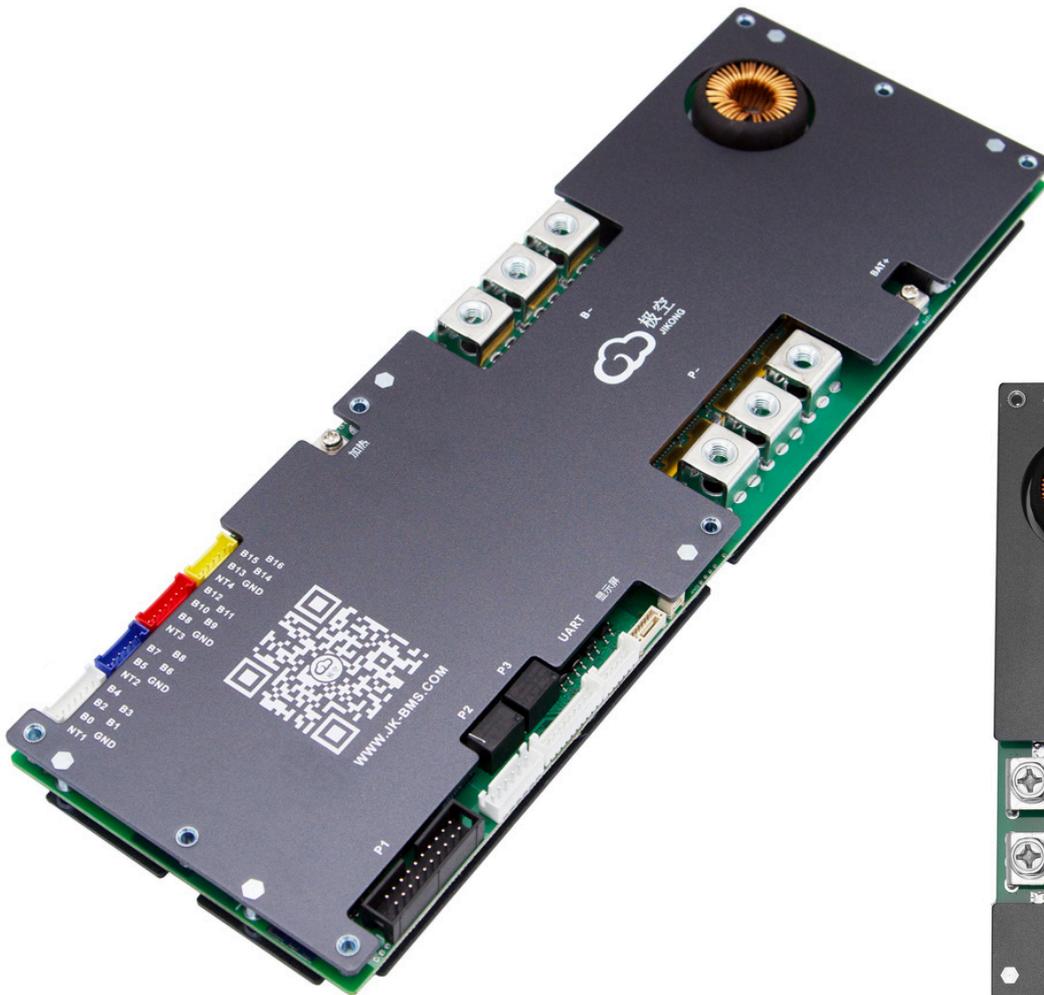


JKBMS Smart Active Balance BMS

Specification and operation manual



(Default parameters)

| NUM | PARA | LI-ION | LIFE PO4 | LTO | (unit) |
|------------|---|---------------|-----------------|------------|---------------|
| 1 | (balancing initial voltage) | 3 | 3 | 2 | V |
| 2 | (Maximum balancing current) | 2 | 2 | 2 | A |
| 3 | (Unit overcharge voltage) | 4.2 | 3.6 | 2.7 | V |
| 4 | (Single overcharge protection recovery) | 4.17 | 3.54 | 2.64 | V |
| 5 | (Monomer undervoltage protection) | 2.82 | 2.6 | 1.8 | V |
| 6 | (Single undervoltage protection recovery) | 2.85 | 2.65 | 1.85 | V |
| 7 | (Automatic shutdown voltage) | 2.8 | 2.5 | 1.7 | V |
| 8 | SOC-0% (SOC-0% voltage) SOC-100% | 2.9 | 2.6 | 1.85 | V |
| 9 | (SOC-100% voltage) | 4.18 | 3.5 | 2.65 | V |
| 10 | (Trigger balancing differential pressure) | 0.01 | 0.01 | 0.01 | V |
| 11 | (Charging overcurrent protection delay) | 3 | 3 | 3 | (S) |
| 12 | (Charge overcurrent protection release time) | 60 | 60 | 60 | (S) |
| 13 | (Discharge overcurrent protection delay) | 300 | 300 | 300 | (S) |
| 14 | (Discharge overcurrent protection release time) | 60 | 60 | 60 | (S) |
| 15 | (Short-circuit protection delay) | 5 | 5 | 5 | (uS) |

| | | | | | |
|----|--|-----|-----|-----|-----|
| 16 | (Short circuit protection release time) | 30 | 30 | 30 | (S) |
| 17 | Charging overtemperature protection temperature | 70 | 70 | 70 | °C |
| 18 | (Charge overtemperature restore temperature) | 60 | 60 | 60 | °C |
| 19 | (Discharge overtemperature protection temperature) | 70 | 70 | 70 | °C |
| 20 | (Discharge overtemperature recovery temperature) | 60 | 60 | 60 | °C |
| 21 | (Charging low temperature protection temperature) | -20 | -20 | -20 | °C |
| 22 | (Charge low temperature to restore temperature) MOS | -10 | -10 | -10 | °C |
| 23 | (MOS Overtemperature protection temperature) MOS | 100 | 100 | 100 | °C |
| 24 | (MOS Overtemperature protection recovery temperature) | 80 | 80 | 80 | °C |
| 25 | (Device address) | 0 | 0 | 0 | / |

| | | |
|----------------------------|----------------------------|---|
| Function | Log storage | <input checked="" type="checkbox"/> storage_ 10000__strip |
| | Charging current limited | 10A |
| | | Definition: Open when the charging current is greater than the charging protection current |
| | Balance current | <input type="checkbox"/> 0.4A <input type="checkbox"/> 0.6A <input type="checkbox"/> 1A <input checked="" type="checkbox"/> 2A |
| | Max current | <input type="checkbox"/> 40A <input type="checkbox"/> 60A <input type="checkbox"/> 100A <input checked="" type="checkbox"/> 150A <input type="checkbox"/> 200A |
| | LCD Choice | 2.5Inch color LCD 3.5Inch color LCD 4.5Inch color LCD |
| | Dry contact | <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes |
| | | Definition: Dry contact 1-PIN1 to PIN2: Normally open, closed in case of failure and protection; Dry contact 2-PIN3 to PIN4: Normally open, low power alarm closed |
| | Heating Function | Definition: when charging, start heating when the temperature of electric core is lower than-20°C and heating to-10°C Stop heating. (Temperature configurable)。 |
| | Reverse connect protection | <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes |
| | Weak current switch | <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes |
| | Buzzer | <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes |
| | Positioning | <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (Can be customized) |
| | Sampling socket | vertical |
| | Dial switch | 4 Bit,For RS485 communication address selection |
| | LED light | <input type="checkbox"/> No <input checked="" type="checkbox"/> ALM <input checked="" type="checkbox"/> RUN <input checked="" type="checkbox"/> ON/OFF <input checked="" type="checkbox"/> SOC6 pcs |
| Current detection resistor | 10pcs | |
| Cell Capacity | Configurable | |

