Product Acceptance Certificate

Specification For Approval

<table>
<tr><td>Customer name
Customer Name</td><td colspan="3"></td></tr>
<tr><td>Product model
Product Model</td><td colspan="3">48200-H200(16S 200A 314AH 16-unit configuration)Split panel+ Touchscreen + Active Equalization + WiFi + Light Strip</td></tr>
<tr><td>Customer Type
Customer Model</td><td colspan="3"></td></tr>
<tr><td>Customer Material Number
Customer Part Number</td><td colspan="3"></td></tr>
<tr><td>Version
Version</td><td colspan="3">A1</td></tr>
<tr><td>Date
Date</td><td colspan="3">2026/06/05</td></tr>
<tr><td>Kesheng BMS</td><td></td><td colspan="2">Customer Confirmation
Customer Confirmation</td></tr>
<tr><td>Formulate:
Prepared By</td><td></td><td rowspan="2">Re-sign:
Approved By:</td><td rowspan="2"></td></tr>
<tr><td>Approval：
Reviewed By:</td><td></td></tr>
<tr><td>This product complies with environmental compliance standards.</td><td colspan="3">■ROHS □REACH □Halogen-Free</td></tr>
<tr><td>Address
Address</td><td colspan="3"></td></tr>
</table>

Parts List			
Serial Number No.	Name	Model	Quantity
1	BMS motherboard	48200-H200-V2 (16S200A) Split version: No heating; 10A current limiting function; 2 channels of 485 interface and 1 channel of CAN interface; no 232 interface or dry contacts.	1 block
2	Single-cell voltage sampling line	XHB-17P buckle; UL1430:22#; red and black Custom length, based on the customer's drawing	1 twig
3	NTC Sampling Line	PHS-8P; 24#; NTC; 10K, B-value 3950 Custom length, subject to the customer's drawings	1 twig
4	B+ line	UL1015; 16#; Red; 3.5 Banana-shaped head, OT6 L=200mm ±10mm	1 twig
5	Self-locking switch wiring harness	Self-locking switch wire-PHS-4P; UL1430; 24#; white;M 16 L=900mm ±10mm	1 twig
6	Screw	Three-piece screw set: M5*15	8 Granule
7	Touch screen -TTL	LCD-V (Custom UI)	1 block
8	Touchscreen wiring harness	PHS--2.0;UL1430;24#; L=600mm ±10mm	1 Set
9	Keysets	CM3	1 block
10	Transfer Board Wire Harness (18 Pins)	Terminal wire: 2.54 mm, 18P (FC18P crimping connector, double-ended reverse type, UL2651 standard, 26 AWG gauge, red edge with gray grooves), butterfly clip L=650mm ±10mm	1 twig
11	Transfer Board Cable Harness (16 Pins)	Terminal wire: 2.54 mm, 16P (FC16P crimped connector with double-ended reverse connection, UL2651 standard, 26 AWG gauge; red edge and gray conductor strip); equipped with butterfly clip. L=650mm ±10mm	1 twig
12	Convergence Copper Busbar	200A dedicated 4-port copper busbar	2 twig
13	Active Balance Module	16S-5A_V3 (16S)	1 block
14	Active Balance Control Line	Control Line: PHS-2P; 24#; Adhesive; ROHS: L=600mm ±10mm	1 Set
15	Light Bars & Wire Bundles	LED8-V L=600mm ±10mm	1 Set
16	Wifi Module and Power Cable	Bluetooth cable-PHS-4P; UL1430; 24# L=500mm ±10mm	1 Set
17	Secondary Protection Wire Harness	2510-2P L=900mm	1 twig

Function Configuration Table Functionality Configuration Table	
String Number Battery string number	■16 □15 □8
Charging Current Limit Charge Current Limiting	□None ■ 10A ■Passive Limiting□Active Limiting
Reverse Connection Protection Reverse polarity protection	■not have /None□have /Yes
Self-locking switch Self-locking switch	□No/None ■Yes
Buzzer Buzzer	□No/None ■Yes
Memory Data storage	□None ■500 Records□ 1000 Records
Heating membrane interface: Heating	□No/None ■Yes
Secondary Protection Interface Secondary protection	□No/None ■Yes
Pre-load Function Pre-charge Function	□not have /None ■Yes(The pre-charging circuit supports a maximum capacitive load of 30,000 μF; exact values subject to system testing)
Dry Contact Dry Contacts	■not have □Yes (2 lines)
Display screen Display Screen	□None ■English ■White Button Cap□Button Membrane / Keypad Membrane ■ Touch Screen
DIP Switch	□not have /None□4 positions ■6 positions
LED lamp	□None ■RUN ■ALARM ■SOC: 4 indicators per indicator
Collection socket Acquisition socket	■Vertical□Horizontal ■ 17+8 ■ 6+7+6+7
IoT Functions IoT Capabilities	□None ■ Bluetooth/BT ■ WIFI□**4G**
Anti-theft Feature Anti-theft function	■not have /None□have /Yes
Communication	
CI Communications	□RS232 ■RS485 ■Parallel Dual RS485 ■CAN
Upgrade Method Upgrade Method	■RS485
Protocol Communication Protocol	Victron-CAN-V1.00-220910 Voltronic-485-V1.0.3-200325 WOW-Protocol-Shuo Ri-V1.3 TYON CAN LV V2.0.6-2022.05.10 Power Protocol Growatt BMS CAN-Bus-protocol-low-voltage-V1.05 BMS_Protocol_V1_0_0

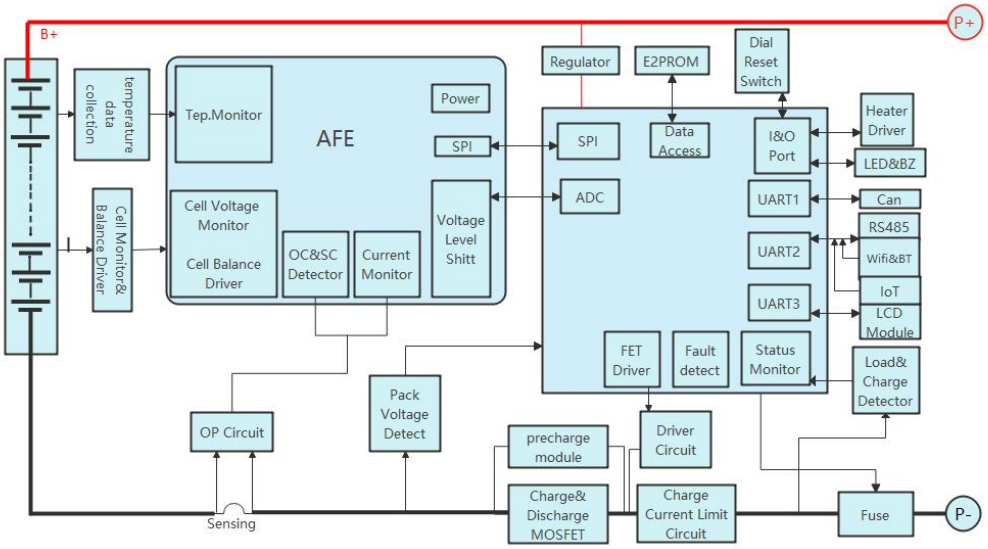
File Change Summary

Revision History

Date Date	Version Number	Revision description	Formulator Prepared By	Authorizer Approved By
2026-06-05	A1	Write the initial draft.		

