



# AM controller series

The AM is the lightest standard member of the ESC3 controller family. It can be used in wide range of applications, especially in industrial and automotive. Using most modern technologies it achieves extreme dynamics and maximal efficiency, it implements smooth start or regenerative braking, all this with minimum dimensions. The AM controller is capable of driving all common types of electric motors.

## Applications:

- Automotive or Industrial motor control
- Electric hand tools and equipment
- Hi-end e-bikes, surf boards
- Combustion engine starter-generators
- Military inertial stabilization
- Professional drones, RC models
- Research & development
- Servo drive



## Features

- Motors: PMSM (BLDC, BLAC), Induction, Stepper
- Vector drive with DTC and FOC
- Block commutation Drive with DTC and hybrid sensorless control
- Zero-RPM sensorless control
- MOS-FET power stage with all kinds of protection incl. Phase short circuit
- Designed for highest dynamic response

## Firmware

- State-of-the-art sensorless control (including zero-RPM)
- Speed / Torque / Voltage control
- Proportional regenerative braking
- Flux weakening operation together with MTPA control for PMSM
- Advanced auto-diagnostics and fail-safe modes
- Motor parameters automatic identification
- Service logging (max. amps and rpm, total motor-hours, mileage, etc.)
- Deep customization with custom firmware branches

## Motor sensors

- Motor temperature sensor
- UVW Hall sensors
- Resolver / Sin-Cos
- SSI / BiSS
- A/B encoder

## Electrical parameters

Version	0420	0610
Batt. Nominal voltage	28.8 V DC	43.2 V DC
Battery configuration	8 S	12 S
Min. operating voltage	12 V DC	12 V DC
Max. operating voltage	34 V DC	51 V DC
Nominal power (60min, BLDC)	1 850 W <sup>1</sup> , 1 300 W <sup>2</sup> , 860 W <sup>3</sup>	2 100 W <sup>1</sup> , 1 500 W <sup>2</sup> , 950 W <sup>3</sup>
Nominal current (60min, BLDC)	65 A <sup>1</sup> , 45 A <sup>2</sup> , 30 A <sup>3</sup>	50 A <sup>1</sup> , 35 A <sup>2</sup> , 22 A <sup>3</sup>
Power dissipation	20 W <sup>1</sup> , 10 W <sup>2</sup> , 5 W <sup>3</sup>	20 W <sup>1</sup> , 10 W <sup>2</sup> , 5 W <sup>3</sup>
Peak power (10sec)	4 300 W <sup>1,2</sup> , 2 700 W <sup>3</sup>	4 300 W <sup>1,2</sup> , 2 300 W <sup>3</sup>
Peak current (10sec)	150 A <sup>1,2</sup> , 95 A <sup>3</sup>	100 A <sup>1,2</sup> , 75 A <sup>3</sup>

<sup>1</sup> Controller mounted inside the aluminium enclosure, thermally connected to infinite heatsink which does not exceed 60°C

<sup>2</sup> Controller mounted inside the aluminium enclosure, placed in still air of temperature 25°C

<sup>3</sup> Controller mounted in shrinking tube, placed in still air of temperature 25°C

**\*Variant 0420 is available only on request**

## Control I/O

- 2x analog inputs
- 2x digital inputs
- On / Off input switch, safety switch
- 2 x digital outputs with PWM (open-collector, 2 Amps)

## Wiring

- Power: solder pads, 15 cm AWG12 wires, Amass, HIGO connectors or cable lugs
- Signal & communication: JST JWPF, HIGO or RC connectors

## Connectivity

- Multiple addressed interfaces for service, debugging, application and firmware management
- USB, RS-232 (galvanically isolated), CAN-bus (galvanically isolated), external WIFI dongle

## Software tools

- Service tools: CLI for fast and effective set-up, GUI for easy set-up, Graphing and visualization tool
- Firmware update and remote management tool
- Custom software for PC or mobile devices can be designed on request

## Mechanical characteristics

- Aluminum housing: 89 x 34,5 x 13 mm, 140 g
- Shrinking tube: 80 x 30 x 10 mm, 90 g

