Product Specification

Customer's Name:

客户名称:

Spec.No.: DY-R16S48330A-001
Item Coding:
Ver: A1
Date: 2025-04-01

Shenzhen Deriy New Energy Technology Co., Ltd

深圳市德瑞锂新能源科技有限公司

Specification For Approval
客户承认书

Specifications : DY-R16S48330A-51.2V 330Ah

规格: DY-R16S48330A-51.2V 330Ah

Approval	Checked	Draft
Customer Approval		

Product Specification

History of specification

规格书修订记录

Date	Contents	Remarks
2025-04-01	首次发行	

Contents 目录

Product Specification

1. Scope 适用范围

The specification shall be applied to LiFePO4 rechargeable battery pack Of DY-R16S48330A-51.2V 330Ah which is manufactured by Shenzhen Deriy New Energy Technology Co., Ltd.

本规格书适用于深圳市德瑞锂新能源科技有限公司生产的 DY-R16S48330A-51.2V 330Ah 磷酸铁锂锂离子可充电电池.

2. Main specifications 主要技术参数

2.1 Cell Battery specifications（电芯技术参数）

	No. (序号)	Item （项目）	General Parameter (常规参数)		Remark （备注）
Cell 单体电芯	1	Rated Capacity （额定容量）	Typical (标称容量)	314Ah	Standard discharge（0.2C5A) after Standard charge （标准充电后 0.2C5A 标准放电）
			Capacity Range (容量范围)	320~340Ah	
	2	Nominal Voltage （正常电压）	3.2V		Mean Operation Voltage （即工作电压）
	3	Internal Impedance (内阻)	≤0.20 mΩ		Internal resistance measured at AC 1KHz after 50% charge （半电态下用交流法测量内阻） The measure must uses the new batteries that within one week after shipment and cycles less than 5 times (使用出货后不到一个星期及循环次数少于 5 次的新电池测量)
	4	Dimension （尺寸）	Thickness/厚度:Max 72.5mm Width/宽度：Max 174.5mm Height/高度：Max 208.5mm		Initial Dimension （初始尺寸）
	5	Weight（重量）	5600g ± 300g		APPROX
	6	Standard charge （标准充电）	Constant Current 0.5C5A Constant Voltage 3.65V 0.02C5A cut-off (持续电流：0.5C5A 持续电压：3.65V 截止电流：0.02C5A		Charge time : Approx2.0h
	7	Rapid Charge 快速充电	Constant Current 0.5C5A Constant Voltage 3.65V 0.01C5A cut-off (持续电流： 0.5C5A 持续电压：3.65V 截止电流：0.01C5A		Charge time : Approx2.0h@≧10℃
	8	Standard discharge （标准放电）	Constant current 0.5C5A end voltage 2.5 V (持续电流：0.5C5A 截止电压： 2.5V)		165A
	9	Maximum discharge current 最大放电电流	Discharge current：1C5A end voltage：2.5 V (放电电流 1C5A 截止电压： 2.5V)		330A@≧0℃ (Pulse)

2.2 Battery Pack specifications（电池组技术参数）

	No. (序号)	Item （项目）	General Parameter (常规参数)		Remark （备注）
Package 电池组	1	Combination method （组合方式）	16S1P		
	2	Rated Capacity （额定容量）	Typical （标称容量）	330Ah	Standard discharge after Standard charge package)（标准充电后标准放电（针对电池组））
			Minimum (最小容量)	320Ah	
	3	Factory Voltage （出厂电压）	51V-53.0V(40-60%)		Mean Operation Voltage （即工作电压）
	4	Voltage at end of Discharge （放电终止电压）	41.6V		Discharge Cut-off Voltage （放电截止电压）
	5	Charging Voltage (充电电压)	53-58.4V		
	6	Internal Impedance (内阻)	≤10mΩ		Internal resistance measured at DC after 50% charge （半电态下测量直流内阻）
	7	Standard charge （标准充电）	Constant Current 165A(0.5 C) Constant Voltage see No.5 0.02CA cut-off （持续电流：165A(0.5C) 持续电压：见序号 5		Charge time : Approx 2 h （充电时间：大约 2 个小时）
	8	Standard discharge （标准放电）	Constant current：165A end voltage see NO.4 （持续电流：165A 截止电压：见序号 4）		
	9	Maximum Continuous Charge Current (最大持续充电电流)	200A		⩾10ºC
	10	Maximum Continuous Discharge Current （最大持续放电电流）	200A		⩾10ºC
	11	Operation Temperature Range （工作温度范围）	Charge（充电）: 0~45℃		60±25%R.H. Bare Cell （单体电池储存湿度范围）
			Discharge（放电）: -20~55℃		
	12	Storage Temperature Range （储存温度范围）	Less than 12 months : -10~35℃ （小于 12 月：-10~35℃）		60±25%R.H. at the shipment state （出货状态时的湿度范围）
			less than 3 months: -10~45℃ （小于 3 个月：-10~45℃）		
			Less than 7 day : -20~65℃ （小于 7 天：-20~65℃）		
	13	Dimensions（尺寸）	930*450*270 mm		Include Roller Wheel
	14	Weight（重量）	Approx：120kg		

3. Battery Management System Specification 电池管理系统规范

3.1 BMS function introduction（BMS 功能介绍）

1）： The BMS is designed for 16 series lithium battery.（BMS 为 16 串锂离子电池设计）

2）： The BMS have all functions which are :（该 BMS 系统具有以下一些功能）

overcharge detection function（过充电保护功能）

over discharge detection function（过放电保护功能）

over current detection function（过电流保护功能）

short detection function（短路保护功能）

Temperature detection function （温度保护功能）

balance function（均衡功能）

communicate function (通讯功能)

Alarm function (告警功能)

Total capacity function (总容量功能)

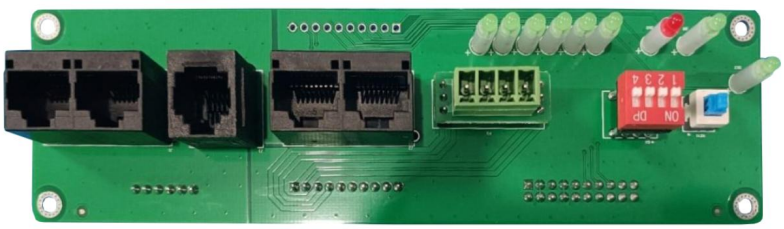
Storage history function (存储历史记录功能)

3.2 BMS Protect parameter（电池管理系统保护参数）

BMS technical data attached at appendix 2.

BMS 技术参数详见附录 2.

