

The Modelica *HouseModels* Library: Presentation and Evaluation of a Room Model with the ASHRAE Standard 140

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In this paper we present the *HouseModels* library, which will be made available free of charge in summer 2014, as part of our contribution to the IEA Annex 60. The library contains complete standard house models for one and multi-family dwellings, as well as a model for a single apartment. The models can be easily parameterized for different thermal masses and energy saving ordinances. These variations are useful when testing energy concepts and control strategies, as a robust system has to be able to adapt to different types of buildings.

Our motivation for creating this library is to bridge the gap between developers and users of Modelica for dynamic building system simulations. The models are easy to understand and use. Extra effort has been made to enrich the parameter window and to make the icons dynamic in regard to the chosen parameters (figure 1). In order not to confuse first time users

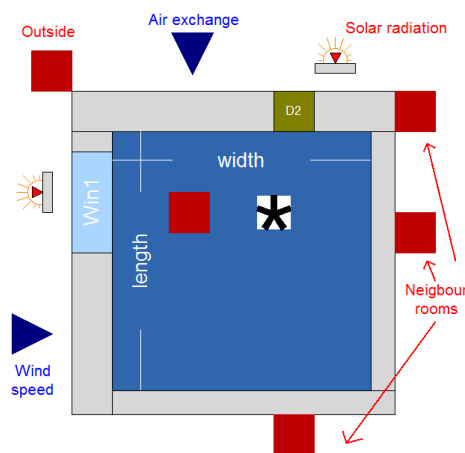


Figure 1: Icon for a room model

certain parameters have been set as protected and the parameterization of a room model can be done by specifying only a handful of parameters. This makes the library suitable for teaching purposes as well.

The set of room types developed for the one family dwelling can, if necessary, be parameterized differently than the standard model or extended in order to build up specific house models.

As we try to keep the models as simple as possible and as detailed as needed in order to have good CPU-times for the simulations, a validation of the room models is currently on the way. In this paper we present first results obtained with case 600 of the ASHARE Standard 140. For all the required outputs our room model produced results within the minimum and maximum specified ranges. We plan on further evaluating the models with the whole suite of tests and improving them if necessary.