BRUSHLESS DC DRIVES LIBRARY

Enables effective development of drive systems containing brushless DC drives

MODELING AND SIMULATION OF BRUSHLESS DC MOTORS AND CONTROLLERS

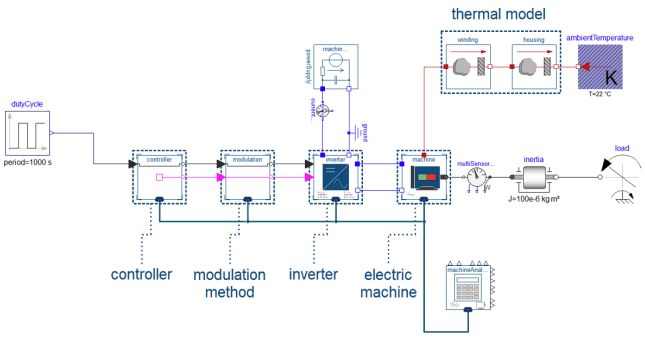
The Brushless DC Drives (BLDC) Library helps with designing and integrating BLDC drives into systems. It covers the key components of a BLDC drive with varying levels of complexity. From a DC-motor equivalent to a full PWM trapezoidal-field physical motor including suitable inverters and controllers, with motors sharing the same data set.

Being Modelica-based, it allows simple integration within other technical domains. Typical examples are mechanical loads and thermal models potentially from other commercially available or open libraries as well as custom-built. The generic template-based structure enables flexible adoptions and user-based extensions.

APPLICATION

The Brushless DC Drives library enables engineers to develop and quickly assess the performance of a complete drive, including the motor, the power electronics and the control software for speed or torque control.

The library offers models with a varying level of complexity, from DC-equivalent drives for fast computation and overall system simulation, up to detailed models to study, for example, voltage and current ripple effects. High performance models enable the validation of energy consumption for complete cycles and to estimate overload capabili-ties based on thermal models. All motors share a very similar set of data to enable quick replacement.



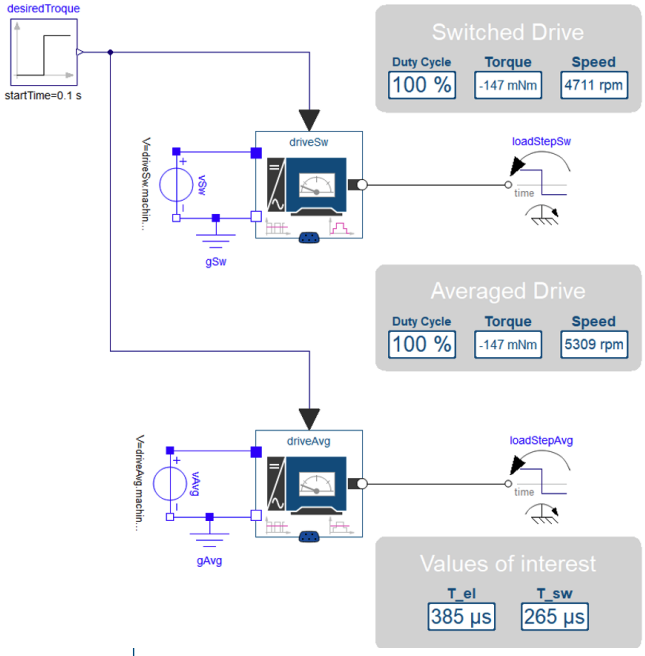
Overload operation with a second order thermal model

BENEFITS

- Covers a wide range of scenarios due to the different levels of complexity available
- Simple coupling with other technical domains with the high flexibility of Modelica
- Parameters and models can be added by the user, extending and specializing the functional-ity
- Brushless DC motor characteristics from datasheets can be easily transferred to the li-brary to assess the performance of existing mo-tors in the system

KEY FEATURES

- Speed/torque controller design of BLDC drives
- Power loss estimation of electric machine and thermal analysis
- Study the voltage- and current-ripple effect
- Compute the system energy consumption
- "Variant"-packages containing models with pre-defined parameters allow quick usage of most models



Investigation on differences between modeling levels

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Europe/Middle East/Africa
Dassault Systèmes
10, rue Marcel Dassault
CS 40501
78946 Vélizy-Villacoublay Cedex
France

Asia-Pacific
Dassault Systèmes
17F, Foxconn Building,
No. 1366, Lujiazui Ring Road
Pilot Free Trade Zone, Shanghai 200120
China

Americas
Dassault Systèmes
175 Wyman Street
Waltham, Massachusetts
02451-1223
USA