Tools and Software

Motor Control Development Toolbox

Overview

The motor control development toolbox is a comprehensive collection of tools that plug in to the MATLAB™/Simulink™ model-based design environment to support rapid application development targeting Freescale MCUs. The toolbox includes support for motor control application development and is designed to enable control engineers and embedded developers to meet the demands of shorter project life cycles. The motor control development toolbox includes an integrated Simulink-embedded target supporting Freescale MCUs for direct rapid prototyping and processor-in-the-loop (PIL) development workflows. The toolbox contains peripheral device interface blocks and drivers, target-optimized math and motor control algorithm blocks for efficient execution on the target MCU and bit-accurate simulation results in the Simulink simulation environment.

Development Tools

The motor control development toolbox generates all code required to start up the MCU and run the application code supporting builds with multiple compilers. Integrated into the toolbox are utilities to profile execution on the target MCU for rapid prototyping or PIL modes of operation.

The toolbox has built-in support for direct code download to the target MCU through the RAppID boot loader utility. Freescale's FreeMASTER real-time debug monitor and data visualization tool interfaces are also built in to provide an interface to monitor signals in real time on the embedded target as well as to support data logging, signal capture and parameter tuning. FreeMASTER provides visibility into the target MCU for algorithm calibration and tuning that is often required in advanced control systems and those required by motor control development.

Target Applications

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

MathWorks Product Requirement

- MATLAB (32-Bit or 64-Bit)*
- Simulink
- MATLAB Coder
- Simulink Coder
- Embedded Coder

*Earlier released products only support 32-bit

Product Part Numbers

Standard Suite: Motor Control Development Toolbox

- Perpetual node locked

  - Part number: CWP-MCTB-564xL-N

  - Part Number: CWP-MCTB-567xK-N

  - Part Number: CWP-MCTB-574XP-N

  - Part Number: CWP-MCTB-S12ZV-N

  - Part Number: CWP-MCTB-MKVxx-N

  - Part Number: CP-MCTB- MC56F82-N

Contact your local Freescale representative for more information.

Support Policy

Online help and documentation includes:

- 12-month technical support

- Free time-limited evaluation license available

Contact your local Freescale representative for more information

MCU Support

Summary of Device Driver Blocks Provided

MCUs	CAN	SPI	PWM	ADC	GPIO	Timers	ISR	GDU	CTU	PDB	LIN	PTU	I²C
MPC564xL	x	x	x	x	x	x	x		x				
MPC567xK	x	x	x	x	x	x	x		x				
MPC574XP	x	x	x	x	x	x	x		x				
MCS12ZVM	x	x	x	x	x	x	x	x			x	x	
MKV1x		x	x	x	x	x	x			x			x
MKV3x		x	x	x	x	x	x			x			x
MKV4x	x	x	x	x	x	x	x			x			x
MC56F82	x	x	x	x	x	x	x						x

Automotive Math and Motor Control Libraries

GFLIB

Trigonometric Functions	• GFLIB_Sin • GFLIB_Cos • GFLIB_Tan • GFLIB_Asin • GFLIB_Acos • GFLIB_Atan • GFLIB_AtanXY
Limitation Functions	• GFLIB_Limit • GFLIB_LowerLimit • GFLIB_UpperLimit • GFLIB_VectorLimit
PI Controller Functions	• GFLIB_ControllerPIr • GFLIB_ControllerPIrAW • GFLIB_ControllerPIp • GFLIB_ControllerPIpAW
Linear Interpolation	• GFLIB_Lut1D
Hysteresis Function	• GFLIB_Hyst
Signal Integration Function	• GFLIB_IntegratorTR
Sign Function	• GFLIB_Sign
Signal Ramp Function	• GFLIB_Ramp

GMCLIB

Clark Transformation	• GMCLIB_Clark • GMCLIB_ClarkInv
Park Transformation	• GMCLIB_Park • GMCLIB_ParkInv
Duty Cycle Calculation	• GMCLIB_SvmStd
Elimination of DC Ripples	• GMCLIB_ElimDcBusRip
Decoupling of PMSM Motors	• GMCLIB_DecouplingPMSM

GDFLIB

Finite Impulse Filter	• GDFLIB_FilterFIR
Moving Average Filter	• GDFLIB_FilterMA
First Order Infinite Impulse Filter	• GDFLIB_FilterIIR1init • GDFLIB_FilterIIR1
Second Order Infinite Impulse Filter	• GDFLIB_FilterIIR2init • GDFLIB_FilterIIR2

For more information, please visit freescale.com