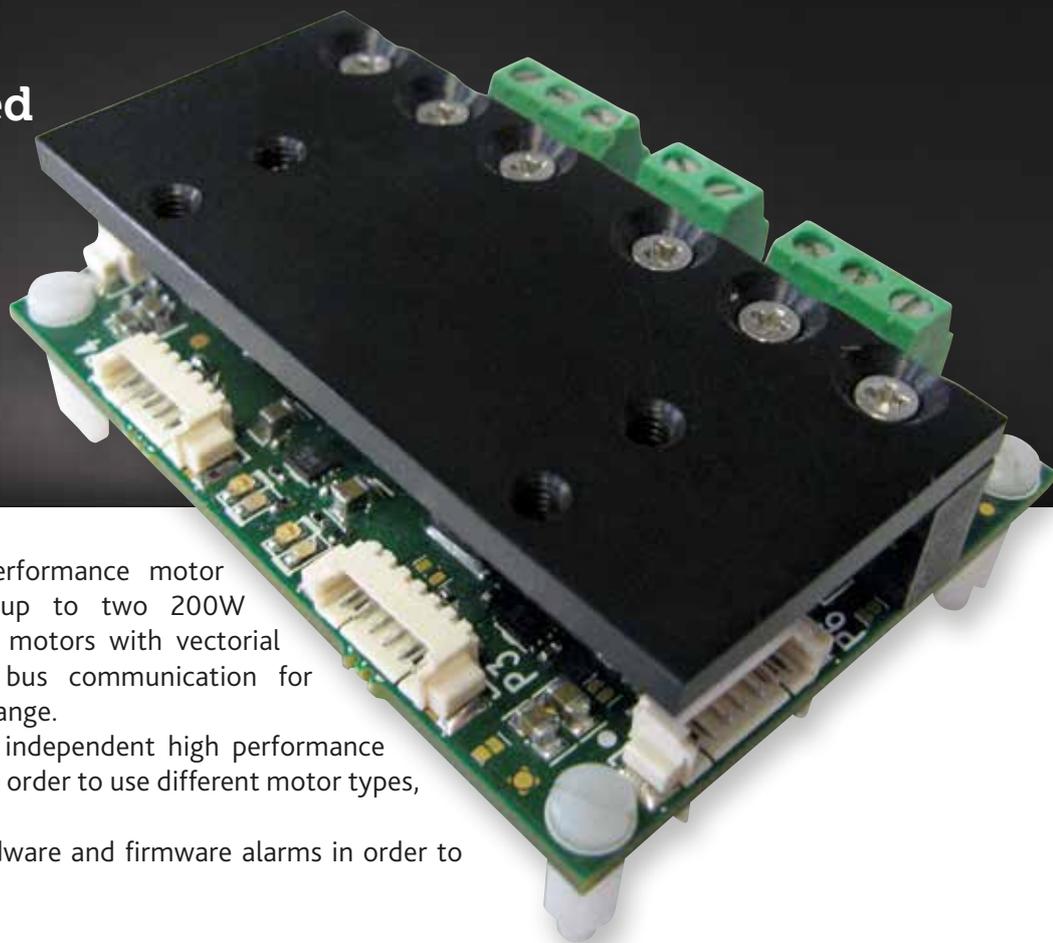


2FOC

Dual Field Oriented Controller for brushless motors



The **2FOC** board is a high performance motor controller capable of driving up to two 200W permanent magnet synchronous motors with vectorial algorithms (FOC), using CAN bus communication for commands and control data exchange.

The board is provided with two independent high performance DSPs and is highly configurable in order to use different motor types, sensors or control loops.

The board uses a mixture of hardware and firmware alarms in order to safely detect fault conditions.