Type 型号：JK-PB2A16S20P



4. Appearance and structural dimensions 外观结构尺寸

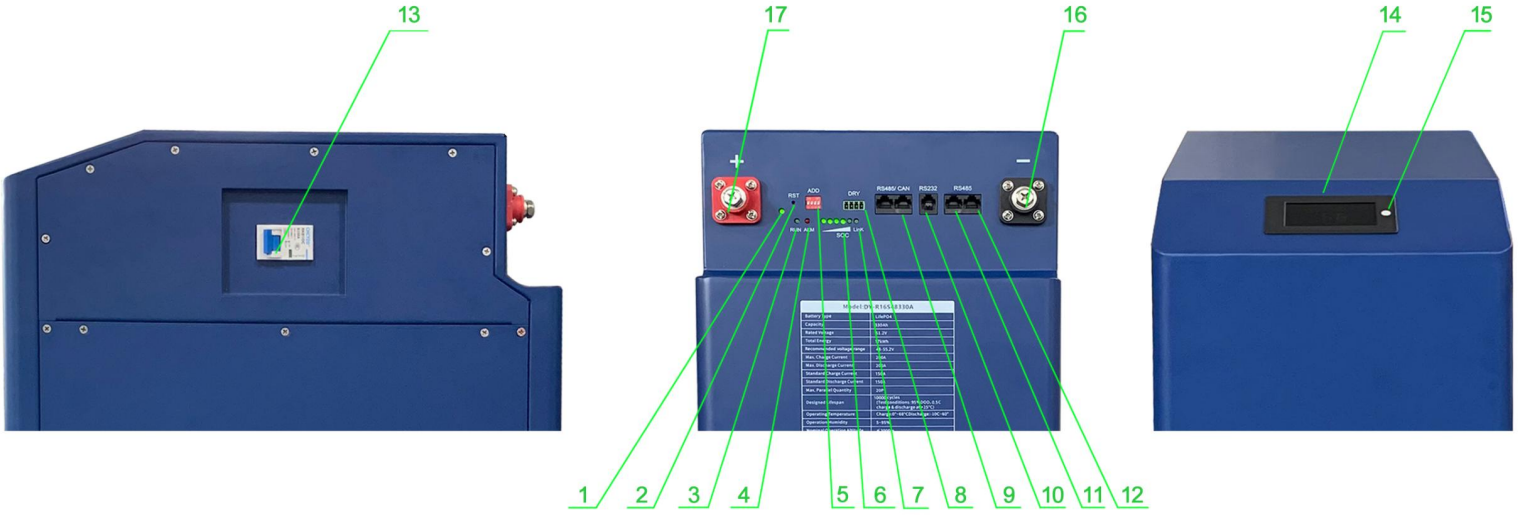
There shall be no such defect as scratch, bur and other mechanical scratch, and the connector should be no rust dirt. The structure and dimensions see attached drawing of the battery.

电池的表面应无明显的划痕毛刺及其其它机械划伤，外露的金属端子应无锈蚀污垢。

结构尺寸见电池的外形尺寸图；

Model : Roller Wheel Type- Blue					
L(长度)	450mm	W(宽度)	270mm	H(高度) Include wheel	930mm
Wheel Height 滚轮高度	90mm	Terminal Height 端子高度	16mm	Terminal type 端子型号	M8
Screen 显示屏	Size:3.2inch (100*60mm included frame)				

5. Case Structure of Battery Pack 电池组面板结构定义



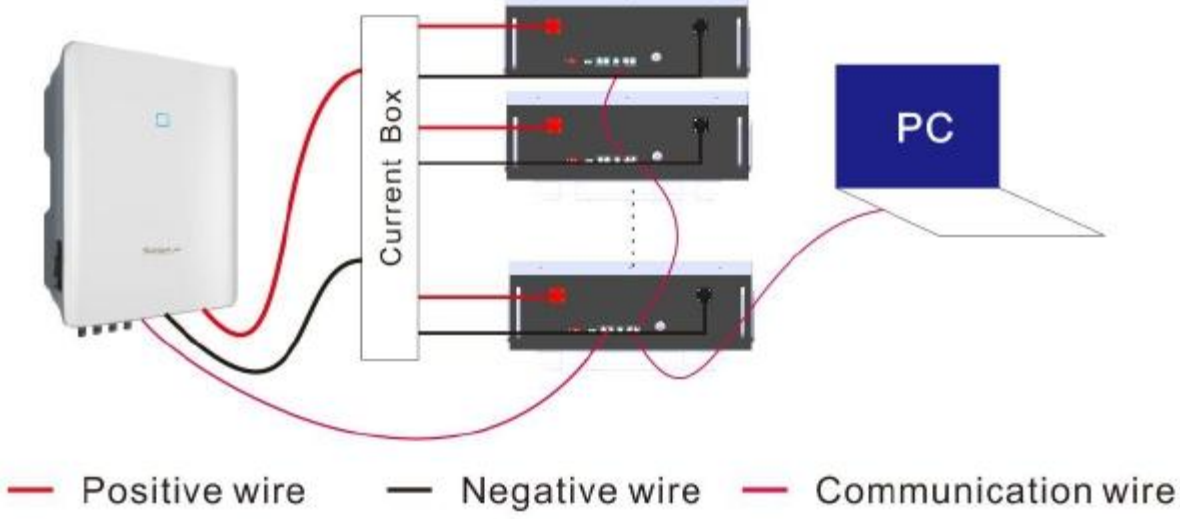
No.	Description	Silk-screen	Remark
1	Switch LED		Switch indicator
2	Reset	RST	For reset the battery
3	LED	RUN	Operation indicator
4	LED	ALM	Alarm indicator
5	Dial switch	ADD	Set the address
6	LED	SOC	Capacity indicator
7	LED	Link	
8	DRY port	DRY	
9	RS485 port	RS485/CAN	RS485 communication
10	CAN port	CAN	CAN communication
11	RS232 port	RS232	RS232 communication
12	RS485 port	RS485	RS485 communication
13	Air Switch		Fuses
14	LCD Screen		
15	Switch	ON/OFF	
16	Input/Output	P-	Input/Output terminal
17	Input/Output	P+	Input/Output terminal

6. Connection mode for parallel communication（并机通讯联接）

6.1 RS485 Parallel Communication（**RS485** 并机通讯模式）

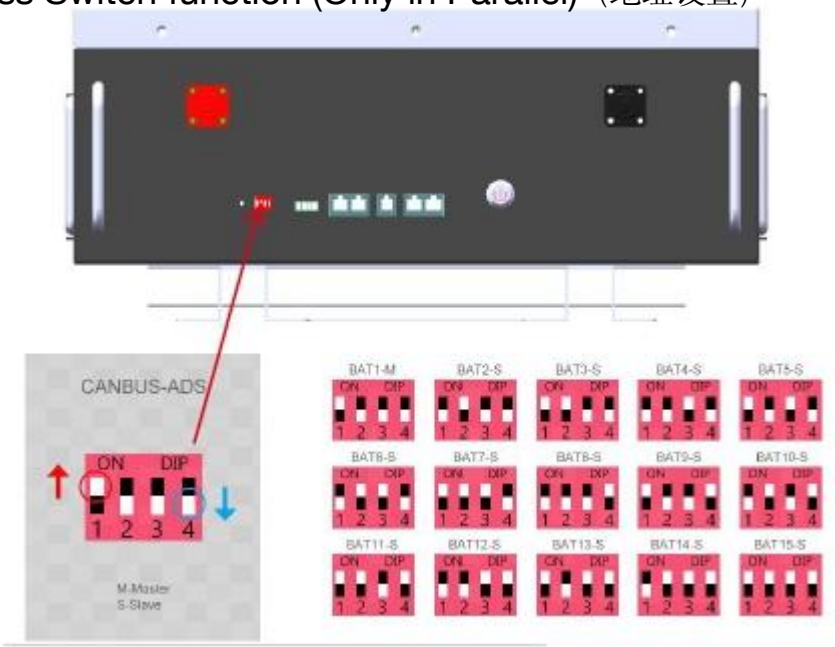
While in RS485 parallel communication, dial-up addresses of battery module are 1,2,3,4……14,15; By this method, we can be allowed to read each data depending on battery module. Any battery other than address 0 can be connected to the host computer; FF polling mode used as consulting mode.