Table of Contents

1 ProductTopologyDiagram



2 Scope of Application

This product is designed for 8–16-cell lithium battery management systems, providing protection and recovery functions against overvoltage, undervoltage, overcurrent, high/low temperatures, and short circuits. It enables precise SOC measurement and SOH (State of Health) monitoring during charging and discharging, ensures voltage balance during charging, and supports human-machine interaction via host software for displaying and setting alarm parameters such as voltage, current, and temperature, as well as storing and displaying real-time and historical battery operation data. The system offers multiple sleep and wake-up modes and supports parallel communication via RS485. Parameter configuration and data monitoring can be performed through host software interface, making it widely applicable in household energy storage inverters and indoor/outdoor base stations.

This product is suitable for 8-16 series lithium battery management system, providing protection and recovery functions such asovervoltage, undervoltage, overcurrent, high temperature, low temperature and short circuit for battery packs. Realize accurate SOC(State of Charge) measurement and SOH (State of Health) health status statistics during charging and discharging. Realize voltagebalance during charging process. Through human-computer interaction of host computer software, display and set alarm protectionparameters such as voltage, current, temperature, store and display real-time data and historical data of battery operation status. It has multiple sleep and wake-up modes. Parallel communication is carried out through RS485. Parameter configuration and datamonitoring are carried out by human-computer interaction of host computer software, It can be widely applied in home energy storageinverters, indoor and outdoor base stations, etc.

3 Function Descriptions

3.1 Cell and Battery Voltage Monitoring

Real-time voltage monitoring is performed on series-connected battery cells to enable overvoltage and undervoltage alarms as well as protection functions. The voltage detection accuracy ranges from ±10 mV at 0–45 °C and ±20 mV at –20 to 70 °C. Alarm and protection parameter settings can be adjusted via a host computer.

Real-time collection and monitoring of series-connected cell voltages are provided to realize over-voltage and under-voltagealarms and protection. The accuracy of cell voltage detection is ±10mV within the temperature range of 0~45° C, and ±20mV within -20~70° C. Alarm and protection parameter settings can be adjusted via the upper computer.

3.2 Battery Charge/Discharge Current Monitoring

Overcurrent alarms and protection mechanisms for battery pack charging/discharging currents, along with short-circuit detection of battery pack outputs. Real-time monitoring of battery pack charging/discharging currents. Continuous charging/discharging current measurement ≤ 200 A with temperature rise below 50°C and accuracy better than ±1%. Alarm and protection parameters can be adjusted via a host computer.

The battery pack provides overcurrent alarms and protection for charge/discharge currents, and short-circuit protectionfor output. It continuously monitors the charge/discharge current of the battery pack in real-time. The system supports continuous charge/discharge current up to 200A with a temperature rise of less than 50° C and accuracy better than± 1%. Alarm and protection parameter settings can be adjusted via the upper computer.

3.3 Cell,Environmental and Power Temperature Monitoring(Cell, Ambient, and Power Temperature Monitoring)

4 The system includes one cell temperature sensor, one ambient temperature sensor, and one MOS temperature sensor for detecting cell temperature, enabling high/ low-temperature alarms and protection. The temperature detection accuracy is ±2°C. The cell temperature sensors utilize a 10K resistor with a B-value of 3950.

The system includes 4 channels for cell temperature detection, 1 channel for ambient temperature detection, and 1 channel for MOS temperature detection, enabling high and low-temperature alarms and protection. The temperature detection accuracy is ±2° C, with cell temperature sensors using 10K, B value 3950.

3.4 Battery Capacity Calculation and Cycle Count Function

The system calculates the battery's remaining capacity in real time and learns the total charge/discharge capacity in a single operation, achieving an SOC estimation accuracy of ±5%. It includes a cycle count function: when the battery pack's cumulative discharge reaches 80% of its set full capacity, the cycle count increases by one. Amper-hour integration enables precise SOC calculation. The system supports SOC correction using both open-circuit voltage static calibration and dynamic charging/discharging calibration methods.

The system supports real-time calculation of remaining battery capacity and learns the total charge/discharge capacity in a single cycle, with SOC estimation accuracy better than ±5%. It includes a cycle count function, where the cyclecount increases by 1 when the cumulative discharge capacity of the battery pack reaches 80% of the set full capacity.Precise SOC calculation is achieved through amp-hour integration, and SOC correction is supported using both open-circuit voltage static calibration and dynamic calibration during charging and discharging.

3.5 Charge/Discharge MOSFET Switch Function

Low internal resistance and high current capacity, featuring an optimized design for backup power applications with capacitive loads—ensuring smooth startup, zero switching, and high charging voltage tolerance.

Designed for low internal resistance and high current, this system is optimized for large capacitive loads, zero switching,and high charging voltage tolerance in backup power applications.

3.6 Battery Charging Balancing Function

The charging balancing strategy can be flexibly configured (with enable voltage and balancing voltage settings), effectively extending the battery's operational duration and cycle life.

The charging balance strategy can be flexibly configured (activation voltage, balancing voltage) to effectively extend battery life and cycle longevity.

3.7 LED Status Indicator Function

It features 6 LED indicators, 4 battery remaining capacity indicators, 1 operating status indicator, and 1 alarm protection status indicator.

The system includes 6 LED indicators: 4 for battery remaining capacity, 1 for operation status, and 1 for alarm protection status.

3.8 Button Switch Function

- Self-locking switch: Features an intelligent one-touch activation design that allows manual system startup when powered off, and enables manual shutdown in any operating state.
- Reset and Sleep Keys: Press and hold the key for 3–6 seconds in non-backup power mode to enter sleep; press and hold it for 1–3 seconds in standby mode to wake up.
- Self-locking Switch: Smart one-key switch design, manually start the system in shutdown mode, and manually shut down in any state.
- Reset and Sleep Button: In non-backup power mode, long-press the button for 3-6 seconds to enter sleemode; in sleep mode,p long-press for 1-3 seconds to wake up.

3.9 RS485 and CAN Communication Functions(RS485 and CAN Communication Function)

PCs or EMS systems can perform battery data monitoring, control, and parameter settings via RS485 commands for telemetry, signal transmission, remote adjustment, and remote control, enabling real-time monitoring of BMS and Pack status. Inverters or terminals can acquire battery status data and adjust output parameters through CAN or RS485 communication.

PC or EMS can use RS485 for remote telemetry, remote signaling, remote adjustment, and remote control commands tomonitor, control, and set parameters for the battery in real-time. The inverter or terminal can use CAN or RS485 communication to obtain battery status data and adjust output.

3.10 Upper Computer Control Function

The system allows configuration of various battery management parameters, including individual cell over/under voltage, total cell voltage over/under voltage, charging current surge, discharge current surge, cell temperature extremes, ambient temperature extremes, balancing strategy, number of series-connected cells, and battery capacity. It also enables control of discharge MOS, charging MOS, current limiting function switch, buzzer alarm switch, forced sleep mode switch, and supports online system software upgrades.

This system allows setting management parameters for individual cell over/under-voltage, total battery voltageover/ under-voltage, charging over-current, discharging over-current, cell high/low temperature, ambient high/lowtemperature, balancing strategy, series string number, battery capacity, and more. It supports enabling/disabling of discharge MOS, charge MOS, current limiting switch, buzzer alarm switch, forced sleep switch, and system softwareonline upgrade.