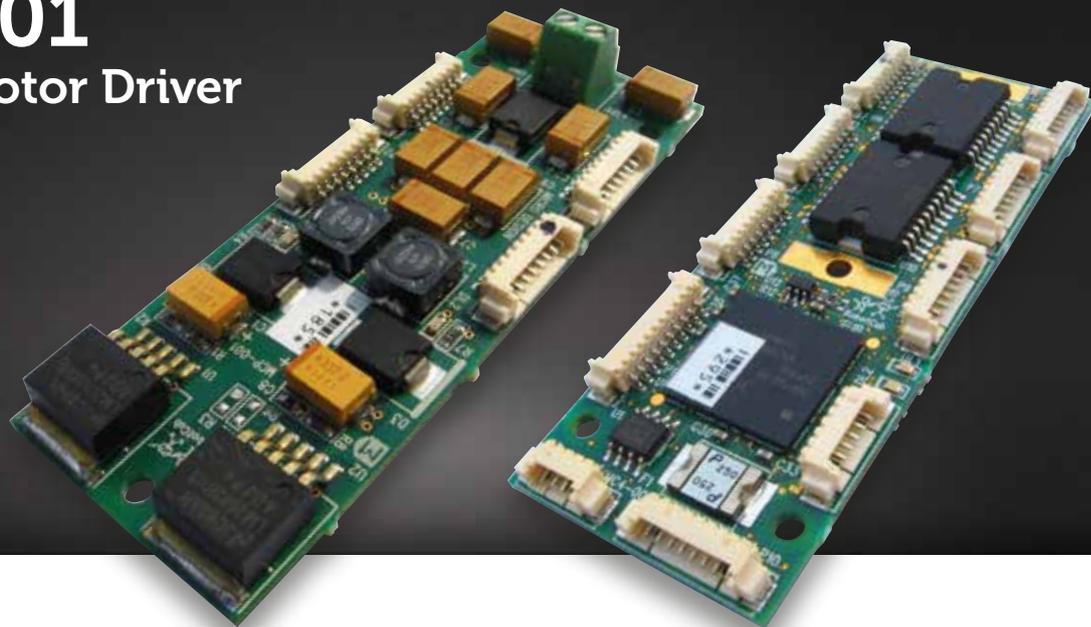
Specifications

Power supply	18V to 48V (max 75V peak)
Communication	CAN Bus 2.0B, 1Mbps
Motor number, type	Two, three phase Permanent Magnet Synchronous Motor (PMSM) or Brushless DC
Output current	5A continuous, up to 20A I2T limited
Microcontrollers	dsPIC33F802 16bit, 40MIPS, 128K Flash, 16K RAM, CAN, SPI
Incremental encoders	Magnetic and optical, w or w/o index up to 16.000 CPR (see LCORE , ROIE , ROIEL info sheet)
Absolute encoders	Magnetic, SPI communication (see AEA and AEA2 info sheet), Hall effect sensors
Brake energy recovery	With (required) external capacitor
Alarms	Overcurrent, overvoltage, undervoltage, I ² T, emergency button, sensor feedback, CAN communication, memory, current sensors
Current loop speed	20 to 40KHz depending on encoder choice
Velocity loop speed	Up to 2KHz
Position loop speed	Up to 1KHz
Torque sensing	Via CAN bus when used with 6SG board or FTSensor
Utilities	In field reprogramming, drive configuration, graphical data analysis
Operating conditions	0 to 50°C, humidity <85% without condensation
Dimensions [LWH]	58x42x17 mm
Weight	44g

MC4-001

MCP-001

Quad DC Motor Driver



The **MC4** board is a small motor controller capable of driving up to four brushed DC motors, using CAN bus communication for commands and control data exchange. This is complemented by a small power supply board (MCP).

Specifications

Power supply	12 to 24V
Communication	CAN Bus 2.0B 1Mbps
Motor number, type	4 Brushed DC motors
Output current	1A continuous, 2A overcurrent protection
Microcontrollers	Freescale DSP56F807, 80MHz, 144KB Flash, 8KB SRAM, 2KB EEPROM
Incremental encoders	Magnetic and optical, with an index up to 16.000cpr (see LCORE , ROIE , ROIEL info sheet)
Absolute encoders	Magnetic, SPI communication (see AEA and AEA2 info sheet), Analog Hall effect sensors
Alarms	Overcurrent, I ² T, emergency button, sensor feedback, CAN communication, current sensors
Velocity loop speed	Up to 1KHz
Position loop speed	Up to 1KHz
Utilities	In field reprogramming, the board can be either stacked or connected trough a cable
Operating conditions	0 to 50°C, humidity <85% without condensation
Dimensions [LWH]	MC4 80x30x9mm / MCP 80x30x11mm
Weight	MC4 20g / MCP 20g

EMS4

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
Microcontroller	STM32F407VGT6, ARM Cortex M4 168MHz clock
Memory	256KB Flash ROM, 64KB SRAM and 64KB non-volatile EEPROM
Communications	Ethernet 10/100Mbps MAC with IEEE1588 capability. On board managed switch with dual 10T/100TX PHY ports, with auto-MDI/ MDI-X protocol
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 \pm 3%, max. 450mA (CAN and SPI buses) / 3.3Vcc \pm 3%, max 200mA (CAN and SPI buses)
Tools	Programming and debugging tools from ST, Kail, GNU, Raisonance, IAR and others. JTAG or USART download
Operating Conditions	0°C to 50°C, relative humidity <85% (operating)
Dimensions [LxWxH]	58x42x11 mm (2.28x1.65x0.43 in)
Weight	17g

BLL-001

BLP-001

Dual Brushless Motor Driver



This motor controller is made of two separate boards. The BLL contains the logic circuits, while the BLP includes the power drivers. The controller is capable of driving up to two 250W Brushless DC motors using CAN bus communication for command and control data exchange.

Specifications

Power supply	18V to 48V
Communication	CAN Bus 2.0B 1Mbps
Motor number, type	Two Brushless DC
Output current	7A continuous, up to 25A I ² T limited
Microcontrollers	Freescale DSP56F807, 80MHz, 144KB Flash , 8KB SRAM, 2KB EEPROM
Incremental encoders	Magnetic and optical, with index up to 16.000cpr (see LCORE , ROIE , ROIEL info sheet)
Absolute encoders	Magnetic, SPI communication compatible with AEA-001 and AEA-002 (see info sheet), Hall effect sensors
Alarms	Overcurrent, overvoltage, undervoltage, I ² T, emergency button, sensor feedback, CAN communication, current sensors
Velocity loop speed	Up to 1KHz
Position loop speed	Up to 1KHz
Utilities	In field reprogramming, the board can be either stacked or connected trough a flat cable
Operating conditions	0 to 50°C, humidity <85% without condensation
Dimensions [LxWxH]	BLL 58x42x10mm / BLP 58x42x18mm
Weight	BLL 16g / BLP 47g