

04 - Large Grid Simulation

This is a step-by-step guide used to generate the FMUs used in the Multi-domain simulation test case. The FMUs were generated using Dymola 2019 and the Modelica source files needed are listed below.

Files

Name	Package Type	Files
<u>OpenIPSL</u>	Root	OpenIPSL.zip
<u>N44</u>	Final	N44.zip

In this test case example, a large system is considered to be exported as one FMU. The system that is going to be exported is shown in Figure 1 below.

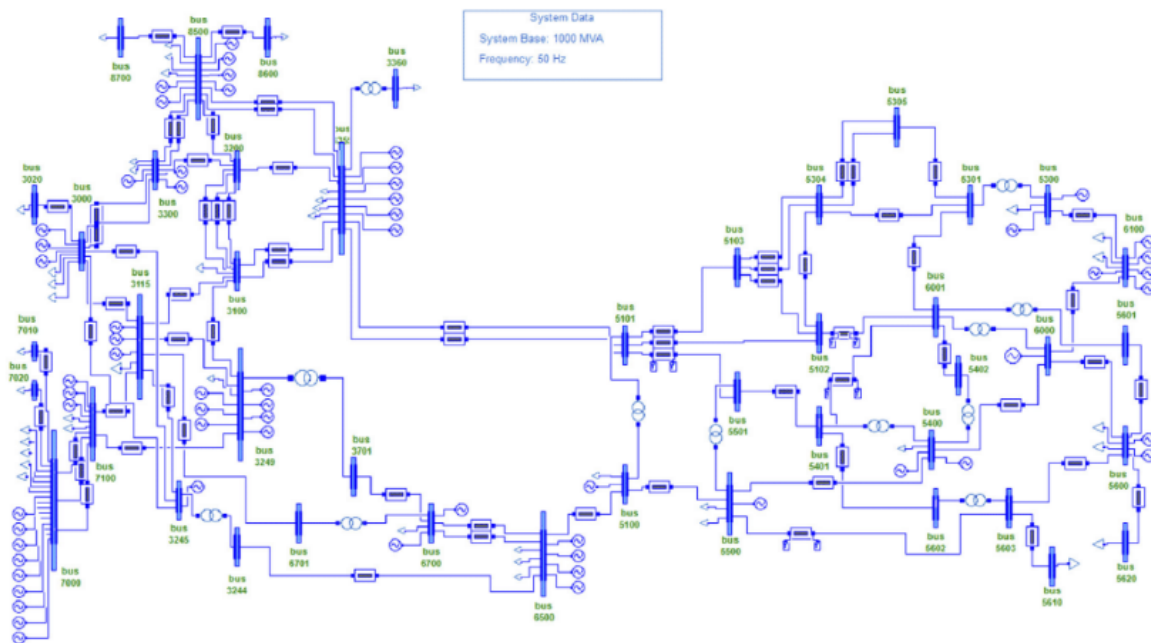


Figure 1 - Nordic44 System.

In this test system, two FMUs were prepared. One FMU for Co-Simulation (found in folder CS) and the other one FMU for Model Exchange (found in folder ME).

Each folder (CS or ME) contains the a folder named N44_FMU and the Simulink file that was used to test the FMUs. Hence, each folder has the following files:

- Folder named N44_FMU.
- Simulink file named N44_FMU_XX_Test.slx (where XX can be ME or CS depending on the type of FMU).

Both FMUs were generated using Dymola 2019 and they include the source code. The parameters chosen for the Co-simulation FMU are shown in the Figure 2 while the parameters chosen for the Model Exchange FMU are shown in the Figure 3.