在 RS485 并机通信时，电池模块的拨号地址为 1,2,3,4 ..... 14,15; 通过这种方法，我们可以根据电池模块读取每个数据。 地址 0 以外的任何电池都可以连接到主机; FF 模式为轮巡查询模式。



Note: RS485 communication address can not be 0, the address set by the host computer is required to be the same as the battery communication address, do not have duplicate addresses, otherwise communication may be affected.

6.2 Address Switch function (Only in Parallel)（地址设置）



7. Packaging of Battery Pack(电池组包装)

Wooden Carton 木箱包装尺寸：

Carton size: 970*540*470mm

Gross weight: 135.6Kg


DOZRIY®
Bring Green New Energy To The World
9
4D/Y150/S/24
CN/C530107
PI:0012
UN3480
LITHIUM ION BATTERIES


4D/Y150/S/24
CN/C530249
PI:0001
UN3480
LITHIUM ION BATTERIES
DOZRIY®
Bring Green New Energy To The World

8. Battery test equipment 电池测试设备

8.1 Dimension Measuring Instrument 尺寸测量仪器

The dimension measurement shall be implemented by instruments with equal or more precision scale of 0.1mm.
测量尺寸的仪器的精度应不小于 0.1mm

8.2 Voltmeter 电压表

Standard class specified in the national standard or more sensitive class having inner impedance not less than 10 KΩ/V.
国家标准或更灵敏等级,内阻不小于 10 KΩ/V.

8.3 Ammeter 电流表

Standard class specified in the national standard or more sensitive class. Total external resistance including ammeter and wire is less than 0.01Ω.
国家标准或更灵敏等级，外部总体内阻包括电流表和导线应小于 0.01Ω.

8.4 Impedance Meter 内阻测试仪

Impedance shall be measured by a sinusoidal alternating current method(AC 1kHz LCR meter).
内阻测试仪测试方法为交流阻抗法(AC 1kHz LCR).

9. Standard Test Condition 标准测试条件

Test should be conducted with new batteries within one month after shipment from our factory and the cells shall not be cycled more than five times before the test. Unless otherwise defined, test and measurement shall be done under temperature of 23±2℃ and relative humidity of less 75%.,air 86Kpa~106Kpa.
测试电池必须是本公司出厂时间不超过一个月的新电池，且电池未进行过五次以上充放电循环。除非其它特殊要求，本产品规格书规定的测试的环境条件为：温度 23±2℃，相对湿度 ≤75%,气压 86Kpa~106Kpa.
Unless otherwise defined, 30min,rest period after charge,30min,rest period after discharge.
如无特殊要求，电池充放电间隔为 30min。

10. Storage and Others 贮存及其它事项

10.1 Long Time Storage 长期贮存

If stored for a long time(don't used,exceed three months), the cell should be stored in drying and cooling place. The cell's storage voltage should be 51.2V-54.4V and the cell is to be stored in a condition that the temperature of 23±2℃ and the humidity 0f 45%- 75%. Long-term use of unused batteries to recharge every 3 months。Ensure that the battery voltage is within the above range。
长期贮存的电池（未使用,超过 3 个月）须置于干燥、凉爽处。贮存电压为 51.2V-54.4V。储存于 23±2℃，湿度为 45%-75%的洁净环境。长期搁置未使用电池每 3 个月补电一次，确保电池电压在上述范围内。

10.2 Others 其它事项

Any matters that this specification does not cover should be conferred between the customer and Deriy
任何本规格书中未提及的事项，须经双方协商确定

11. Amendment of this Specification 产品规格书的修订

This specification is subject to change with prior notice.
本公司有权对本产品规格书进行修订。

12. Appendix 1 附录 1

Handling Precautions and Guideline

For Li-ion Rechargeable Batteries

锂离子充电电池操作指示及注意事项

Preface 前言

This document of 'Handling Precautions and Guideline Li-ion Rechargeable Batteries' shall be applied to the battery cells manufactured by Deriy

本檔“锂离子充电电池操作指示及注意事项”仅适用于深圳市德瑞锂新能源科技有限公司生产电池。

Note (1) ： 声明一

The customer is requested to contact Shenzhen Deriy New Energy Technology Co., Ltd.. in advance, if and when the customer needs other applications or operating conditions than those described in this document. Additional experimentation may be required to verify performance and safety under such conditions.

客户若需要将电池用于超出本规格书规定以外的设备，或在本规格书规定以外的使用条件下使用电池，应事先联系深圳市德瑞锂新能源科技有限公司，因为需要进行特定的实验测试以核实电池在该使用条件下的性能及安全性。

Shenzhen Deriy New Energy Technology Co., Ltd will take no responsibility for any accident when the cell is used under other conditions than those described in this Document.

Note (2) ： 声明二

对于在超出本规格书规定以外的条件下使用电池而造成的任何意外事故，深圳市德瑞锂新能源科技有限公司概不负责。

Note (3)： 声明三

Shenzhen Deriy New Energy Technology Co., Ltd will inform, in a written form, the customer of improvement(s) regarding proper use and handling of the cell, if it is deemed necessary.

如有必要，深圳市德瑞锂新能源科技有限公司会以书面形式告知客户有关正确操作使用电池的改进措施。

Danger!

危 险!

— Do not immerse the battery in water or allow it to get wet.
— 勿将电池投入水中或将其弄湿!
— Do not use or store the battery near sources of heat such as a fire or heater.
— 禁止在火源或极热条件下给电池充电！勿在热源（如火或加热器）附近使用或贮存电池！如果电池泄漏或发出异味，应立即将其从接近明火处移开；

— Do not use any chargers other than those recommended by Deriy.
— 请使用专用充电器!
— Do not reverse the positive(+) and negative(-) terminals.
— 勿将正负极接反!
— Do not connect the battery directly to wall outlets or car cigarette-lighter sockets.
— 勿将电池直接连接到墙上插座或车载点烟式插座上!
— Do not put the battery into a fire or apply direct heat to it.
— 勿将电池投入火中或给电池加热!
— Do not short-circuit the battery by connecting wires or other metal objects to the positive(+) and negative(-) terminals.
— 禁止用导线或其它金属物体将电池正负极短路，禁止将电池与项链、发夹或其它金属物体一起运输或贮存!
— Do not pierce the battery casing with a nail or other sharp object, break it open with a hammer, or step on it.
— 禁止用钉子或其它尖锐物体刺穿电池壳体，禁止锤击或脚踏电池!
— Do not strike, throw or subject the battery to sever physical shock.
— 禁止撞击、投掷或者使电池受到机械震动
— Do not directly solder the battery terminals.
— 禁止直接焊接电池端子!
— Do not attempt to disassemble or modify the battery in any way.
— 禁止以任何方式分解电池!
— Do not place the battery in a microwave oven or pressurized container.
— 禁止将电池置入微波炉或压力容器中!
— Do not use the battery in combination with primary batteries(such as dry-cell batteries) or batteries of different capacity, type or brand.
— 禁止与一次电池（如干电池）或不同容量、型号、品种电池组合使用!
—Do not use the battery if it gives off an odor, generates heat, becomes discolored or deformed, or appears abnormal in any way. If the battery is in use or being recharged, remove it from the device or charger immediately and discontinue use.
— 如果电池发出异味、发热、变形、变色或出现其它任何异常现象时不得使用；如果电池正在使用或充电，应立即从用电器中或充电器上取出并停止使用!

