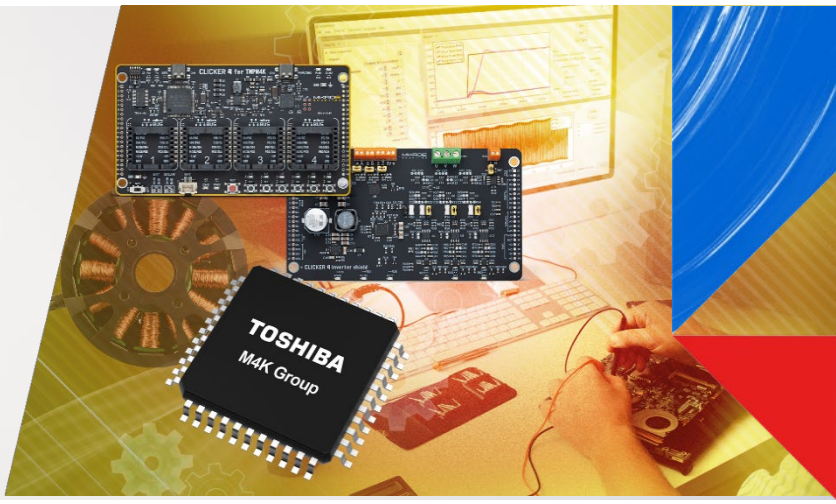
MCU Motor Studio Firmware & PC Tool

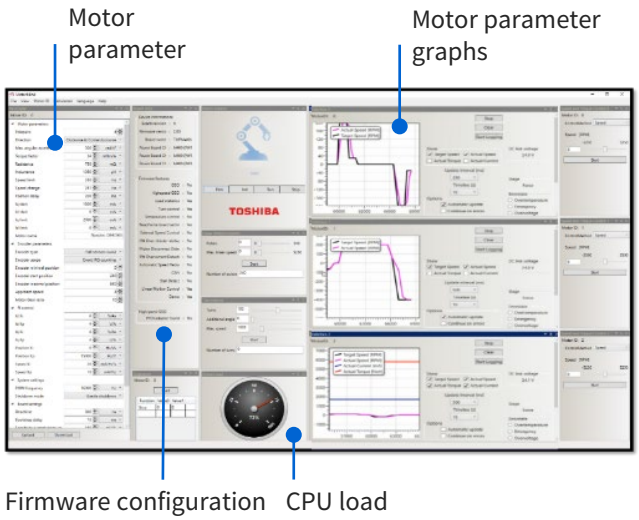


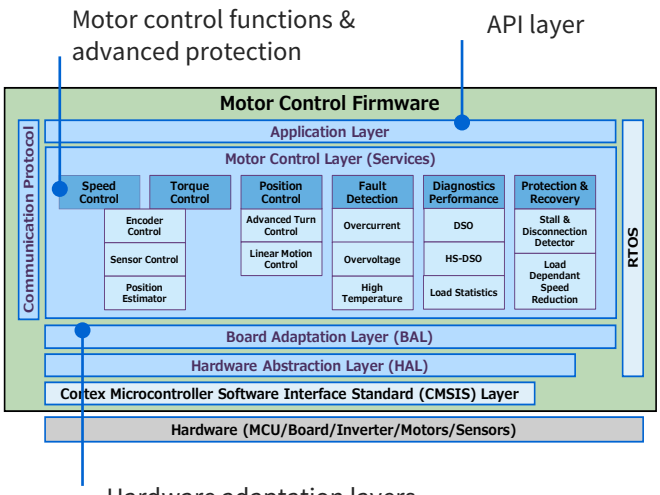
Speed, Torque & Position Control of Brushless DC Motors

MCU Motor Studio is an easy-to-use, well-structured, and versatile solution featuring two main components. The first is a motor control PC Tool allowing parameter configuration, drive control, real-time logging and diagnostics via high-speed UART. The second is the scalable, fully configurable motor control firmware for the TXZ+™ Family Advanced Class M4K & M3H Group. Motor Studio together with the Clicker 4 MCU board and the Clicker 4 Inverter Shield from MikroElektronika (MIKROE) allows quick and easy MCU evaluation, BLDC motor application development and prototyping.

