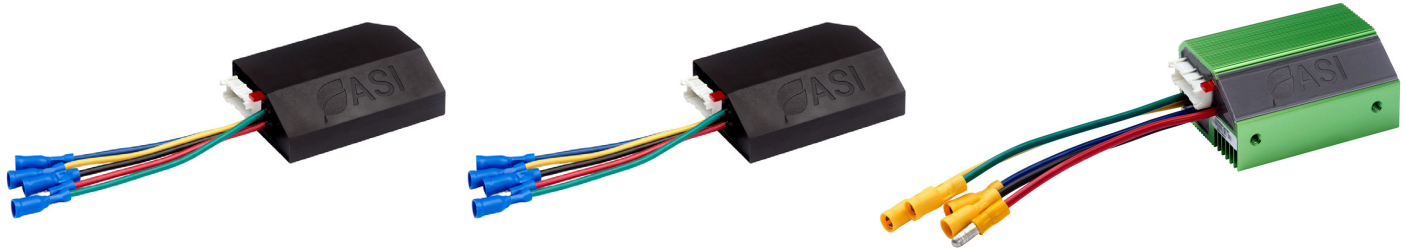


eMOBILITY CONTROLLERS

BAC355 | BAC555 | BAC855



YOUR RIDE, YOUR WAY.

The ASI family of motor controllers provide OEMs with the most compact and adaptable eMobility controllers in the marketplace today. Our belief, that it is “your customer, your ride, your way” led us to develop the most configurable controller, without compromising on features or quality.

We believe one size does not fit all.

ASI, one supplier for all your eMobility products.

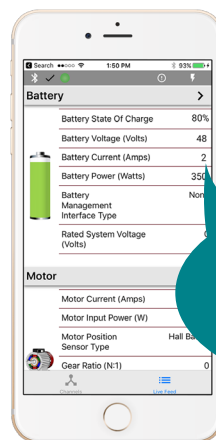
Our versatile eMobility controller ecosystem gives you the flexibility to diversify your product offering.

Benchmark Features

Regenerative & Engine Braking

Zero Speed Full Torque Sensorless Start

Reverse, OnRoad/OffRoad Settings



iOS & Android

Includes BACDoor™ software to fine tune performance.

Available for OEM customers only.



Engineered in Canada

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YOUR RIDE, YOUR WAY.



BESPOKE

Set the personality of your bike with second-to-none customization. Each eBike model can reflect the ride feel that will most resonate with your diverse customer base.



COMPACT

Our eMobility Controllers are the smallest in the industry without sacrificing capability. Similar powered controllers are 4x the size.



RELIABLE

We hand-pick our supply partners according to their quality focused performance. 100% of ASI eMobility controllers go through stringent multi-phase testing.



AUTONOMY

Our controllers support unsurpassed freedom in frame design, motor, peripheral and applications choices.

Open Architecture Software with Read/Write Capabilities	We empower customers with the autonomy to customize and manipulate the parameters of the controller to achieve your unique ride feeling over UART or CANOpen.	Unparalleled Sales Support	Our application engineering team will work with you, in real time, to create a unique ride for your target customer base.
Halls and Sensorless Motors	Ultimate freedom in motor choice. Hall based motors provide smooth engagement. Sensorless motors provide better efficiency. Hall start and sensorless run for the best of both worlds in either geared or direct drive motors.	BACDoor™ Engineering Software	Complimenting ASI's series of peerless eMobility controllers is BACDoor™. Proprietary software enabling eBike OEMs the ultimate experience in ride customization and diagnostics.
Sine Wave FOC Controller	Our proprietary algorithms take this industry standard to even greater levels of smoothness and quietness. Unfluctuating, buttery smooth ride-feel while also being whisper quiet.	Connectivity to Display Units	Our controllers harmonise best with equally high-quality display units from APT, KING-METER, Topology and EggRider.
Portable Technology	Our software is fully portable. It can drive multiple eMobility products, so you can benefit from standardizing on a single supplier without needing to re-learn software.	Limitless Expandability with Partnerships	Using IOT devices from Comodule or GPS Tuner, torque sensors from THUN or AUTORQ, the partnerships we have cultivated in the industry are yours to explore.
		Certifications	EN 15194 and ISO 13849 certified.