| | | |
|------------------------|-------------------------|---|
| | bar code | QR Code |
| communication | communication interface | <input checked="" type="checkbox"/> RS232 <input checked="" type="checkbox"/> RS485 <input checked="" type="checkbox"/> RS485 parallel <input checked="" type="checkbox"/> CANBUS |
| | Upgrade method | <input checked="" type="checkbox"/> RS232 <input checked="" type="checkbox"/> RS485 |
| | Bluetooth | Through APP connect |
| Communication protocol | | <p>RS485 Protocol</p> <ul style="list-style-type: none"> (1) 000 - 4G-GPS Remote module protocol V4.2 (2) 001 -JK BMS RS485 Modbus V1.0 (3) 002 - NIU U SERIES (4) 003 -China tower shared battery cabinet V1.1 (5) 004 - PACE_RS485 Modbus V1.3 (6) 005 - PYLON low voltage Protocol RS485 V3.3 (7) 006 - Growatt BMS RS485 Protocol 1xSxxP_ESS Rev2.01 (8) 007 - Voltronic Inverter and BMS 485 communication protocol 20200325 (9) 008 – china tower shared battery cabinet V2.0 (10) 009 -SRNE_LOW_Voltage_Protocol_RS485_V3.3 (11) 010 - Protocol 10 <p>CANBUS Protocol</p> <ul style="list-style-type: none"> (1) 000 - JK BMS CAN Protocol V2.0 (2) 001 Deye Low-voltage hybrid inverter CAN communication protocol V1.0 (3) 002 - PYLON-low-voltage-V1.2 (4) 003 - Growatt BMS CAN-Bus-protocol -low-voltage Rev 05 (5) 004 - Victron CANbus BMS protocol 20170717 (6) 005 - SEPLOS BMS CAN Protocol V1.0 (7) 006 - Protocol 6 (8) 007 – INVT BMS CANBUS Protocol V1.02 (9) 008 - Protocol 8 (10) 009 - Protocol 9 (11) 010 - Protocol 10 |

Overview

With the rapid growth of the renewable energy storage market, there is a growing demand for battery management systems. This product is a smart BMS for energy storage applications. It uses sophisticated detection techniques to achieve protection against overcharging, over discharge, and over current of the energy storage battery, ensuring safe and reliable operation of the energy storage system. At the same time, advanced active voltage equalisation is integrated, allowing the voltage of each battery cell to be monitored in real time, improving battery life through active balance management. This product provides an intelligent battery protection solution for a wide range of energy storage applications.

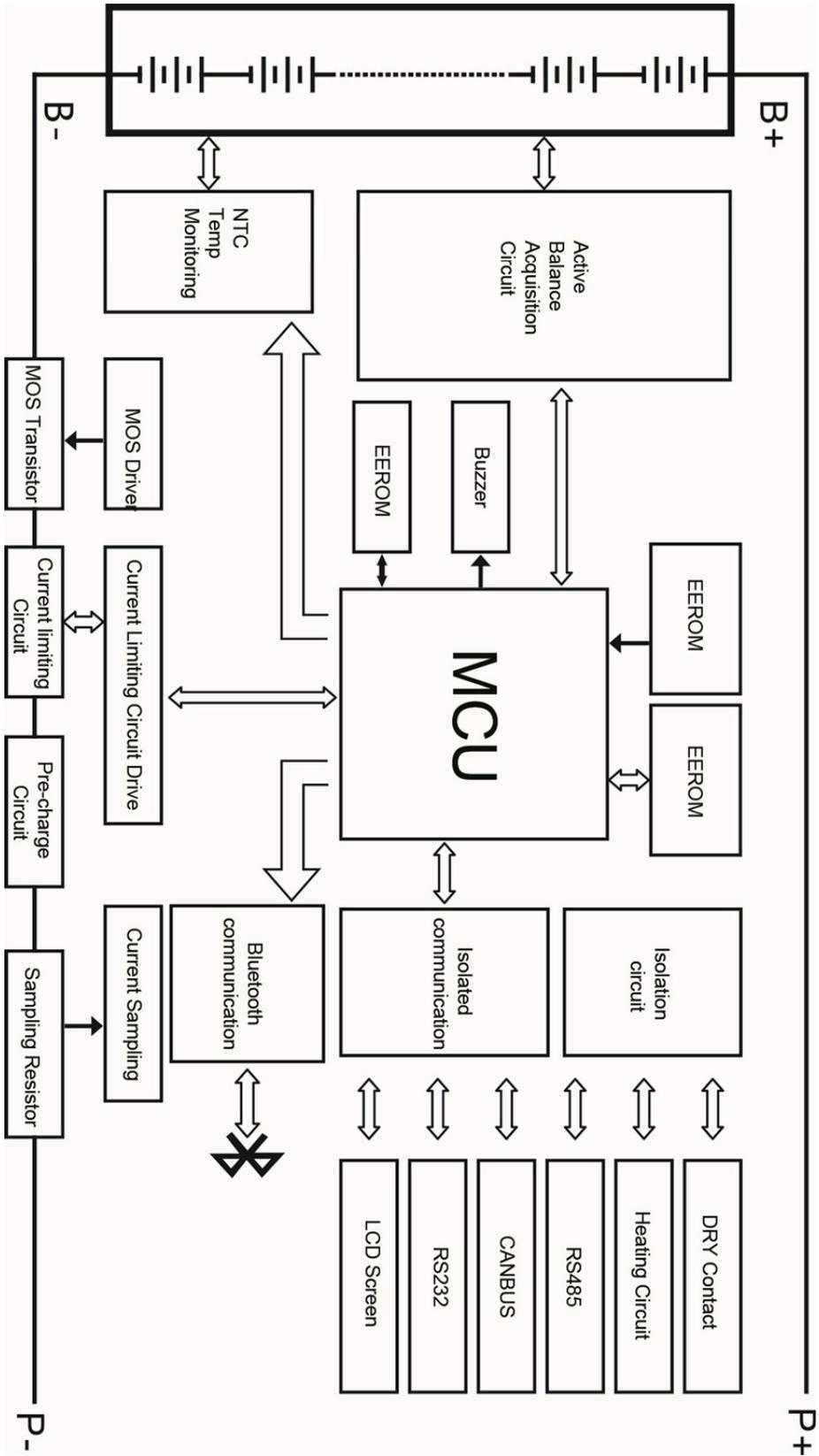
Function Characteristics

- Active Balance Function App Remote
- Operation Support PC Program Screen
- Display High Precision Voltage
- Acquisition($\leq 20\text{mV}$) High Precision Current
- Acquisition($\leq 2\%@\text{FS}$)
- Isolated power circuit
- 4 NTC detection protection
-
- LED status indication
- OVP and OCP
- Low Power Consumption
- Support RS485\CAN\RS232
- Battery Capacity Estimation
- Precise Time Log Record
- Short circuit protection
- MOS Temperature Detection Protection

Service Environmental Conditions

| Test Project | Parameter | Unit |
|---------------------|-----------|------|
| Work-temperature | -30~70 | °C |
| Storage temperature | -30~70 | °C |
| Work-humidity | 10~80 | %RH |
| Storage humidity | 10~85 | %RH |
| Power Supply | 20~70 | V |
| Working consumption | 19mA@58V | |
| standby consumption | 200uA@58V | |

