MC4-PLUS: Quad DC Motor Driver

The ***MC4-PLUS*** board is a small motor controller capable of driving up to four DC motor, using 100 Mbps Ethernet communication for commands and control data exchange.

Specifications	
Power supply	12..32V
Communication	Ethernet 10/100Mbps MAC with IEEE1588 capability. On board managed switch with dual 10T/100TX PHY ports, with auto-MDI/MDI-X protocol, CAN Bus, 1Mbps
Motor number, type	Four DC motors
Output current	1A continuous, 2A overcurrent protection
Microcontrollers	STM32F407VGT6, ARM Cortex M4. 168MHz clock
Incremental encoders	Magnetic and optical, w or w/o index up to 16.000 CPR (***LCORE***, ***ROIE***, ***ROIEL***)
Absolute encoders	Magnetic, SPI communication (***AEA*** and ***AEA2***), Analog Hall effect sensors
Alarms	Overcurrent, I2T, emergency button, sensor feedback, Ethernet communication, CAN communication, current sensors
Velocity loop speed	Up to 1KHz
Position loop speed	Up to 1KHz
Generated power supply	5Vcc ±3%, max. 450mA (CAN and SPI buses) 3.3Vcc ±3%, max 200mA (CAN and SPI buses)
Tools	Programming and debugging tools from ST, Kail, GNU, Raisonance, IAR and others. JTAG or USART download (with EMS-DWLD or EMS-TEST cards)
Operating conditions	0..50°C, humidity <85% without condensation
Dimensions [LWH]	80x30x11 mm
Weight	35 g

EMS4: Arm Cortex M4 based Ethernet Motor Supervisor

The **EMS4** card is a 32-bit Arm Cortex-M4 embedded microcontroller based device designed for managing several communication channels in robotic applications. Its main function is to provide the bridges among two Ethernet 10/100 base-T high-speed link, two CAN-2.0B buses and six SPI-master buses. When connected to external motor-driver cards (i.e. 2FOC, BLL/BLP or MCP/MC4), the EMS4 embedded microcontroller provides enough computational power to directly manage up to four motor control-loops.

Specifications	
Power supply	Operating: 9.5Vcc to 58Vcc
Communication	Ethernet 10/100Mbps MAC with IEEE1588 capability. On board managed switch with dual 10T/100TX PHY ports, with auto-MDI/MDI-X protocol, CAN Bus, 1Mbps
Microcontrollers	STM32F407VGT6, ARM Cortex M4. 168MHz clock
Incremental encoders	Magnetic and optical, w or w/o index up to 16.000 CPR (***LCORE***, ***ROIE***, ***ROIEL***)
Expansion buses	2 independent CAN 2.0B buses / 6 (3x2 multiplexed) SPI Master buses
Special functions	3 axes accelerometer: 16bit output, full scale 2g, 4g or 8g 3 axes gyroscope: 16bit output, full scales 250dps, 500dps or 2000dps
Expansion I/O	7 general purpose terminals configurable as digital I/O, incremental encoder inputs, PWM outputs, analog inputs (6 channels), and analog outputs (2 channel)
Generated power supply	5Vcc ±3%, max. 450mA (CAN and SPI buses) / 3.3Vcc ±3%, max 200mA (CAN and SPI buses)
Tools	Programming and debugging tools from ST, Kail, GNU, Raisonance, IAR and others. JTAG or USART download (with EMS-DWLD or EMS-TEST cards)
Operating conditions	0..50°C, humidity <85% without condensation
Dimensions [LWH]	58x42x11 mm (2.28x1.65x0.43 in)
Weight	17g