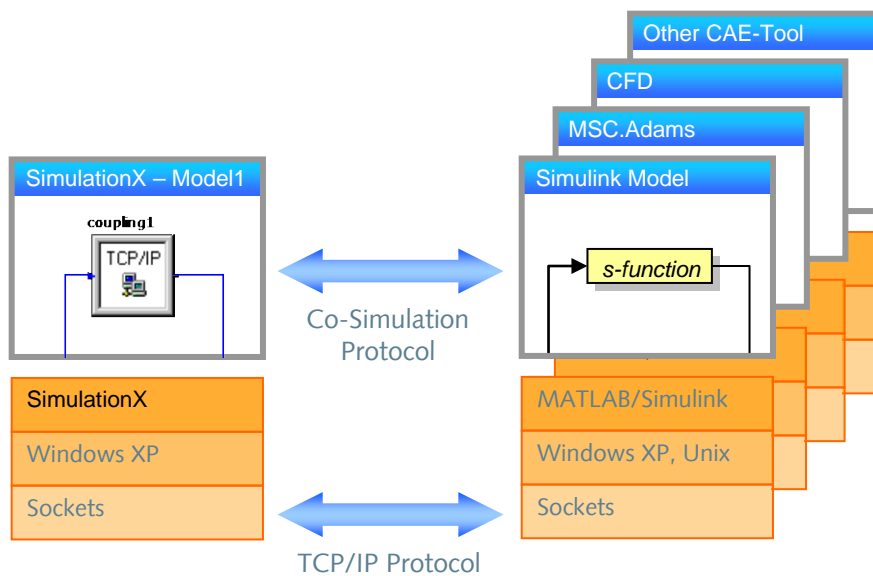# Fact Sheet

Co-Simulation

Co-Simulation with other simulation software and CAE-Tools is possible with the universal TCP/IP-based coupling element. The standardized transfer protocol allows the communication between programs running on separate computers with different hardware and operating systems.

- *Universal TCP/IP-basiertes coupling element for Co-Simulation*

- *Ready to use solutions for MATLAB/Simulink, MSC.Adams, Cadmould und Fluent*

- *Easy Integration of your own tools based on delivered code samples*

- *Development support by ITI*

The protocol describes the transfer of control data, the exchange of simulation data in a fixed time grid and the synchronization between SimulationX and the involved tool. The coupling element has signal connectors which receives and provides respectively the simulation data as vectors.
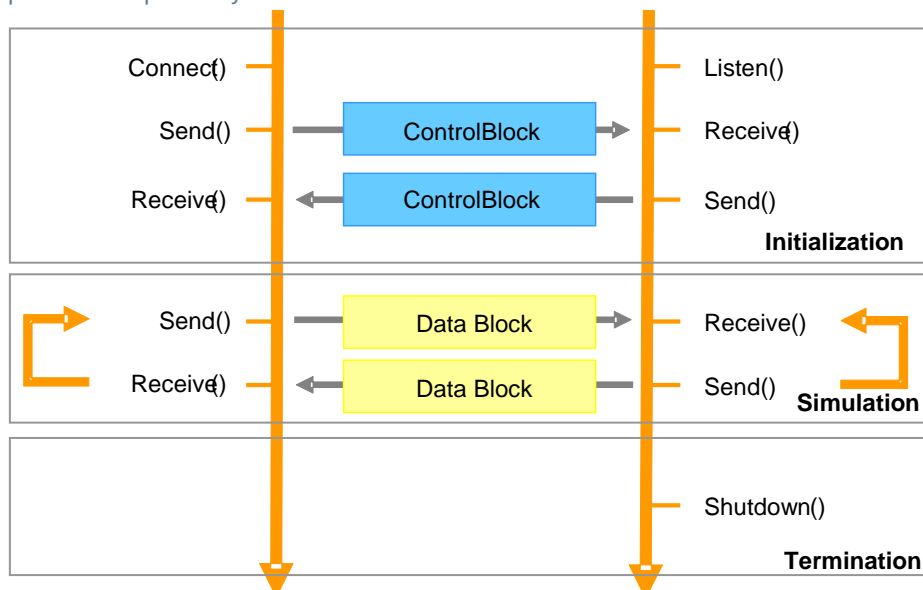
CAE Tools which want to communicate with the coupling element must have an API (Application Programming Interface) which allows to access calculation data during the simulation.

