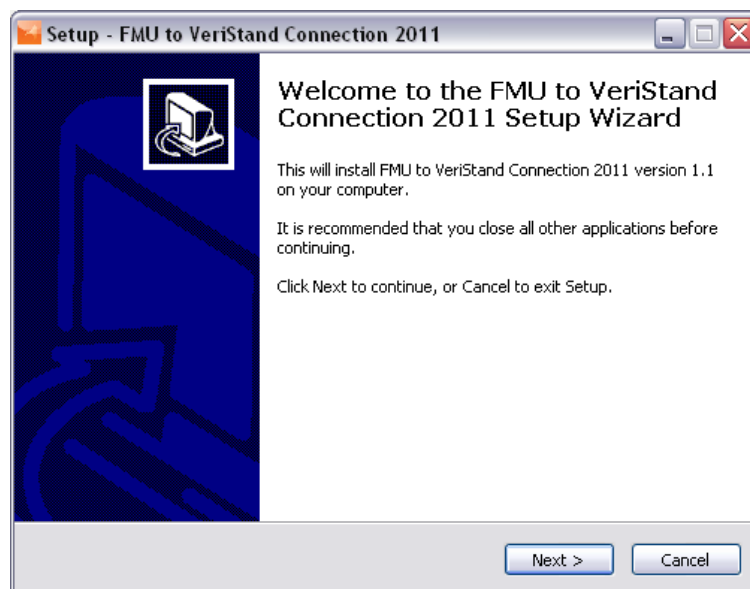


Figure 2.1 First installer dialog, welcome text.

2. Read the license agreement, and click *I Agree* to agree to the terms and continue.



Figure 2.2 Second installer dialog, license agreement

3. Choose the directory where the FMI Connection should be installed. The default installation directory, which will be pre-selected, is ***C:\Program Files\FMUtoNIVS***. If you use more than one VeriStand version, I suggest to change this name folder. For example if you use NI VeriStand 2011, I suggest to install the connection in ***C:\Program Files\FMUtoNIVS2011***.

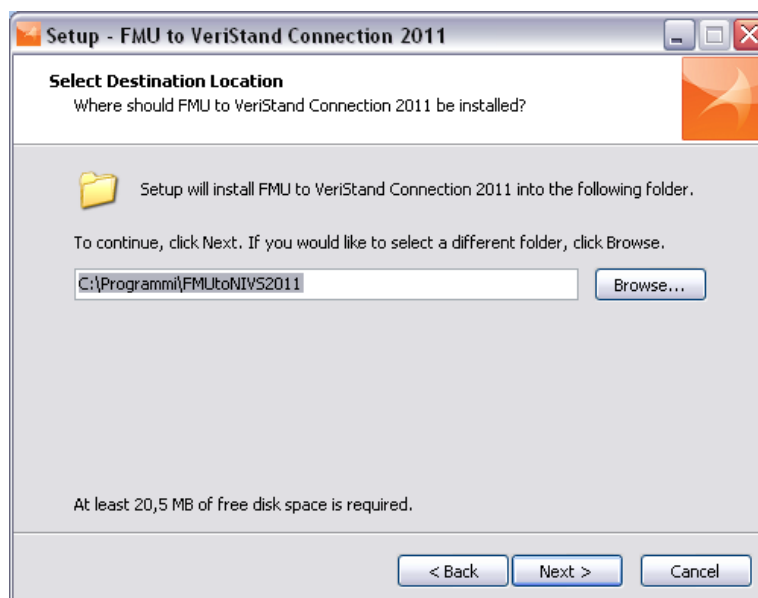


Figure 2.3 Third installer dialog, select installation folder.

4. Select Install if you are ready to start the installation. Select Back to redo the last step.

5. After the installation has completed you will find a folder created for the FMI Connection in the Windows Start menu and click on it folder you can view folders show below:

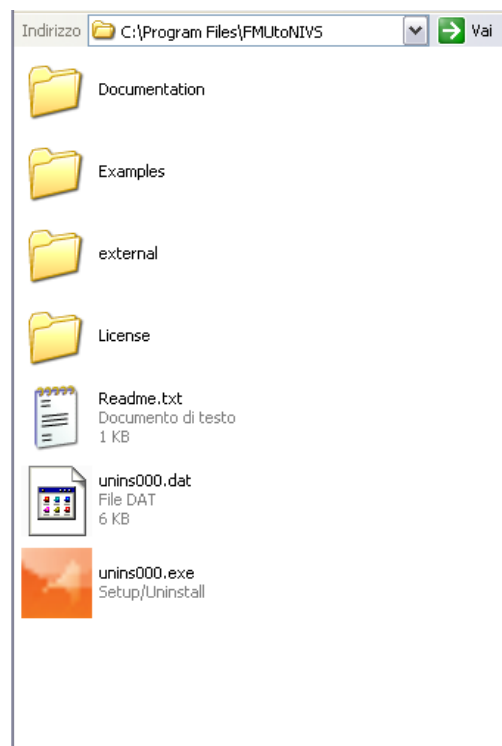


Figure 2.4 FMI Connection folder.

3. License file installation

After the installation procedure, FMI Connection will be in demo mode. To use the program fully, a license file must be installed. After purchasing a license, you should receive a file named license.lic. Place that file in the *\FMUtoNIVS\License* directory that is found in the *\Program Files* on Windows x86 and *\Program Files (x86)* on Windows x64.

4. Install FMI Add-on in NI RT-Target

Open the Measurement & Automation Explorer :

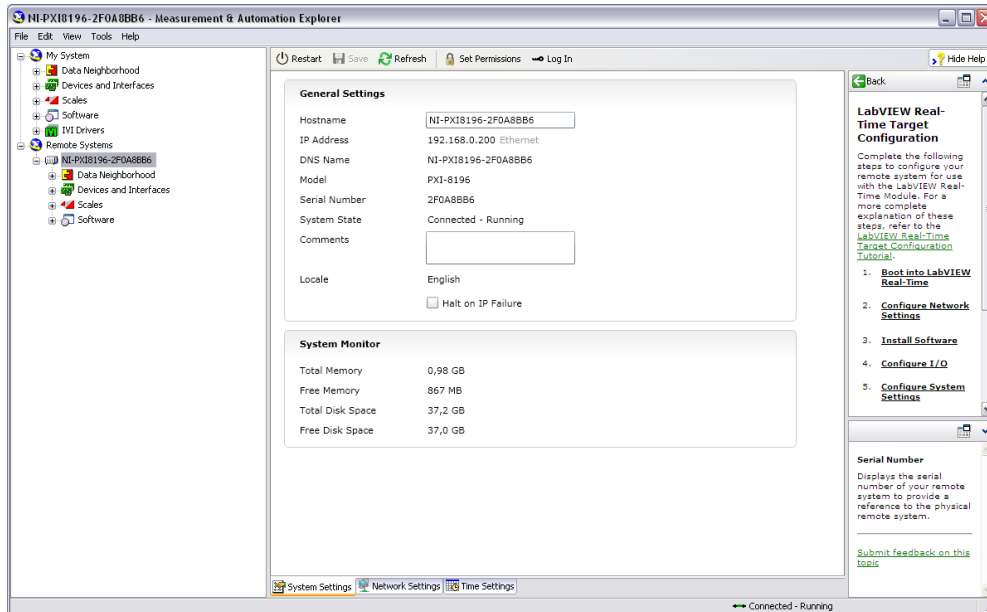


Figure 4.1 Measurement & Automation Explorer

Click on “*Software*” and then “*Add/Remove Software*”, locate “*FMI to VeriStand 2011*” and Install the feature:

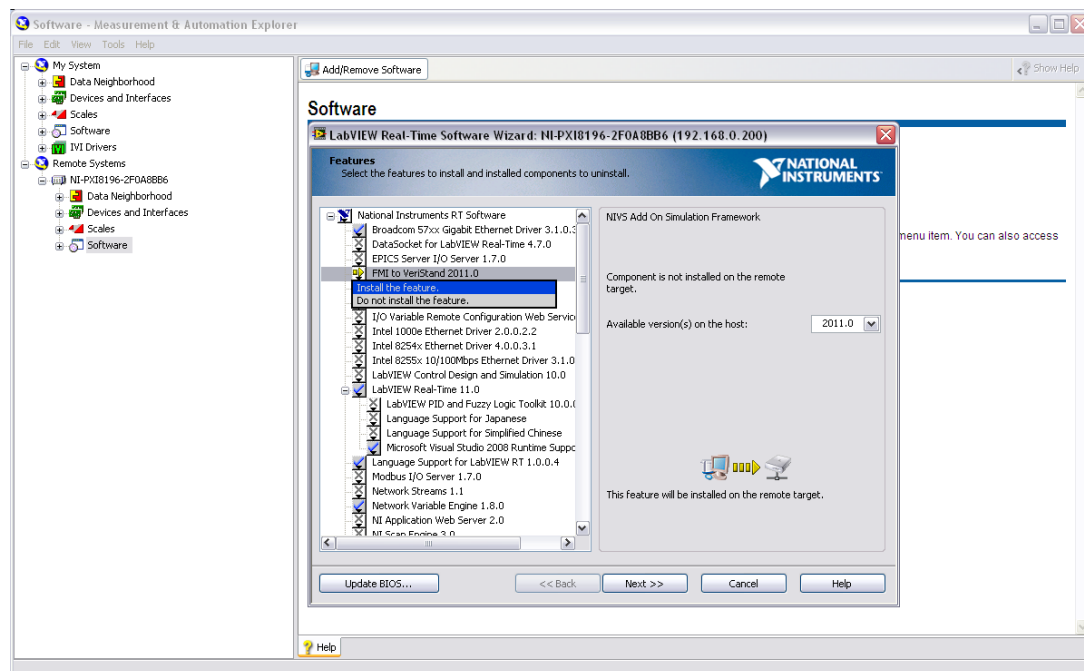


Figure 4.2 Install FMI Add-on on your target

You have FMI support on your RT Target:

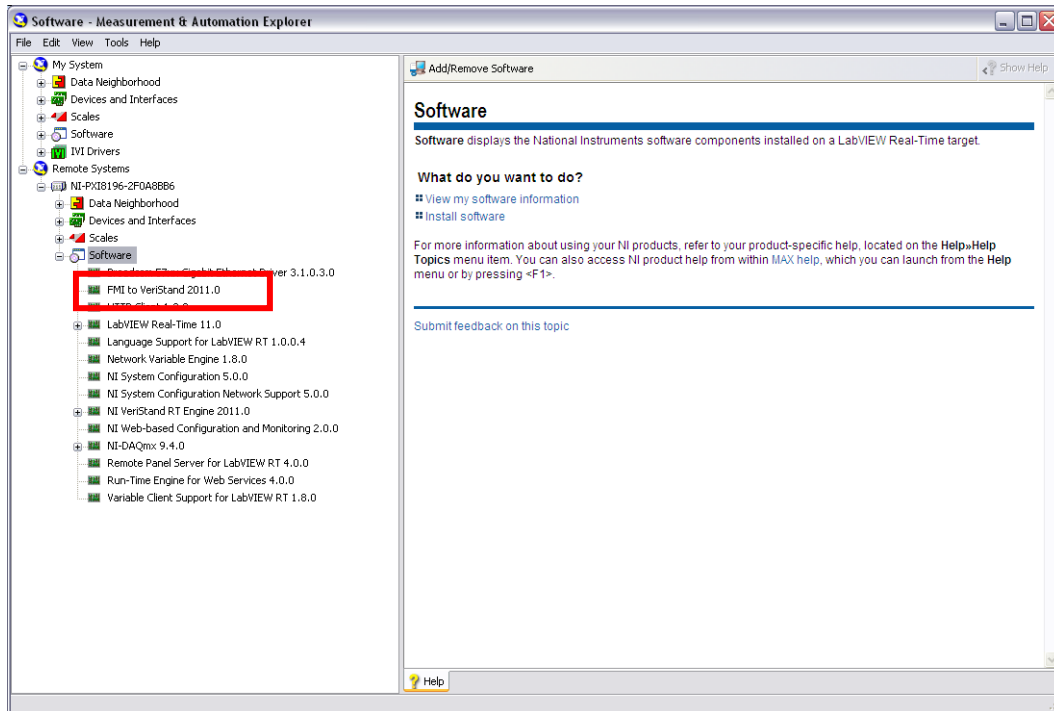


Figure 4.3 FMI Add-on installed

Now you can deploy your NI VeriStand project that have FMU model in your FMU target.

5. Uninstallation Procedure

5.1. For Windows

FMI Connection provides an uninstaller. The following steps uninstalls the FMI Connection.

1. The uninstaller is found in the start menu. Click Uninstall to open the uninstaller dialog.

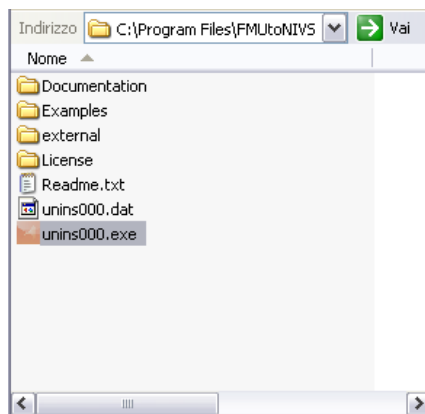


Figure 5.1 FMI Connection folder - unistall.

6. Support

Support inquires are sent to support@dofware.com

7. Dymola: Export Model as FMU

7.1. FMI for Co-Simulation

The Dymola FMU export functionality, has been extended to also support the FMI for Co-Simulation specification version 1.0 for export of models (slaves) with built-in numerical solvers.

The new functionality uses the SUNDIALS suite of numerical solvers (version 2.4.0). The SUNDIALS code is not distributed with Dymola 2012, but can be downloaded from the Sundials website (<https://computation.llnl.gov/casc/sundials/main.html>) or found into the `\external\` folder.

To install the SUNDIALS libraries needed to activate the FMU for Co-Simulation export functionality in Dymola, you can follow the instruction on Dymola manuals or unzip the package "`\external\sundials-2.4.0.zip`" into the folder "`<Dymola2012 installation folder>\Dymola 2012\Source\FMI\`".

7.2. FMI for Co-Simulation generation

To generate FMU for Co-Simulation from Dymola (2012 FD01) please follow the instructions below:

