1 Main Characteristics and Specifications

1.1 Basic Functions

□1□ Using high-power MOSFET, highly effective (as high as 98%) electronic communication can be achieved; a powerful, intelligent processor provides complete and precise control.

□2□ Expanded error checks and protection: errors can be identified by a flashing LED signal.

□3□ Real-time control of battery voltage: if battery voltage is too high or too low, the device can reduce the output and even stop working.

□4□ Built-in starting current, running current and enhanced output (BOOST) current controls provide good acceleration and climbing capabilities and extend battery life.

□5□The function of temperature sensing and protection warning: if the temperature goes above 85C, the controller will signal that the temperature is too high and limit current output. If the temperature is above 110C, the controller will also signal that the temperature is too high and cut off output. It can ensure the controller is not damaged. Functions will be automatically restored once temperature returns to normal.

□6□ Over current Protection: over current will be cut off until the power supply is disconnected. If over current is unexpected, the controller will internally cut off . Should an overcurrent error occur in the controller, the power supply will be immediately cut off to ensure that no serious damage occur.

□7□ Configuration of the controller can be done by connecting to the programming unit. The controller can be continually updated.

□8□ The controller is able to provide pull-up power for input from the 3-phase hall position sensor.

1.2 Specifications

□1□Nominal Voltage: 48V

□2□Maximum Voltage: 60V

□3□Nominal Current: 45A

□4□Enhanced Output Current: 80A (1 minute)

□5□Maximum Impact Current Allowed: 120A

Warning*:* Under nominal conditions, the controller can operate stably for an extended period of time. Under extreme conditions, the reliability of the controller may be compromised and may result in irreversible damage. Factory settings of the controller have been set at 120° Hall mode.

1.3 Application

This should be used with a Hall sensor equipped brushless DC motor at a nominal voltage of 48V and nominal power of 2KW (Maximum power is 4KW), including electric mopeds, scooters and small electric four-wheelers. Performance will be enhanced if used with our brushless DC motors. There may be some differences in Hall modules installed on brushless DC motors from other companies. If you want to use for motors produced by other companies, we suggest you make appropriate adjustments to the orientation of the Hall sensor on your motor.

2. Installation and Use

2.1 Controller Installation

The controller can be installed in a position of your choice, but should be fixed with six screws on a clean, flat metal panel that allows for heat to be released. Good airflow and heat sink will help the controller last longer. Figure 1 is an external diagram of the controller.

Warning: 1.Under some circumstances, the vehicle may lose control. When working on the electrical control system, the vehicle should be propped on a stand with the wheels off the ground.

2.The batteries of electric vehicles can output very powerful current. Power must be cut off before installing the controller.

3.Use insulated tools to prevent short circuits.

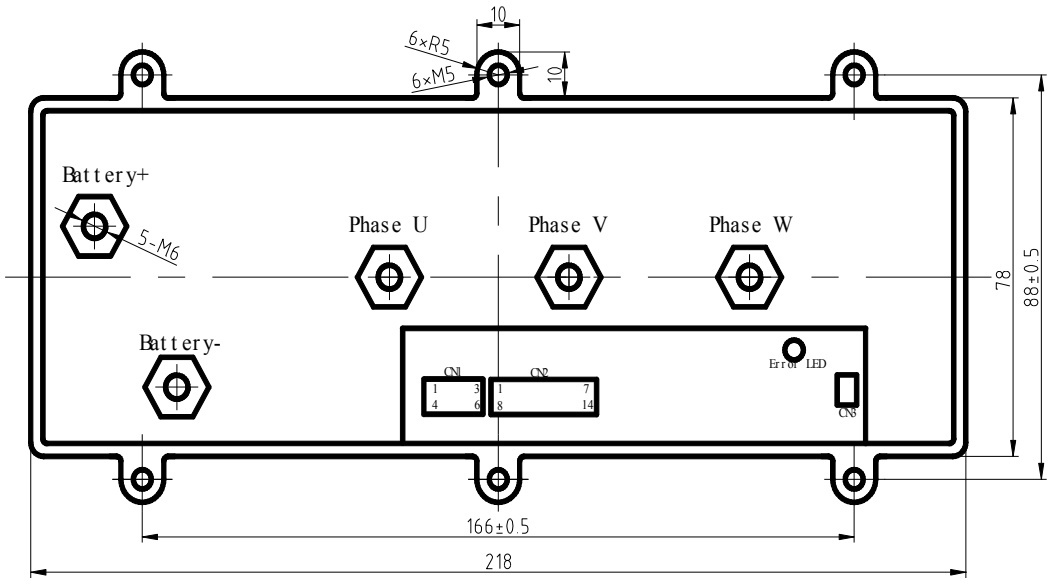

Figure 1: External diagram of the controller. (Unit: mm)

2.2 Wiring

Five hexagonal cylinders and two MOLEX connectors (CN1, CN2) complete the connection between the battery, the motor and the controller.