3.11 Hardware Voltage Detection Function

The BMS is designed with a unique hardware detection and protection circuit, ensuring safe, reliable, and prolonged operation under abnormal conditions.

The BMS is designed with a unique hardware detection and protection circuit to ensure long-term safe and reliable operation under abnormal conditions.

3.12 Historical Data Storage Function

It features historical record storage with a capacity of at least 500 records, facilitating system monitoring, analysis, and maintenance.

The system has a historical record storage function with a capacity of no less than 500 records, facilitating system monitoring, analysis, and maintenance.

3.13 And the Parallel Communication Function

RS485 enables communication functionality through automatic address allocation by Can.

It supports address auto-assignment via CAN, with parallel communication functionality achieved through RS485.

3.14 Charge Current Limiting Function

Has a 10 A current limiting function with passive and active modes, defaulting to passive mode. Current limiting activates when charging current exceeds 120 A.

The system features a 10A current limiting function with both passive and active limiting modes, with passive limiting asthe default. Current limiting activates when the charge current exceeds 120A.

3.15 Dry Contact Function (Optional)

Dry contact definition: (Default: normally open)

- When protected, dry contact 1 closes.
- When a fault occurs (NTC fault, MOS fault, or single-cell sampling fault), Dry Contact 2 activates.

Dry Contact Definitions (Default Normally Open):

- When protection is activated, Dry Contact 1 closes.
- When a fault occurs (NTC fault, MOS fault, cell sampling fault), Dry Contact 2 activates.

3.16 Heating Function (Optional)

Equipped with a low-temperature heating function for batteries: when the cell temperature is below 0°C during charging, the heating function activates to trigger low-temperature protection; when the cell temperature exceeds 15°C, the heating function stops.

The system includes a battery low-temperature heating function. Heating is activated when the cell temperature is below0° C during charging or when low-temperature protection is triggered, and deactivated when the cell temperatureexceeds 15° C.

3.17 Secondary Protection Function

The BMS can trigger the trip mechanism to disconnect the external output circuit when a charge/discharge MOS fault occurs or when the voltage of a single cell is excessively high or low, thereby providing secondary protection. Control strategy: Execute upon meeting any condition.

- After a MOS fault occurs, if the MOS temperature exceeds 100°C or an MOS NTC fault alarm persists for 6 seconds, the fuse will trigger a "secondary protection" alert.
- The maximum individual cell voltage exceeds the overvoltage protection threshold by +300 mV, and the system remains in charging mode for 6 seconds; the fuse trips with a "secondary protection" alarm.
- The minimum cell voltage is <the undervoltage protection threshold by 300 mV, and the system remains in discharge mode for 6 seconds; the fuse trips with a "secondary protection" alarm.

The BMS can drive the circuit breaker to disconnect the external output circuit for secondary protection in the event of charge/discharge MOS failure or when individual cell voltage is too high or too low.

Control strategy: Execute if any condition is met.

- Trigger MOS failure, and if MOS temperature exceeds 100° C or MOS NTC fault alarm persists for 6 seconds, blow the fuse and report "Secondary Protection."
- If the highest cell voltage > over-voltage protection value + 300mV and the system is still in charging mode, persist for 6 seconds, blow the fuse and report "Secondary Protection."
- If the lowest cell voltage < under-voltage protection value - 300mV and the system is still in discharge mode, persist for 6 seconds, blow the fuse and report "Secondary Protection."

3.18 Appendix: Reliability Parameters

Order number No.	Project Item	Specifications/Conditions Specifications/Conditions
1	Detection Accuracy Detection Accuracy	Current Accuracy: ±2% Voltage Accuracy: ±20 mV Temperature accuracy: ±3°C SOC Average Accuracy: ≤ ±5%
2	Current Threshold Current Threshold	Charging Current: 0.6 A Discharging Current: 0.6 A
3	Failure Type Failure Types	1. Charge/Discharge MOSFET failure; 2. Current detection failure; 3. Temperature detection failure; 4. Voltage detection failure (charging is prohibited if voltage is below 1.0 V)
4	Storing of information Data Storage	Store no fewer than 500 historical data entries, including current total voltage, current, temperature, SOC, SOH, cycle count, and operational status.
5	Communication Interface	1. Supports RS485 communication (program upgrade is possible via the communication port) (Supports RS485 communication (enables firmware upgrades)) ; 2. Supports RS485 parallel communication
6	Starting up Power On	In shutdown mode, turn on the low-voltage switch to power on; the corresponding LED lights will illuminate in real time based on the SOC level. In shutdown mode, turning on the weak current switch powers up the system, and the LED corresponding to the current SOC lights up simultaneously
7	Shut down Power Off	In startup mode, disconnect the low-voltage switches 3–6S until all six LEDs turn off sequentially. In power-on mode, disconnecting the weak current switch for 3~6 seconds will turn off the system, and the 6 LEDs will sequentially turn off
8	Short Short Circuit	The internal resistance of the battery pack and short-circuit loop shall not be less than 40 mΩ, with a short-circuit current not exceeding 1000 A. The system must withstand 50 short-circuits using an air switch.

4 Electrical Characteristics

4.1 Electrical Properties

Project Item	Minimum Minimum	Maximum Maximum	Conventional Typical	Unit Unit
Working voltage **Operating Voltage**	35	60	51.2	V
Charging Voltage	48	58.4	57.6	V
Operating Temperature Range	-40	60	25	℃
Working Humidity Range	10	85	/	%
Continuous charge/discharge current		210	200	A
Discharge Output Resistance	<10		mΩ	
Normal operating power consumption	⩽30 (Without display)		mA	
	⩽50 (with display)		mA	
Sleep Power Consumption		200	100	uA

4.2 Basic Parameter Settings

Alarm Values					
Function Name: Function	**Function Settings**	**Can be configured**	**Indicator Item Indicator**	**Factory Default Value Factory Setting**	**Remarks Remarks**
Single Cell Voltage Alarm	Enabled	Set to Yes	Overvoltage Alarm	3600mV	±20mV
		Set to Yes	Overvoltage delay	3000mS	1000-5000mS
		Set to Yes	Overvoltage Recovery	3380mV	±20mV
		Set to Yes	Undervoltage Alarm	2700mV	±20mV
		Set to Yes	Undervoltage delay	3000mS	1000-5000mS

Alarm Values					
Function Name: Function	**Function Settings**	**Can be configured**	**Indicator Item Indicator**	**Factory Default Value Factory Setting**	**Remarks Remarks**
		Set to Yes	Undervoltage recovery Recovery	3000mV	±20mV
Total Voltage Alarm Alarm	Enabled	Set to Yes	Overvoltage Alarm	57.6V	±50mV
		Set to Yes	Overvoltage delay	3000mS	1000-5000mS
		Set to Yes	Overvoltage Recovery	54.4V	±50mV
		Set to Yes	Undervoltage Alarm	44.0V	±50mV
		Set to Yes	Undervoltage delay	3000mS	1000-5000mS
		Set to Yes	Undervoltage recovery Recovery	48.0V	±50mV
Cell Temperature Charge Inhibition Alarm	Enabled	Set to Yes	High Temperature Alert Alarm	55℃	±2℃
		Set to Yes	High Temperature Delay Time Delay	5000ms	1000-5000mS
		Set to Yes	High Temperature Recovery Recovery	50℃	±2℃
		Set to Yes	Low Temperature Alert Alarm	3℃	±2℃
		Set to Yes	Low Temperature Delay (Low Temperature): Delay	5000ms	1000-5000mS

