



# SL controller series

The SL is automotive grade controller from ESC3 family, it can deliver maximum power whilst keeping weight as low as possible. It can be used in wide range of applications, especially in industrial and automotive. Using the most modern technologies it achieves extreme dynamics, maximum efficiency, sensorless control or regenerative braking, all kinds of protection or galvanic isolation, all this with minimum dimensions. The SL controller is capable of driving all common types of electric motors.

## Applications:

- Automotive or Industrial motor control
- Hi-end sport motorbikes, e-bikes
- 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
- Charge step-up conversion and SOC estimator with current and voltage logging
- Capacitors pre-charge option

## 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 ....)
- 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	0660	0860	1060	1240
Batt. Nominal voltage	43.2 DC	57.6 V DC	72 V DC	84.6 V DC
Battery configuration	12 S	16 S	20 S	24 S
Min. operating voltage	18 V DC	18 V DC	18 V DC	18 V DC
Max. operating voltage	51V DC	68 V DC	84 V DC	101 V DC
Nominal power (60min, BLDC)	17 700 W	21 300 W	24 500 W	23 300 W
Nominal current (60min, BLDC)	410 A	370 A	340 A	270 A
Power dissipation	300 W <sup>1</sup>	300 W <sup>1</sup>	300 W <sup>1</sup>	300 W <sup>1</sup>
Peak power (10sec)	25 900 W	28 800 W	36 600 W	34 500 W
Peak current (10sec)	600 A	500 A	500 A	400 A

<sup>1</sup> Controller bottom pad thermally connected to infinite heatsink which does not exceed 60°C  
**\*variant 1240 is available only on request**

## Control I/O

- 5x analog or digital GPIO (range from 0 v to BATT+)
- Up to 5 galvanically isolated analog or digital inputs
- On / Off input switch, safety switch, capacitor pre-charge
- 3x contactor output with PWM and current control
- Charge input up to 25 A with current measurement

## Wiring

- Power: M6 terminals
- Signal & communication: AMPSEAL 35-pin connector

## 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

- Box with aluminium bottom pad: 148 x 96 x 64 mm, 1100 g