Functional Block Diagram



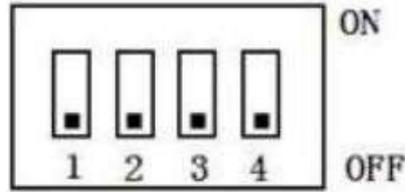
Specification parameters

| NO | Index items | | Default Parameters | Whether settable | Note |
|------------------------|-----------------------------------|--|--------------------|------------------|---------------------------------------|
| | | | | | |
| 1 | Strings | Support Battery | Lifepo4/Li-ion/LTO | YES | All Parameters are Lifepo4 parameters |
| | | Support Strings | 16 | YES | |
| 2 | OVP | Unit overcharge protection voltage | 3600mV | YES | |
| | | Unit overcharge protection recovery voltage | 3550mV | YES | |
| 3 | OVDP | Unit under voltage protection voltage | 2600mV | YES | |
| | | Unit under voltage protection recovery voltage | 2650mV | YES | |
| | | unit under voltage automatic shutdown voltage | 2500mV | YES | |
| 4 | Active Balance | Balance trigger differential voltage | 10mV | YES | |
| | | Balance starting working voltage | 3000mV | YES | |
| | | Max Balance Current | 1A | YES | |
| 5 | Overall Overcharge Protection | Max Charging Current | 150A | YES | |
| | | Charging over current delay | 2s | YES | |
| | | Charging over current alarm cleared | 60s | YES | |
| | | Charging over current limiting current | 10A | NO | |
| 6 | Overall over Discharge Protection | Max Discharging Current | 150A | YES | |
| | | Discharge over current delay | 300s | YES | |
| | | Discharge over current alarm cleared | 60s | YES | |
| 7 | Short circuit protection | Short circuit protection current | 550A | NO | |
| | | Short circuit protection delay | 30us | YES | |
| | | Short circuit protection released | 60s | YES | |
| 8 | Temperature Protection | Charging over temperature protection | 70°C | YES | |
| | | Charging over temperature recovery | 60°C | YES | |
| | | Discharge over temperature protection | 70°C | YES | |
| | | Discharge over temperature recovery | 60°C | YES | |
| | | Low temperature protection during charging | -20°C | YES | |
| | | Low temperature recovery during charging | -10°C | YES | |
| | | MOS Over Temperature Protection | 100°C | YES | |
| | | MOS over temperature recovery | 80°C | YES | |
| | | Battery alarm temperature | 60°C | YES | |
| Battery alarm recovery | 50°C | YES | | | |

Dial switch settings

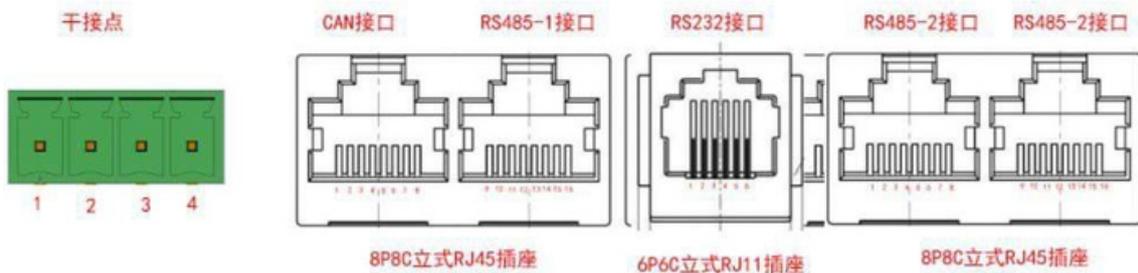
When multiple battery packs are used in parallel, the battery packs need to

be set to different addresses through a dial switch for normal use. The following dial switch address table.



| Address | Dial switch position | | | |
|---------|----------------------|-----|-----|-----|
| | 1 | 2 | 3 | 4 |
| 0 | OFF | OFF | OFF | OFF |
| 1 | ON | OFF | OFF | OFF |
| 2 | OFF | ON | OFF | OFF |
| 3 | ON | ON | OFF | OFF |
| 4 | OFF | OFF | ON | OFF |
| 5 | ON | OFF | ON | OFF |
| 6 | OFF | ON | ON | OFF |
| 7 | ON | ON | ON | OFF |
| 8 | OFF | OFF | OFF | ON |
| 9 | ON | OFF | OFF | ON |
| 10 | OFF | ON | OFF | ON |
| 11 | ON | ON | OFF | ON |
| 12 | OFF | OFF | ON | ON |
| 13 | ON | OFF | ON | ON |
| 14 | OFF | ON | ON | ON |
| 15 | ON | ON | ON | ON |

Interface definition



Definition of dry contact interface

| Pin Num | Pin Definition | Num |
|---------|----------------|--|
| 1 | COM1 | S1 and COM1 conduct under alarm conditions |
| 2 | S1 | |
| 3 | COM2 | S2 and COM2 conduct under low battery conditions |
| 4 | S2 | |

CAN and RS485-1 Interface definition

| RS485- adopts 8P8C vertical RJ45 socket | | CANBUS- adopts 8P8C vertical RJ45 socket | |
|---|----------------|--|----------------|
| Pin Num | Pin Definition | Pin Num | Pin Definition |
| 1、 8 | RS485- B1 | 9、 10、11 14 、 16 | NC |
| 2、 7 | RS485-A1 | 12 | CANL |
| 3、 6 | GND | 13 | CANH |
| 4、 5 | NC | 15 | GND |

RS232 Interface definition

| RS232 adopts 6P6C vertical RJ11 socket | | |
|--|----------------|------|
| Pin Number | Pin Definition | Note |
| 1、 2 6 | NC | |
| 3 | RS232_TX | |
| 4 | RS232_RX | |
| 5 | GND | |