- Go in Simulation TAB
- Simulation -> Translate ->FMU

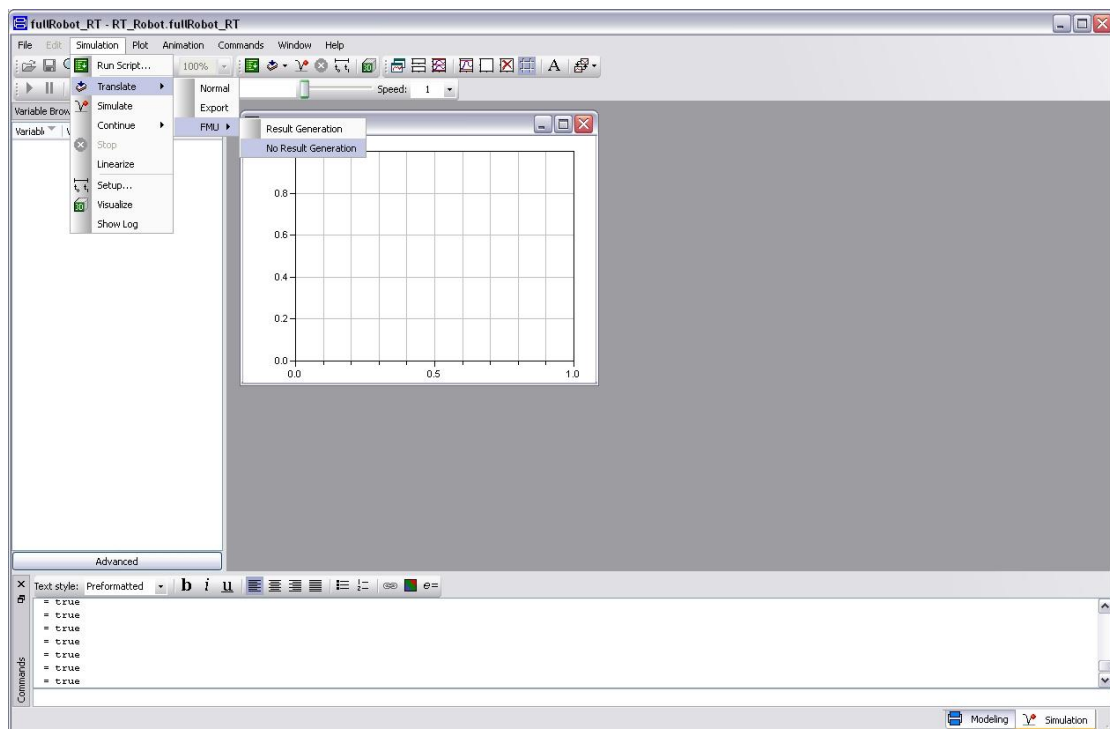


Figure 7.1 Translate model as FMU.

Or from your modeling tab see the image below:

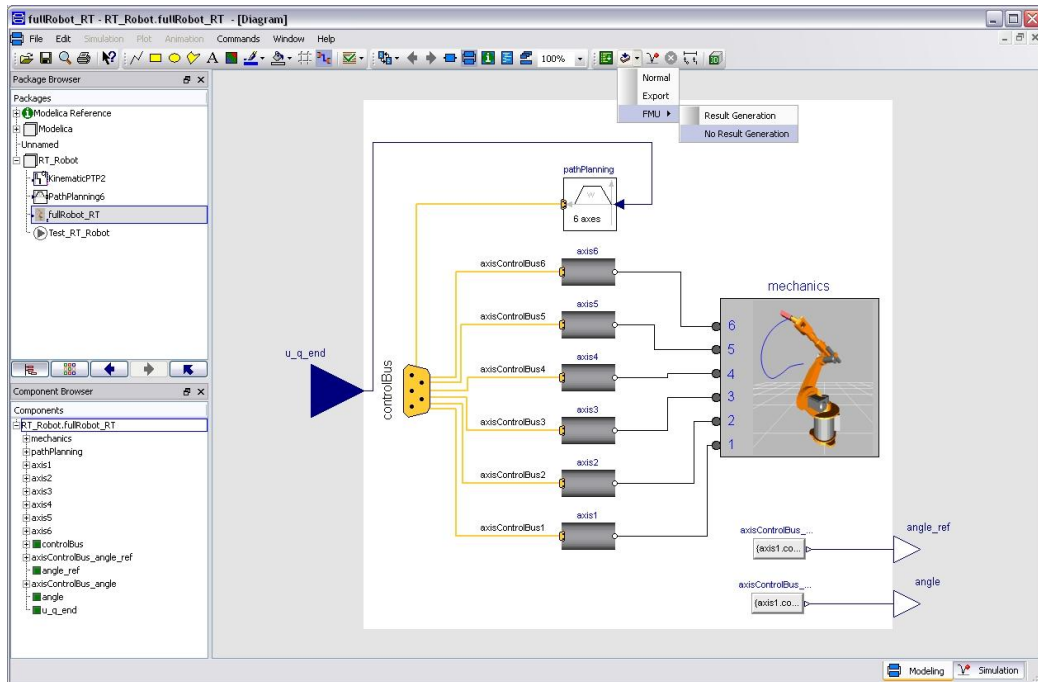


Figure 7.2 Translate model as FMU.

8. Import FMU in NI VeriStand

To import the FMU generated into Dymola follow the instruction below:

- Open NI VeriStand;
- Create a New project;
- Copy your FMU into the Project folder;
- Launch the System Explorer related to a System Definition File from the Project Explorer;
- Load the fmu model:

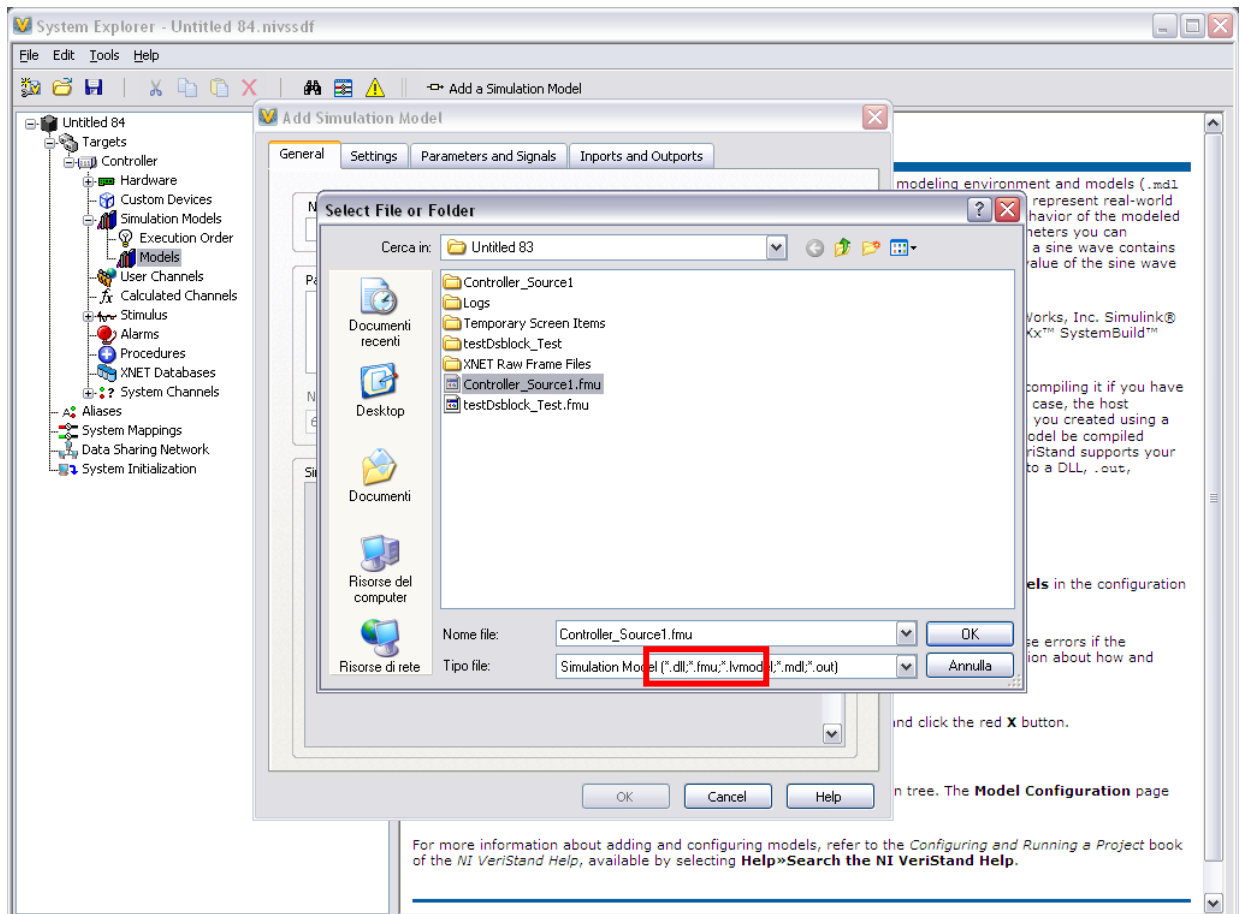


Figure 7.1 Import FMU.

- Save and close the System Explorer Project;

- Open and setup the workspace from the Project Explorer;
- Deploy and run the Experiment.