The communication of MATLAB/Simulink models is realized with a special s-Function which implements the transfer protocol.

For other CAE-Tools other solutions were realized together with partners and customers. More interfaces are currently developed. The delivered samples in C and C++ can be easily adapted for other tools. The ITI development team looks forward to support you to realize a solution for your tool.

Co-Simulation with MATLAB/Simulink
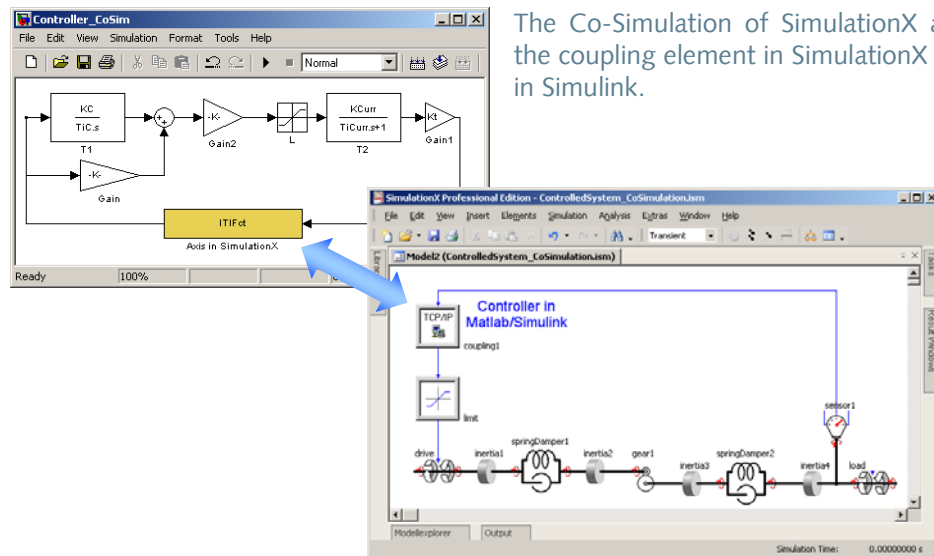
The Co-Simulation of SimulationX and Simulink uses the coupling element in SimulationX und an s-Function in Simulink.
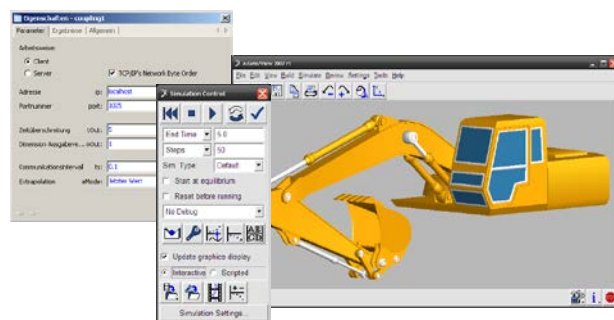
Co-Simulation with MSC.Adams

The coupling element allows the transfer of scalar values between a SimulationX model and an MSC.Adams model in both directions. The user must have valid licenses of both programs. SimulationX and MSC.Adams solve a subsystem of the complete task. The exchange of the user defined inputs and outputs are done in a fixed step time grid.

To use the coupling with Adams you need the SimulationX Co-Simulation interface with the option MSC.Adams. Adams Release 2007r2 is currently supported.

Die Co-Simulation uses the SimulationX coupling element (Library Signal elements / Coupling and Interfaces).

In MSC.Adams the coupling is realized with state-variables. For each input and output you have to create a state variable. The control of the simulation calculation is done by the Interactive Simulation Control of Adams/View.

Co-Simulation with CarSim, BikeSim, TruckSim

VehicleSim is a toolset for the efficient simulation of cars, trucks and motorcycles. SimulationX models and VehicleSim models are connected by using a special co-simulation block (included in the package *Co-Simulation/CarSim, BikeSim, TruckSim*) in the SimulationX model.