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Simcenter Amesim Cooling System library

Developing new design concepts for engines and power electronics

LMS/IL-DSS.31.4/16-001

Benefits
- Study the energy couplings of complete systems with full multi-domain compatibility
- Ensure sufficient flow to maintain the required and optimal temperature for critical engine parts
- Use a single model for flow rate distribution validation (isothermal) and warm-up simulations

Features
- Transient and steady-state simulation
- Graphical user interface that enables you to rapidly create new designs
- Easily input parameters from supplier data, measurements or data from technical drawings
- Hydraulic network analysis using isothermal, isentropic or full energy conservation assumptions

Summary
Fully dedicated to the design of engine or power electronics cooling systems, the Simcenter Amesim™ Cooling System library includes a wide range of components with various levels of complexity.

Based on a transient heat transfer approach, this library allows you to model the thermal-hydraulic behavior of cooling systems (energy transport, convection, pressure levels, flow rate distribution) and heat transfers through heat exchangers, and characterize specific components (thermostat, pumps, etc.) using constant operating points or drive cycles.

The Cooling System library helps you efficiently develop new design concepts. With a large collection of components, this library enables you to optimize the development of cooling systems, regardless of the operating point being studied.

Components
- Mission profile, ambient condition data
- Vehicle characteristics data and engine rotary speed calculation
- Centrifugal pump
- Controlled pump
- Two- and three-way thermostats with and without hysteresis effects
- Controlled three-way thermostat
- Heater component
- Immersion heaters and alternator
- Oil coolant heat exchanger
- Expansion tank with or without pressure cap
- Expansion tank with pneumatic port
- Exhaust gas recirculation (EGR) heat exchanger
- Engine component with or without EGR port

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Features *continued*

- Variable gas content with or without aeration and dissolution dynamics
- Adaptive graphical representation of the thermodynamic assumption and the specified aeration option
- Engine component with thermal port, with or without thermal capacity
- Engine thermal model based on macro-geometrical parameters
- Heat release from combustion chamber
- Radiator and fan components with imposed or calculated air velocity
- Radiator, fan and shutter components with imposed or calculated air velocity
- Condenser and compressor system
- Ambient temperature source
- Ambient temperature and air velocity source

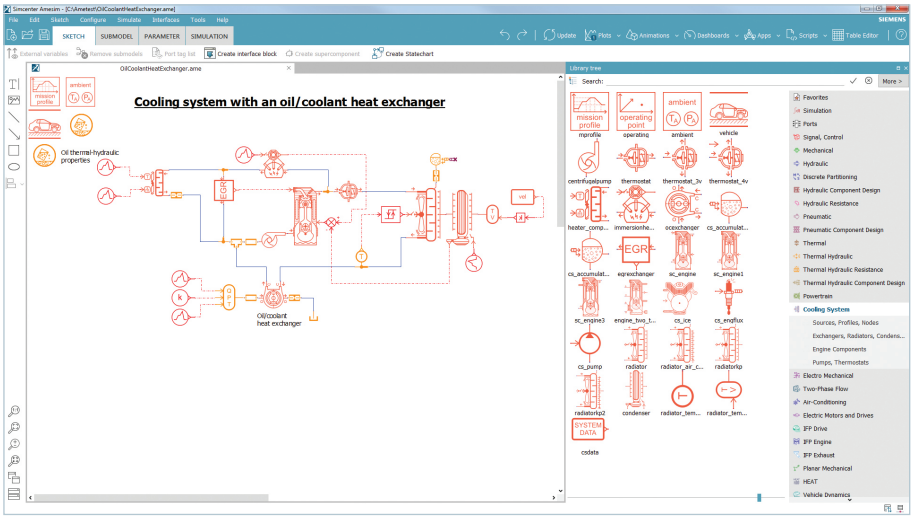
Prerequisites

The Cooling System library requires the following:

- Simcenter Amesim Base [IL-AME.01.1]
- Simcenter Amesim Thermal library [IL-DSS.21.2]
- Simcenter Amesim Thermal-hydraulic library [IL-DSS.22.3]

Supported hardware platforms

For details on supported hardware, minimum/recommended physical configurations and operating systems, please refer to the Simcenter Amesim fact sheet.



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