LBMC072202HA3X

Product Descriptions

• The product is the latest PMSM(Permanent Magnet Synchronous Motor) controller made by Wuxi Lingbo Electronic Technologies Co.,Ltd, which can output 2000W 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) or CAN BUS, Bluetooth communication interface(user option).
• 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

LBMC072202HA3X

Specifications

Maximum Ratings & Main parameters	
Rated Input Voltage	48V/60V/72VDC
Max Input Current	80A
Max Output Current	210A
Rated Output Power	2000W
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	Torque 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
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	12
Motor over-heat-protection	Motor Temperature is higher than the value of configuration	13

Throttle non-Idle state Protection	The throttle is not in the idle state when System Power On	14
Braking indication	Indicating Braking Mode	15

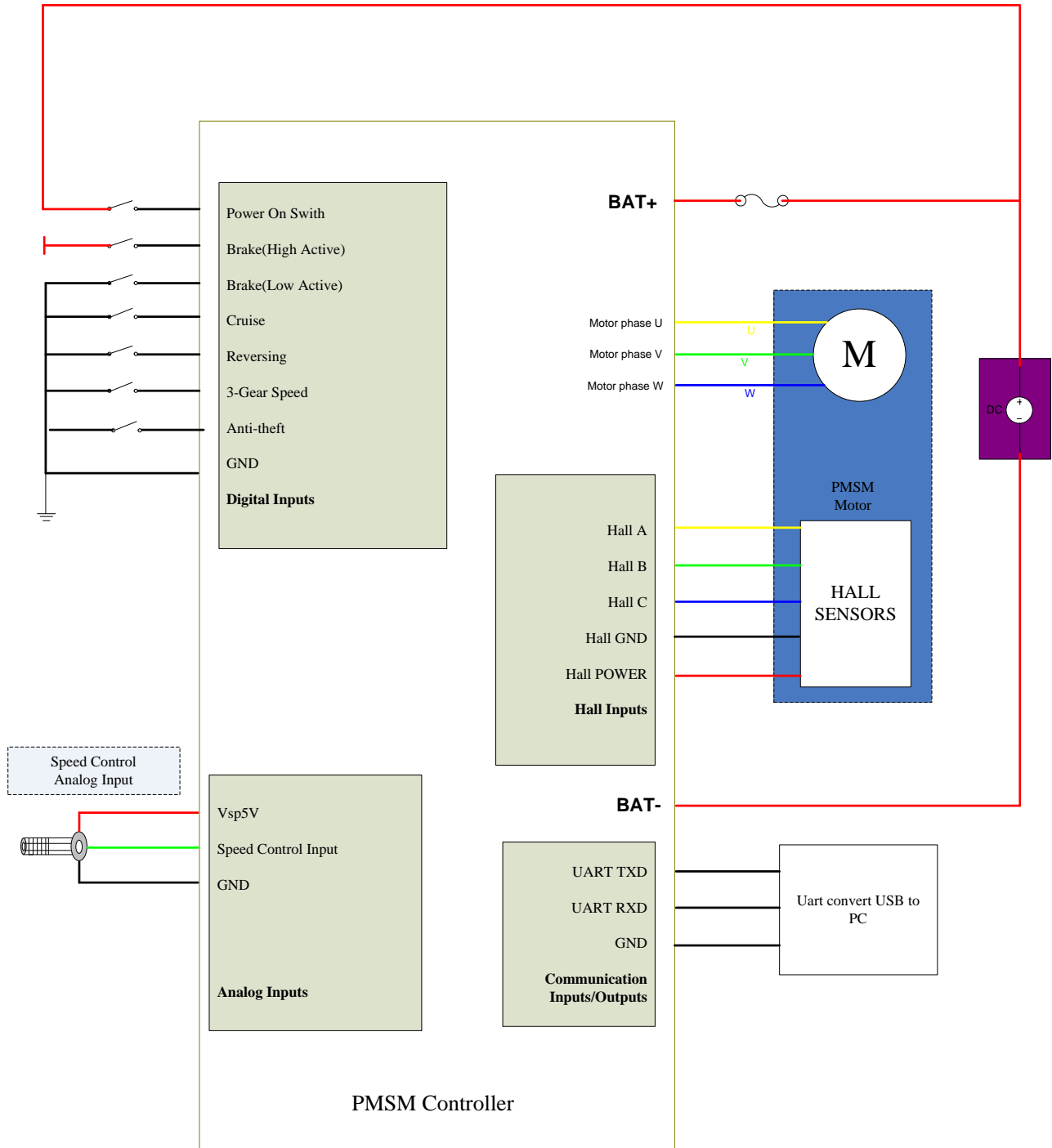| Communication Characteristics	
GUI Tool	TTL interface: parameter configuration and working state monitoring(optional function)
RS485 Communication	RS485 interface(optional function)
CAN Communication	CAN interface (optional function)
Bluetooth Communication	Bluetooth wireless interface: parameter configuration and working state monitoring(optional function)
LED Indicator	Indicate current working or fault state