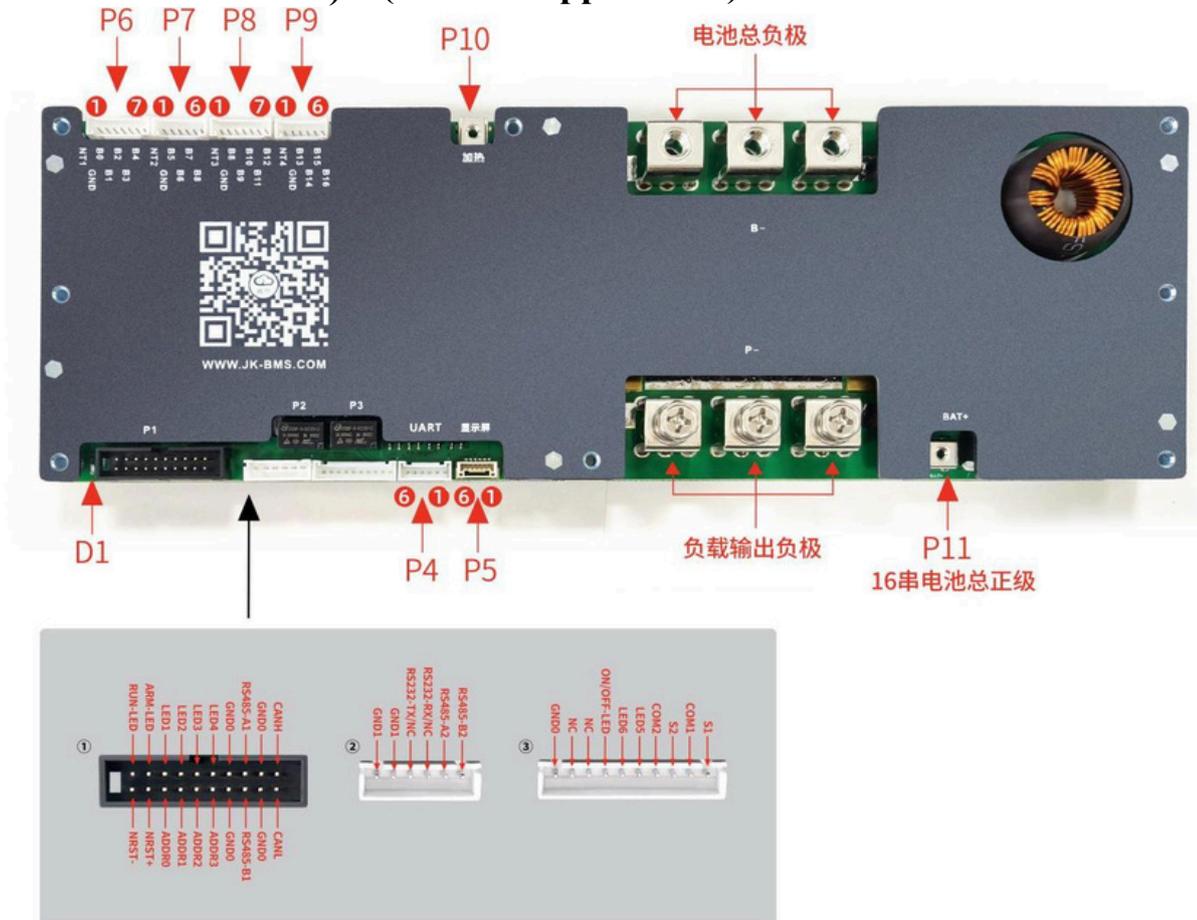
RS485-2 Parallel interface definition

| RS485- adopts 8P8C vertical RJ45 socket | | RS485- adopts 8P8C vertical RJ45 socket | |
|---|----------------|---|----------------|
| Pin Num | Pin Definition | Pin Num | Pin Definition |
| 1、 8 | RS485- B2 | 9、 16 | RS485-B2 |
| 2、 7 | RS485-A2 | 10、 15 | RS485-A2 |
| 3、 6 | GND | 11、 14 | GND |
| 4、 5 | NC | 12、 13 | NC |

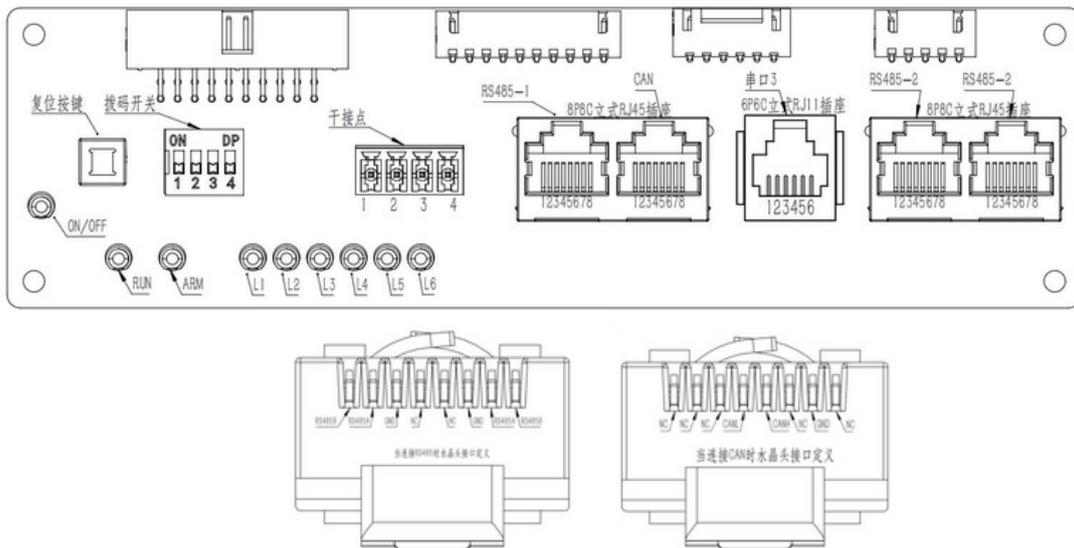
Battery interface definition

| Interface | Definition Description | | | |
|-------------------------------|---|-------------------------------------|-----|--|
| BAT+ | It is connected to the total positive pole of the battery cells PACK to supply power to the BMS board. | | | |
| B- | Connect to battery cells PACK total negative pole | | | |
| P- | The battery PACK negative, and it is also the charge and discharge negative, charging and discharging are the same port | | | |
| Battery cells and temperature | NT1 | Connect NTC1 Temperature probe | NT3 | Connect NTC3 Temperature probe |
| | GND | Connect NTC1 Temperature probe | GND | Connect NTC3 Temperature probe |
| | B0 | Battery cells first negative pole | NC | NC |
| | B1 | Battery cells first positive pole | B9 | Battery cells ninth positive pole |
| | B2 | Battery cells second positive pole | B10 | Battery cells tenth positive pole |
| | B3 | Battery cells third positive pole | B11 | Battery cells eleventh positive pole |
| | B4 | Battery cells fourth positive pole | B12 | Battery cells twelfth positive pole |
| | NTC2 | Connect NTC2 Temp probe | B13 | Battery cells thirteenth positive pole |
| | GND | Connect NTC2 Temp probe | B14 | Battery cells fourteenth positive pole |
| | B5 | Battery cells fifth positive pole | B15 | Battery cells fifteenth positive pole |
| | B6 | Battery cells sixth positive pole | B16 | Battery cells sixteenth positive pole |
| | B7 | Battery cells seventh positive pole | | |
| | B8 | Battery cells eighth positive pole | | |

(Interface definition) (Product Appearance)



Interface board interface diagram



(This section describes the functions of the interface board)

Protection board Factory standard interface board for users to use LED indicator, reset switch, dip switch, dry contact, communication and other functions. The LED indicator can help the user judge the current BMS working status and the remaining battery power; The reset button can be pressed to reset the BMS when the user fails to use the BMS. The dip switch can be used to set the address when the BMS is used in parallel, and supports a total of 16 addresses from 0 to 15. Dry contact user control of external devices such as alarms and fans; CAN and RS485-1 are used for communication between BMS and inverter. RS485-2 is used to connect battery packs in parallel and communicate with the upper computer, The panel interface is described as follows (see the attachment for details).

(Function introduction and usage instructions)

(Active equalization)

The protection board adopts active equalization technology, and the principle of equalization is to transfer the energy of the high-voltage cell to the low-voltage cell, and realize the energy transfer through the medium of the protection board. Before using the balancing function, users need to set the basic parameters of the battery and download the JIKONG BMS-APP. After downloading, set the battery type on the parameter setting page of the extreme space APP. For default parameters, see Chapter 4. After setting the battery type, set basic battery parameters in common Settings, including the number of cells, battery capacity, trigger equalization differential pressure (the default value can be retained), voltage calibration, and current calibration.

Users can set the balance trigger pressure difference (mV) in the parameter setting of the APP. When the balance is turned on, the balance will be turned on automatically when the pressure difference of any two strings of batteries in the battery pack is greater than the set value, and the balance will be turned off when the pressure difference is less than the set value. The default balance current is 2A. Users can adjust the balance current according to their own battery capacity. It is recommended that the balance current not exceed 0.2C of the battery capacity (C). If you do not need the balancing function, you can set the balancing switch to off in the BMS control page of the APP.

(Display interface)

The display interface is reserved for the protection board, which supports users to select our display for convenient viewing of battery information. Users can select and select according to actual needs.