Caution!

注　意!

Do not use or store the battery where is exposed to extremely hot, such as under window of a car in direct sunlight in a hot day. Otherwise, the battery may be overheated. This can also reduce battery performance and/or shorten service life.

不要使用处于极热环境中的电池，如阳光直射或热天的车内。否则，电池会过热，可能着火（点燃），这样就会影响电池的性能、缩短电池的使用寿命。

If the battery leaks and electrolyte gets in your eyes, do not rub them. Instead, rinse them with clean running water and immediately seek medical attention. If left as is, electrolyte can cause eye injury.

如果电池漏液后电解液进入眼睛，不要擦，应用水冲洗，立即寻求医疗救助。如不及时处理，眼睛将会受到伤害。

13. Appendix 2 BMS Specification　附录 2 BMS 规格

Type 型号：JK-PB2A16S20P

Energy storage battery BMS

JK-PB1A16S10P

JK-PB1A16S15P

JK-PB2A16S15P

JK-PB2A16S20P

Specification and operation manual

Technical Index	Product model			
	JK-PB1A16S10P	JK-PB1A16S15P	JK-PB2A16S15P	JK-PB2A16S20P
Li-ion	7~16S			
Lifepo4	8~16S			
LTO	14S			
Balance Method	Active Balance			
Balance Current	1A	1A	2A	2A
Main Circuit conduction internal	1mΩ	0.65mΩ	0.65mΩ	0.47mΩ
Continuous Discharge Current	100A	150A	150A	200A
Maximum Discharge Current	200A	300A	300A	350A
Over Charge Protection Current(Adjustable)	10~100A	10~150A	10~150A	10~200A
Other Interfaces (Customized)	RS232/RS485/CAN			
Display interface	Yes			
Wiring Output	Common Port			
Single Cell Voltage Range	1~5V			
Voltage Acquistion	±5mV			
Over Charge Protection Voltage	1.2-4.35V Adjustable			
Over Charge Relese Voltage	1.2-4.35V Adjustable			
Over Current Detect Delay	2-120S Adjustable			
Over Discharge Protection Voltage	1.2-4.35V Adjustable			
Over Discharge Relese Voltag	1.2-4.35V Adjustable			
Quantity of Temperature Detection	4Pcs			
Temp Protection	Yes			
Short Circuit protection	Yes			
Coulomb Counter	Yes			
UPGRADE	Yes			
Operation,alarm,and power indication	Yes			
Bluetooth Function	Support for Android/IOS phone			
Parallel charging current limiting	10A			
Address dial switch	4 digits			
DRY CONTACT	2 groups			

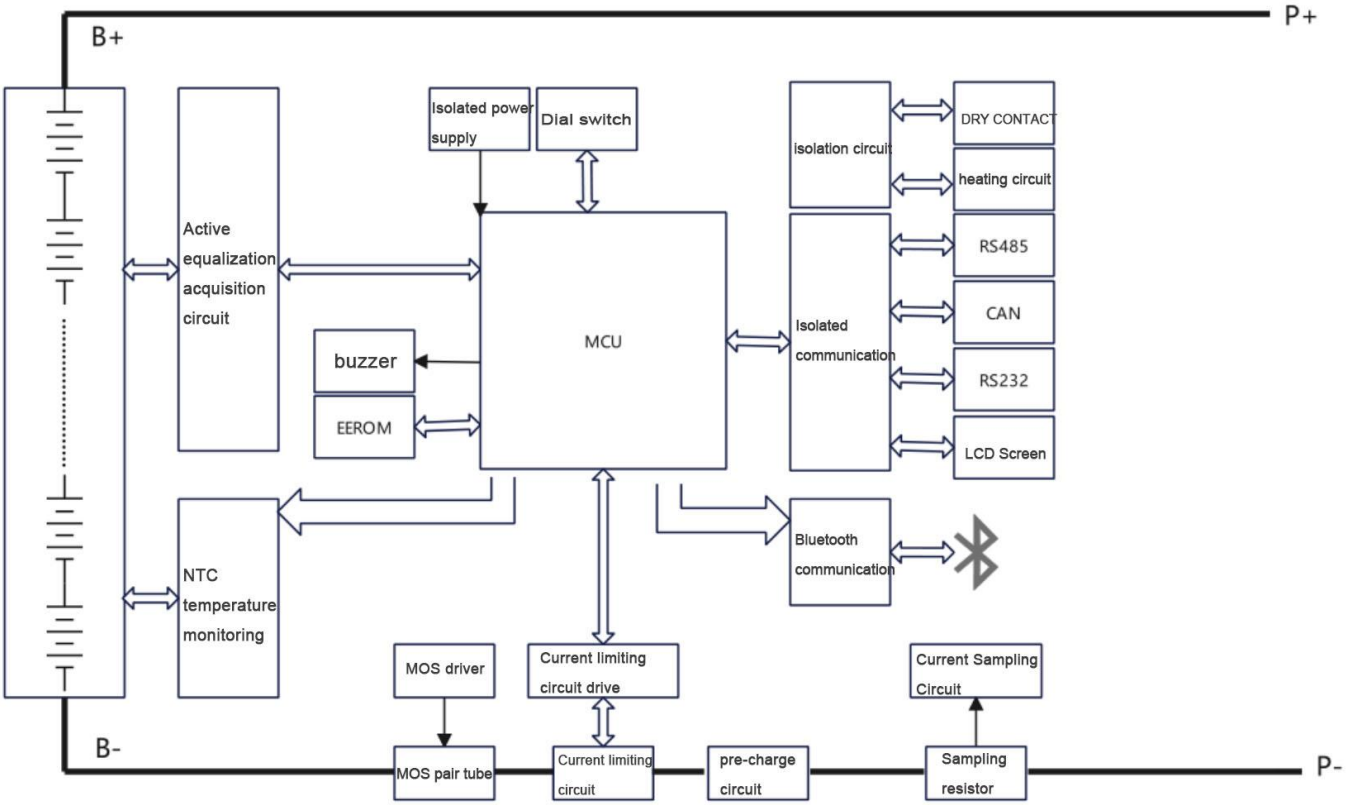
1. Overview

With the rapid growth of the renewable energy storage market, the demand for battery management systems is increasing. This product is an intelligent lithium battery protection board for energy storage applications. It adopts precise detection technology to protect the energy storage battery from overcharging, discharging, and overcurrent, ensuring the safe and reliable operation of the energy storage system. At the same time, advanced active voltage balancing function is integrated, which can monitor the voltage of each battery cell in real-time, and improve the service life of the battery pack through active balancing management. This product provides intelligent battery protection solutions for a wide range of energy storage applications.

