VESYMA LIBRARY

Vehicle Systems Modelling and Analysis in Dymola

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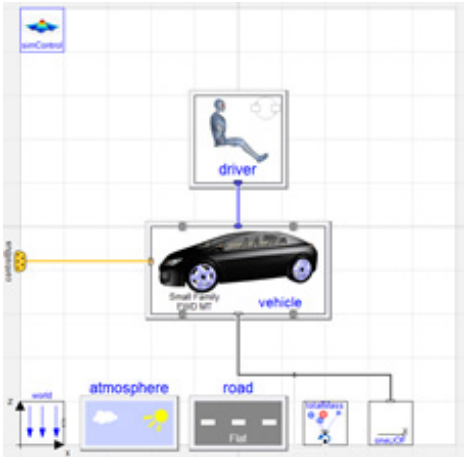
The VeSyMA Library serves two purposes: the first is to provide a common ancestor and base library to the wider VeSyMA suite of libraries (like VeSyMA – Suspensions, VeSyMA – Engines or VeSyMA – Powertrains). The second is to provide a platform for longitudinal drive cycle testing and concept evaluation.

The library features multiple vehicle templates for various vehicle layouts, including a full complement of simplified subsystem models, designed for fast simulation and placeholder roles in more detailed studies

APPLICATION

The VeSyMA (Vehicle Systems Modelling and Analysis) library is the cornerstone library of the wider VeSyMA suite. It provides a comprehensive framework for building and simulating complete vehicle models, with emphasis on longitudinal performance, drive-cycle testing, and concept evaluation. The library contains ready-to-use vehicle templates—covering internal combustion, hybrid, and electric configurations—alongside modular subsystems such as powertrains, drivelines, chassis, driver models, and environmental definitions.

Its architecture is based on the open-source Vehicle Interfaces library, allowing subsystems to be swapped, upgraded, or simplified without changing the overall vehicle structure. This supports rapidly iterating design ideas or comparing multiple configurations. VeSyMA supports both open- and closed-loop simulations, enabling engineers to examine vehicle responses to standardized drive cycles or virtual driver inputs.



USAGE

Using VeSyMA to conduct longitudinal evaluation of vehicles is simple.

1. Select one of the supplied vehicle templates as a starting point, then tailor the model by modifying subsystems and parameters. The templates represent common layouts—such as front-wheel drive, rear-wheel drive, all-wheel drive, and electric architectures—and include simplified but functional components for rapid setup.

2. Configure the driver model (open-loop, closed-loop and test), choose or define a drive cycle (e.g., NEDC, Artemis, FTP-75), and set environmental conditions such as road gradients, ambient temperature, and wind.

BENEFITS

Modular and scalable design

- Refine detail to areas of interest
- Easily increase fidelity in areas of interest
- Include subject specific extension libraries in VeSyMA vehicles

Wide applicability

- Templates for many common vehicle layouts
- Supports ICE, Hybrid, EV, Fuel Cell and Heavy Good Vehicles/Semi trucks

Common simplified components

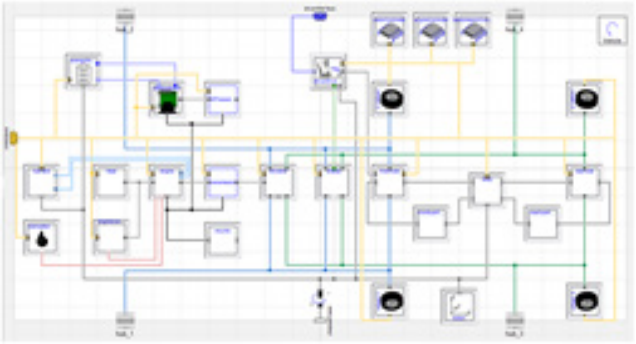
- Full library of simplified components
- Remove superfluous details from specific studies

Standard Modelica Connectors

- Ease of integrating other Modelica Libraries with VeSyMA vehicle models

KEY FEATURES

- Comprehensive vehicle templates for ICE, hybrid, Electric, and Fuel Cell drivelines
- Open & closed loop driver models, as well as test driver models
- CAN bus style control signal exchange between subsystems
- Atmospheric and road models
- Open-source template format from Vehicle Interfaces



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