Alarm Values					
Function Name: Function	**Function Settings**	**Can be configured**	**Indicator Item Indicator**	**Factory Default Value Factory Setting**	**Remarks Remarks**
		Set to Yes	Recovery from low temperatures Recovery	5℃	±3℃
Cell Temperature Discharge Inhibition Alarm	Enabled	Set to Yes	High Temperature Alert Alarm	60℃	±3℃
		Set to Yes	High Temperature Delay Time Delay	5000ms	1000-5000mS
		Set to Yes	High Temperature Recovery Recovery	55℃	±3℃
		Set to Yes	Low Temperature Alert Alarm	-15℃	±3℃
		Set to Yes	Low Temperature Delay (Low Temperature): Delay	5000ms	1000-5000mS
		Set to Yes	Recovery from low temperatures Recovery	-5℃	±3℃
Ambient Temperature Alert Temperature Alarm	Enabled	Set to Yes	Ambient High Temperature Alarm	55℃	±3℃
		Set to Yes	Ambient high-temperature delay	3000ms	1000-5000mS
		Set to Yes	Environmental temperature recovery: Ambient High Temperature Recovery	50℃	±3℃
		Can be set	Environmental Low Temperature Alert	-15℃	±3℃

Alarm Values					
Function Name: Function	**Function Settings**	**Can be configured**	**Indicator Item Indicator**	**Factory Default Value Factory Setting**	**Remarks Remarks**
		Yes	Ambient Low Temperature Alarm		
		Set to Yes	Ambient low-temperature delay	3000ms	1000-5000mS
		Set to Yes	Ambient temperature recovery: Ambient Low Temperature Recovery	-10℃	±3℃
Charge Overcurrent Alarm Overcurrent Alarm	Enabled	Set to Yes	Charge Overcurrent Alarm	200A	±2A
		Set to Yes	Charge overcurrent delay	5000ms	1000-4000mS
		Set to Yes	Charge Overcurrent Recovery	195A	±2A
Discharge Overcurrent Alarm	Enabled	Set to Yes	Discharge Alarm Current Current	200A	±2A
		Set to Yes	Discharge overcurrent delay	5000ms	1000-4000mS
		Set to Yes	Discharge recovery current Current	195A	±2A
MOS High-Temperature Alarm MOS High-Temperature Alarm	Enabled	Set to Yes	MOS High-Temperature Alarm MOS High-Temperature Alarm	90℃	±3℃

Alarm Values					
Function Name: Function	**Function Settings**	**Can be configured**	**Indicator Item Indicator**	**Factory Default Value Factory Setting**	**Remarks Remarks**
		Set to Yes	MOS High-Temperature Delayed MOS High-Temperature Delay	3000ms	1000-5000mS
		Set to Yes	MOS High-Temperature Recovery Alert MOS High-Temperature Recovery Alarm	80℃	±3℃
Pressure Difference Alarm	Enabled	Set to Yes	Excessive Voltage Difference Alarm	500mV	±50mV
		Set to Yes	Recovery of the "Excessive Voltage Difference" alarm due to excessive pressure difference	300mV	±50mV
SOC report an emergency SOC Alarm	Enabled	Set to Yes	Low SOC Alarm	10%	
		Set to Yes	Low SOC Alarm Recovery – Low SOC Alert Recovery	15%	

Protection Values					
Function Name: Function	**Function Settings**	**Can be configured**	**Indicator Item Indicator**	**Factory Default Value Factory Setting**	**Remarks Remarks**
Single Cell Protection Protection	Enabled	Set to Yes	Single Cell Overvoltage Protection Overvoltage Protection	3650mV	±20mV
		Set to Yes	Single-cell overvoltage delay	2000ms	±2000mS
		Set to Yes	Single Cell Overvoltage Recovery Overvoltage Recovery	3400mV	±20mV
		Set to Yes	Single-cell undervoltage protection Undervoltage Protection	2500mV	±20mV
		Set to Yes	Single-cell undervoltage delay	3000ms	±2000mS
		Set to Yes	Single-cell voltage recovery under low voltage conditions Undervoltage Recovery	3000mV	±20mV
Total Protection	Enabled	Set to Yes	Total Overvoltage Protection	58.4V	±50mV
		Set to Yes	Total Overvoltage Delay	2S	±2000mS
		Set to Yes	Total Overvoltage Recovery	54.4V	±50mV
		Set to Yes	Total Undervoltage Protection	40V	±50mV

Protection Values					
Function Name: Function	**Function Settings**	**Can be configured**	**Indicator Item Indicator**	**Factory Default Value Factory Setting**	**Remarks Remarks**
		Set to Yes	Total Undervoltage Delay	3S	±2000mS
		Set to Yes	Total Undervoltage Recovery	48.0V	±50mV
Cell temperature-induced charge inhibition	Enabled	Set to Yes	High Temperature Protection During Charging Temperature Protection	60℃	±3℃
		Set to Yes	Charge High Temperature Delay	3000mS	±1000mS
		Set to Yes	Recover Charge High after heating Temperature Recovery	55 ℃	±3℃
		Set to Yes	Charge Low Protection Temperature Protection	0℃	±3℃
		Set to Yes	Charge low-temperature delay	3000mS	±1000mS
		Set to Yes	Recover from low charging temperature Temperature Recovery	5℃	±3℃
Cell temperature-based discharge inhibition	Open	Set to Yes	Discharge High Temperature Protection Temperature Protection	65℃	±3℃

Protection Values					
Function Name: Function	**Function Settings**	**Can be configured**	**Indicator Item Indicator**	**Factory Default Value Factory Setting**	**Remarks Remarks**
		Set to Yes	Discharge high-temperature delay	3000mS	±1000mS
		Set to Yes	Discharge High Temperature Recovery Temperature Recovery	60℃	±3℃
		Set to Yes	Discharge Low Temperature Protection Temperature Protection	-20℃	±3℃
		Set to Yes	Discharge low-temperature delay	3000mS	±1000mS
		Set to Yes	Discharge low-temperature recovery Temperature Recovery	-15℃	±3℃
Environmental Temperature Protection (Ambient) Temperature Protection	Enabled	Set to Yes	Environmental temperature protection: Ambient Low Temperature Protection	-25℃	±3℃
		Set to Yes	Environmental low temperature has been lifted. Temperature Recovery	-15℃	±3℃
		Set to Yes	Environmental temperature protection: Ambient High Temperature Protection	65℃	±3℃
		Set to Yes	Ambient high temperature has been removed. Temperature Recovery	55℃	±3℃

Protection Values					
Function Name: Function	**Function Settings**	**Can be configured**	**Indicator Item Indicator**	**Factory Default Value Factory Setting**	**Remarks Remarks**
MOS transistor with high-temperature protection; MOSFET High Temperature Protection Temperature Protection	Open	Set to Yes	MOS High-Temperature Protection MOS High Temperature Protection	110℃	±3℃
		Set to Yes	MOS High-Temperature Delay	3000mS	±1000mS
		Set to Yes	MOS High-Temperature Recovery MOS High Temperature Recovery	80℃	±3℃
Pressure Difference Protection Voltage Difference Protection	Enabled	Set to Yes	Overpressure Protection Excessive Voltage Difference Protection	800mV	±50mV
		Set to Yes	Excessive voltage difference recovery due to excessive pressure difference	500mV	±50mV
Overcurrent Protection During Charging	Enabled	Set to Yes	Overcurrent Protection 1: Protection Against Overcurrent Protection 1	215A	±2A
		Set to Yes	Overcurrent Protection 1 Delay	3000mS	1000-5000mS
		Set to Yes	Overcurrent Protection 2: Protection Against Overcurrent Protection 2	250A	±2.0A
		Set to Yes	Overcurrent Protection 2 Delay	500mS	100-2000mS
		Not Set No	Automatic Overcurrent Recovery Recovery	10min	Automatically attempts recovery in 10 minutes; tries locking three times. You can perform manual recovery or discharge recovery. Automatically attempts recovery every 10 minutes, locks after 3