2. Functional characteristics

- With active balancing function
- LED status indication
- APP remote operation
- Overvoltage and overcurrent protection
- Support PC upper computer operation
- Information screen display
- Information screen display
- Support RS485 CAN RS232 communication
- High precision voltage acquisition
- Battery capacity estimation
- High precision current collection
- Accurate time logging
- Isolate power circuits
- Short circuit protection
- 4-way temperature detection protection
- MOS temperature detection protection

3. Functional schematic diagram



4. Environmental conditions for use

Test items	parameter	unit
operation temperature	-30~70	°C
storage temperature	-30~70	°C
Working humidity	10~80	%RH
Storage Humidity	10~85	%RH
Power supply pressure	20~70	V
Working power consumption	19mA@58V	

5. Specification parameters

NO	Indicator items		Factory default parameters	Is it possible to set	Notes
1	Number of strings	Supports batteries	li-ion, lifepo4, LTO	Yes	All parameters are lifepo4 parameters
		Support string count	7~16、8~16、14~16	Yes	
		Equalizing trigger voltage difference voltage	10mV	Yes	
2	Individual overcharging protection	Individual overcharging protection voltage	3600mV	Yes	
		Single overcharge recovery voltage	3550mV	Yes	
3	Individual undervoltage protection	Individual undervoltage protection voltage	2600mV	Yes	
		Single unit undervoltage recovery voltage	2650mV	Yes	
		Single unit undervoltage automatic shutdown voltage	2500mV	Yes	
4	Active balancing function	Equalizing voltage difference triggering voltage	10mV	Yes	
		Balanced starting working voltage	3000mV	Yes	
		Maximum balanced current	1A	Yes	
5	Overall overcharge protection	Maximum charging current	25A	Yes	
		Charging overcurrent delay	2s	Yes	
		Charging overcurrent alarm cleared	60s	Yes	
		Charging overcurrent limiting current	10A	No	
6	Overall overvoltage protection	maximum discharge current	150A	Yes	
		Discharge overcurrent delay	300s	Yes	
		Discharge overcurrent alarm cleared	60s	Yes	
7	Short circuit protection	Short circuit protection current	300A	No	
		Short circuit protection delay	20us	Yes	
		Short circuit protection released	60s	Yes	

8	temperature protection	Charging over temperature protection	70°C	Yes	All parameters are lifepo4 parameters
		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	

6. LED indication instructions

Led working status indication

state	Normal/Alarm/Protection	ON/OFF	RUN	ALM	Battery indicator LED					
Shutdown	normal	turn off	turn off	turn off	turn off	turn off	turn off	turn off	turn off	turn off
balanced	normal	turn on	turn on	turn off	Based on battery level display					
charge	normal	turn on	turn on	turn off	Based on battery level display					
	Over current/over temperature/over voltage/ charging failure	turn on	turn on	flicker	Based on battery level display					
discharge	normal	turn on	turn on	turn off	Based on battery level display					
	Overcurrent/ over temperature/ under voltage/ discharge failure	turn on	turn on	flicker	Based on battery level display					
Other alarms	Password not modified/short circuited/temperature abnormal	turn on	turn on	flicker	Based on battery level display					

Capacity indication instructions

State		Charge						Discharge					
Capacity indicator light		L6	L5	L4	L3	L2	L1	L6	L5	L4	L3	L2	L1
electricity (%)	0~16.6%	turn off	turn off	turn off	turn off	turn off	turn on	turn off	turn off	turn off	turn off	turn off	turn on
	16.6~33.2%	turn off	turn off	turn off	turn off	turn on	turn on	turn off	turn off	turn off	turn off	turn on	turn on
	33.2~49.8%	turn off	turn off	turn off	turn on	turn on	turn on	turn off	turn off	turn off	turn on	turn on	turn on
	49.8~66.4%	turn off	turn off	turn on	turn on	turn on	turn on	turn off	turn off	turn on	turn on	turn on	turn on
	66.4~83.0%	turn off	turn on	turn on	turn on	turn on	turn on	turn off	turn on	turn on	turn on	turn on	turn on
	83.0~100%	turn on	turn on	turn on	turn on	turn on	turn on	turn on	turn on	turn on	turn on	turn on	turn on

7. **Switching on/off instructions**

Can be done by pressing the button. In the shutdown state, press the button to turn on the device. When turned on, press and hold the button for more than 3 seconds to turn off the device.

8. Communication instructions

8.1 RS232 communication

Bms can communicate with the upper computer through the RS232 interface, thereby monitoring various battery information, including battery voltage, current, temperature, status, and battery production information, with a default baud rate of 9600bps.

8.2 CAN communication

The default communication speed for CAN communication is 250k.

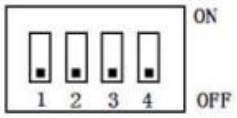
8.3 RS485 communication

There are two RS485 communication interfaces, one of which outputs two interfaces in parallel for viewing battery pack information, with a default baud rate of 115200. By setting the dial switch to set the communication address, it is possible to poll and query the data of all

battery packs, with an address setting range of 0-15.

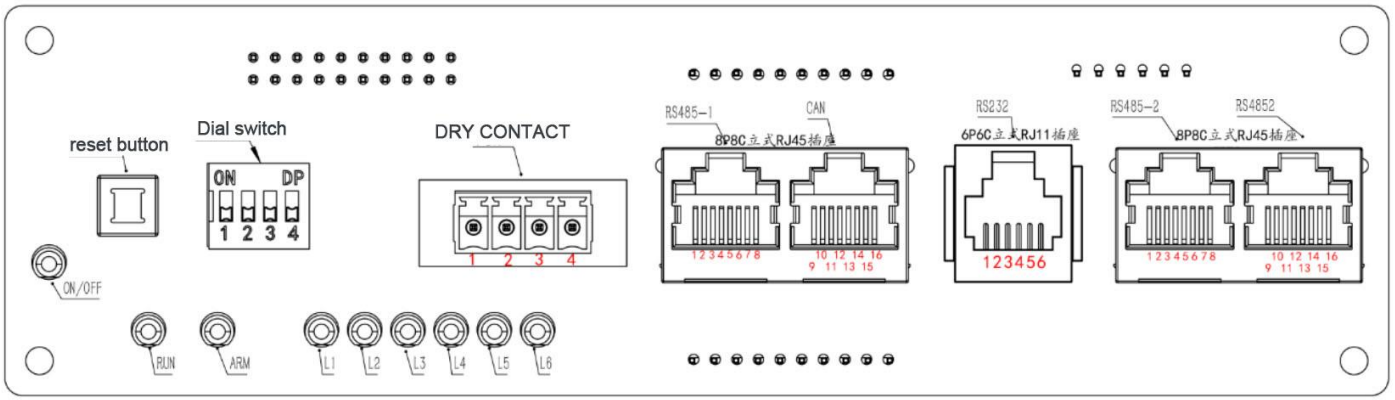
8. 4 DIP switch settings

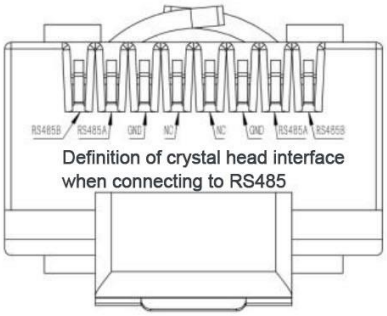
When multiple battery packs are used in parallel, the battery packs need to be set to different addresses through a dial switch for normal use. The following dial switch address table.

