Simulink co-simulation

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Cameo Simulation Toolkit supports Simulink (MATLAB) co-simulation. Simulation executes the entire Simulink model (*.slx) on all steps, if there are any value changes in the input, which is similar to FMI. Simulation works with Simulink models as attached files and Simulink models located in the same directory of the project.

0	 Warning You must successfully integrate MATLAB Version 2016b or later before using Simulink co-simulation. See Integration with MATLAB.
	 Any duplicated Simulials model is not allowed in the project
	Note
	• Simulink models without input/output Ports are not executed because there is no connectivity, and value change is not propagated to the Block.
	• This type of Simulink integration is for atomic calculations. When any input changes, outputs such as the parametric diagram are calculated, e.

Using Simulink in an Internal Block/Parametric diagram as FMU.

1. Tolintpostia Simulitek (novelets inpoteted orainoditied, Stateda file a dereast festentat Simulitik Bitessionport calls such as a back of the simulation of the Block Definition diagram, Internal Block diagram, or Parametric diagram of the project. The Simulink Import Options dialog opens as shown what in console.

Simulink Import Options								×	
Simulink Import Options Select which features and how to import them from the Simulink file. Specify a Block name and select which Simulink variables to import as value properties or ports. Inputs and outputs are imported as ports by default. If you drop the Simulink file onto an existing Block as implementation, you can also select which Simulink variables map and redefine Block properties. You can attach the Simulink file to a project for a more effective team									
Block name: GainAdd 🕼 Select All 🖒 Select None									
#		Direction	Name	Type	Description	As Port	Interface Block		
1	\checkmark	in	In1	🖾 Real		Proxy Port	🖳 In1		
2	\checkmark	in	In2	🔽 Real		Proxy Port	🖳 In2		
3	\checkmark		Out1	💵 Real		Flow Port \sim	None		
						None			
						Flow Port			
						Proxy Port			
Attach file to the project									
							OK Canc	el	

The Simulink Import Options dialog opens after importing a Simulink model into the project.

- 2. All Input/Output Ports of the Simulink model are selected by default. However, you can select Proxy Port, Flow Port, or both of them in the same Block for the simulation, e.g., *In1* and *In2* Proxy Ports and Out1 Flow Port. The following scenarios apply:
 - a. If you select the Proxy Port, you can select an existing Interface Block or **<NEW>** to automatically create a new Interface Block for each Port with «SimulinkBlock» applied as the model name with the Proxy Port. The automatically created Interface Block will have the default settings with *In/Out In1/Out1 : Real «FlowProperty»* according to I/O Ports of the Simulink model.
 - b. If you select the Flow Port, a Block with «SimulinkBlock» applied as the model name and the Flow Port with In/Out In1/Out1 : Real «FlowPort» according to I/O Ports of the Simulink model will be automatically created.

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p_GainAdd «Block» «SimulinkBlock»		In1 : Real Wolock» Out1 : Real
In1 : Real «FlowPort»		In2 : Real for Coin Add
In2 : Real «FlowPort»		
Out1 : Real «FlowPort»		
GainAdd «Block» «SimulinkBlock»		
in In1 : In1 «ProxyPort»		
In In2 : In2 «ProxyPort»		«proxy» «proxy»
out Out I : Out I «ProxyPort»		In1 : In1 wblock» Out1 : Out1
In I «Interfaceblock»		«proxy»
F in In2 · Real «FlowProperty»		
Dut1 «InterfaceBlock»		
🛄 🖪 out Out1 : Real «FlowProperty»		

The Simulink model is created as Blocks with Proxy/Flow Ports.

Warning The Interface Block of a Proxy Port must have only a Flow Property.

• The names of the Proxy Port and Simulink I/O Port must be the same, e.g., In1-In1 and Out1-Out1.

- 3. Connect those Proxy/Flow ports through binding Connectors in the Internal Block/Parametric diagram.
- 4. Run the simulation When inputs are available to initial zation (munassed via binding) (Siguin Kalock will be run at the first time and on every input change. You can also see animation of Flow Ports and set breakpoints for debugging.

From the figure below, a system is with two Simulink models: *GainAdd* and *Gain5*. *GainAdd* will multiply Port *In1* by 10, multiply Port *In2* by 2, and add the two results to Port *Out1*. *Gain5* will multiply Port *m* by 5. Therefore, *result* will be [(2 * 10) + (2 * 2)] * 5 = 120.



The Simulink co-simulation result from the system which has two Simulink models (GainAdd.slx and Gain5.slx) connected via Flow Ports.

Using Simulink in an Activity diagram

A Simulink model can be used in the Activity diagram through drag-and-drop operation. The dropped Simulink file is presented as an Activity in the Containment tree with the same name as the Simulink model name, and «SimulinkBlock» is automatically applied. Parameters and directions are the same as the Simulink In/Out ports and can be used as a CallBehaviorAction on demand as shown in the figure below.

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name Nurd sumInport dv		print("Result is : " + inputValue)
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A Simulink model, sumInport1, is presented as an Activity and used as a CallBehaviorAction in the Activity diagram.