

Simulating motor drive systems made easy

The Motor Drive Module provides an easy and effective way of modeling and simulating motor drive systems.

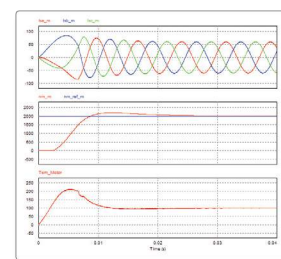
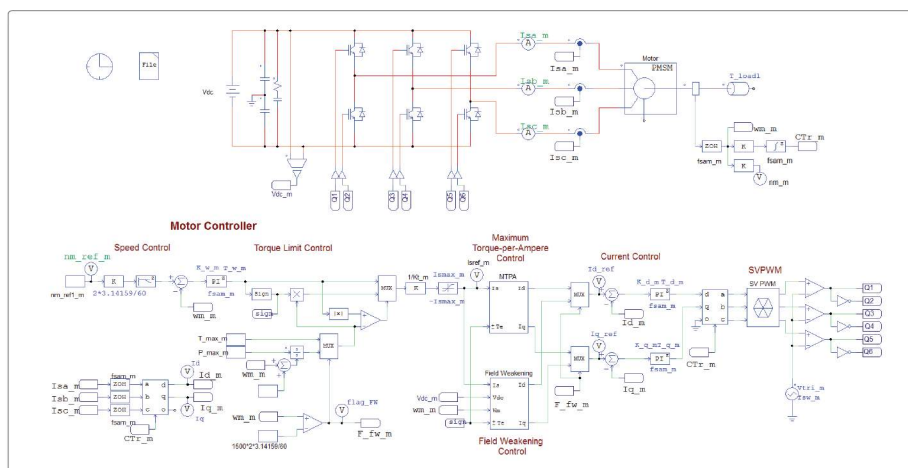
Analysis and design of a motor drive system is often a challenging task, due to the complexity in machine modeling and controller design. Such a task becomes considerably easier with the Motor Drive Module. Commonly used electric machine models, mechanical load models, and control blocks (such as Maximum-Torque-Per-Ampere Control and Field Weakening Control blocks) are provided. Using Motor Drive Module elements and other library elements, one can set up a motor drive system quickly and conveniently.

In addition, provision is given so that one can connect custom-built machine or load models to the models in PSIM, providing great flexibility.

The example below illustrates PSIM's capability to simulate motor drive systems. The system consists of a PMSM drive with current and speed control. Maximum-Torque-Per-Ampere control is implemented to achieve the maximum torque possible. Also, for this system, field weakening control must be used at high rotor speed as the dc bus voltage would not be high enough to maintain a normal operation.

FEATURES & BENEFITS

- ◆ Comprehensive electric machine library and mechanical load library
- ◆ Easy setup of motor drive systems
- ◆ Commonly used power and control blocks available
- ◆ Motor control loop stability analysis



Above: Simulation waveforms of the motor currents, rotor speed, and motor developed torque.

Left: PMSM drive system with maximum-torque-per-ampere control and field weakening control.