LBMC072122HK2A

Product Descriptions

• The product is the latest PMSM(Permanent Magnet Synchronous Motor) controller made by Wuxi Lingbo Electronic Technologies Co.,Ltd, which can output 1200W power. It's designed with FOC(Field Oriented Control) algorithm in which SVPWM is used to drive the power device so that it injects sinusoidal current to the three-phase of motor. Meanwhile, we use a 32-bit microprocessor which integrates the latest ARM core, it exhibits excellent operational capability and task processing ability. The system can handle several close loops which include torque, flux, speed loop and other high demands of real-time task operations at the same time. Through these control methods, the system can achieve the following performance: maximum torque control, constant power control, speed closed loop control and energy feedback control while braking. Compared with traditional DC motor (BLDC) controller, the PMSM controller has significant advantages as follows:

Comfortable driving

• Direct torque control, smooth start-up, excellent acceleration performance, especially in medium and high speed stages, which approximates to the performance of fuel motorcycle.

Super low noise

•Vector control sinusoidal current injection and smooth motor output torque, which fully suppresses the low frequency noise caused by the fluctuations of motor torque.

Flexible configuration

• Provide PC software(GUI), by which can configure hundreds of parameters, so will improve the flexibility of on-site application.
•Monitor the operating status in real-time.
•Have UART(standard equipment).
•Make the function interfaces of different types of products compatible.

Perfect protection functions

• Have Signal integrity detection(e.g. motor interface signal, control signal, etc.).
• With Over-current protection, over or under voltage protection & over-heat protection.
•Provide motor temperature-control interface.

Key features

• On-site parameters setting & provide PC software
•Self-checking function after system power-on
•Energy regenerative braking
•Brake, cruise, and 3-modes speed selection port
•Integrate waterproof terminal port
•PWM output port
•Display port
•LED indication for operation and fault status
•Ultra-thin shape design, to be installed inside the vehicle easily

Applications

•Electric scooter
•Small electric vehicle
•Electric golf vehicle
•Electric Sightseeing vehicle
•Electric boat

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Specifications

Maximum Ratings & Main parameters	
Rated Input Voltage	48V/60V/72VDC
Max Input Current	45A
Max Output Current	150A
Rated Output Power	1200W
Operating Temperature Range	-20℃~+90℃
Storage Temperature Range	-10℃~+40℃
Motor Control Mode	FOC (Field Oriented Control)
Standby Power Consumption	20～40mA
Max. Motor Speed Limitation	Depended on Motor and configuration
Driving Method	Speed Loop Control

System Protection Characteristics		LED Blinking Times
Over-voltage protection	Battery voltage is higher than default value	1
Under-voltage protection	Battery voltage is lower than default value	2
Motor over-current protection	Motor phase is short-circuit or phase to B+ is short-circuit	3
Stalling protection	Motor stalling time is over default value	4
Hall Sensor protection	Hall input is abnormal	5
MOSFET protection	MOSFET self-checking is abnormal	6
Phase winding disconnect protection	One of the motor phase is disconnection	7
Brake Status	Controller work at brake status	9
Self-checking error protection	Self-checking is abnormal if internal system power-on	10
Controller over-heat protection	Controller operation temperature is higher than default value	11
Throttle protection	Throttle input is abnormal	14

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Antitheft Status	Controller work at antitheft status	15

Communication Characteristics	
RS485 Communication	RS485 interface(optional function)
LED Indicator	Indicate current working or fault state