Benefits

- Achieve the highest efficiency by Vector Control
- Quick start-up and configuration of BLDC motors
- Performance tuning by real-time data logging & diagnostics
- 1-shunt & sensorless options lead to system cost reductions
- Scalable firmware, easy to adapt to Toshiba motor MCUs and boards



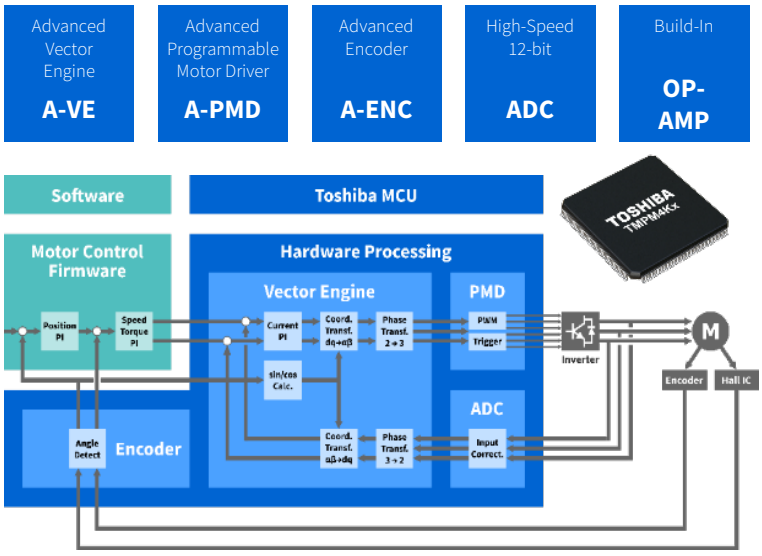


Motor Studio PC GUI

- Initial parameter configuration: motor, board, system
- Dynamic change of motor, system and PI parameters
- Digital Storage Oscilloscope (DSO) for live monitoring, & logging: target/actual speed, torque, current, temperature & DC Link Voltage real-time monitoring
- Runtime parameter inspections, tuning and recording

Motor Studio firmware

- Sinewave commutation & field oriented control (Vector Control)
- Speed, torque, position control method including sensor-less and 1/3-shunt current detection scheme
- Advanced protection & diagnostics: over current, over voltage, under voltage, over temperature, field stall & motor disconnection detection

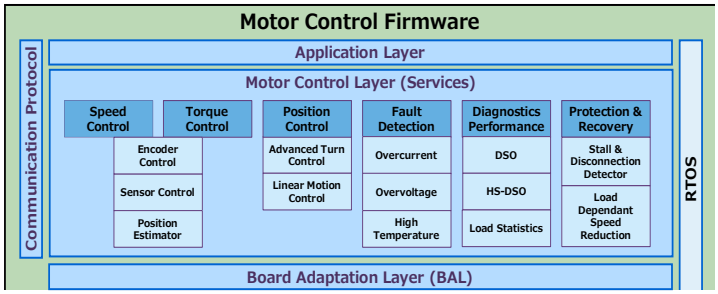


Full support of M4K's & M3H's dedicated motor control function

The MCU Motor Studio is designed for advanced Field-Orientated-Control (FOC) and supports all dedicated functions available in M4K motor MCUs: the built-in Vector Engine (VE) takes care for the complex vector control calculations and feeds the Programmable Motor Drive (PMD) block to generate the PWM waveforms and perform other necessary functions such as dead-time control. Sensor based position, speed and torque control is supported using the integrated encoder or can be achieved without a sensor by software algorithms.

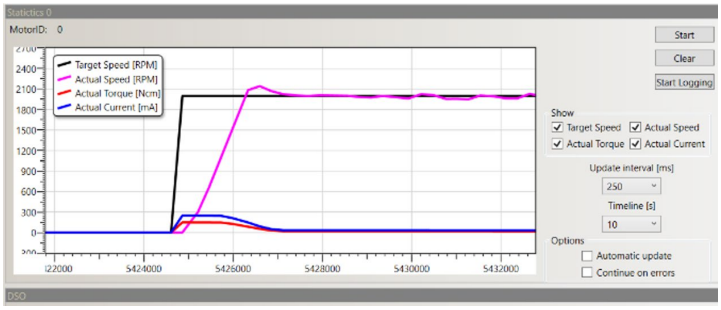
Advanced control & protection functions

- Zero current point detection
- Initial motor positioning
- Stop control – gentle break, short-break,
- Magnetic field stall recovery
- Load dependent speed reduction
- Over current / over voltage / under voltage / over temperature
- Field stall detection
- Motor disconnection detection



Debugging & tuning

- Digital Storage Oscilloscope (DSO)
- Graphical tracking of up to 4 parameters - target/actual speed, torque, current
- Scalable and zoom able chart
- Error state indication
- Temperature & DC link voltage real-time monitoring



MCU Motor Studio download

https://toshiba.semicon-storage.com/eu/semiconductor/product/microcontrollers/motor-studio.html

MIKROE clicker 4

for TMPM4K

https://www.mikroe.com/clicker-4-for-tmpm4k

for TMPM3H

https://www.mikroe.com/clicker-4-for-tmpm3h

Inverter shield

https://www.mikroe.com/clicker-4-inverter-shield