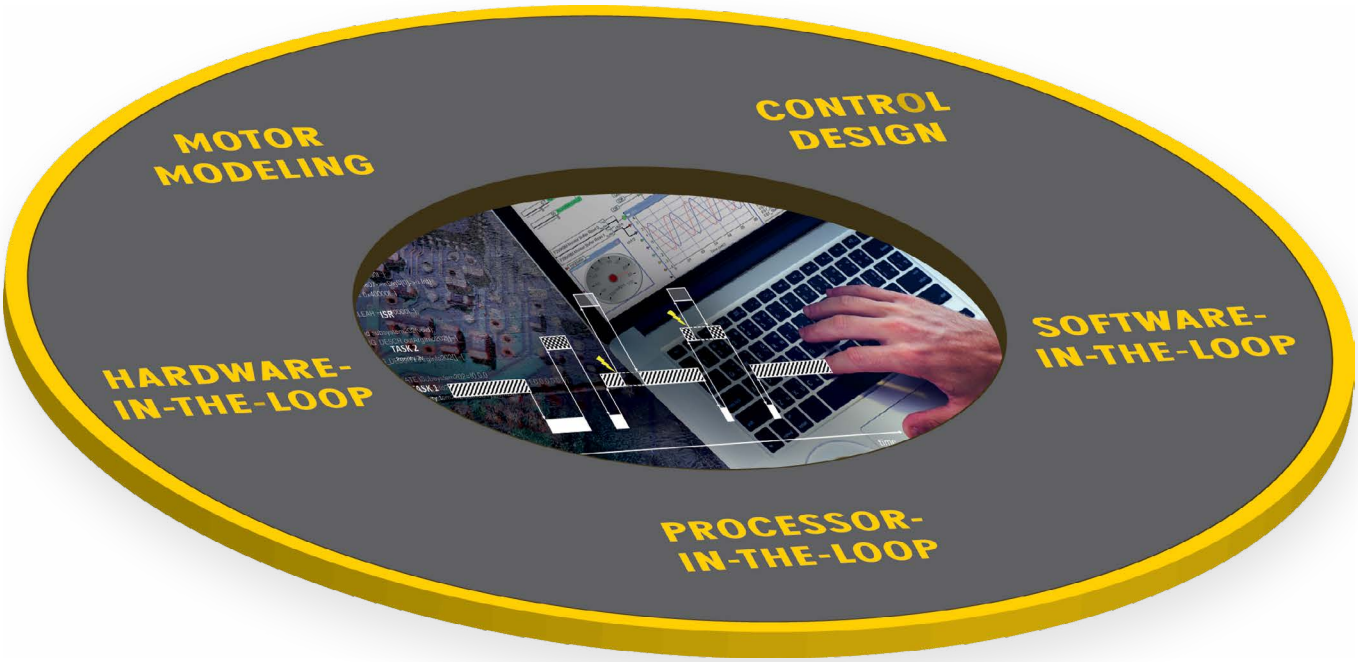
APPLICATION NOTE

Electric Drive Control

EMBED™
solidThinking®



solidThinking Embed provides a highly efficient environment covering all phases of developing control systems for electric drives. Its diagram-to-code capabilities frees electric drive engineers from manual coding and allows them to concentrate on developing the most optimal control system in the shortest time.