Protection Values					
Function Name: Function	**Function Settings**	**Can be configured**	**Indicator Item Indicator**	**Factory Default Value Factory Setting**	**Remarks Remarks**
					attempts. Manual recovery or discharging isrequired.
Overcurrent Protection during Discharge	Open	Set to Yes	Discharge Overcurrent Protection 1: Overcurrent Protection 1	215A	±2A
		Set to Yes	Discharge Overcurrent 1 Delay; Overcurrent Protection 1 Delay	5000mS	1000-5000mS
		Set to Yes	Discharge Overcurrent Protection 2: Overcurrent Protection 2	250A	±5.0A
		Set to Yes	Discharge Overcurrent 2 Delay; Overcurrent Protection 2 Delay	500mS	100-2000mS
		Not Set No	Automatic recovery from discharge overcurrent Automatic Overcurrent Recovery	1min	It automatically attempts recovery every minute; if this happens three times consecutively, the device will lock. You can perform manual recovery or charge it manually.
Short Circuit Protection Protection	Open	Not Set No	Short-circuit protection current	400A±100A	The upgrade program can be changed Can be changed via software upgrade
		Not Set No	Short-circuit protection delay Protection Delay	450uS±100uS	The upgrade program can be changed Can be changed via software upgrade
		Short-Circuit Protection Release	1、 Valid charging current detected 2、 Re-test every minute and lock after three consecutive attempts 1、 Detects effective charging current. 2、 Attempts to re-detect every 1 minute, locks after 3 consecutive attempts.		

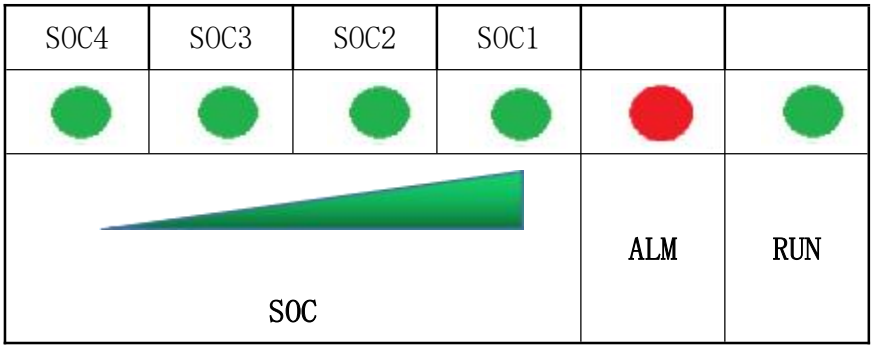
Basic Parameter Settings

Function Name: Function	Function Settings	Can be configured	Indicator Item Indicator	Factory Default Value Factory Setting	Remarks Remarks
Cell Balancing Function Function	Enabled	Set to Yes	Cell Charging Balance Balancing	Static or charging (does not activate when a high-temperature alarm is triggered)	
		Set to Yes	Balancing Start Voltage Voltage	3450mV	±20mV
		Set to Yes	Balance the start voltage difference (Balancing Start Voltage Difference)	30mV	±10mV
		Not Set No	Balancing Current	68mA	50-100mA
Battery Capacity Settings Settings	Enabled	Set to Yes	Rated Capacity of the Battery Capacity	314AH	
		Set to Yes	Remaining Battery Capacity	314AH	
BMS Power Consumption Management – BMS Power Management	Open	Set to Yes	Sleep Voltage	3.35V	±50mV
		Set to Yes	Sleep delay	1440min ±30min	No charge/discharge current, no communication, no external charging voltage (<48 V)
Full Charge Setting: Full Charge Settings	Open	Set to Yes	Constant Voltage Value Value	57.6±0.5V	When the total voltage exceeds the constant voltage threshold and the current falls below the constant current value, the BMS determines that the battery is fully charged and meets the self-learning criteria. When the total voltage exceeds the constant
		Set to Yes	Constant Current Value Value	1.5A±0.5A	

Basic Parameter Settings					
Function Name: Function	Function Settings	Can be configured	Indicator Item Indicator	Factory Default Value Factory Setting	Remarks Remarks
		Not Set No	Delayed Delay	10S±2S	voltage value and thecurrent is less than theconstant current value, the BMS will consider thebattery fully charged and the self-learning conditionmet.

4.3 LED Indicator Definitions

LED lights: 4 green capacity indicators, 1 red alarm indicator, and 1 green operation indicator



4.3.1 Capacity Indicator

State		Charge				Discharge			
Capacity Indicator Light		SOC4●	SOC3●	SOC2●	SOC1●	SOC4●	SOC3●	SOC2●	SOC1●
	0～25%	Flash 2	Go out	Go out	Go out	Always On	Go out	Go out	Go out
	25～50%	Always On	Flash 2	Go out	Go out	Always On	Always On	Go out	Go out
	50～75%	Always On	Always On	Flash 2	Go out	Always On	Always On	Always On	Go out
	75～100%	Always On	Always On	Always On	Flash 2	Always On	Always On	Always On	Always On
Operation Indicator ●		Always On				Flash 3			

4.3.2 State Indication

System mode	Anomalous event	Quantity of electricity LED	ALM	RUN	Remarks
		● ● ● ●	●	●	
Shut down	Turn Off/Sleep			Complete eradication	
Await the opportune moment	Normal	Based on the electricity level indication	Go out	Flash 1	During standby mode, only normal and alarm states are reported; protection and fault conditions are reported based on charge/discharge status. Alarms include the following categories: significant voltage difference alarms, low capacity alarms, high/low cell voltage alarms, high/low overall voltage alarms, and all temperature alarms (high/low cell temperature, high/low ambient temperature, high MOS temperature). The ALM does not flash when overvoltage alarms for either individual cells or the overall system occur.
	Report an emergency		Flash 2	Flash 1	
Charge	Normal	Based on the electricity level indication	Go out	Always On	
	Report an emergency	(Supreme Indicator LED flashes twice)	Flash 2	Always On	Alarms include the following categories: pressure differential alarm, low capacity alarm, high/low cell voltage, high/low total voltage, all temperature alarms (high/clow cell temperature, high/low ambient temperature, high MOS temperature), and overcurrent alarm (the ALM does not flash when both cell and total voltage exceed limits).
	Single/Monolithic Overvoltage Protection / Full Charge Protection	Based on the electricity level indication	Go out	Flash 2	
	Overcurrent protection (Enter limited-flow charging mode)	Based on the electricity level indication (Flashes when charging current is present)	Go out	Always On	After overcurrent protection, the system enters current-limiting charging mode with normal charging current displayed; after overcurrent protection, it enters current-limiting charging mode without charging current displayed as a fault status, with ALM always illuminated and all other indicators off.
	Temperature Protection	Go out	Always On	Go out	Cell, MOS, environment.
Discharge	Normal	Based on the electricity level indication	Go out	Flash 3	
	Report an emergency		Flash 2	Flash 3	The alarms include the following categories: pressure differential alarm, low capacity alarm, high/low individual cell voltage, high/low overall voltage, all temperature alarms (high/low cell temperature, high/low ambient temperature, high MOS temperature), and overcurrent alarm.
	Single/Monolithic Under-Voltage Protection		Flash 2	Go out	
	Overcurrent and short-circuit protection	Go out	Always On	Go out	
	Temperature Protection	Go out	Always On	Go out	Cell, MOS, Environment
Hitch	NTC fault, MOS fault, reverse connection, voltage difference protection, ultra-low voltage protection	Go out	Always On	Go out	