TECHNICAL SPECIFICATIONS

	BAC355	BAC555	BAC855
Nominal input voltage	24 V to 48 V	24 V to 48 V	24 V to 72 V
Recommended lower voltage limit	18 V	18 V	18 V
Absolute max. operating voltage	56 V	56 V	90 V
Battery current consumption - Off	0 A	0 A	0 A
Battery current consumption - Idle	< 0.1 A	< 0.1 A	< 0.1 A
Battery current consumption - Estimated max.	50 A	68 A	82 A
Peak phase current	55 A	75 A	90 A
Peak Efficiency	95% or greater	95% or greater	95% or greater
FET PWM switching frequency range	10 kHz to 17 kHz (application and firmware dependant).		
Max. recommended motor electrical frequency	500 Hz, contact ASI Application Engineering & Technical Support for more information		
Min. recommended motor phase to phase inductance	20 µH	20 µH	20 µH
Supported motor types	3-Phase surface permanent magnet motors. For other 3-phase motor types, contact ASI Application Engineering for more information		
Supported motor position sensor types	60° Electrical Halls or sensorless. For other motor position sensor types, contact ASI Application Engineering for more information		
Input capacitance	0.45 mF	0.67 mF	0.79 mF
Operating ambient temperature range	-20°C to 50°C	-20°C to 50°C	-20°C to 50°C
Storage temperature range	-35°C to 75°C	-35°C to 75°C	-35°C to 75°C
Ingress protection	IP67 (excluding electrical connections)		
Communication protocols & qty	Standard: 1x TTL-232, Optional: 1x Bluetooth Low Energy and/or 1x ASI CANopen		
Dielectric withstand production test	< 2mA at 600Vac, min.	< 2mA at 600Vac, min.	< 2mA at 600Vac, min.
Supplied power cable	14AWG, 300V, 105°C	14AWG, 300V, 105°C	12AWG, 300V, 105°C
Supplied connector limits	19Arms continuous, 600Vdc, 75°C	19Arms continuous, 600Vdc, 75°C	27Arms continuous, 600 Vdc, 75°C
Thermal cutback	<p>PEAK MOTOR CURRENT LIMIT</p> <p>TEMPERATURE (°C)</p>		

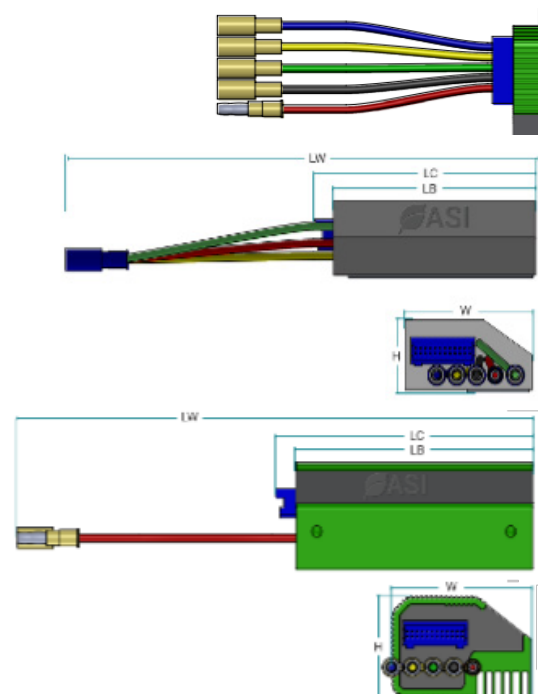
POWER CABLES

CABLE	TYPE	FUNCTION NAME	INSTALLED CONNECTOR BAC355	INSTALLED CONNECTOR BAC555	INSTALLED CONNECTOR BAC855
Red	Battery	VBat+	KST MPD2-156	KST MPD2-156	KST MPD5.5-195
Black	Battery	VBat-	KST FRD2-156	KST FRD2-156	KST FPD5.5-195
Green	Phase	Phase A	KST FRD2-156	KST FRD2-156	KST FPD5.5-195
Yellow	Phase	Phase B	KST FRD2-156	KST FRD2-156	KST FPD5.5-195
Blue	Phase	Phase C	KST FRD2-156	KST FRD2-156	KST FPD5.5-195

DIMENSIONS, WEIGHT AND MOUNTING

MODEL	LW	LC	LB	W	H
BAC355/555	190 mm	90 mm	84 mm	52 mm	27 mm
BAC855	196 mm	90 mm	81 mm	55 mm	39 mm

MODEL	WEIGHT	MOUNTING	DRY TORQUE
BAC355/555	220 g	2x M5x0.8 ↓ 5 mm	6 Nm
BAC855	335 g	2x M5x0.8 ↓ 8 mm	6 Nm



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INPUT SPECIFICATIONS, BAC355, BAC555, BAC855

