Overview: Modelling in PowerFactory, Model Import and Model Export

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		RMS (slow plant controllers)	RMS (fast power electronic controllers)	EMT
Modelling languages in PowerFactory	Hybrid Modelica			
	Clocked Modelica		2	
	DSL			
Interfaces for model import	IEC 61400-27-2 (clocked interface)		2	
	FMI 2.0 for Model Exchange (FMI ME), used for time continuous models			
	FMI 2.0 for Model Exchange (FMI ME), used for time discrete models		2	5
	FMI 2.0 for Co-Simulation (FMI CS), used for time continuous models[7]		2	
	FMI 2.0 for Co-Simulation (FMI CS), used for time discrete models		2	
	FMI 2.0 Tool Coupling using Co-Simulation, using discrete sampling time[1]	1	2	1
Interfaces for model export	FMI 2.0 for Model Exchange (FMI ME), used for hybrid Modelica models			
	FMI 2.0 for Model Exchange (FMI ME), used for clocked Modelica models		2	
	FMI 2.0 for Co-Simulation (FMI CS), used for clocked Modelica models		2	

1: FMI Tool Coupling requires both simulation tools to be present, which introduces additional complications and is therefore not recommended. This setup increases the dependency on the availability and compatibility of both tools, making it more challenging to ensure a seamless simulation process. Moreover, the synchronization between the tools can lead to performance bottlenecks, especially in real-time or large-scale scenarios. Debugging and troubleshooting are also more complex, as issues may arise from the interaction between the tools rather than the models themselves.

2: Using a discrete sampled control in an RMS simulation requires very small integration steps because the maximum integration step size is always limited to the sampled model with the highest sampling rate.
Models with a sampling rate that is too low can, for example, lead to significant errors, such as a very high current injection after a fault has been cleared. Such events will propagate instantaneously throughout the network due to the steady-state equations used for the network components.
Using a high sampling rate (i.e. very small integration step sizes) may be a possible solution for small, detailed networks, but is not recommended for large networks.

3: All statements regarding the export capabilities of MATLAB/Simulink are based on DIgSILENT's current knowledge. However, no guarantee is provided for the accuracy or completeness of these statements. Users are strongly advised to verify the export capabilities directly with MathWorks.

4: not recommended due to known issues and outstanding testing

5: model clock rate based on a parameter must be appropriate

6: IEC export from Matlab/Simulink is only possible with custom target function.

7: FMI 2.0 for Co-Simulation only supports time-discrete solvers, i.e. continuous models are discretised.

Legend

Correct functionality
Correct functionality with some limitations
Not recommended

Time discrete model: No continuous state, fixed-step discrete solver (in PowerFactory: clocked Modelica model)

Time continuous model: Includes continuous states, continuous solver (in PowerFactory: hybrid Modelica model / DSL)