4.3.3 Flash Explanation

Flash Method	Bright	Go out
Flash 1	0.25 S	3.75 S
Flash 2	0.5 S	0.5 S
Flash 3	0.5 S	1.5 S

5 Operating Modes

5.1 Basic Modes

5.1.1 Charging Mode

When BMS detects an external charging voltage and both the cell voltage and temperature are within the chargeable range, it activates the charging MOSFET to begin charging. Once the charging current reaches the required level, charging mode is initiated. During charging mode, both the charging and discharging MOSFETs remain conducting.

When the BMS detects an external charging voltage and both the cell voltage and temperature are within the allowablecharging range, the charging MOSFET is activated to begin charging. Once the charging current reaches a valid level, thesystem enters charging mode. In charging mode, both the charging and discharging MOSFETs are turned on.

5.1.2 Discharging Mode

The BMS enters discharge mode when it detects a load connection and the cell voltage and temperature are within the allowable discharge range, with the discharge current reaching the effective discharge current. In discharge mode, both the charging and discharging MOSFETs are turned on.

When the BMS detects a connected load and the cell voltage and temperature are within the allowable discharging range, and the discharging current reaches a valid level, the system enters discharging mode. In discharging mode, both the charging and discharging MOSFETs are turned on.

5.1.3 Sleep and Wake-up Mode

The system enters sleep mode when the following conditions are met:

- The single-unit under-voltage protection or overall under-voltage protection has not been released within 30 minutes.
- Press the button for 3 seconds and release it;
- The minimum cell voltage falls below the sleep threshold voltage (default value: 3350 mV) and remains below it for the specified duration (default value: 1440 minutes), with no communication activity or charge/discharge current.
- Perform a forced shutdown using the host computer software.

The system enters sleep mode when any of the following conditions are met:

- Single-cell undervoltage protection or total undervoltage protection is not cleared within 30 minutes.
- The button is pressed for 3 seconds and then released.
- The minimum cell voltage falls below the sleep set voltage (default value: 3300mV), and this condition persists for the delay time (default: 1440 minutes), along with no communication and no charge/discharge current.
- Forced shutdown via upper computer software.

Before entering sleep mode, ensure the P-end is not connected to an external voltage; otherwise, low-power mode cannot be activated.

- If the minimum cell voltage falls below the under-voltage protection threshold of-500 mV, the system will enter deep sleep mode automatically after a 10-minute delay.

  Before entering sleep mode, ensure that the P-terminal is not connected to external voltage; otherwise, low-power mode cannot be entered.
- If the minimum cell voltage falls below the undervoltage protection value by 500mV, the system will forcibly enter deep sleep mode after a 10-minute delay.

Awakening conditions for hibernation mode:

- Connect to a charger with an input voltage greater than 48 V.
- Wake up by holding button 1 for 1 second.

Wake-up conditions from sleep mode:

- Connect the charger; the input voltage of the charger must be greater than 48V.
- Press the button for 1 second and then release it to wake up the system.

5.2 Shutdown Mode

When the low-voltage switch is opened, the BMS enters shutdown mode and can only be powered on by closing the switch.

When the low-voltage switch is disconnected, the BMS enters shutdown mode. The system can only be turned on again by closing the low-voltage switch.

5.3 Button Instructions

- When the BMS is in sleep mode, press and hold button 1 for 1 second to activate it; the LEDs will then light up sequentially from "RUN" for 0.5 seconds each.
- When the BMS is operational, press keys 3S–6S and release them to put the BMS into sleep mode; the LEDs will then light up sequentially for 0.5 seconds starting from the lowest power level indicator.
- When the BMS is operational, press and hold the button for ≥10 seconds to perform a hardware reset; the LED indicator will display the current battery level.
- When the BMS is in sleep mode: Press the button for 1 second and then release it. The BMS will be activated, and theLEDs will light up sequentially from the "RUN" indicator for 0.5 seconds each.
- When the BMS is in operating mode: Press the button for 3-6 seconds and then release it. The BMS will enter sleep mode,and the LEDs will light up sequentially starting from the lowest capacity indicator for 0.5 seconds each.
- When the BMS is in operating mode: Press the button for 10 seconds or more and then release it. The BMS will undergoa hardware reset, and the LEDs will display according to the current battery capacity.

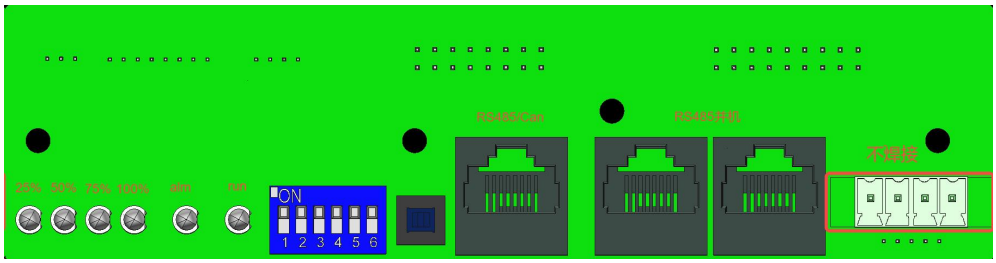
6 Communication

6.1 RS485 Communication

- RS485-1: Features a baud rate of 9600 and supports communication protocols including KS1363, Shengyang 1.6,Vertiv, ELTKE, and others.
- RS485-2: Parallel interface with a baud rate of 9600, supporting the 1363 protocol for master-slave communication between devices
- RS485-1: Baud rate is 9600, supports KS1363 protocol, Sacred Sun 1.6 protocol, Vertiv, ELTKE and other communication battery protocols.
- RS485-2: Parallel interface, baud rate is 9600, supports 1363 protocol, master-slave parallel communication between Packs

6.2 Communication Interface Definition

6.2.1 Interface Diagram



6.2.2 Communication Interface Definitions

RS485-1 – Uses a vertical RJ45 connector	
RJ45 Pin	Defined declaration
1	RS485A-B
2	RS485A-A
4	Can-H
5	Can-L
6	GND

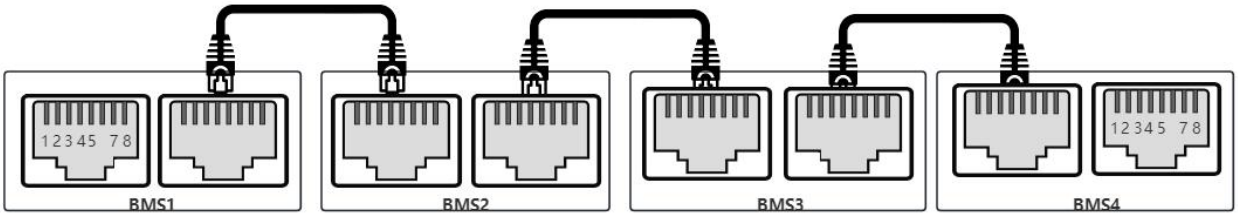
RS485 Communication Interface – RJ45			
RS485-1 – Uses a vertical RJ45 connector		RS485-2 – uses an 8P8C vertical RJ45 connector	
RJ45 Pin	Defined declaration	RJ45 Pin	Defined declaration
1	RS485B-B	1	RS485A-B
2	RS485B-A	2	RS485A-A
4	-	4	
5	-	5	
6	GND	6	GND
7	RS485B-A	7	RS485B-A
8	RS485B-B	8	RS485B-B

6.2.3 BMS Board Parallel Connection Method

When multiple packs are used in parallel, distinct pack addresses are identified via hardware code assignment, with each pack having a unique address within the entire battery pack. The hardware addresses are configured using a code-switching mechanism as shown in the table below.