TYPE	QTY	PIN(S) / POWER CABLE COLOUR	LOGIC				ELECTRICAL LIMITS		
			TYPE	Vin.min	Vin.max		PEAK CURRENT	TRANSIENT VOLTAGE	
					BAC355 BAC555	BAC855		BAC355 BAC555	BAC855
Digital 5 V, pulled-up, active low – Halls	3	3, 4, 6	Vin.low	n/a	1.2 V	1.2 V	n/a	56 V	90 V
			Vin.high	2.5 V	n/a	n/a			
Digital 5 V, pulled-up, active low – Peripherals	2	9, 12	Vin.low	n/a	3.6 V	3.6 V	n/a	56 V	90 V
			Vin.high	4.7 V	n/a	n/a			
0-5 V analogue, configurable pull-up	2	8, 10	Vin.high	n/a	5.3 V	5.3 V	n/a	n/a	n/a
0-5 V analogue, pulled-down	1	14	Vin.high	n/a	5.3 V	5.3 V	n/a	n/a	n/a
0-10 V analogue, pulled-down	1	7	Vin.high	n/a	10.9 V	10.9 V	n/a	n/a	n/a
Key-in	1	21	VBat+	18 V	56 V	86 V	Not limited	56 V	90 V
CAN	1	19, 20	5V	n/a	n/a	n/a	n/a	±52 V	±52 V
TTL	1	17, 18	5V	n/a	n/a	n/a	n/a	56 V	90 V
Battery	1	Red	Battery Positive, (VBat+)	18 V	56 V	86 V	Not limited	56 V	90 V
	1	Black	Battery Ground, (VBat-)	n/a	n/a	n/a	Not limited	n/a	n/a
Ground	1	1	Hall Ground	n/a	n/a	n/a	100 mA	n/a	n/a
	2	5, 16	Signal Ground	n/a	n/a	n/a	400 mA shared	n/a	n/a
	1	24	Power ground	n/a	n/a	n/a	400 mA	n/a	n/a

OUTPUT SPECIFICATIONS, BAC355, BAC555, BAC855

TYPE	QTY	PIN(S) / POWER CABLE COLOUR	NOMINAL OUTPUT	ELECTRICAL LIMITS		
				PEAK CURRENT	TRANSIENT VOLTAGE	
					BAC355 BAC555	BAC855
Hall 5V output	1	2	5 V	100 mA	47.5 V	47.5 V
5V output	1	11	5 V	50 mA Shared	n/a	n/a
12V output	1	13	12 V	50 mA	47.5 V	47.5 V
Configurable 6V output	1	23	6 V	400 mA	14 V	14 V
Low side switch	1	15	0 V	100 mA	57 V	57 V
Phases	3	Blue, Yellow, Green	VBat+	Not limited	56 V	90 V



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PIN-OUT, BAC355, BAC555, BAC855

PIN	TYPE	FUNCTION NAME	NOTES
1	Hall Ground		
2	Hall 5V output		
3	Digital 5 V, pulled-up, active low – Halls	Hall A	
4	Digital 5 V, pulled-up, active low – Halls	Hall C	
5	Signal ground		
6	Digital 5 V, pulled-up, active low – Halls	Hall B	
7	0-10 V analogue, pulled-down	Analog input 4	“ABMS”
8	0-5 V analogue, configurable pull-up	Analog input 3	“Brake 2”
9	Digital 5 V, pulled-up, active low – Peripherals	Digital input 2	“PFS”
10	0-5 V analogue, configurable pull-up	Analog input 2	“Brake 1”
11	5V output		
12	Digital 5 V, pulled-up, active low – Peripherals	Digital input 1	“Cruise”
13	12V output		
14	0-5 V analogue, pulled-down	Analog input 1	“Throttle”
15	Low side switch		“HDQ”
16	Signal ground		
17	5V TTL	TTL-Rx	
18	5V TTL	TTL-Tx	
19	5V CAN	CAN-L	If CAN controller, software configurable 120 Ω termination resistor
20	5V CAN	CAN-H	If CAN controller, software configurable 120 Ω termination resistor
21	B+ output	Key-out	
22	Controller enable	Key-in	Requires B+
23	Configurable 6V output		“Light ouput”, “Power ouput”
24	Power Ground		6V Switchable dedicated ground

Connector JST 2.0mm Pitch, Dual Row, 24 Pin PAD

Mating connector: JST PADP-24V-1-S

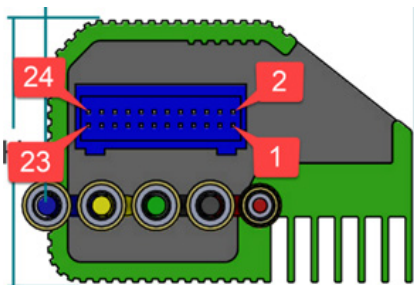


Figure 1 – Pin-out



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