LBMC072202HA3X
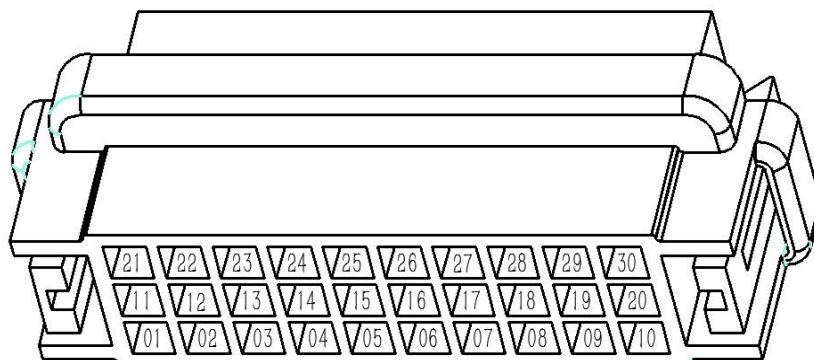
LBMC072202HA3X Dimensions
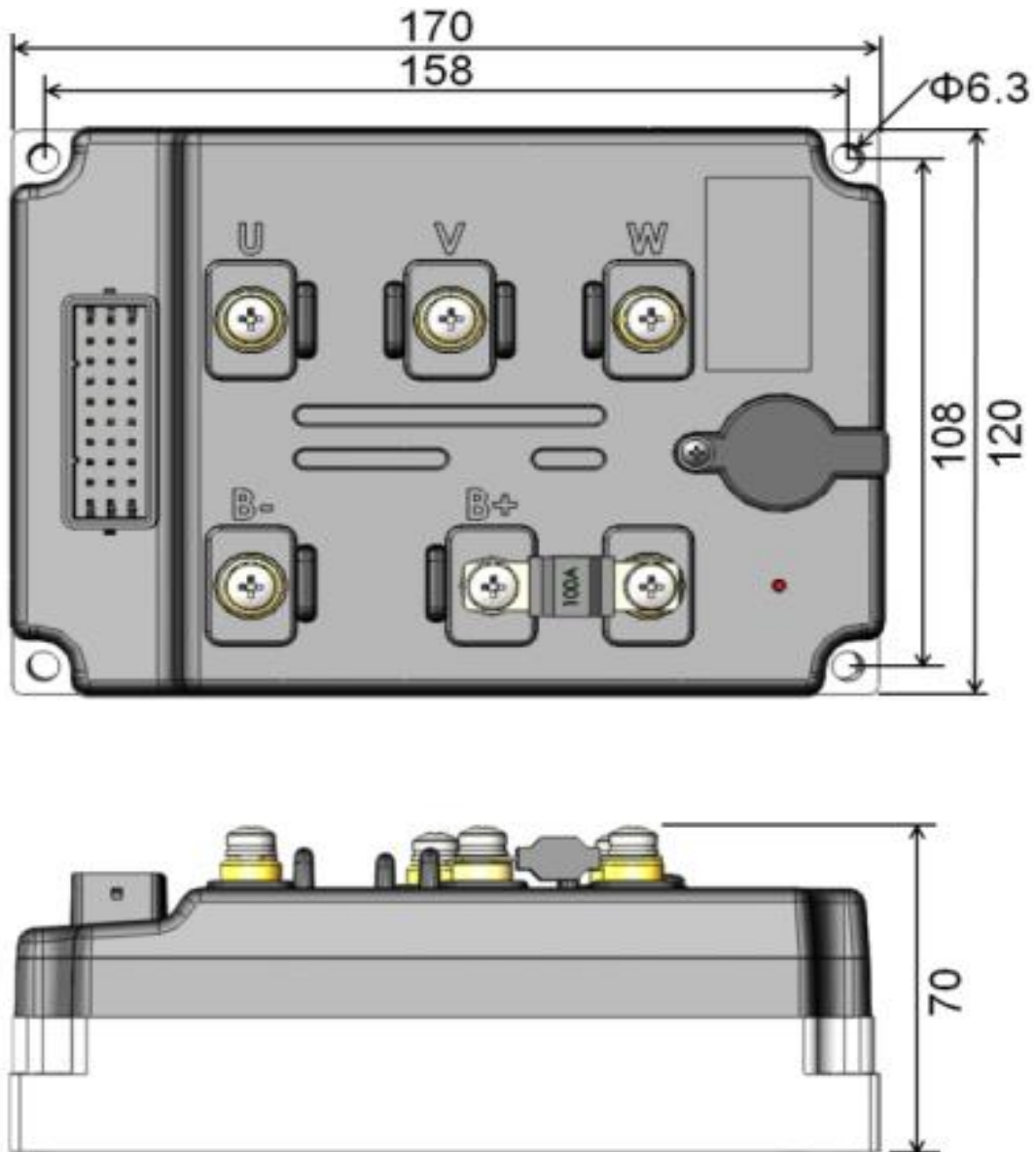
LBMC072202HA3X