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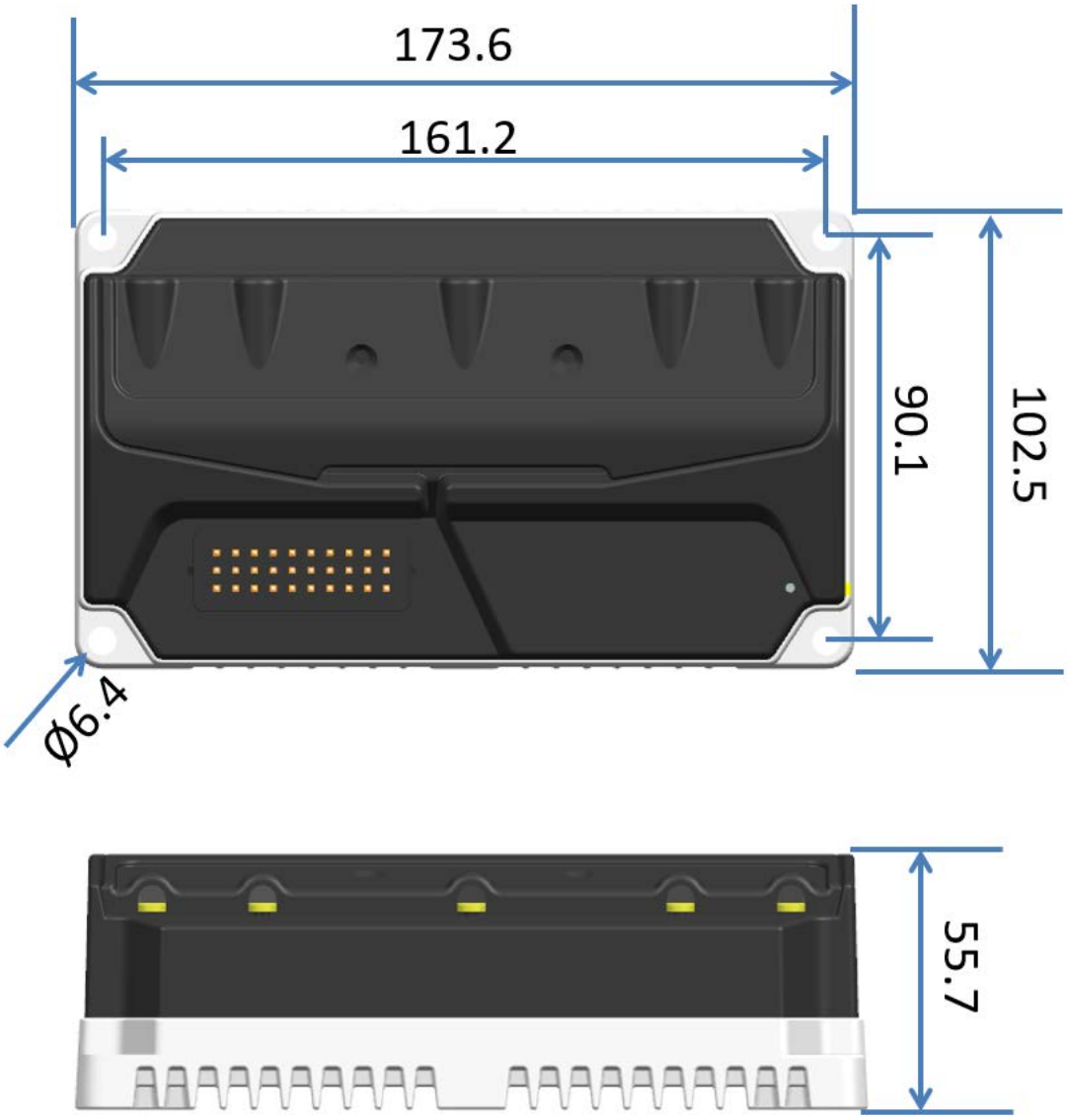
LBMC072122HK2A Dimensions