9. Getting Started

9.1. Introduction

This chapter will take you through some example in order to get you started with FMU to NI VeriStand Connection.

9.2. Dymola to NI VeriStand: Step by Step example

9.2.1. Prerequisites

- Dymola 2012 or later
- NI VeriStand 2011
- FMU to NI VeriStand Connection 2011

9.2.2. Generated FMU in Dymola

Start Dymola:

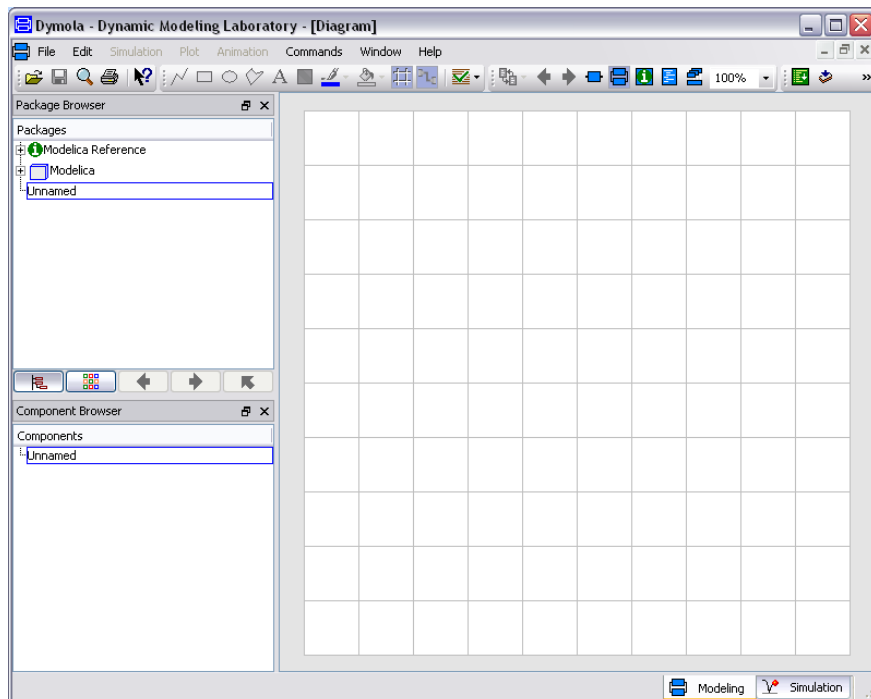


Figure 9.1 Dymola.

In Dymola use “*File -> Open*” . Open *FMUtoNIVS.moe* library located in your FMUtoNIVS installation folder:

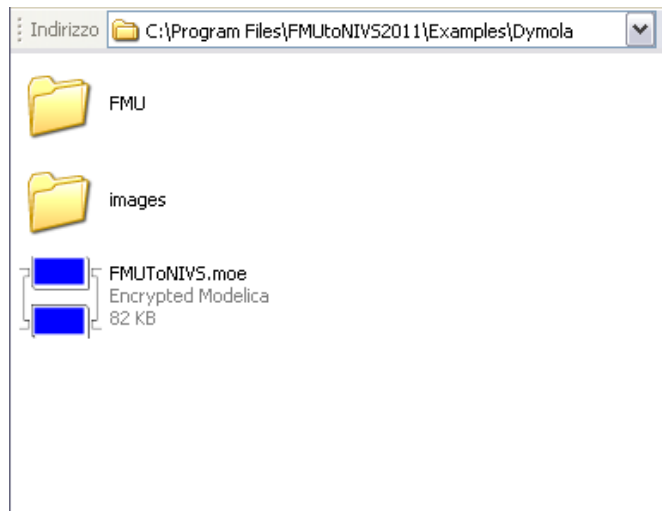


Figure 8.2 FMUtoNIVS Dymola example library.

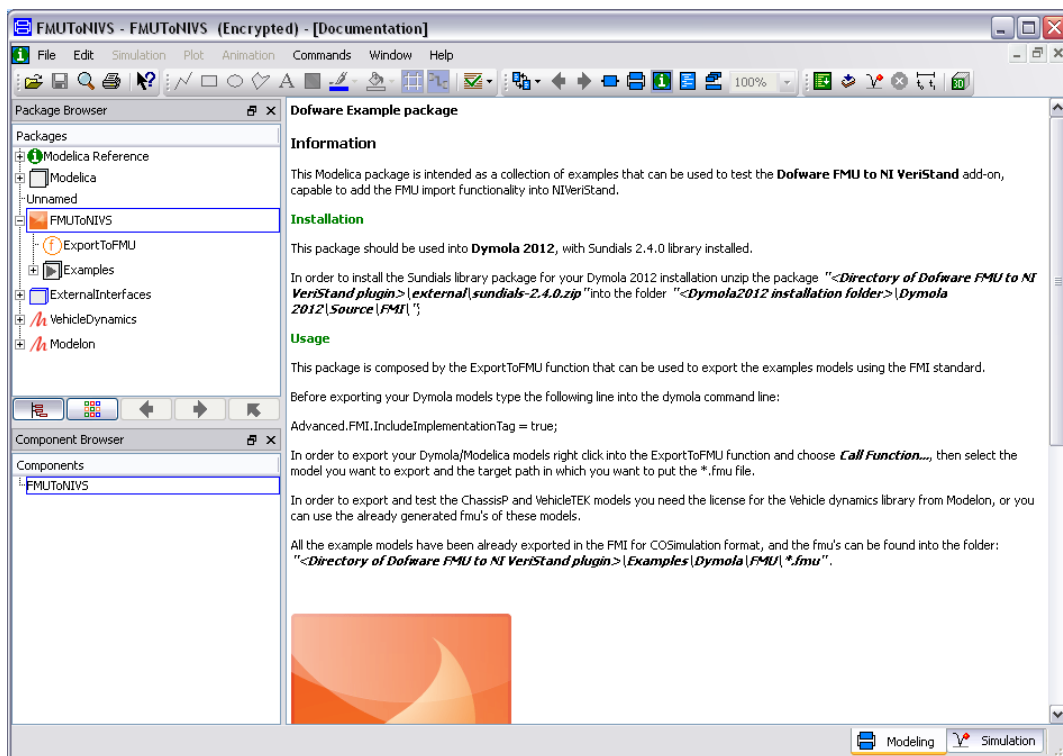


Figure 9.2 Open FMUtoNIVS Dymola example library.

Expand *Example* folder and open one of the example listed. In this starting tutorial I open *fullRobot* example:

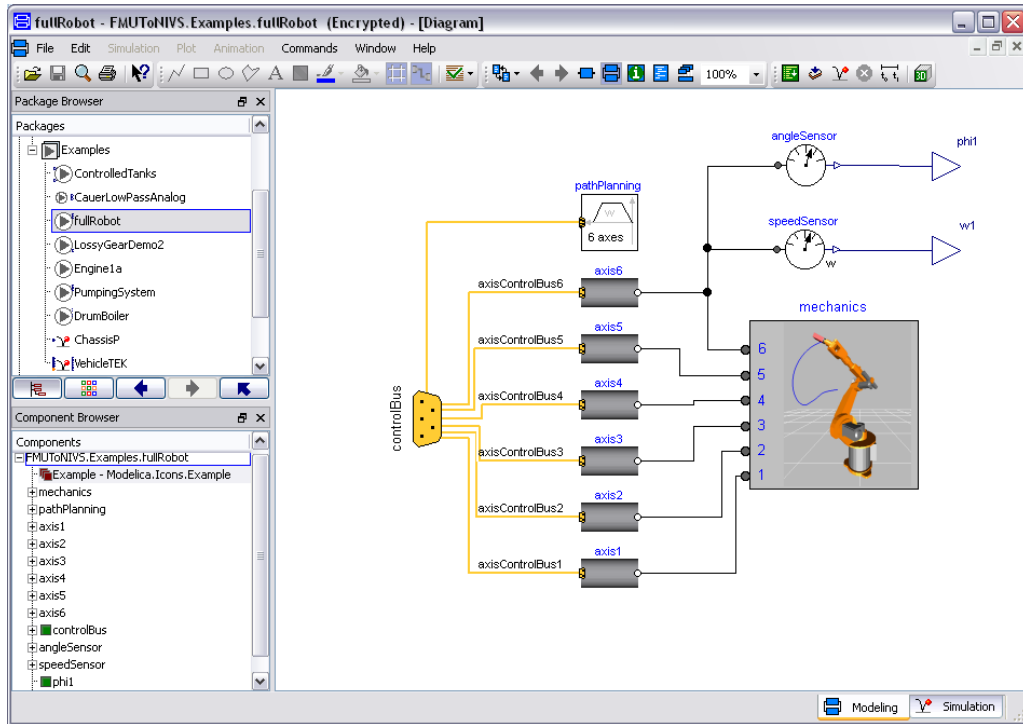


Figure 9.3 fullRobot example.

