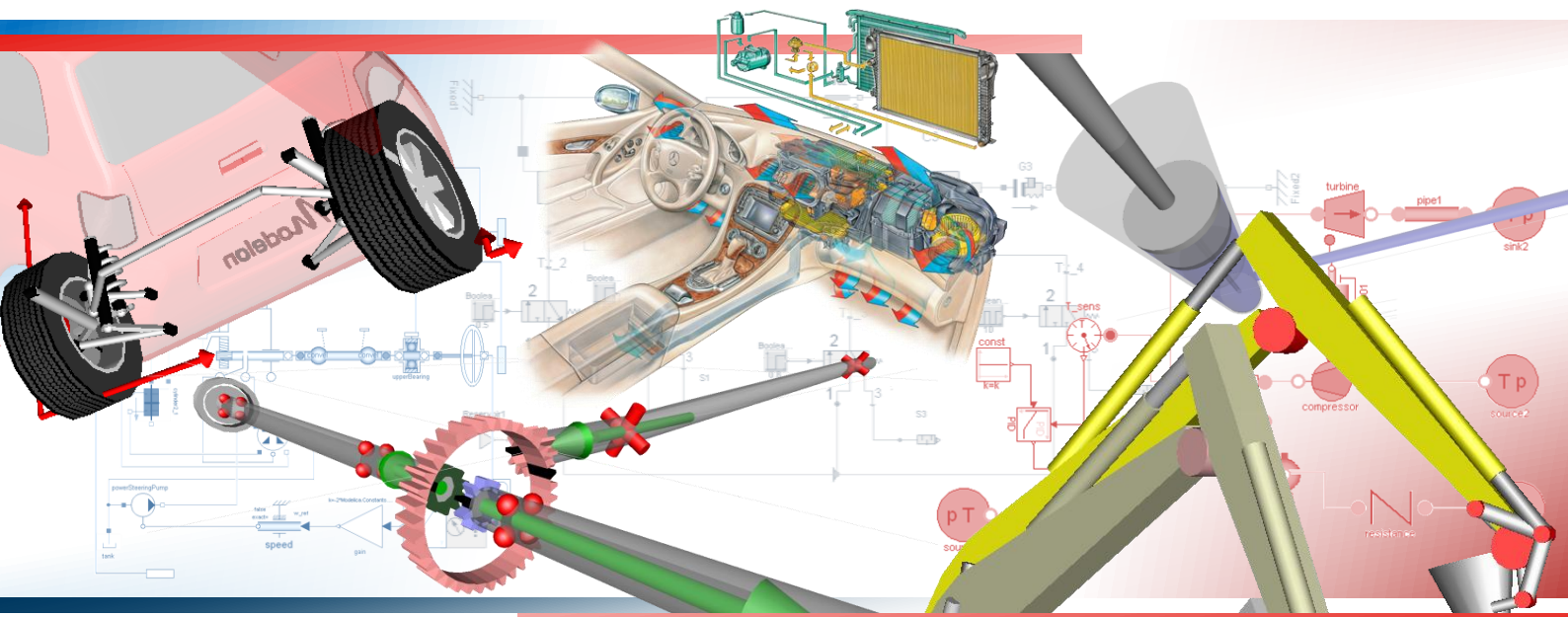# Modelon

Modelon specializes in advanced model-based engineering of complex technical systems. We offer unique know-how in physical modeling, simulation, analysis and optimization of dynamical systems. Our customers are found all over the world and represent a variety of application areas with emphasis on the aerospace, automotive, energy and process industries. We have the experience and knowledge to solve the most challenging problems and are proud to have some of the world's most renowned technology companies among our customers.

Full Modelica solutions provider – Modelon has a strong competitive edge in technology and solutions related to the Modelica language and takes an active part in the development of the language. We have profound expertise in systems design and engineering, covering modeling, simulation, analysis, control, and optimization. Customers benefit from our expertise in many ways thanks to our ability to provide full solutions, including reselling, training, consulting and product development.

Product Sales – Modelon is an appointed Value Added Reseller for the complete Dymola™ product line in Austria, Denmark, Germany, Finland Norway, Sweden, and Switzerland. With local offices offering both reselling, training and consultancy services we provide a close connection to our expertise, allowing us to better identify and target our customers' needs. In addition to Dymola we can also offer the product range from QTronic, including Testweaver™ and Silver™.

Training – Modelon standard training courses are offered on a regular regular basis at different levels, from beginner to advanced for Dymola, Modelica and our full product range. We also hold customized courses on regular basis, both at our premises and on-site when requested. Our engagement in the Modelica Association and the

experiences from our product development ensure that our courses are always up-to-date with the development of Modelica technology.

Consultancy Services – Our experience and knowledge allow us to build efficient and user-friendly libraries from scratch as well as customize existing libraries. We have successfully helped users to improve their in-house libraries, for example with respect to simulation, real-time performance, accuracy and robustness. The Modelon staff consists of modeling and simulation specialists from many different domains, which means that we have insight in different domain-specific problems. Of course, the key domain-specific expertise is often found with our customers so we take great care in using our combined knowledge to maximize the outcome of the projects.

Product Development – Modelon has a long tradition of library development, and the first library to be released, the Air Conditioning Library™, is fast becoming a de-facto industry standard for its field of application. Modelon continuously develops and extends its product portfolio and is the largest supplier of libraries for the Dymola product line. See the reverse side for more information on our products.