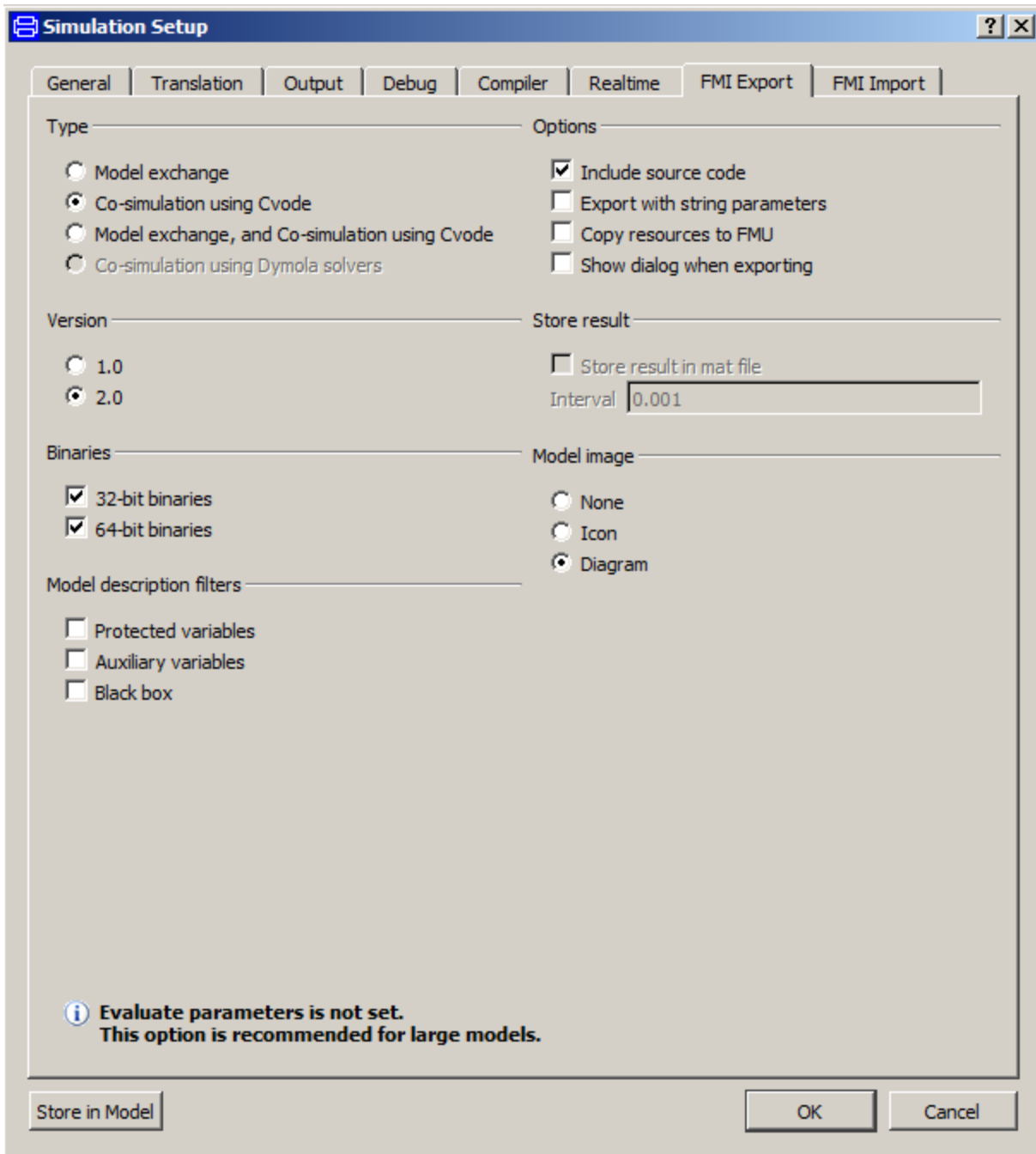


Figure 2 - Parameters used for generation of co-simulation FMU.