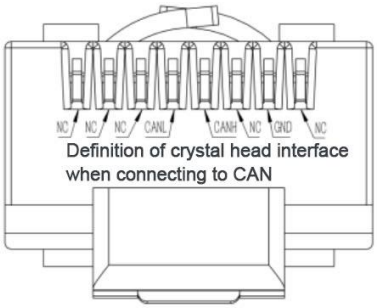


Address	Dial switch position			
	1	2	3	4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

9. Interface Definition







Definition of dry contact interface

Pin number	Pin Definition	Notes
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

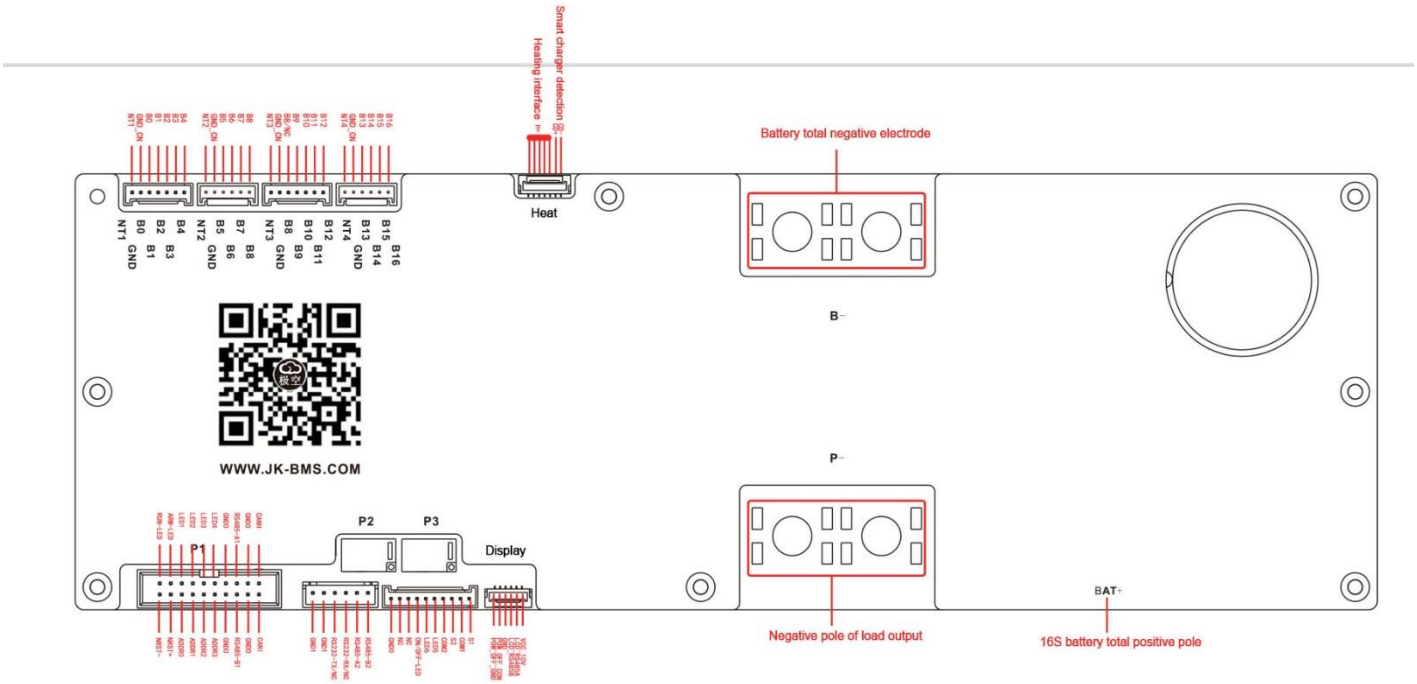
RS485- adopts 8P8C vertical RJ45 socket		CAN - adopts 8P8C vertical RJ45 socket	
Pin number	Pin Definition	Pin number	Pin Definition
1、8	RS485- B1	9、10、11、14、16	NC
2、7	RS485-A1	12	CANL
3、6	GND	13	CANH
4、5	NC	15	GND

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 number	Pin Definition	Pin number	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



Definition of protection board interface

interface	Definition Description			
BAT+	Connect the battery pack positive electrode to provide power to the BMS board.			
B-	Connect the negative electrode of the battery pack.			
P-	The negative electrode of the battery PACK is also the charging and discharging negative electrode, with the same charging and discharging port			
Cell and temperature	NT1	Connected to NTC1 temperature probe	NT3	Connected to NTC3 temperature probe
	GND	Connected to NTC1 temperature probe	GND	Connected to NTC3 temperature probe
	B0	The first negative pole of the battery cell string	B8	NC
	B1	1st cell+	B9	9th cell+
	B2	2nd cell+	B10	10th cell+
	B3	3rd cell+	B11	11th cell+
	B4	4th cell+	B12	12th cell+
	NTC2	Connected to NTC2 temperature probe	B13	13th cell+
	GND	Connected to NTC2 temperature probe	B14	14th cell+
	B5	5th cell+	B15	15th cell+
	B6	6th cell+	B16	16th cell+
	B7	7th cell+		
	B8	8th cell+		

Heating interface definition

Interface	Definition Description
CD+	Charging indicator input positive pole
CD-	Charging indicator input negative pole
H+	Heating negative electrode