When the Pack is used in parallel, the hardware DIP address is used to distinguish different PACK addresses, and the address of each PACK in the entire battery pack is unique. The following is the setting of the hardware address through the DIP switch, refer to the table

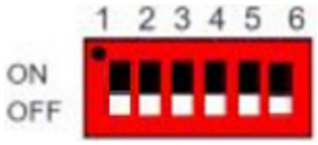
below.



6.2.4 DIP Switch Settings (Supports Parallel Operation and Protocol Selection)

Connection and Protocol Selection))

When multiple packs are used in parallel, distinct pack addresses are identified via hardware code assignment, with each pack having a unique address throughout the battery pack. The hardware addresses are configured using a code-switching mechanism as shown in the table below.



Address	Dial switch position				Reserve	Main engine	Explain
	#1	#2	#3	#4	#5	#6	
0	OFF	OFF	OFF	OFF	OFF	OFF	(main engine)
1	ON	OFF	OFF	OFF	OFF	OFF	(Secondary) Pack1
2	OFF	ON	OFF	OFF	OFF	OFF	(Secondary) Pack2
3	ON	ON	OFF	OFF	OFF	OFF	(Secondary) Pack 3
4	OFF	OFF	ON	OFF	OFF	OFF	(Secondary) Pack 4
5	ON	OFF	ON	OFF	OFF	OFF	(Secondary Unit) Pack 5
6	OFF	ON	ON	OFF	OFF	OFF	(Secondary Unit) Pack 6
7	ON	ON	ON	OFF	OFF	OFF	(Secondary) Pack 7

8	OFF	OFF	OFF	ON	OFF	OFF	(Secondary) Pack8
9	ON	OFF	OFF	ON	OFF	OFF	(Secondary) Pack9
10	OFF	ON	OFF	ON	OFF	OFF	(Secondary) Pack10
11	ON	ON	OFF	ON	OFF	OFF	(Secondary) Pack11
12	OFF	OFF	ON	ON	OFF	OFF	(Secondary) Pack12
13	ON	OFF	ON	ON	OFF	OFF	(Secondary) Pack13
14	OFF	ON	ON	ON	OFF	OFF	(Secondary) Pack14
15	ON	ON	ON	ON	OFF	OFF	(Secondary) Pack15
17	ON	OFF	OFF	OFF	ON	OFF	(Secondary) Pack16
18	OFF	ON	OFF	OFF	ON	OFF	(Secondary) Pack17
19	ON	ON	OFF	OFF	ON	OFF	(Secondary) Pack18
20	OFF	OFF	ON	OFF	ON	OFF	(Secondary) Pack19
21	ON	OFF	ON	OFF	ON	OFF	(Secondary Unit) Pack20
22	OFF	ON	ON	OFF	ON	OFF	(Secondary) Pack21
23	ON	ON	ON	OFF	ON	OFF	(Secondary) Pack22
24	OFF	OFF	OFF	ON	ON	OFF	(Secondary) Pack23
25	ON	OFF	OFF	ON	ON	OFF	(Secondary) Pack24
26	OFF	ON	OFF	ON	ON	OFF	(Secondary) Pack25
27	ON	ON	OFF	ON	ON	OFF	(Secondary) Pack26
28	OFF	OFF	ON	ON	ON	OFF	(Secondary) Pack27
29	ON	OFF	ON	ON	ON	OFF	(Secondary) Pack28
30	OFF	ON	ON	ON	ON	OFF	(Secondary) Pack29
31	ON	ON	ON	ON	ON	OFF	(Secondary) Pack30

7 Electrical Interface Definition

7.1 BMS Board Interface Definition

Mainboard Interface Definition

Wiring Definition

- B+: Positive terminal of the battery pack cathode, used to power the BMS; the power positive terminal P+ is directly connected to the battery cell's positive terminal.
- B-: Negative terminal of the battery pack (uses M5 terminal)
- P-: Negative terminal of the battery pack; serves as both the charging and discharging negative electrode (using the same port for both functions).

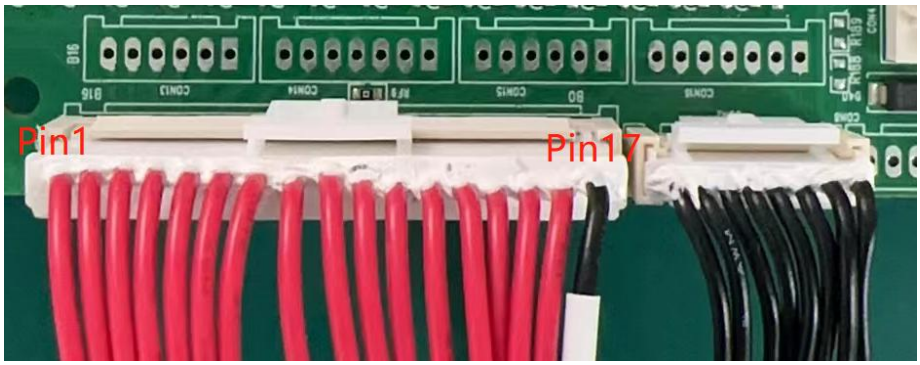
Note:*B-P uses M5 terminal blocks*

- B+: The positive terminal of the battery pack (PACK+). It is used to power the BMS, and the power positive terminal (P+) is directly connected to the positive terminal of the battery pack.
- B-: The negative terminal of the battery pack (PACK-), connected using an M5 terminal.
- P-: The negative terminal of the battery pack, which serves as both the charging and discharging negative terminal (shared charging and discharging port).

Note*: Both B- and P- use M5 terminals.*

When using a 17+8-pin sampling cable (for safety):

When using a 17+8 PIN sampling ribbon cable (for foolproofing):



CON2: (PHS-2.0-8PIN) From PIN1 to PIN8: NTC1+, NTC1-, NTC2+, NTC2-, NTC3+, NTC3-, NTC4+,NTC4-

CIN3: (XHB-2.5-17PIN) from PIN 1 to PIN 17: CELL16 B+, CELL15, CELL14, CELL13, CELL12, CELL11, CELL10, CELL 9, CELL8, CELL7, CELL6, CELL5, CELL4, CELL3, CELL2, CELL1, CELL0 B-

remarks :

CELL0 – Pin 17 is the B-side of the package; CELL16 – Pin 1 is the B+ side of the package.

