

# SIMPACK Realtime Car Model VDYM

Based on the unique SIMPACK Code Export the INTEC product range has been extended by a completely new realtime car model called SIMPACK VDYM. INTEC has partnered up with ETAS to come up with a highly sophisticated, and extendable vehicle model. SIMPACK VDYM is completely integrated in MATLAB/Simulink. It's main competitive edges are scalable model accuracy, realtime performance, open model structure, comprehensive parameterisation features and its close connection to SIMPACK off-line simulation models.

## APPLICATION FIELDS AND MAIN DESIGN GOALS

The design goals of SIMPACK VDYM have been chosen to be in-line with the application fields of mechatronic vehicle design. The model has to support and accompany the V-cycle development process in all stages for applications such as ABS, ESP, ABC, Steer-by-Wire, Brake-by-Wire, Drive Train, ECU-Networks, as well as ECU-function evaluation, like test reference for ECUs, model-, software-, hardware-in-the-loop configurations and off-line and realtime simulations. Also ECU-calibration in advance, which requires fine tuning and optimisation of ECU-controller parameters has to be supported. Finally, general functional mechatronic design studies for handling vehicle dynamics and concept studies have to be feasible by vehicle dynamics specialists and controller design specialists as well.

The wide range of applications for one model required a scalable model architecture ranging from a functional model to a highly detailed model such as in an off-line multi-body model approach. This goal has been achieved by taking a detailed SIMPACK model and exporting this model using Code Export. Another goal was a reliable and easy parameterisation process for physical parameters and model structure. The model was required to be open end extendable, so that model parts can be exchanged or modified. All model parameters have to be ac-

cessible during off-line and realtime simulation without the need of code re-generation and re-compilation. The integration and simulation platform should be independent from the hardware and therefore MATLAB/Simulink was chosen as the quasi standard. Finally, the model execution has to be possible on any standard industrial hardware and the sample times were aimed below 1 ms.

## BASIC STRUCTURE OF SIMPACK VDYM

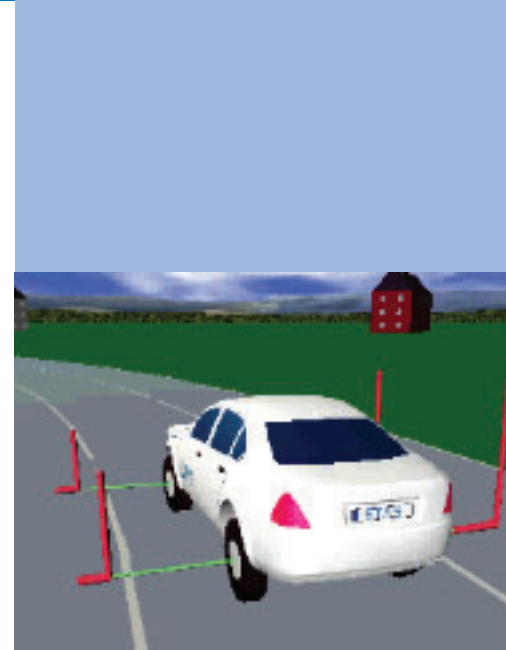
At the top-level, VDYM consists of a driver, an environment and a vehicle block. The driver allows for automatic and manual transmissions with gear switch logic, it includes a lateral and longitudinal controller and much more. The environment block contains track, friction and height definitions. The vehicle block contains the SIMPACK based vehicle dynamics as well as the engine model, drive-train model and brake hydraulics. The vehicle dynamics model is a S-function whereas all other model components are Simulink based with open structure and open source. The minimum requirements to run the model is having Simulink installed on your computer. Different add-ons, include a graphical user interface, animation, ADAMS/Car connector and a realtime connector, are available for SIMPACK VDYM.

In addition to the ready-to-use vehicle dynamics model, INTEC offers non-standard vehicle structures such as trucks, busses, motorbikes or substructures, for example 3D-drive trains for VDYM on a consultancy basis.

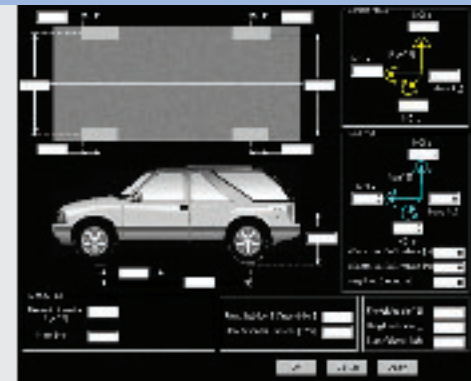
## INTRODUCTORY DAY

A free of charge SIMPACK VDYM information day to SIMPACK VDYM will be offered for interested parties. The exact date will be disclosed soon. We recommend contacting our Marketing Manager Ms. Erni Engert ([erni.engert@simpack.de](mailto:erni.engert@simpack.de)) in order to book in advance.

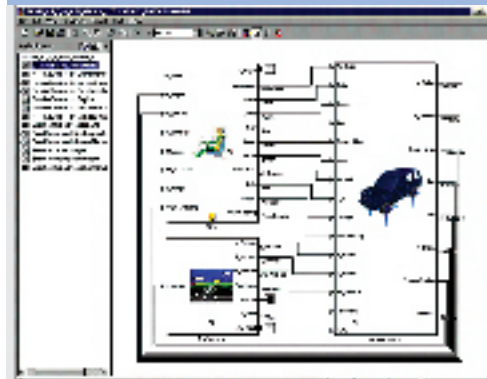
For more information on functionality and prices, please send an e-mail to [sales@simpack.de](mailto:sales@simpack.de).



VDYM Animation



VDYM GUI



VDYM Top Level Structure