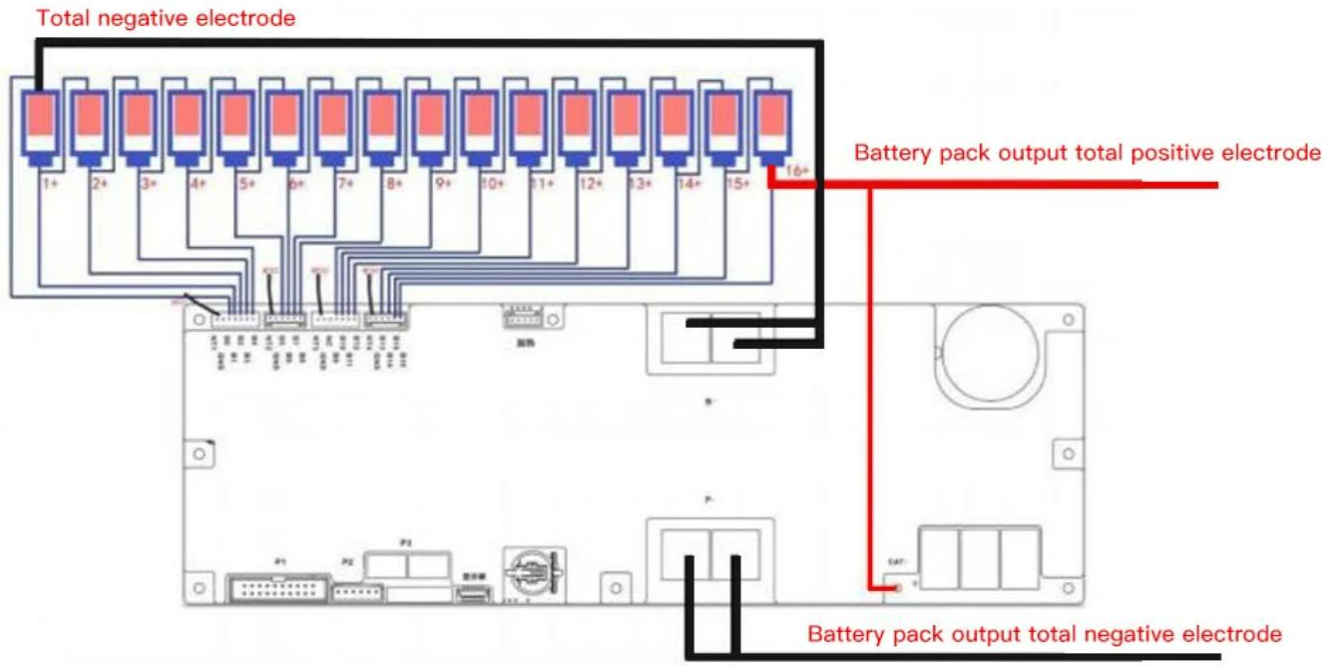
Display interface definition

Interface	Definition Description
VCC_10V	Display screen power supply positive pole
LCD_485A	Display screen data transmission signal
LCD_485B	Display screen data transmission signal
GND	Display screen power supply negative pole
POW_OFF_COG	Positive pole of equipment power switch
POW_OFF_GND	Negative pole of equipment power switch

Note: The P1 P2 P3 interface is mainly used to connect the interface board.

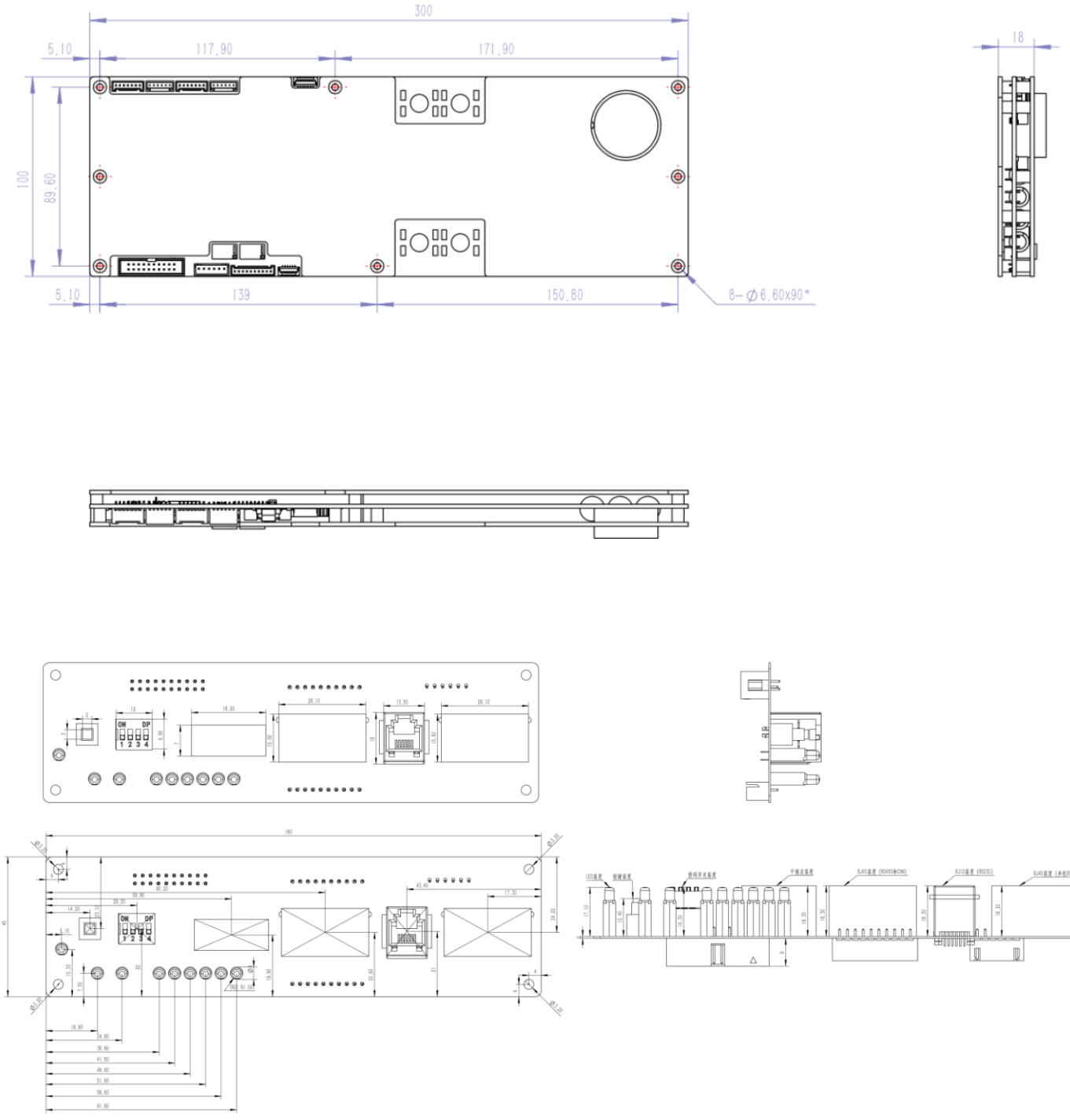
10. Wiring diagram

There are strict sequence requirements for powering on the protection board. First, weld B -, P -, B+, P+, and then plug in the battery sampling line connectors from low to high in sequence. After powering on, you need to activate the button. Only after all connecting wires are installed can the load or charger be added. When dismantling, first unplug the charger or load, and then disassemble the battery sampling line connectors in descending order. Finally, disassemble B+, P+, B -, and P -.



11. Dimensional drawing

Unit: mm



APP installation

Scan the QR code to obtain the mobile phone APP matching with the product.

5.3 App operation instructions

5.3.1 Equipment operation

a) Device connection

First turn on the mobile phone's Bluetooth, and then turn on the APP, as shown in Figure 13.

Click the icon in the upper left corner to scan the device. After the scan is completed, click the name of the device to be connected, such as "JK-B1A24S15P". The APP will prompt for a password when connecting for the first time. The default password of the device is "1234" or “123456”. The APP will automatically record the password after the device is connected. There is no need to enter the password for the next connection. It will automatically connect after opening the APP. The password input interface is shown in Figure 14.

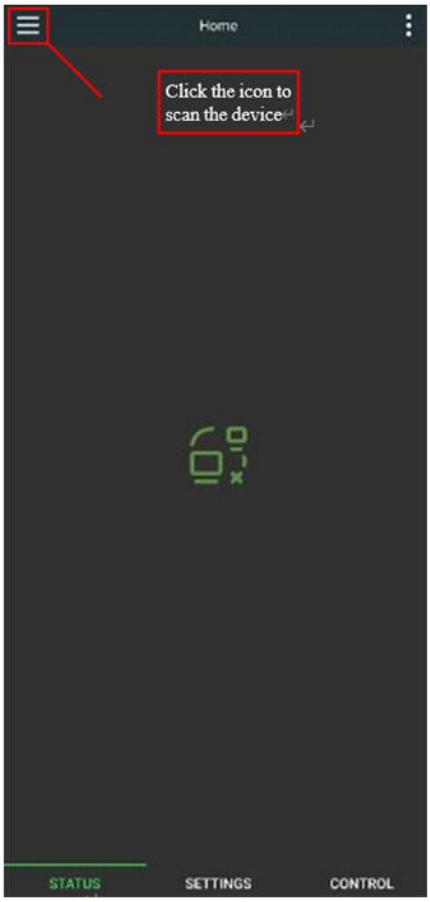


Figure 13. Scan the device

Figure 14. Password input

a) Change password and name

After the device is connected, click the "pen" icon on the right side of the device list to modify the device name and password.