Standard PMSM Controller Wiring Diagram

Power On Swith

Brake(High Active)

Brake(Low Active)

Cruise

Reversing

3-Gear Speed

Anti-theft

GND

Digital Inputs

BAT+

Motor phase U   U

Motor phase V   V

Motor phase W   W

M

DC   +

PMSM
Motor

Hall A

Hall B

Hall C

Hall GND

Hall POWER

Hall Inputs

HALL
SENSORS

Speed Control
Analog Input

Vsp5V

Speed Control Input

GND

Analog Inputs

BAT-

UART TXD

UART RXD

GND

**Communication
Inputs/Outputs**

Uart convert USB to
PC

PMSM Controller

LBMC072202HA3X

Pin	Function	Voltage range	Pin	Function	Voltage range
1	485B/CANL	0~5V	16	Brake(Low Active)	0~5V
2	485A/CANH	0~5V	17	Reverse Input	0~5V
3	Motor Temperature	0~3.3V	18	5V Signal Output	0~5V
4	HALL/GMR GND	0V	19	Reserve Input	0~5V
5	GND	0V	20	Low Gear Input	0~5V
6	GND	0V	21	GND	0V
7	Cruise Input	0~5V	22	Reserve Input	0~5V
8	PWM Output	0~B+	23	Meter HALL Signal Or GMR B-	0~5V 0~5V
9	ACC	B+	24	High Gear Input	0~5V
10	GMR Z+	0~5V	25	Reserve Input	0~5V
11	HALL Signal C Or GMR B+	0~3.3V 0~5V	26	Throttle GND	0V
12	HALL Signal B Or GMR A-	0~3.3V 0~5V	27	Throttle Signal	0~5V
13	HALL Signal A Or GMR A+	0~3.3V 0~5V	28	Throttle 5V	5V
14	HALL/GMR 5V	5V	29	GMR Z-	0~5V
15	Brake(High Active)	0~12V	30	Reserve Input	0~5V