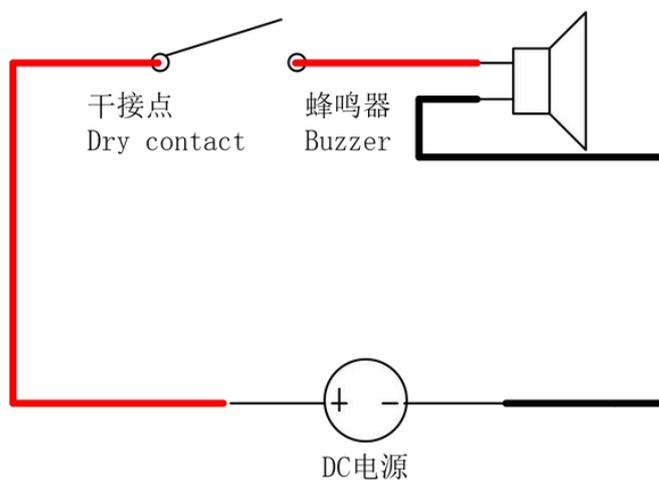
(Heating function)

The protection plate comes standard with heating function. The resistance heater or heating film is used to heat the battery at low temperature to avoid the failure of charging and discharging due to the decrease of battery activity caused by low temperature. The designed heating current is 10A. This function allows users to switch operations in the BMS control page of the APP according to their actual temperature. At the same time, it is recommended to series a temperature control switch in the heating circuit as a secondary protection to prevent thermal runaway in extreme cases. You are advised to select a normally closed temperature switch of 45 °C to 65 ° C. When the temperature reaches the threshold of the temperature switch, the temperature switch is turned off and the heating circuit is cut off to prevent further heating.

(Dry contact function)

The protection board is equipped with two dry contacts to control external devices such as alarms and fans. When the BMS detects that the battery is in overtemperature, overcharge, or overdischarge state, the alarm interface can switch the status of the dry contact to drive the buzzer to alarm or drive the fan to cool down. You can select two trigger conditions based on your requirements. After switching the trigger alarm conditions, users need to set the conditions according to their own needs.

The control principle of dry contact to external alarm equipment is shown in the following figure:



DC power supply

Dry contact wiring diagram

(Charge overvoltage protection and recovery)

The protection board is equipped with charge overvoltage protection as standard. Users can set the single overcharge protection voltage and single overcharge recovery voltage in the parameter setting page of the APP. When any string of batteries is overvoltage during battery charging, the protection board will turn off the charging to protect the battery. To prevent the battery from overcharging and damaging the cell.

(Discharge undervoltage protection and recovery)

The protection board is equipped with discharge undervoltage protection function as standard. Users can set battery undervoltage protection voltage (V), battery undervoltage recovery voltage (V) and automatic shutdown voltage (V) in the parameter setting page of the APP according to their own battery type. When the protection board is in the discharge state, when the voltage of any string of batteries is lower than the set undervoltage protection voltage value, the protection board triggers the undervoltage protection and closes the discharge at the same time to protect the battery cell and prevent overdischarge from damaging the battery cell. When the battery is charged until the voltage of all individual cells is higher than the undervoltage recovery voltage, the undervoltage protection release will turn on the discharge again. When the voltage of any string of batteries is lower than the automatic shutdown voltage, the protection board will automatically shut down to protect the battery.

(Charge overcurrent protection and recovery)

The protection board is equipped with the charging overcurrent protection function as standard. Users can set the continuous charging current (A), charging overcurrent delay (S) and charging overcurrent release (S) in the parameter setting page of the APP according to their own battery capacity and the output current of the charger. When the charging current is greater than the set continuous charging current, the charging protection will be triggered after the set charging overcurrent delay time, and the protection board will close the charging, and the protection board will open the charging again after the charging overcurrent release time.

(Discharge overcurrent protection and recovery)

The protection board is equipped with the discharge overcurrent protection function as standard. Users can set the continuous discharge current (A), discharge overcurrent delay (S) and discharge overcurrent release (S) in the parameter setting page of the APP according to their own battery capacity and load output current. When the discharge current is greater than the set continuous discharge current, the discharge overcurrent protection is triggered after the set discharge overcurrent delay time, and the protection board closes the discharge. After the discharge overcurrent release time, the protection board starts the discharge again.

(Over temperature protection and recovery)

The protection board is equipped with charge and discharge overtemperature protection function as standard. Users can set charge overtemperature protection (°C), charge overtemperature recovery (°C), discharge overtemperature protection (°C), and discharge overtemperature recovery (°C) on the parameter setting page of the APP according to their own needs. When the temperature data collected by the protection board is higher than the set charge overtemperature protection value, the protection board shuts down the charging, and turns on the charging again when the temperature is lower than the set charge overtemperature recovery value. The same applies to the discharge overtemperature protection and recovery.

(Low temperature protection and recovery)

The protection board is equipped with charging low temperature protection function as standard. Users can set charging low temperature protection (°C) and charging low temperature recovery (°C) in the parameter setting page of the APP according to their own needs. When the temperature data collected by the protection board is lower than the set charging low temperature protection value, the protection board closes the charging, and turns on the charging again when the temperature returns to higher than the set charging low temperature recovery value. It is recommended that users in extremely cold areas in winter choose the heating function to better protect the battery cell.

(Short circuit protection and recovery)

The protection board is equipped with the short circuit protection function as standard. The user does not need to set the current that triggers the short circuit protection by himself. If necessary, the user can set the short circuit protection delay (us) and short circuit protection recovery time (S) on the parameter setting page of the APP. When the user connects the charger for the first time to charge, if the charging short circuit protection is triggered after the external line is correctly connected in the BMS control page, the short circuit protection delay can be increased. The cause of the protection is that the peak current of the charger is too large when the charger is turned on and output. In this case, the short circuit protection is lifted after the short circuit protection recovery time, and the protection board is turned on and charged. When the user is connected to the load for the first time, the discharge short-circuit protection occurs, and the short-circuit protection delay can be increased to ensure that there is no short circuit in the external wiring. Because the capacitance inside some loads is large, the opening instantaneous current may be too large, which may trigger the short-circuit protection. In this case, the short-circuit protection is removed after the short-circuit protection recovery time, and the protection board is opened and discharged.

(Emergency switch)

The protection board is equipped with the standard emergency switch function. When the user is in normal use, if there are problems such as over-temperature, over-discharge, over-charge, and drop string, the protection board will turn on the charge and discharge for 30 minutes at the same time after the emergency switch is opened on the BMS control page in the APP, giving the user an emergency use time. In this process, if the voltage of the single cell has reached the automatic shutdown voltage, the protection board will turn on the charge and discharge for 30 minutes at the same time. The protective plate will also continue to work until the end of the 30-minute emergency switch cycle to avoid dangerous situations such as breaking down on the road.

(Intelligent sleep)

The protection board is equipped with intelligent sleep function as standard, and users can choose to open or close the BMS control page of the APP according to their own needs. The purpose of this function is to close the protection board when the protection board is in standby state (the charging and discharging current is less than 1A for 26 consecutive hours) to reduce the energy consumption of the protection board itself to the battery. When the user needs to activate it again, the button can be activated or the charger can be activated.

(Communication function)

The protection board is equipped with CAN and RS485 communications. The default communication rate of CAN communication is 250K. Users can select the corresponding protocol in the extreme space APP according to their inverter brand and specific specifications. At the same time, there are two RS45 communication interfaces, among which RS485-1 is used for communication with inverters and other Settings, and users can choose the corresponding protocol in the APP according to their own inverter brand and specific specifications. RS485-2 Parallel output Two ports are used to connect battery packs in parallel to the upper computer to view battery string information. The default baud rate is 115200. The protection board can set the communication address by setting the DIP switch, and query the data of all battery packs through the upper polling. The address range is 0 to 15.