Template models make it straight-forward for Air Conditioning Library users to obtain results quickly.
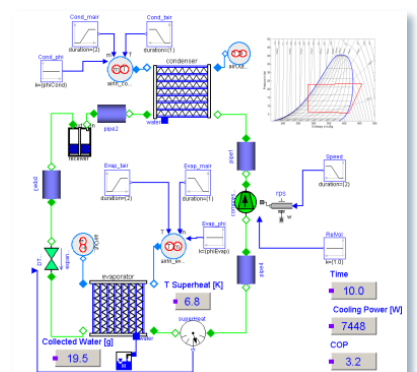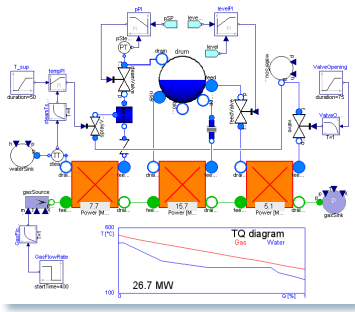
Heat recovery steam generator example from the Combi Plant Library, with closed loop controls and dynamic diagrams.

A/C and refrigeration – Using the Dymola Air Conditioning Library™ in Dymola makes it possible to optimize and verify the design of an air conditioning system from the early design phases through control design and implementation. The library models are based on several years of experience and validation in advanced research applications. ACL targets mainly automotive applications, but is general enough to be used for all kinds of refrigeration and air conditioning applications.

Road vehicle dynamics – The Dymola Vehicle Dynamics Library™ provides modeling, simulation and analysis of the dynamics of road vehicle motion. The library scope covers cars, heavy vehicles, construction equipment, and can easily be adapted for off-road and military vehicles. The library is targeted at facilitating engineering tasks such detailed suspension design, active safety system development, and driveline design and control. The modular infrastructure of the library makes it well suited to integration with subsystems from other libraries, for instance electrical and hydraulic systems.

Hydraulics system and component design – The Dymola Hydraulics Library™ contains models for hydraulic component and system design. Use it to optimize and verify the design of hydrostatic drive systems from the early design phases through control design and implementation. It is especially designed for multi-domain system modeling, e.g. hydraulics with controls, electrical drives and/or multi-body mechanics.

Pneumatics and compressible flow – The Pneumatics Library™ is dedicated to modeling, simulation and analysis of pneumatic systems. The inherent openness and multi-domain capabilities from Dymola and Modelica makes it the most flexible tool on the market. It is very well-suited for system and control design and handles real-time and HIL applications.
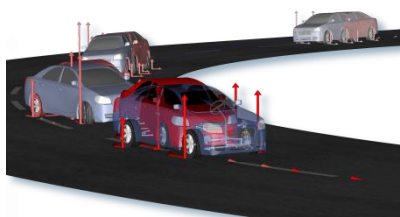
Braking while cornering evaluation of different active safety systems for improved stability. The modeling, virtual testing, and analysis are done with the Vehicle Dynamics Library.

Power plants and steam processes – The Combi Plant Library™ is a model library for the simulation of combined cycle power plants and heat recovery steam generators. It possesses all components for the dynamic simulation of such cycles and can be used both for steady-state performance evaluation and dynamic control tasks.

Hydro power – The Hydro Plant Library™ is designed to be an effective tool for commissioning, testing of new control strategies and development and verification of new hydro power plant designs. The library contains all the main components necessary for testing of a complete hydro power plant.

Electric power systems – One of the key purposes of the SPOT Library™ is to provide a common framework for both power-flow and transient representation of large electrical power systems. It is done by the separation of the non-perturbed three-phase sinusoidal dynamics of the system from its transient behavior.

Model regression management – A result of the internal work processes for Modelica library development at Modelon is the Regression Testing Library™. Among other things, it allows for powerful and user-friendly management of model test suites for library developers.

Experiment management and setup – To allow for more systematic handling of simulations, Modelon has developed the Dymola Excel Interface. It is well-suited for batch simulations, parameter sweeps, and calibration. It is also suitable for users with little or no Dymola or simulation knowledge as Excel provides a graphical user interface which most users are familiar with.

Hardware / Software in the loop – A core component for HIL/SIL is the organization and synchronization of the signal routing. Our SimLink software is developed for this purpose. SimLink can be viewed as a coupling panel where input and output signals from different clients are connected or linked via a graphical user interface. Features include sampled data feedback control, and to couple Dymola to PLC controllers via DDE or OPC protocols.

JModelica.org – This is Modelon's initiative to offer a community-based, free, open source, accessible, user and application oriented Modelica environment for optimization and simulation of complex dynamic systems, built on well-recognized technology and supporting major platforms. See **www.jmodelica.org** for more information.

Innovative concept for public transportation in densely populated areas, from NowaitTransit. The track geometry has been optimized using JModelica.org
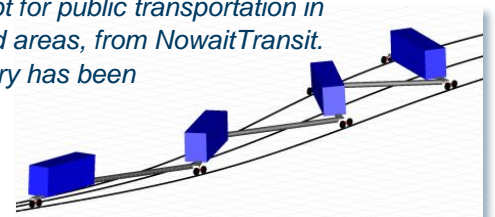
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