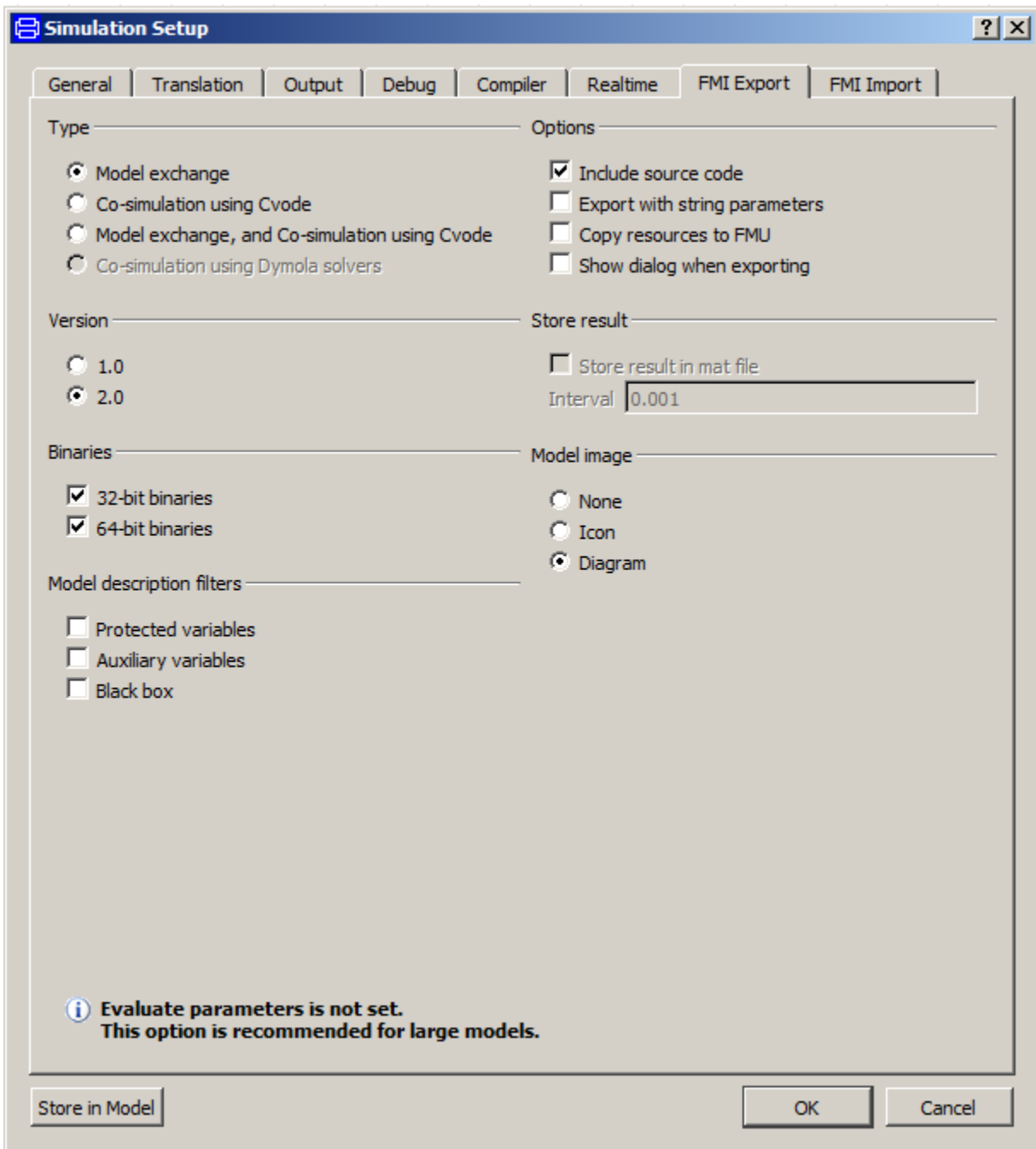


Figure 3 - Parameters used for generation of model exchange FMU.

As one can see, 32-bit and 64-bit binaries are generated for each set. In addition, it is important to highlight that Windows 7 was the operational system used to generate the FMUs. In order to check one of the results of the simulation, the variable `bus_7000.V` was chosen as output in Simulink. Note that the variable was

not chosen as an output when exporting the FMU but when importing it into Simulink. Figure 4 shows the Simulink diagram used to check the FMU.

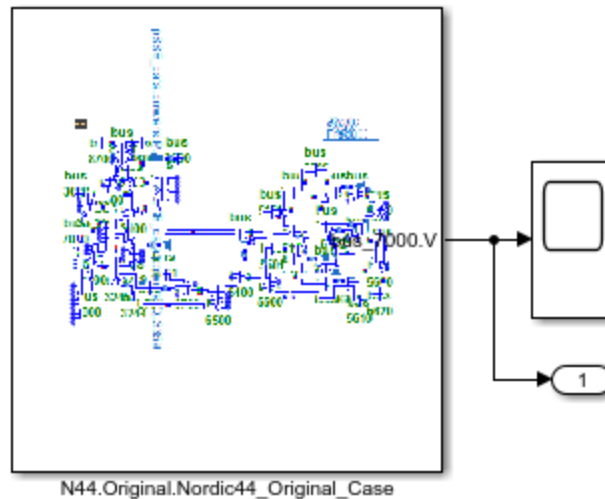


Figure 4 - Simulink diagram.