(Charge current limiting function)

The protection board is equipped with the charging current limiting function as standard. Users can set the continuous charging current (A), charging overcurrent delay (S) and charging overcurrent release time (S) in the APP according to their own battery capacity and charging current. When the battery is charged overcurrent, the current limiting function is started, and the charging current is constant at about 10A to protect the battery.

(Main parameter)

Basic parameter ct)

| (Serial number) | (Project) | (argument) | (Unit) |
|-----------------|--|------------|--------|
| 1 | (Supply voltage) | 20-70 | V |
| 2 | (Standby power consumption) | 12 | mW |
| 3 | (Operating power consumption) | 1100 | mW |
| 4 | (Operating temperature) | -30-70 | °C |
| 5 | (Maximum number of collection strings) | 16 | (S) |
| 6 | (Maximum balancing current) | 2 | A |
| 7 | (Maximum charging current) | 300 | A |
| 8 | (Maximum discharge current) | 300 | A |
| 9 | (Maximum instantaneous current) | 600 | A |
| 10 | (Maximum internal loop resistance) | 0.25 | mΩ |
| 11 | (Protective plate size) | 300*100*24 | mm |
| 12 | (Finished weight) | 1000 | g |

LED (Product connector, LED definition)

(Interface definition)

| (coupler) | (Type of connector) | (Interface name) | (Pin number) | | |
|-----------|----------------------------|--------------------------------------|--------------|-----------------------------|---|
| | | | | (Name) | (definition) |
| P1 | -2.54- 2*10P XH-2.54-6P | | | (Interface board interface) | |
| P2 | HY-2.0-10P | | | | |
| P3 | | | | | |
| P4 | A1254WF-6A | URAT (URAT display interface) | 1 | K- | (Activation signal negative electrode) |
| | | | 2 | K+ | (Activate the positive signal) |
| | | | 3 | GND | (Negative terminal) |
| | | | 4 | RX | UART |
| | | | 5 | TX | _RX,5V |
| | | | 6 | VCC | UART_TX (Display power output) |
| P5 | A1254WF-6A | (Display interface) | 1 | VCC | ,5V (Display power output) |
| | | | 2 | A | RS485-A(Display RS485 signal negative) |
| | | | 3 | B | RS485-B(The display RS485 signal is positive) |
| | | | 4 | GND | (Negative terminal) |
| | | | 5 | K+ | (Activate the positive signal) |
| | | | 6 | K- | (Activation signal negative electrode) |
| P6 | HY2.0-7P | (Acquisition interface) | 1 | NT1 | (Connect the NTC1 temperature probe) |
| | | | 2 | GND | (Connect the NTC1 temperature probe) |
| | | | 3 | B0 | (Total negative battery) |
| | | | 4 | B1 | (The first battery positives) |
| | | | 5 | B2 | (The second battery positive) |
| | | | 6 | B3 | (The third battery positive) |
| | | | 7 | B4 | (The fourth battery positive) |
| P7 | HY2.0-6P | (Acquisition interface) | 1 | NTC2 | (Connect the NTC2 temperature probe) |
| | | | 2 | GND | (Connect the NTC2 temperature probe) |

| | | | | | |
|-----|--|-------------------------|---|-----|--------------------------------------|
| | | | 3 | B5 | (The fifth battery positive) |
| | | | 4 | B6 | (The sixth battery positive) |
| | | | 5 | B7 | (The seventh battery positive) |
| | | | 6 | B8 | (The eighth battery positive) |
| P8 | HY2.0-7P | (Acquisition interface) | 1 | NT3 | (Connect the NTC3 temperature probe) |
| | | | 2 | GND | (Connect the NTC3 temperature probe) |
| | | | 3 | B8 | (reserved pin) |
| | | | 4 | B9 | (The ninth battery positive) |
| | | | 5 | B10 | (The tenth battery positive) |
| | | | 6 | B11 | (The eleventh battery positive) |
| | | | 7 | B12 | (The twelfth battery positive) |
| P9 | HY2.0-6P | (Acquisition interface) | 1 | NT4 | (Connect the NTC4 temperature probe) |
| | | | 2 | GND | (Connect the NTC4 temperature probe) |
| | | | 3 | B13 | (The thirteenth battery positive) |
| | | | 4 | B14 | (The fourteenth battery positive) |
| | | | 5 | B15 | (The fifteenth battery positive) |
| | | | 6 | B16 | (The sixteenth battery positive) |
| P10 | (M3 screw) | (Heating interface) | 1 | HT- | (Heater element negative electrode) |
| P11 | (M3 screw) | λ (Power input) | 1 | B+ | (The power input is positive) |
| D1 | (Bluetooth connection indicator: When the Bluetooth is connected to the protection board, the indicator is steady on, and when the connection is disconnected, the indicator is blinking.) | | | | |
| P- | (Connect to external load or negative terminal of charger, M6 screw) | | | | |
| B- | (Connect to the negative battery terminal, M6 screw) | | | | |

Interface board Interface definition)

| (Definition of a dry contact interface) | | |
|--|--------------------------|------------------|
| (Pin number) | (Pindefinition) | (remark) |
| 1 | COM1 | |
| 2 | S1 | |
| 3 | COM2 | |
| 4 | S2 | |
| CAN RS485-1 Interface definition of CAN and RS485-1) | | |
| (Pin number) | (Pin definition) | (remark) |
| 1、 8 | RS485- B1 | |
| 2、 7 | RS485-A1 | |
| 3、 6 | GND | |
| 4、 5 | NC | |
| 1、、2、3、8 6 | NC | |
| 4 | CANL | |
| 5 | CANH | |
| 7 | GND | |
| (Reserved interface definition) | | |
| (Pin number) | (Pin definition) | (remark) |
| 1-6 | NC | |
| RS485-2 (Interface definition of RS485-2) | | |
| (Pin number) | (Pindefinition) | (remark) |
| 1 | RS485- B2 | |
| 2 | RS485-A2 | |
| 3 | GND | |
| 4 | NC | |

| | | |
|---|----------|--|
| 5 | NC | |
| 6 | GND | |
| 7 | RS485-A2 | |
| 8 | RS485-B2 | |

Dip switch Settings
()

| (address) | (Dip switch position) | | | |
|-----------|-----------------------|-----|-----|-----|
| | 1 | 2 | 3 | 4 |
| 0 | OFF | OFF | OFF | OFF |
| 1 | ON | OFF | OFF | OFF |
| 2 | OFF | ON | OFF | OFF |
| 3 | ON | ON | OFF | OFF |
| 4 | OFF | OFF | ON | OFF |
| 5 | ON | OFF | ON | OFF |
| 6 | OFF | ON | ON | OFF |
| 7 | ON | ON | ON | OFF |
| 8 | OFF | OFF | OFF | ON |
| 9 | ON | OFF | OFF | ON |
| 10 | OFF | ON | OFF | ON |
| 11 | ON | ON | OFF | ON |
| 12 | OFF | OFF | ON | ON |
| 13 | ON | OFF | ON | ON |
| 14 | OFF | ON | ON | ON |
| 15 | ON | ON | ON | ON |