For use models in the example library you have to duplicate it.
Duplicate fullRobot Class:

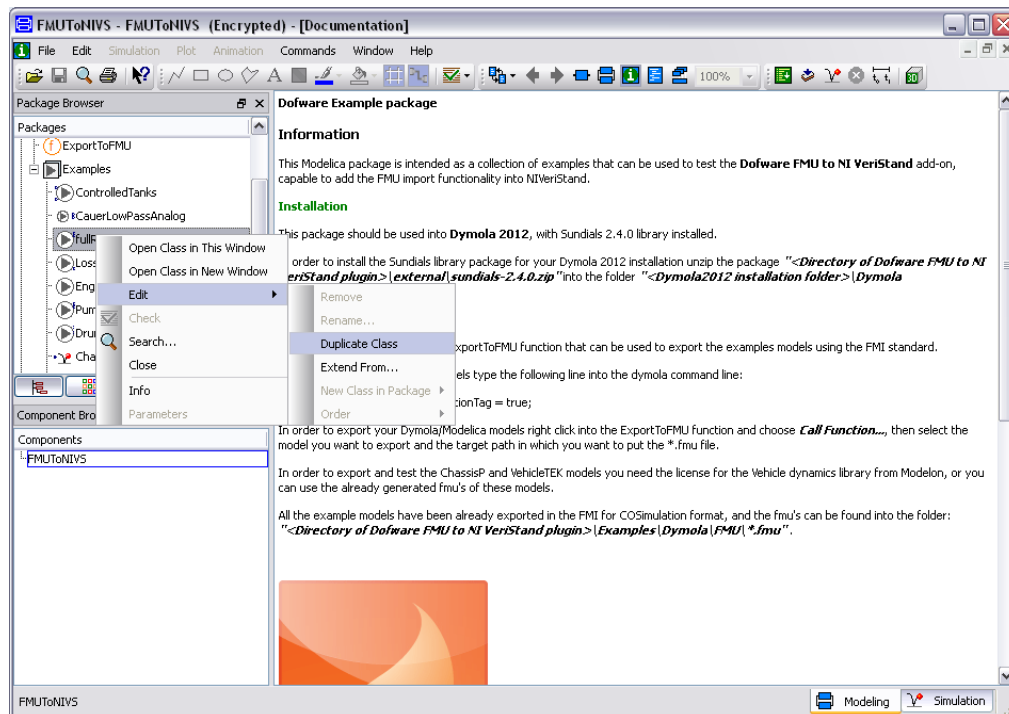


Figure 9.4 Duplicate fullRobot class.

Select Duplicate fullRobot model and check this class:

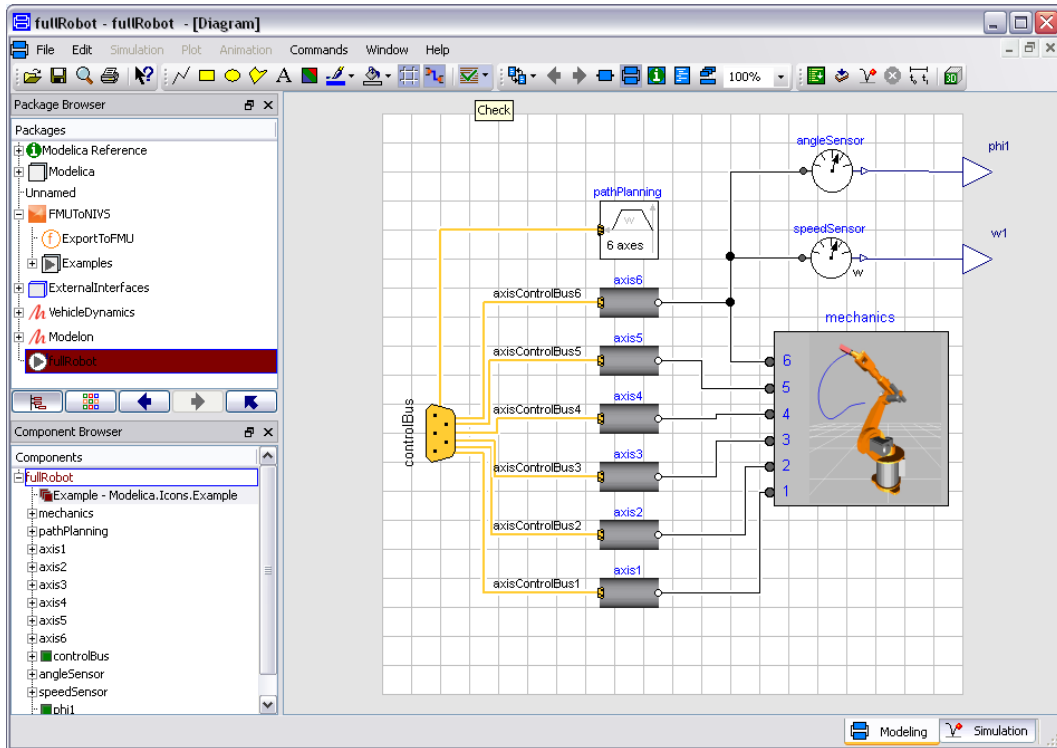


Figure 9.5 Check fullRobot model.

Go in Simulation Tab and setup your experiment and Simulate it:

Figure 9.6 Setup the experiment.

Generate FMU for co-simulation

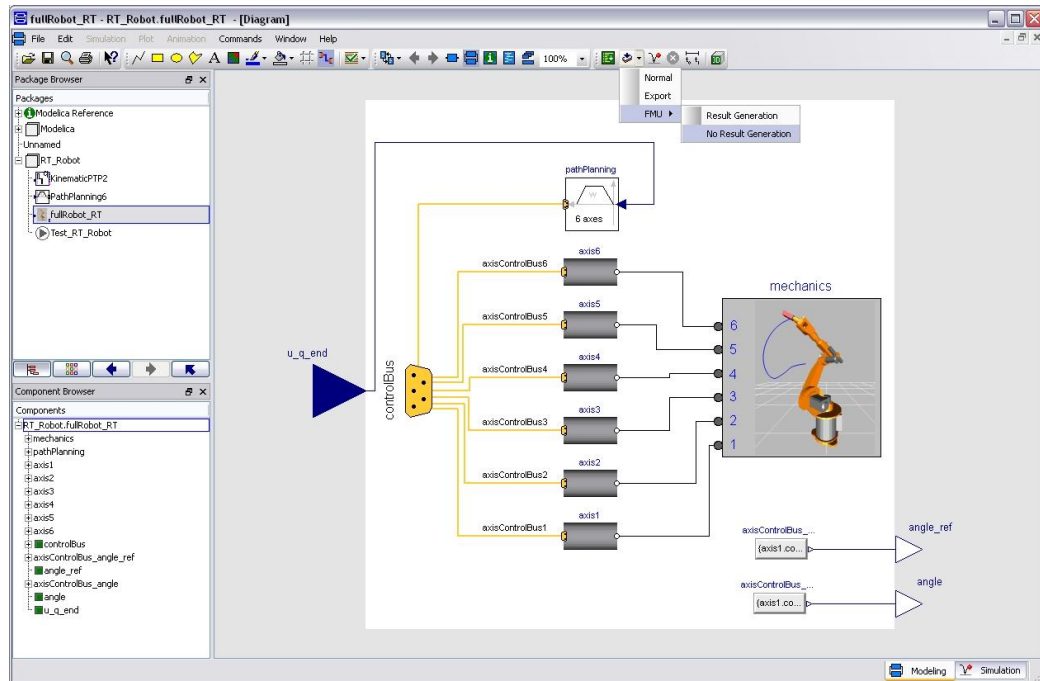


Figure 9.7 export FMU.