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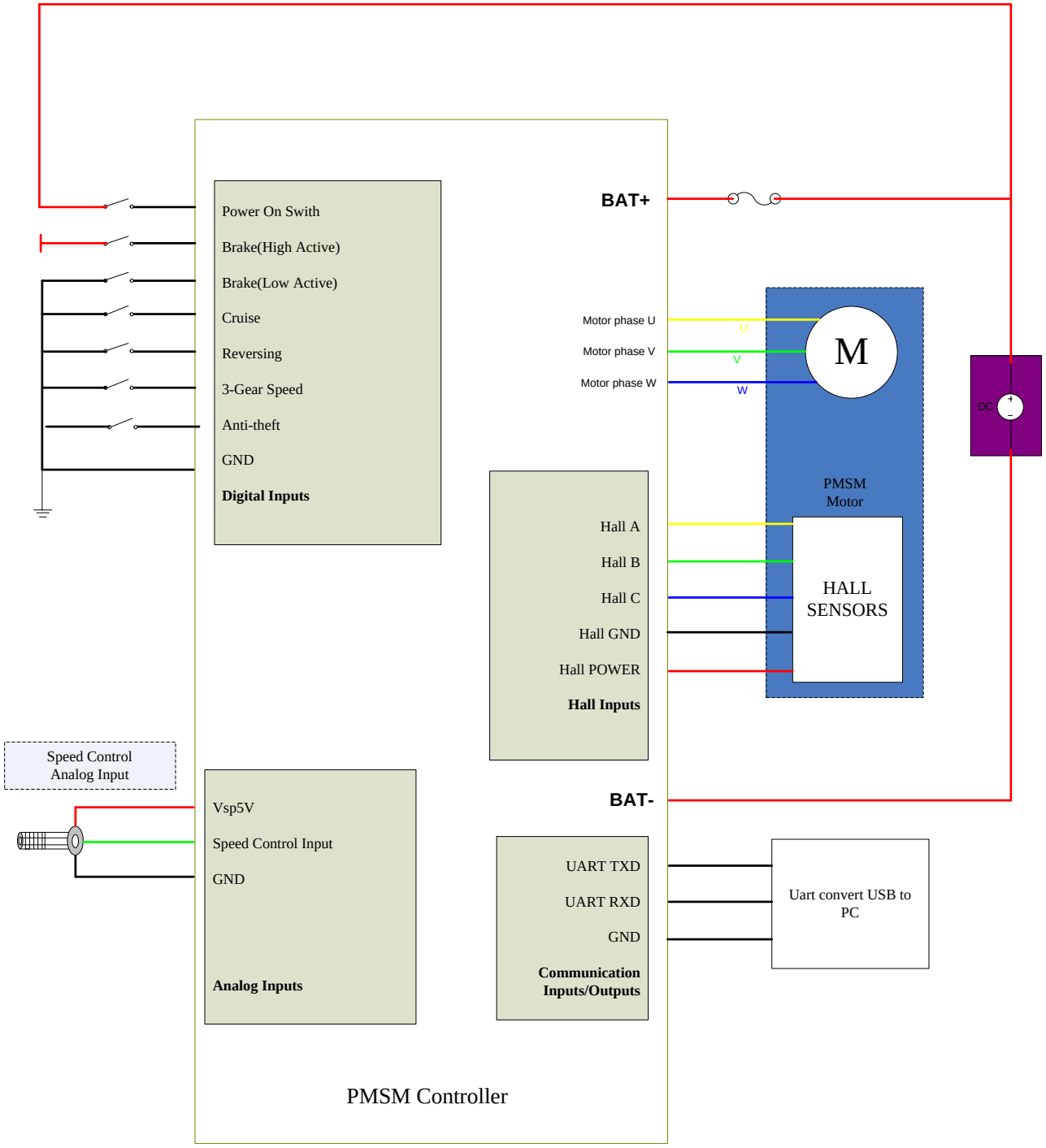
Standard PMSM Controller Wiring Diagram



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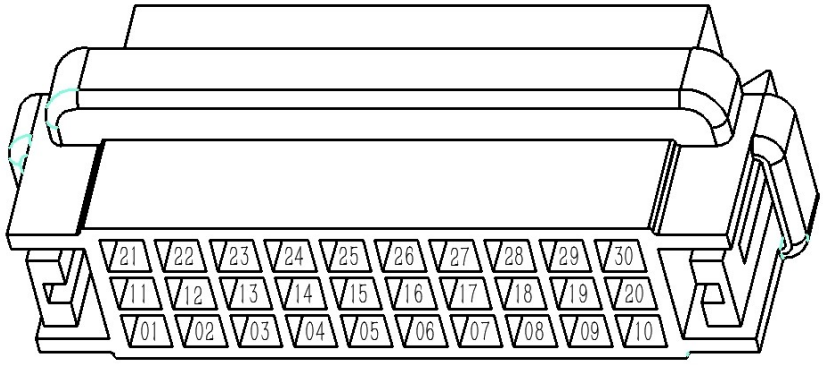
Connecter Descriptions



Pin	Function	Voltage range	Pin	Function	Voltage range
1	HALL Sensor A	0~3.3V	16	GND	0V
2	Low Gear Input	0~5V	17	Reserve Input	0~5V
3	High Gear Input	0~5V	18	Cruise Input	0~5V
4	HALL Sensor 5V	5V	19	Wheel Sensor Alarm	0~B+
5	Single-Stand 5V or CANL[1]	5V 0~5V	20	Anti theft Device ACC	B+
6	HALL Sensor GND	0V	21	Brake(Low Active)	0~5V
7	Anti theft Device GND	0V	22	HALL Sensor C	0~3.3V
8	Reverse Input	0~5V	23	RX/485B	0~5V
9	Wheel Sensor Output or Motor Temperature[2]	0~B+ 0~3.3V	24	Reserve Input	0~5V
10	ACC	B+	25	Reserve Input	0~5V
11	Brake(High Active)	0~12V	26	Throttle GND	0V
12	HALL Sensor B	0~3.3V	27	Throttle Signal	0~5V
13	TX/485A	0~5V	28	Throttle 5V	5V
14	Anti theft Signal	0~5V	29	GUI 3.3V	0~3.3V
15	Reserve Input or CANH[1]	0~5V 0~5V	30	Anti theft Device B+	B+

B+ is the battery voltage; Note 1: limit for HK3AC and HJ3AC; Note2: limit for HK3AC and HJ3AC.

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