LED description)

| (status) | / / (Normal, alarm, or Protection) | ON/OFF F指示 | RUN | ALM | L1 | L2 | L3 | L4 | L5 | L6 | (Instructions) |
|-----------------------|--|---------------|-----------|-----------|-------------------------|----|----|----|----|-----|----------------|
| (Power Off) | (normal) | | | | | | | | | | |
| Balance | (normal) | ON | (flicker) | OFF | (Battery based display) | | | | | OFF | |
| (charging) | (normal) | ON | (flicker) | OFF | (Battery based display) | | | | | OFF | |
| | \\ (Over current, over temperature, over voltage, charging failure) | ON | (flicker) | (flicker) | (Battery based display) | | | | | OFF | |
| (discharge) | (normal) | ON | (flicker) | OFF | (Battery based display) | | | | | OFF | |
| | (Over current, over temperature, under voltage, discharge failure) | ON | (flicker) | (flicker) | (Battery based display) | | | | | OFF | |
| 其他告警 (Other alarm) | (Password not changed \\ short temperature abnormal) | ON | (flicker) | (flicker) | (Battery based display) | | | | | OFF | |

| | | | | | | | |
|--|--|--|--|--|--|--|--|
| | | | | | | | |
| <p>Note: When the device address is set to 0, the last LED indicator L6 blinks. If the value is set to other values, the slave is off and blinks after the communication between the slave and the host is successful.</p> | | | | | | | |
| <p>Note: ON indicates that the LED is on, OFF indicates that the LED is off.</p> | | | | | | | |

(Power LED Description)

| | | | | | | |
|--|----------|------|------|------|------|------|
| <p>Display status during discharge or static state (★:FLASH, ● :ON, ◎ : OFF)</p> | | | | | | |
| | SOC | LED1 | LED2 | LED3 | LED4 | LED5 |
| | 0%~9% | ★ | ◎ | ◎ | ◎ | ◎ |
| | 10%~19% | ★ | ◎ | ◎ | ◎ | ◎ |
| | 20%~39% | ★ | ★ | ◎ | ◎ | ◎ |
| | 40%~59% | ★ | ★ | ★ | ◎ | ◎ |
| | 60%~79% | ★ | ★ | ★ | ★ | ◎ |
| | 80%~100% | ★ | ★ | ★ | ★ | ★ |
| <p>Display status during charging (★FLASH, ● :ON, ◎ : OFF)</p> | | | | | | |
| | SOC | LED1 | LED2 | LED3 | LED4 | LED5 |
| | 0%~19% | ★ | ◎ | ◎ | ◎ | ◎ |
| | 20%~39% | ★ | ★ | ◎ | ◎ | ◎ |
| | 40%~59% | ★ | ★ | ★ | ◎ | ◎ |
| | 60%~79% | ★ | ★ | ★ | ★ | ◎ |
| | 80%~100% | ★ | ★ | ★ | ★ | ★ |

(Device activation)

Before starting the protection board, check whether the balance cable is properly connected and whether P- and B- are correctly connected. Check whether the protection board has been securely fixed with the battery core, and confirm that it is correct before you can switch on the protection board, otherwise it may cause serious consequences such as abnormal work and even burning.

After confirming the preceding operations, power on the protection board. The protection board has no power-on control switch, and is designed for charging activation mode (the charger voltage is 2V higher than the battery voltage), that is, after the battery assembly is completed, the charger needs to be connected to make the protection board work.

In addition to charging activation, the protection board also supports key activation and display activation.

Users who choose the display screen and button only need to insert the cable into the display interface and press the button to activate.

(Parameter setting)

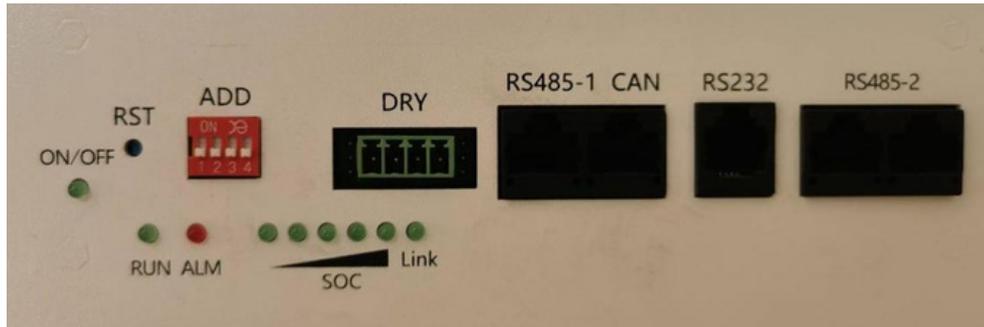
Please refer to the "Instructions for Setting Protection Board Parameters" for details.

(Instructions for using the parallel function)

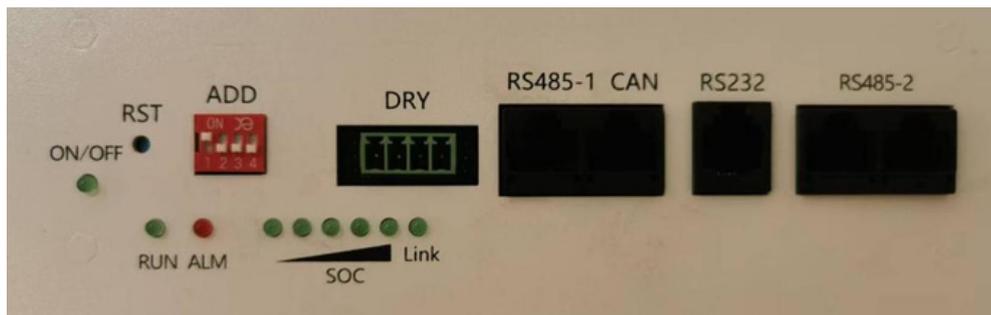
The parallel function refers to the use of multiple energy storage series protection boards to achieve simultaneous monitoring of multiple BMS information by the upper computer through the RS485 bus. Therefore, the tools required to use the parallel function include USB to RS485 serial port cable and Jikong upper computer.

The parallel function supports up to 16 BMS, so it is necessary to set addresses for each BMS. There are a total of 16 BMS with addresses ranging from 0 to 15. BMS with address 0 is the host, and BMS with address 1 to 15 is the slave. The upper computer is connected to the host through a USB to RS485 serial port cable, and the BMS address is set through a dip switch. The specific setting method is shown in 5.2- Dip switch Settings.

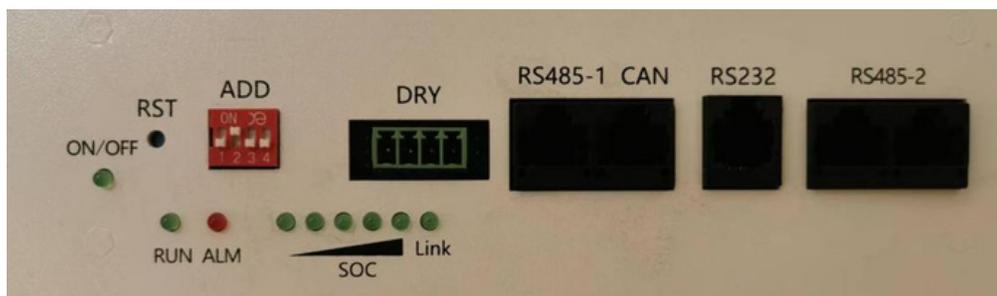
Example of Host Address 0 Setting)