Now you have the “*FMUToNIVS_Examples_fullRobot.fmu*” file:

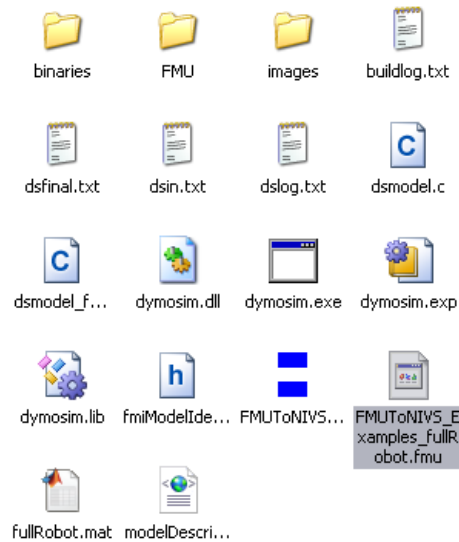


Figure 9.8 FMU file.

Now you can use *FMUToNIVS_Examples_fullRobot.fmu* in VeriStand. Open NI VeriStand 2011 and create a new project:

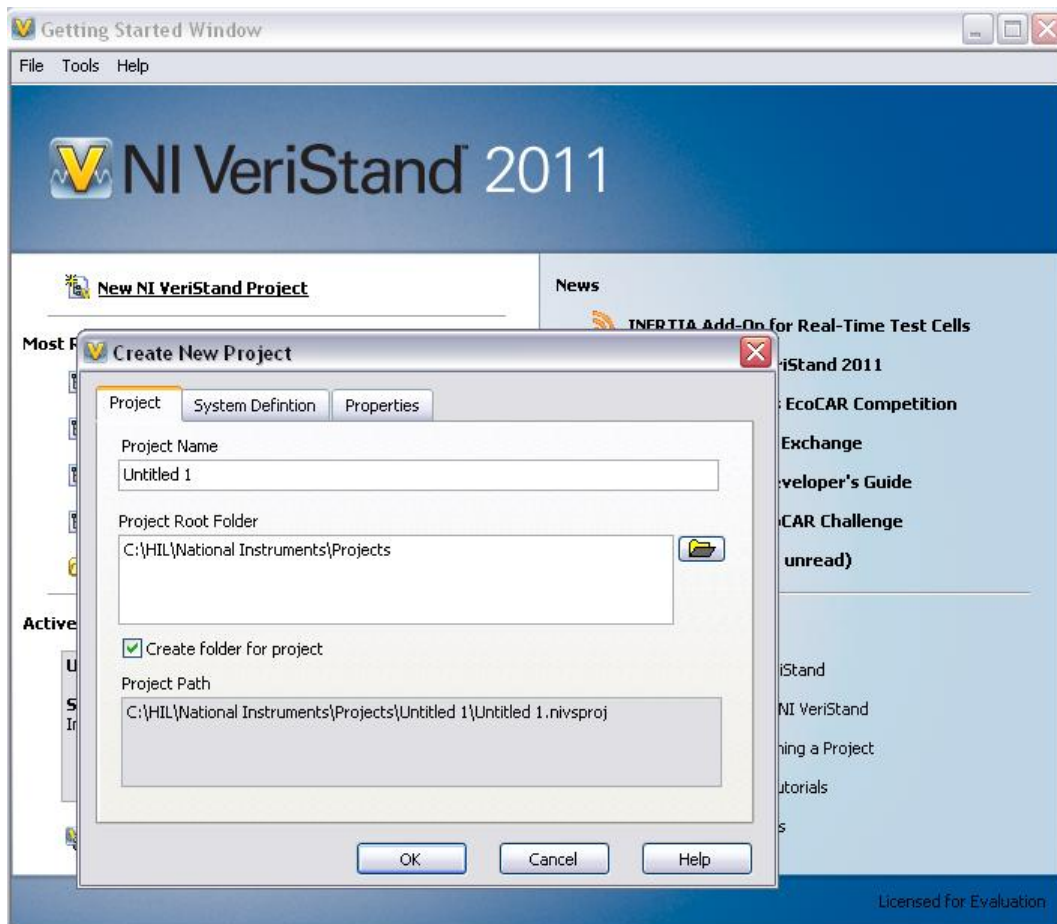


Figure 9.9 Open NI VeriStand and create a new project.

Copy in the folder project (*C:\HIL\National Instruments\Projects*) the *FMUtoNIVS_Examples_fullRobot.fmu* file:

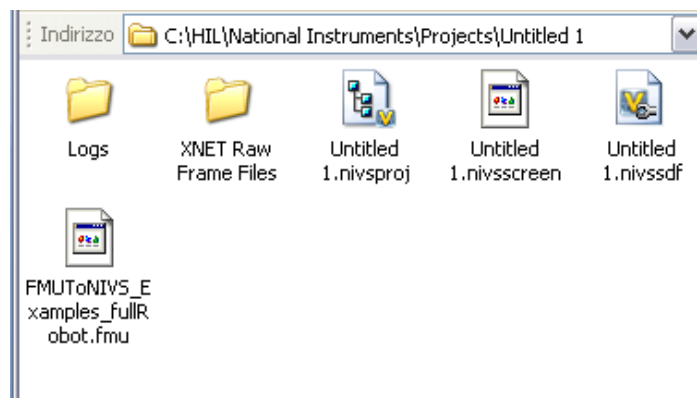


Figure 9.10 .fmu file in your project folder

Open System Explorer:

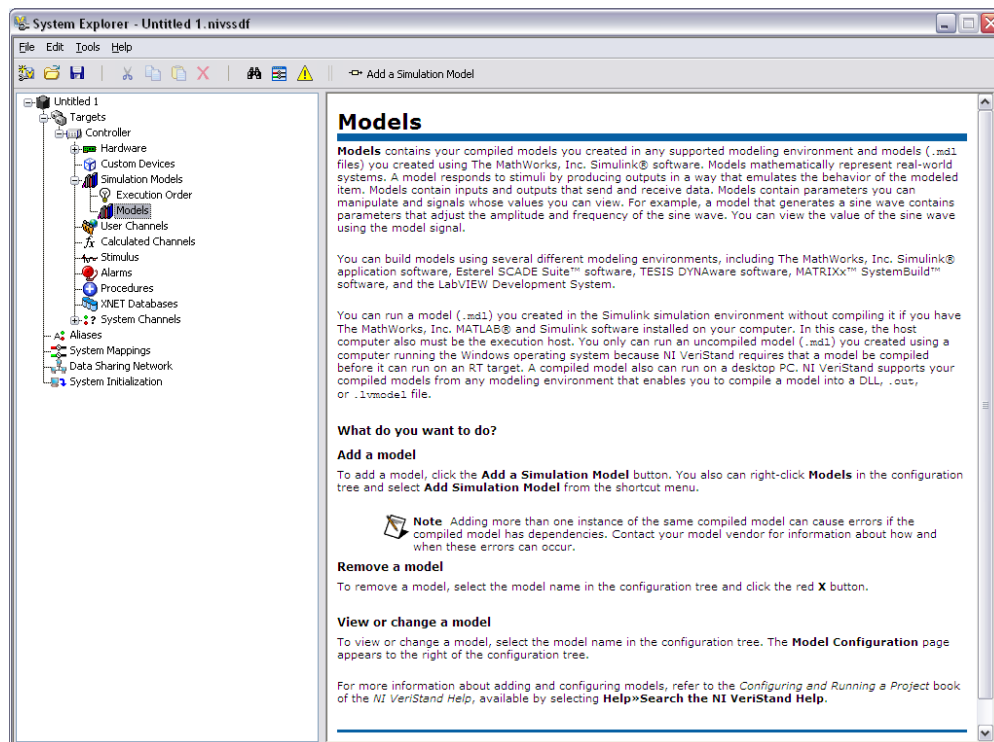


Figure 9.11 System Explorer

Specify the target, in this example I select a PXI target:

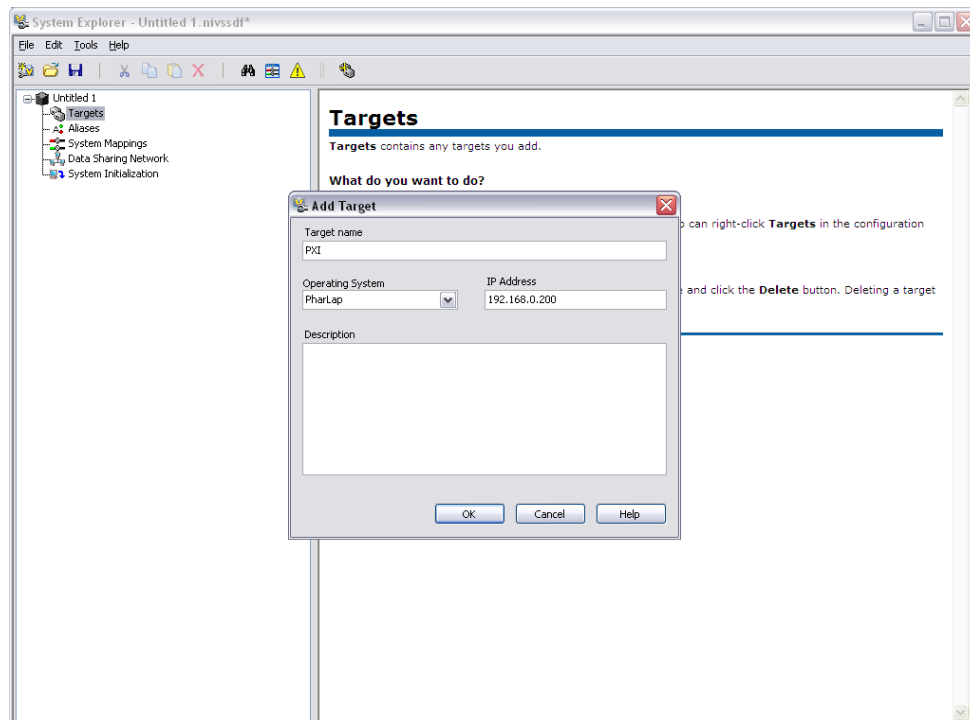


Figure 9.12 Define RT Target

Open your fmu model in your project folder:

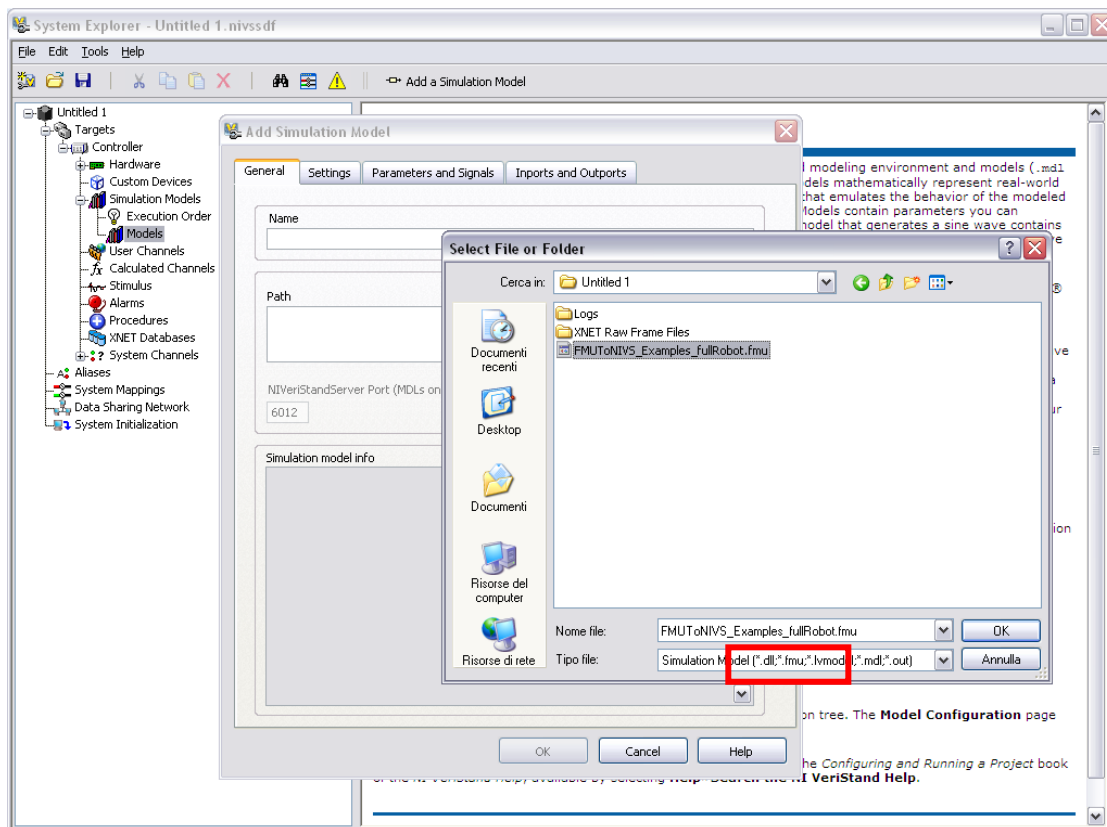


Figure 9.13 Load fmu model

Your model in VeriStand:

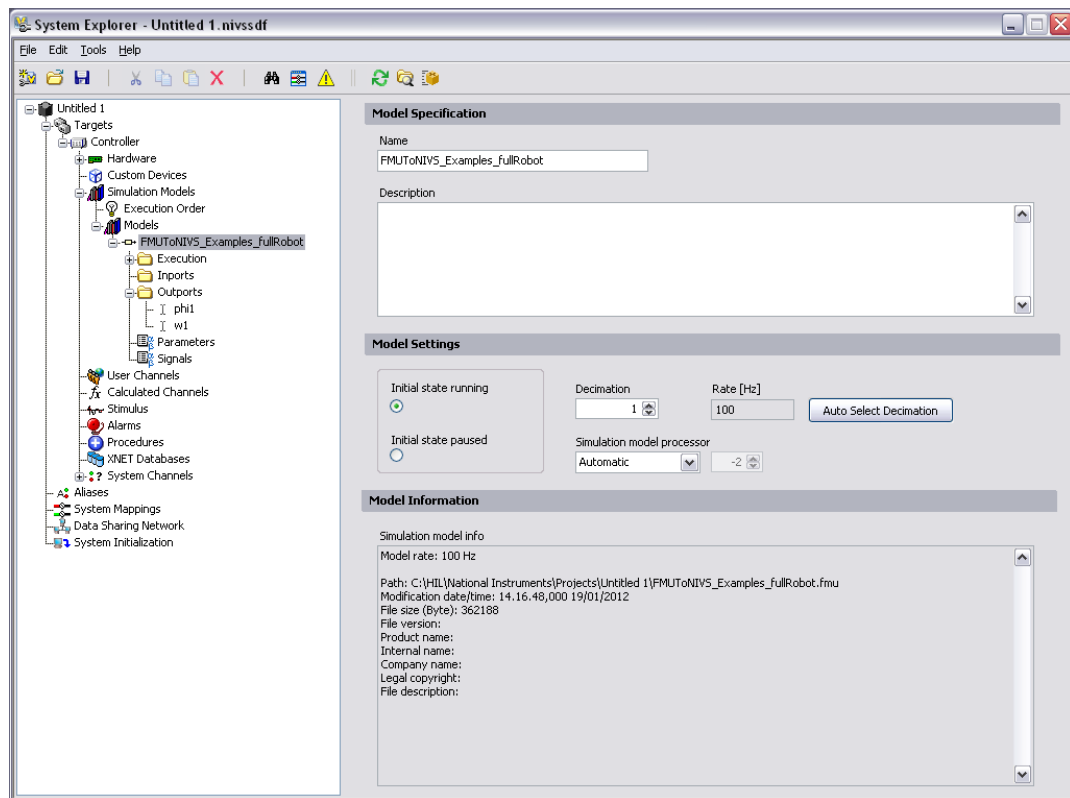


Figure 9.14 fmu model in VeriStand

Save your model, close System Explorer and in the Project Explorer run the project (*Operate > Run*).

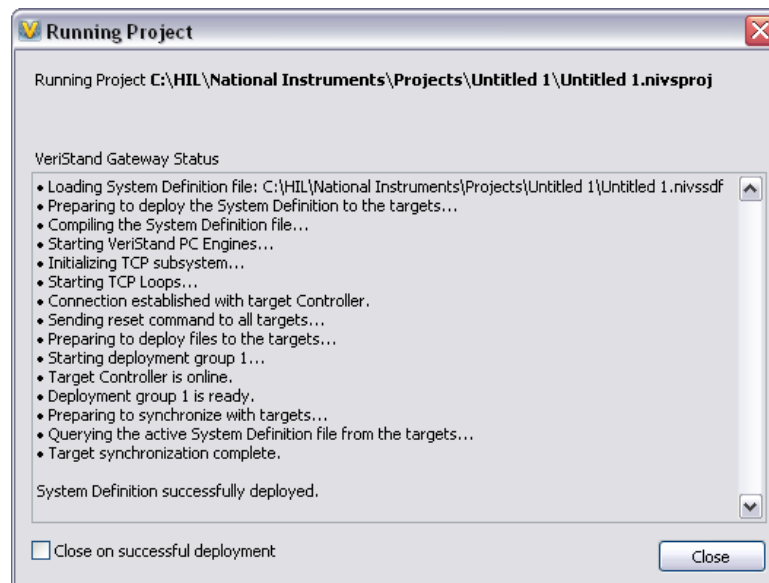


Figure 9.15 Running Project

In the Workspace you can view your variable:

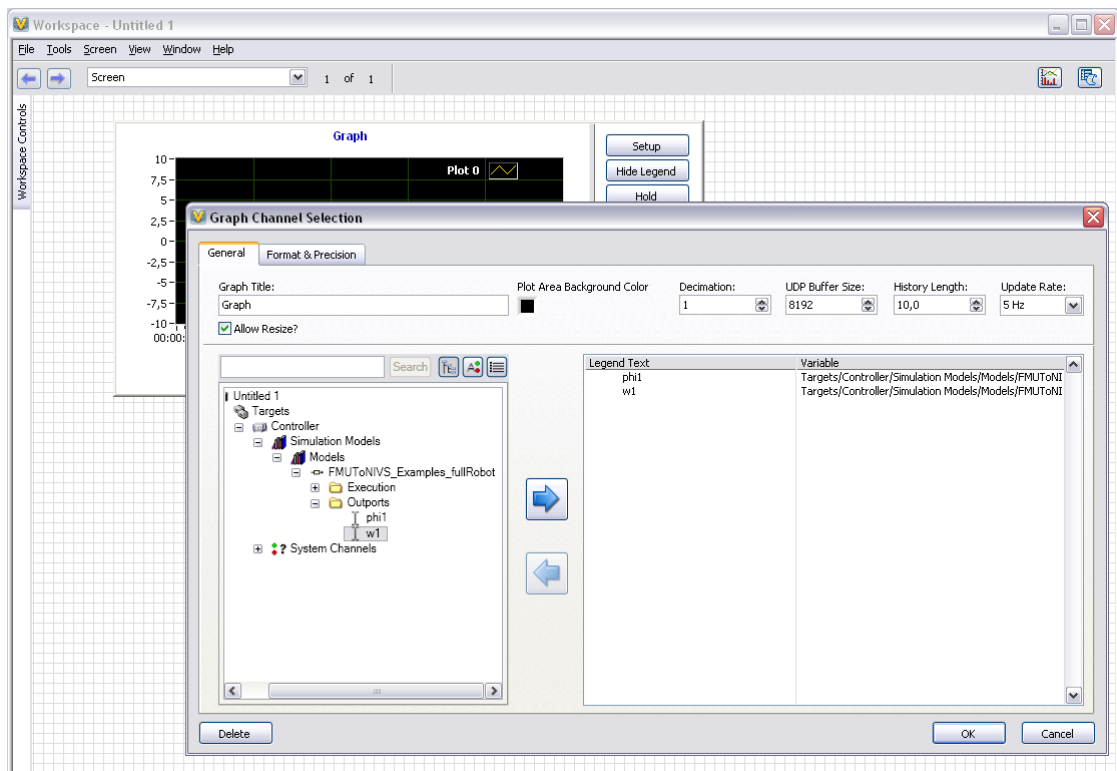


Figure 9.16 Load your model info

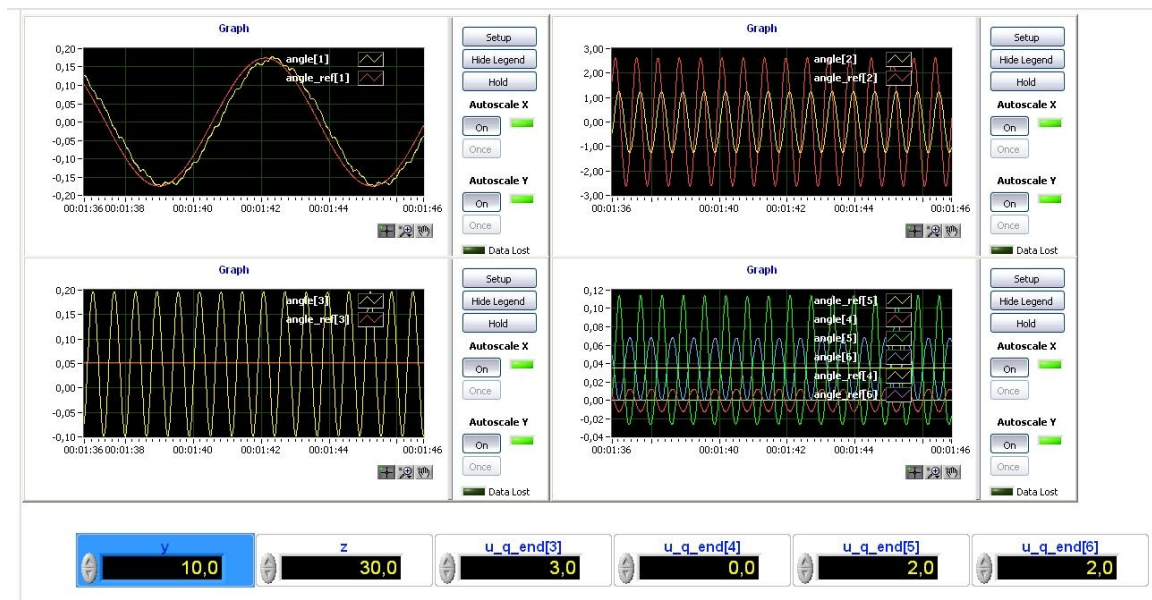


Figure 9.17 Your model deployed on RT Target

