HumanComfort Library® *– enhanced version*
Human Comfort within Air-Conditioned Zones

HumanComfort | Modelica Library

developed by XRG Simulation GmbH
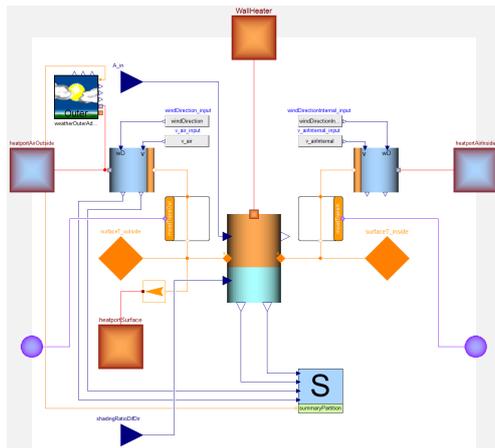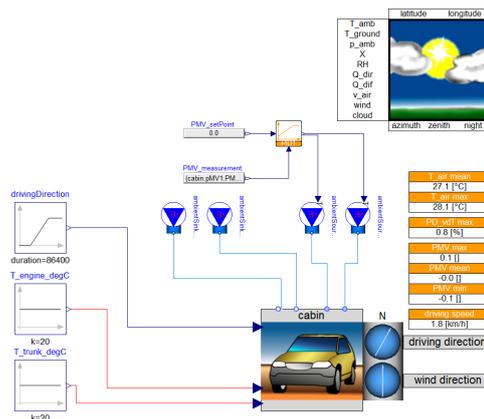distributed by BAUSCH-GALL GmbH

Humans feel comfortable within certain limits defined by thermal and personal factors, but energy systems are often optimized with regard to economical rules.
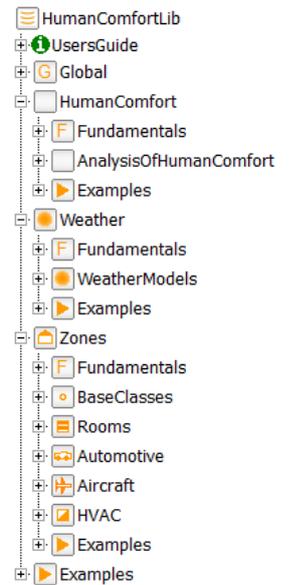
The Library contains basic models to estimate the thermal comfort of occupants or a group of occupants within an air-conditioned zone. The comfort results are provided in form of mathematical criteria and graphical visualizations.

- HumanComfortLib
  - UsersGuide
  - Global
  - HumanComfort
    - Fundamentals
    - AnalysisOfHumanComfort
    - Examples
  - Weather
    - Fundamentals
    - WeatherModels
    - Examples
  - Zones
    - Fundamentals
    - BaseClasses
    - Rooms
    - Automotive
    - Aircraft
    - HVAC
    - Examples
  - Examples

Multi-layer partition (wall or window)

Automotive cabin (pulldown simulation)

The HumanComfort Library was initially developed within the research project EUROSYSLIB and has been extended by modeling details like shading, 3D heat conduction for thermal bridges, condensation at cold surfaces (cooling ceilings, windows), more pressure loss models and CO_2 emission of occupants. The library has a modular approach consisting of three packages:

- HumanComfort: thermal comfort analysis
- Weather: weather model for annual simulation
- Zones: buildings, aircrafts and automotive models

The use of standardized interfaces enables an easy coupling to existing Modelica libraries (e.g. combination of automotive cabin models with AC models using Modelica.Fluid connectors). The user may also combine existing building simulation models with the HumanComfort module.

Highlights of version 1.3:

- Multi-layer walls can be simplified to one capacitive mass without changing parametrization.
- A new weather model allows changes of latitude and longitude during simulation. This enables long flight or driving scenarios.
- All parts of an automotive or aircraft zone have a common frame of reference. This allows turning cabins in all directions, dynamically.

Development
XRG Simulation GmbH, Hamburg, Germany (www.xrg-simulation.de)

Availability
HumanComfort Library 1.3 is available for Dymola
Tested on Dymola 2014 FD01 and Modelica Standard Library 3.2.1