□1□ Connector Terminal Definitions:

Cylinders		CN2	
Code	Function Description	Code	Function Description
Battery+	Positive Anode of Storage Battery	1 Out(+48V)	48V Output (maximum internal draw 1.5A)
Battery-	Negative Anode of Storage Battery	2 In□+48V□	48V Input (from power source lock)
Phase U	Motor Phase line U (orA), to be used with the wide yellow wire on our motors	3 Reverse	Reverse Switch
Phase V	Motor phase line V (or B), to be used with the wide blue wire on our motors	4 Error	Error Message Output (can be connected to LED)
Phase W	Motor phase line W (or C), to be used	5 Disable	Disable Switch

	with the wide green wire on our motors.		
CN1		6 Boost	BOOST button
□□	Description	7 SlaveErr	Error signal input from slave machine (single system can be idle)
1 +5V	+5V Power Sourc	8 +12V	+12V Output
2 SU	U Phase Hall Signal	9 +5V	+5V Output (provides power to the stick throttle)
3 SV	V Phase Hall Signal	10 SigAcc	Stick throttle Signal
4 SW	W Phase Hall Signal	11 Speed	Motor Speed (phase conversion frequency)
5 SGND	Signal Ground	12 CurrInd	Current Indicator
6 NC	Idle	13 GND	Power Ground
		14 GND	Power Ground

□2□Connecting the Controller

As shown in Figure 2,are the ways how to connect the controller to the brushless DC motor. A complete driving system for electric vehicles still requires installation of our converter, pinboard, speedometer, etc. This document does not contain a complete system schematic for electric vehicles.

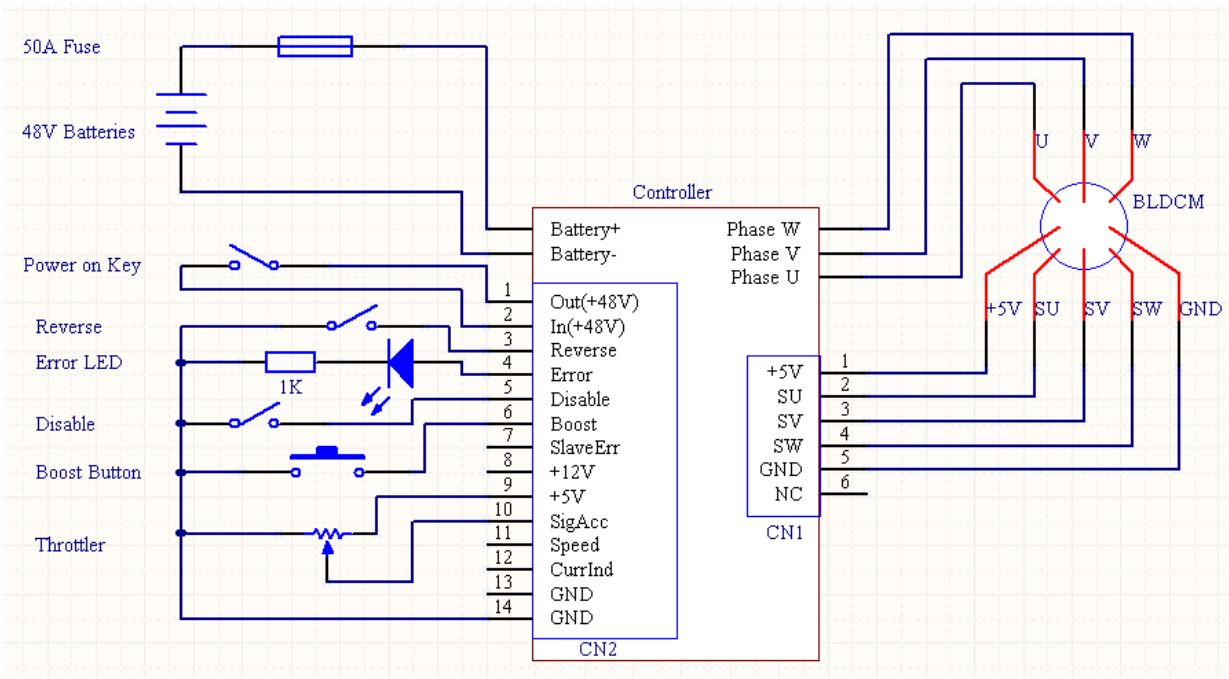

Figure 2: Smallest system schematic

Waring: Ensure that before key on the power that all connections must be correct to avoid damage to the controller.

2.3 Connecting the Programming Unit

After conneting the CN3 port (4 pins) to the programming unit , some of the parameters can be adjusted according the user's requirements, while some can not be modified. Factory settings on the controller are already set at their optimum level.

Warning: Only used by profession people or trained people.

Use before reading the instructions on programing carefully.

Standard factory options do not include the programming unit. The parameter configuration manual is included with the programming unit.

2.4 Important Installation Checks

□1□Ensure that all connections are correct.

□2□jWhile connecting the power, the LED light will flash briefly, but will remain unlit the controller is operating normally. If the LED light continues flashing and the motor does not work, please check the LED error code reference table and find the solution.

□3□When restarting, the vehicle will automatically check error codes.

□4□The motor works stablely, when key on and adhe stick throttle. If the motor does not function normally, check the LED code reference table and follow the solutions provided.

□5□Keep your vehicle in an open, flat place. When operating, the vehicle should start up smoothly and be able to reach full speed.

Warning: 1. Before inspection, the vehicle should be propped on a stand with the wheels off the ground.
2. During inspection, no one should stand in front or behind the vehicle.
3. Make sure that the power source is turned off.
4. Use insulated tools.