

BAC 2000 | BAC 4000 | BAC 8000

# High Power Controllers

**The Controller is the Experience!**

The ASI BAC 2000, BAC 4000 and BAC 8000 are a series of high density motor controllers that utilizing the latest in sinusoidal flux vector control to ensure smooth and quiet brushless DC motor operation and efficient vehicle operation. They can operate over a nominal battery voltage range of 36VDC to 72VDC.

A robust MOSFET-based three phase bridge provides peak efficiencies in excess of 95%, no audible noise. In addition to Hall sensor based motor commutation, sensorless commutation is also supported.

Programmable performance mapping allows throttle and regenerative braking inputs to be adjusted via an optional vehicle display or ASI's BAC Door™ PC configuration. Engineering software to meet specific performance requirements.

Numerous programmable protection features including motor/controller temperature, battery over/under voltage, and motor/battery current limits increase controller and motor longevity.

## Features

- Can be attached to additional heat sinking to significantly increase performance
- CAN OPEN optional, Bluetooth optional
- PWM drive for low ripple current and silent drive
- Field oriented control for increased efficiency and smooth motor operation
- Multiple analogue and digital inputs
- Support multiple sensor configurations
- Single pulse and quadrature pedal or wheel speed inputs
- Analog and voltage model based battery management system interfaces
- Sensorless or hall commutation with automatic switching
- Configurable throttle, brake cut-off and regeneration options
- Fault protection including:
  - Bus over and under voltage
  - Motor over current
  - Motor and controller over temperature
  - MOSFET bridge self tests
  - Battery SOC foldback

| INPUT SPECIFICATIONS |     |   |            |          |         |
|----------------------|-----|---|------------|----------|---------|
| TYPE                 | QTY | DESCRIPTION   | VOLTAGE    | VMIN     | VMAX    |
| Hall sensor inputs   | 3   | Non isolated, diode protected to 50V max<br>Used for motor commutation<br>Max frequency: 1000 Hz<br>Min pulse width: 40 µsec  | Logic Low  | 0 VDC    | 0.5 VDC |
|                      |     |   | Logic High | 3.5 VDC  | 5 VDC   |
| Digital inputs       | 2   | Non isolated, diode protected to 50V max<br>Used for pedal first sensor and cruise control related features<br>1 kHz sampling rate<br>Max frequency: 500 Hz<br>Min pulse width: 40 µsec | Logic Low  | -0.3 VDC | 1.2 VDC |
|                      |     |   | Logic High | 3.3 VDC  | 5.3 VDC |
| 5V analogue inputs   | 3   | Non isolated, resistance protected to 30V max<br>Single ended<br>Min 10 bit resolution<br>Used for throttle, brakes, and motor temperature  | Analogue   | 0 VDC    | 5 VDC   |
| 12V analogue inputs  | 1   | Non isolated, resistance protected to 30V max<br>Single ended<br>Min 10 bit resolution<br>Used for BMS  | Analogue   | 0 VDC    | 12 VDC  |

# High Power Motor Controllers.

## Smooth Performance. Silent.

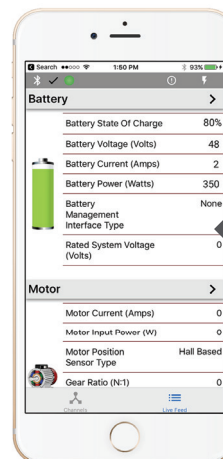
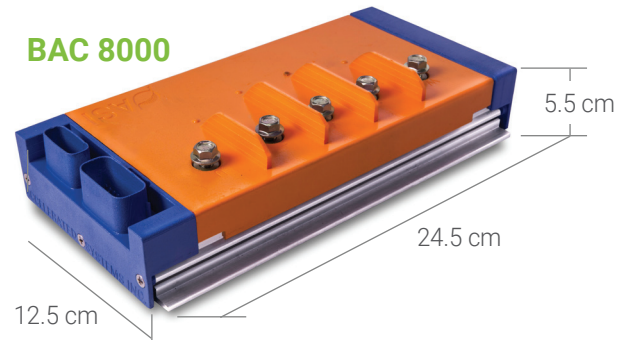
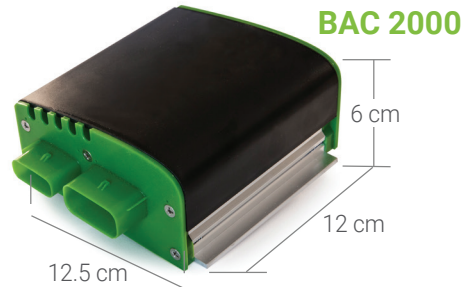
## Configurable. Reliable.

| INPUT (ALL CONTROLLERS) |                       |
|-------------------------|-----------------------|
| FEATURE                 | RATING                |
| Nominal Input Voltage   | 36-72 Volts           |
| Input Power             | Software configurable |

| OUTPUT PEAK PHASE CURRENT |          |
|---------------------------|----------|
| MODEL                     | RATING   |
| BAC 2000                  | 150 Amps |
| BAC 4000                  | 460 Amps |
| BAC 8000                  | 860 Amps |

| CONTROLLER PERFORMANCE                  |                                 |
|---|---------------------------------|
| DESCRIPTION                             | RANGE                           |
| Speed regulation                        | +/- 5% at top speed             |
| Minimum motor phase to phase inductance | 60 uH                           |
| Motor control scheme                    | Sinusoidal field oriented (FOC) |
| Motors supported                        | PMAC and BLDC                   |

| AVAILABLE OPTION CUSTOM PROTOCOL COMBINATIONS |      |                             |
|---|------|-----------------------------|
| CAN   | with | <b>Bluetooth (STANDARD)</b> |
| CAN   | with | <b>TTL-232</b>              |
| TTL-232                                       | with | <b>RS-485 (CUSTOM)</b>      |
| TTL-232                                       | with | <b>Bluetooth (CUSTOM)</b>   |



Includes BACDoor software to fine tune performance. Available for OEM customers.

