Tools and software

Motor Control Development Toolbox

The motor control development toolbox is a comprehensive collection of tools that plug into the MATLAB®/Simulink® model-based design environment to support rapid application development with NXP® MCUs.

OVERVIEW

The motor control development toolbox offers support for motor control application development, enabling control engineers and embedded developers to help shorten project life cycles.

The motor control development toolbox includes:

- Integrated Simulink®-embedded target supporting NXP MCUs for direct rapid prototyping and processor-in-the-loop (PIL) development workflows
- Peripheral device interface blocks and drivers
- Target-optimized math and motor control algorithm blocks for efficient execution on the target MCU
- Bit-accurate simulation results in the Simulink simulation environment

The motor control development toolbox generates all the code required to start up the MCU and run the application code, while supporting builds with multiple compilers.

TARGET APPLICATIONS

- Aerospace and defense
- Automotive control design
- Embedded system development
- Industrial automation
- Machinery real-time systems

FEATURES

- Built-in support for direct code download to the target MCU through the RAppID Boot Loader utility
- Useful for applications outside of motor control
- Complimentary license
- Built-in support for NXP FreeMASTER—a real-time debug monitor and data visualization tool interface. It provides visibility into the target MCU for algorithm calibration and tuning, making it ideal for advanced control systems and those required by motor control development, with:
  - Monitor signals in real time on the embedded target
  - Data logging
  - Signal capture
  - Parameter tuning

MCU SUPPORT

Summary of Device Driver Blocks Provided													
MCUs:	CAN	SPI	PWM	ADC	GPIO	Timers	ISR	GDU	CTU	PDB	LIN	PTU	I²C
S32K MCUs	X	X	X	X	X	X	X			X	X	X	X
MPC564xL MCUs	X	X	X	X	X	X	X		X				
MPC567xK MCUs	X	X	X	X	X	X	X		X				
MPC574xP MCUs	X	X	X	X	X	X	X		X				
S12ZVM MCUs	X	X	X	X	X	X	X	X			X	X	
S12ZVC MCUs	X	X	X	X	X	X	X						X
Kinetis® V Series MCUs	X	X	X	X	X	X	X			X			X
MC56F82 MCUs	X	X	X	X	X	X	X						X

PRODUCT REQUIREMENT

- MATLAB® (32-Bit or 64-Bit)*
- Simulink
- MATLAB coder
- Simulink coder
- Embedded coder

*Earlier released products only support 32-bit

Support available via the NXP community at:
https://community.nxp.com/community/mbdt

Download the tool at **www.nxp.com/mctoolbox**

AUTOMOTIVE MATH AND MOTOR CONTROL LIBRARIES
EMBEDDED SOFTWARE AND MOTOR CONTROL LIBRARIES

General trigonometric and basic functions (GFLIB)
Trigonometric functions
Limitation functions
PI Controller functions
Linear interpolation
Hysteresis function
Signal Integration function
Sign function
Signal ramp function
General motor control functions (GMCLIB)
Clark transformation
Park transformation
Duty cycle calculation
Elimination of DC ripples
Decoupling of PMSM motors
General digital filters functions (GDFLIB)
Finite impulse filter
Moving average filder
First order infinite impulse filter
Second order infinite impulse filter
Mathematical Function Library (MLIB)
Absolute value
Add
Convert
Divide
Multiply accumulate
Multiply-Subtract
Multiply-Subtract-From
Multiply
Negative
Normalize
Bit shift
Shift
Subtract
Vector multiply accumulate

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