NTC Model: NTC tadpole, B value 3950,10 K ± 1%, at 25°C

Notes:

CELL0 (Pin 17) is connected to the PACK's B- terminal, and CELL16 (Pin 1) is connected to the PACK's B+ terminal.

NTC Model: NTC tadpole, B value 3950, 10K ± 1% at 25° C.

Key Points:

To switch to the 15S configuration, connect CELL15 and CELL16 together to the B+ terminal cell, or notify the BMS manufacturer in advance to remove the shorting resistor between CELL15 and CELL16, then update the software. This shipment consists of 15 strings.

Important Points:

If switching to a 15S configuration, CELL15 and CELL16 should be connected together to the B+ terminal of the battery or notify the BMS manufacturer to remove the short-circuit resistors between CELL15 and CELL16 and update the software. This shipment is configured for a 15-cell series.

7.2 BMS Power Supply Wire Instructions

The B+ power line of the BMS must be connected separately to the battery's positive terminal; it should not be connected to a circuit breaker or behind the B+ power line, as this may interfere with the BMS's normal operation. Strict adherence to these wiring requirements is mandatory for the battery pack.

The BMS's B+ power supply wire must be separately connected to the main positive terminal of the battery. It should not be connected to the circuit breaker switch (breaker) or behind the B+ power line, as this may affect the normal operationof the BMS. Please ensure that the Pack wiring follows these instructions strictly.

7.3 Power-On and Power-Out Sequence

Connect the power supply in the following order: First, connect to motherboard B-. Then connect the sampling line, followed by B+. Finally, connect P- and P+ to the negative terminal.

Load or charger.

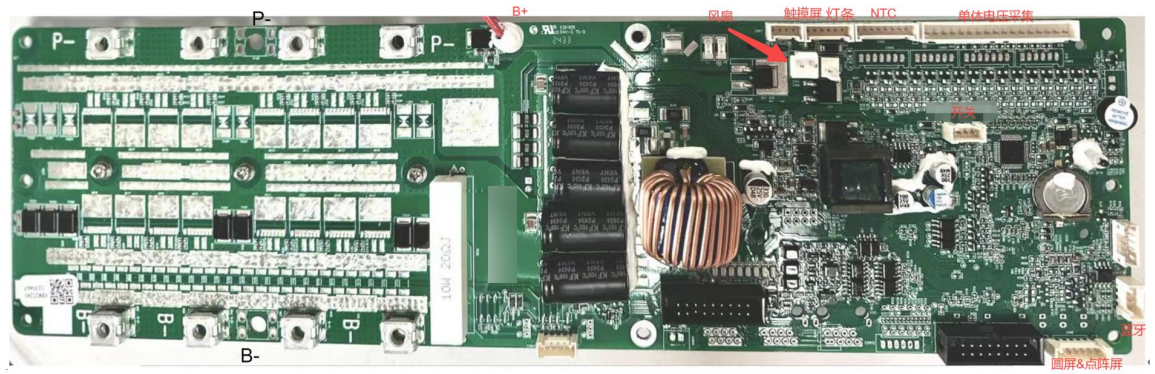
Power-Up Sequence: Connect the mainboard B- first. Connect the sampling line. Connect B+. Finally, connect P- and P+to the load or charger.

The reverse order applies: first disconnect the charger from the load, then remove B+, followed by the port sampling line, and finally disconnect B-.

Power-Down Sequence: Disconnect the charger and load first. Then disconnect B+. Disconnect the sampling line. Lastly, disconnect B-.

8 Product Physical Image and Structural Dimension Drawing (Product Appearance and Dimensions)

8.1 Actual Front View Image



8.2 Rear View

8.3 Display Screen

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8.4 Mainboard Dimensions

8.5 Display Dimensional Drawing

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9 Precautions for Upper Computer Operation

This software is designed for PCs running on the Windows operating system.

Before use, ensure the USB cable supports data transmission and that the communication device is correctly connected to both the communication port on the protection board and the USB port on the PC. Open the dedicated PC client software and configure the communication mode for the BMS. Upon successful connection, the "Communication: Connected" message will appear in the lower-left corner of the main interface. If connection fails, verify that the communication settings are correct and that all wiring is properly connected.

The host computer supports switching between Chinese and English voice modes. Go to Help in the left column of the homepage to change the language.

The following parameter screenshots are for reference only; refer to the actual BMS parameters.

This software is designed for use on Windows-based PCs.

Before Use:

- Ensure that the USB cable you are using supports data transmission.
- Verify that the communication tool is properly connected between the protection board communication port and the PC USB interface.
- Open the dedicated PC client software for BMS, and configure the communication settings for the BMS.

Connection Status:

- After successful connection, the bottom left corner of the PC client’s main page should display “Communication: Connected.”
- If the connection fails, check the communication settings on the PC client and ensure the wiring is properly connected.

  The PC client software supports both Chinese and English. You can switch languages by going to the “Help” section on the left column of the main page.

  The following parameter screenshots are for reference only. Always refer to the actual parameters of the BMS for accurate information.

9.1 Real-Time Monitoring Interface

10 Assembly and Usage Precautions

- When connecting or disconnecting power, follow the specified sequence.
- When connecting the battery pack, never connect it incorrectly or in reverse. If the device fails to connect to the host computer or if the main chips on the circuit board show significant overheating, immediately power off the device. The circuit board may already be defective and requires replacement or repair.
- During assembly, it is strictly prohibited for wire ends or solder to come into contact with circuit board components; such contact may damage the components and cause malfunctions.
- Strictly adhere to the design parameters specified in the specification; failure to do so may damage the circuit board.
- During use, ensure moisture resistance, water resistance, and anti-static properties.
- When conducting charge-discharge tests on a battery pack equipped with the management system, do not use a battery aging chamber to measure the voltage of individual cells; doing so may damage both the management system and the batteries.

- After assembly into a battery pack, complete charging and discharging cycles should be performed to activate overcharge and overdischarge protection mechanisms, enabling the circuit board to determine the battery's initial capacity.
- The system lacks a built-in battery charging function for zero-voltage conditions. Once the battery reaches 0 V, its performance will significantly degrade and it may even become damaged. To prevent damage, users should charge the battery periodically when left unused for extended periods (over three months). Additionally, after use, the battery must be recharged within 12 hours to avoid complete discharge due to self-discharge.
- Always follow the correct sequence for powering on and off.
- Do not connect the battery pack incorrectly or reverse the connections. If the PC fails to connect or if themain chips on the circuit board become noticeably hot, quickly power off. The circuit board may bedamaged and require replacement or repair.
- Avoid touching the circuit board components with wire ends, solder, or other materials to prevent damageto the components.
- Follow the design parameters as specified in the datasheet. Deviating from these parameters may damagethe circuit board.
- Ensure protection against moisture, water, and static electricity during use.
- Do not use an aging cabinet to measure the voltage of each cell in the battery pack during charging and discharging tests. This could damage both the management system and the batteries.
- After assembling the battery pack, perform a complete charge and discharge cycle to trigger overcharge and overdischarge protection. This process helps the circuit board learn the battery's initial capacity.
- The management system does not support charging for 0V batteries. If a battery drops to 0V, itsperformance will severely degrade or it may be damaged. To avoid damage, regularly charge the battery if it is not used for extended periods (over 3 months). After discharging, recharge within 12 hours to prevent thebattery from discharging to 0V due to self-discharge.