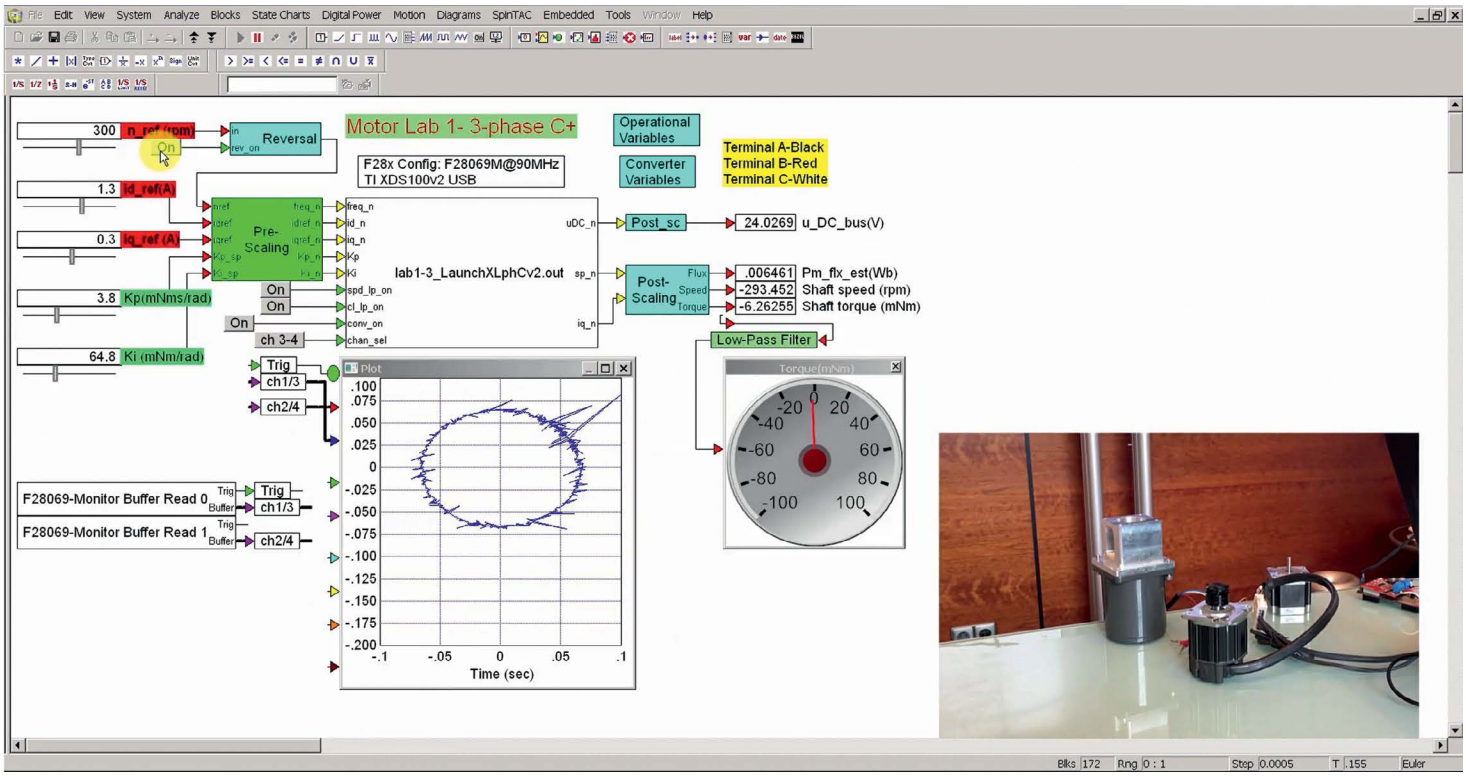
"All the drives I work on are extensively modeled in Embed. From the physics of motion, to DSP control loop detailed algorithms, to detailed analysis of PWM switching effects, Embed has modeled our drives and motors accurately and easily. Simply stated, Embed allows us to get to a robust error-free design faster."

George Yundt
Chief Engineer, Drive Technology, Kollmorgen

MOTOR MODELING AND CONTROL DESIGN

- Large list of motor control blocks making in-depth motor modeling easily achievable while the model based approach gives a clear overview of the models to engineers.
- Simulation and code generatable examples for sensored and sensorless control of AC Induction, BLDC, Brush, PMSM and Stepper motors to get designers quickly started.
- InstaSPIN™ support for motor identification and efficient sensorless field oriented control even at sub 1Hz rates.

Notable blocks: 16- and 32-bit digital motor control blocks, including PID, 3-Phase PWM Drivers, Space Vector Waveform Generators, Park and Clarke Transforms, Volts-to-Hertz Profiles, sensorless flux and rotor speed estimation, and quadrature-encoder-based speed calculator.



Hardware-in-the-Loop Set-up of a Field Oriented Control System

SEAMLESSLY MOVING FROM SOFTWARE-, PROCESSOR-, TO HARDWARE-IN-THE-LOOP

By just swapping a small number of blocks users can change their models from Software to Processor or Hardware in the Loop.

solidThinking Embed offers full peripheral support for a large family of microprocessors thus making hand coding obsolete and the transition to actual motor control seamless.

Models can be simulated and run in Hardware in the Loop simultaneously. solidThinking Embed is built with code efficiency being top priority, so the simulation-only elements and the hardware specific blocks can be disregarded in code generation and simulation respectively.

FAST TRACK DEVELOPMENT – EXPERT DRIVE SUPPORT

In collaboration with Prof. Dr. ir. Duco W. Pulle, founding member of the Texas Instruments InstaSPIN™ development team and author of multiple books for electric drive controls, solidThinking is offering a comprehensive set of application modules for real-time control and simulation of electrical drives.

These training modules can be easily adapted to specific user applications, which significantly shorten the development time.

"A key benefit to using Embed is its code generation capability and how quickly and fast it works. The speed of how its drivers work and being able to interface directly with our ROM code was really the most important benefit."

Dave Wilson,
Senior Motor Systems Engineer,
Texas Instruments

"Duco Pulle bundles state-of-the-art algorithms and software design tools so that the development of electric drives becomes not only a lot more productive, but also a fun experience."

Prof. Dr. ir. Ric W. De Doncker,
RWTH Aachen

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