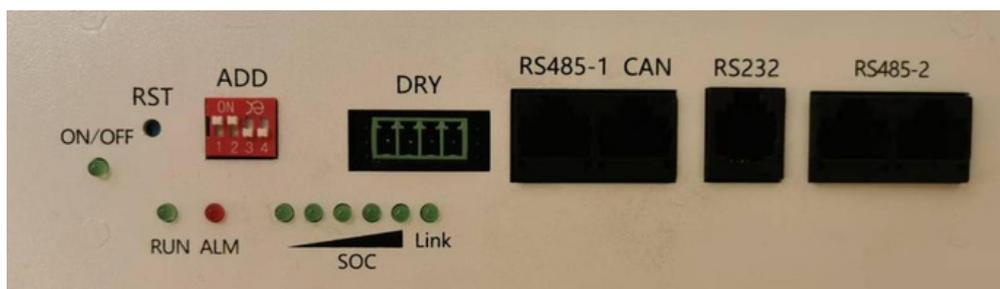
(Example of Setting Slave Address 1)



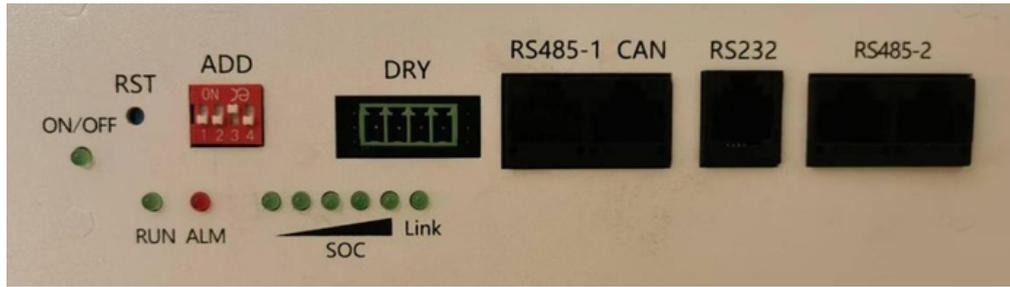
(Example of Setting Slave Address 2)



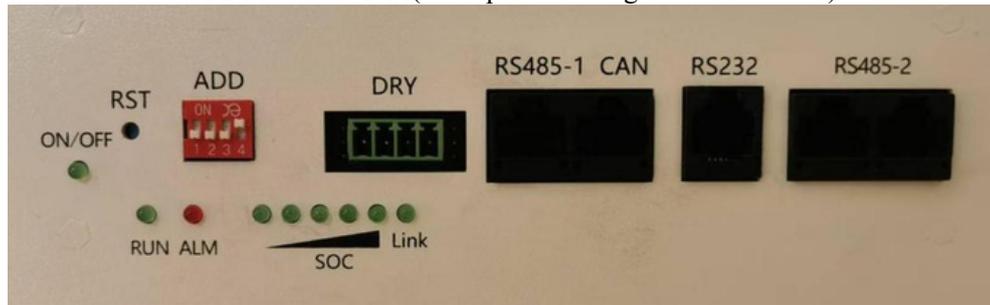
(Example of Setting Slave Address 3)



(Example of Setting Slave Address 4)



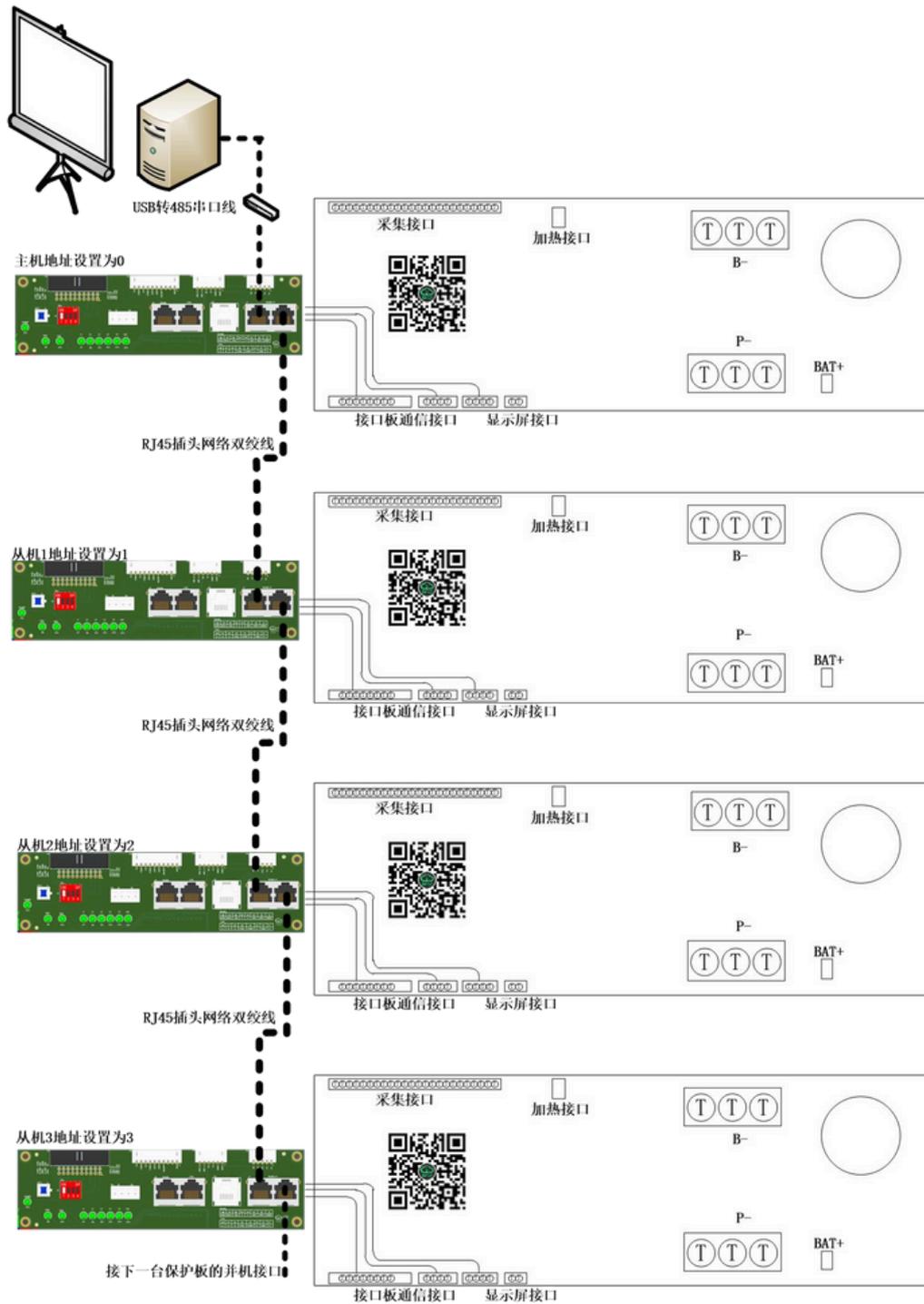
从机地址8设置示例(Example of Setting Slave Address 8)



The RS485-2 between the upper computer and the BMS host is connected through a USB to RS485 serial port cable, and then the RS485-2 of the BMS are connected to each other using RJ45 plug Ethernet cables (RS485-2 has two RJ45 sockets, one socket of the host is plugged into the serial port cable to connect to the upper computer, and the other is connected to the slave computer through Ethernet cable, and the RS485-2 communication interface between the slave computers is connected through Ethernet cable in sequence). The specific operation diagram is as follows:



极空储能系列保护板并机监控示意图



After the communication cable is connected correctly, open the Jikong select the upper computer, corresponding serial port, and click connect, as shown in the following figure:

(APP operation Instructions)

APP installation)

Mobile APP matching the product can be obtained by scanning the QR code shown in Figure . Android Version 7 minimum is required for the Android APP.



Mobile APP link QR code