Finally, the expected result for variable `bus_7000.V` obtained when simulating the system for 10 seconds is shown in Figure 5 below.

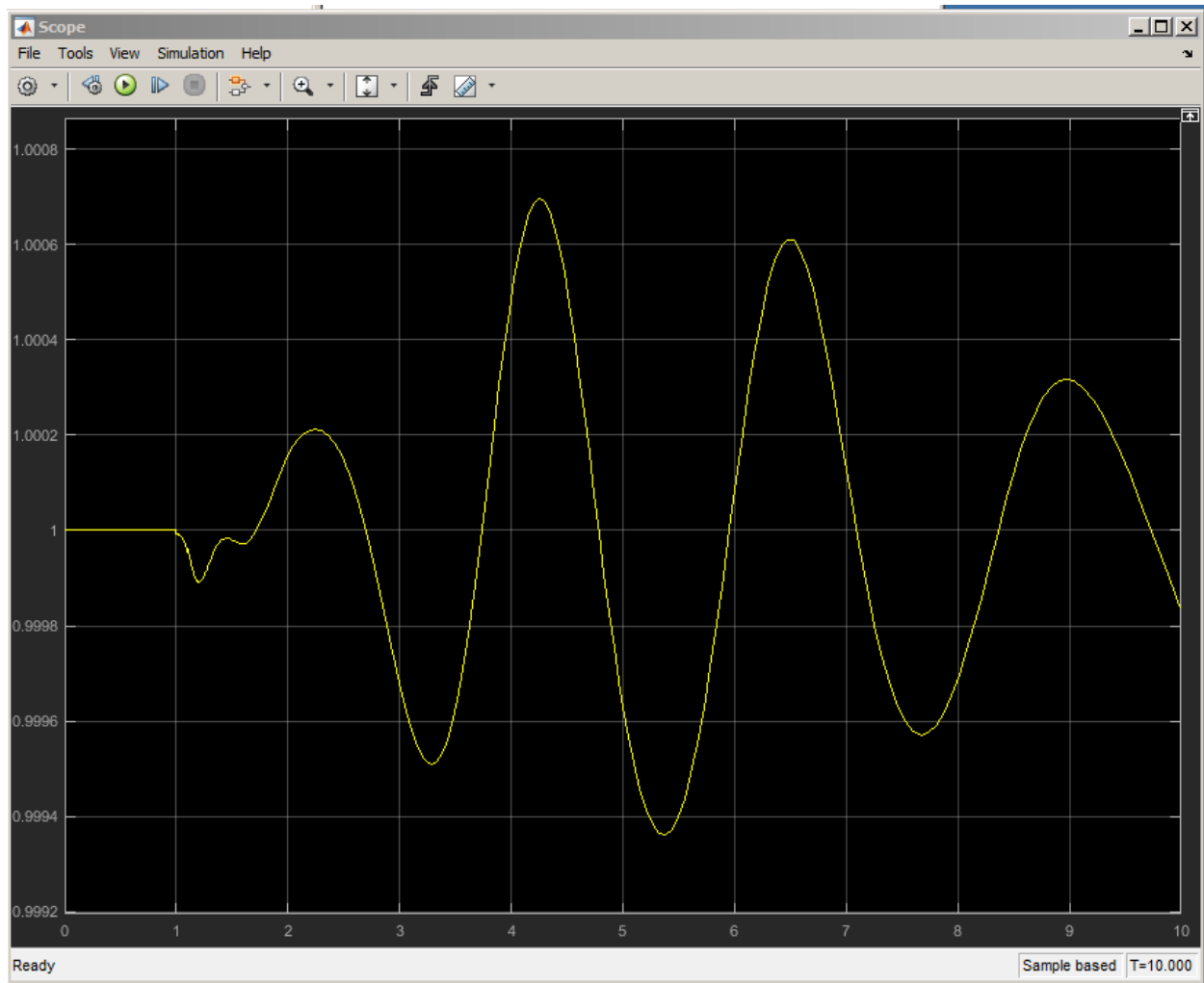


Figure 5 - Expected result when simulating the FMU.