The interface for modifying the device name is shown in Figure 15. Note that the device name only supports English or numbers, not Chinese names and Chinese characters.

The password modification interface is shown in Figure 16. To modify the device password, you must first enter the device's old password. Only when the current password is correct, can you enter the new password input option. After entering the new password twice, click "OK" to complete the device password modification.

Figure 15. Name modification

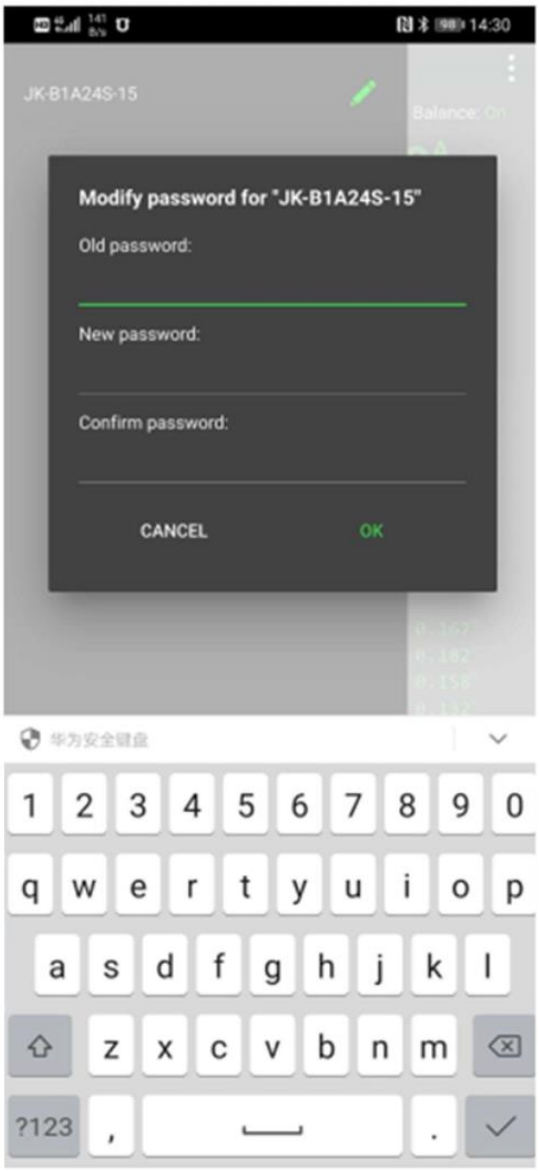


Figure 16. Password modification

5.3.2 Status view.

The real-time status interface is shown in Figure 17.

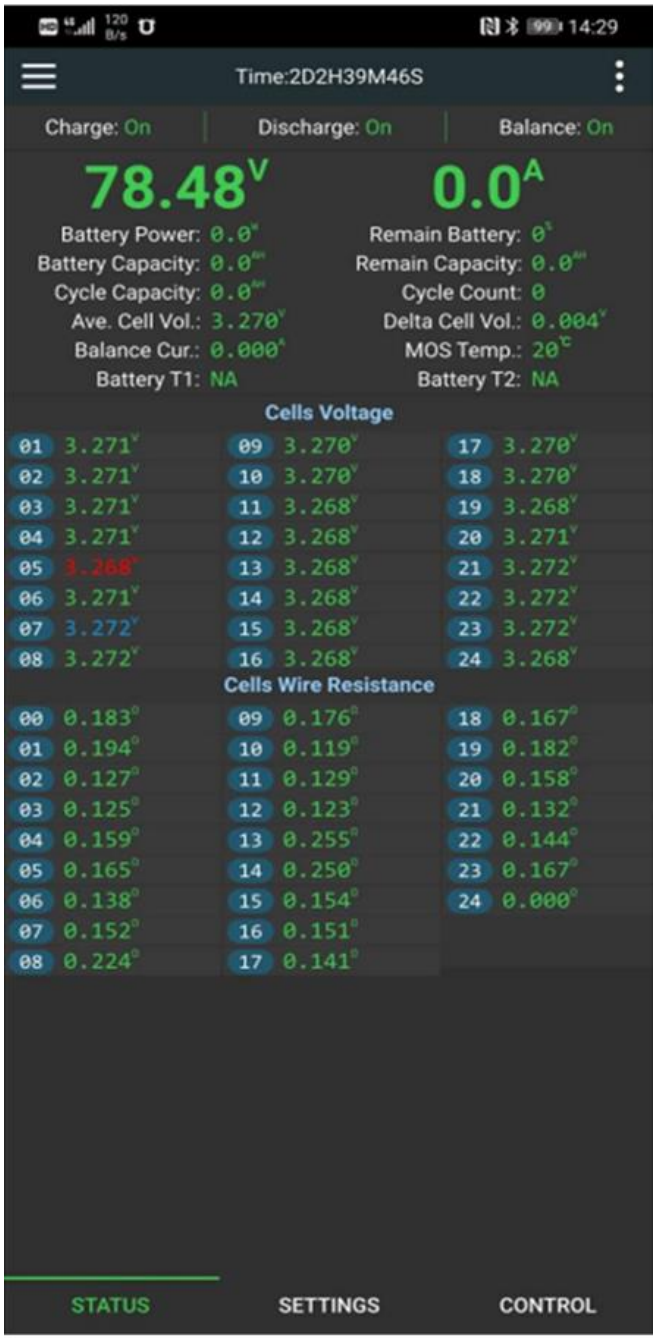


Figure 17. Real-time status display

The real-time status page is divided into 3 areas.

The area 1 in the figure is the comprehensive battery information column. The parameters are explained as follows：

a) Operation hours

Running time represents the total running time from the time the protection board was turned on.

b) Charge

Indicates the current on state of the charging MOS of the protection board. When it displays "on", it

means that the current protection board charging MOS is on and the battery is allowed to charge; when it displays "off", it means the current protection board charging MOS is off and the battery is not allowed to charge.

c) Discharge

Indicates the current on state of the protection board discharge MOS. When "ON" is displayed, it means that the current protection board discharge MOS is on, and the battery is allowed to discharge; when "OFF" is displayed, it means that the current protection board discharge MOS is off, and the battery is not allowed to discharge.

d) Balance

Indicates the current state of the protection board balance switch. When“On”is displayed, the protection board will automatically balance when the balance starting conditions are met; when “Off” is displayed, it means that the balance is off, and the protection board will not balance the battery.

e) Voltage

The voltage area displays the current total voltage of the battery in real time, and the total voltage is the sum of all cell voltages.

f) current

The current area displays the total current of the current battery in real time. When the battery is charging, the current is positive, and when the battery is discharging, the current is negative.

g) Battery power

Represents the total power output or input of the current battery, and its value is the product of the current battery voltage and the absolute value of the battery current.

h) Remaining battery

Represents the percentage of current battery power remaining.

i) Battery capacity

Represents the actual battery capacity calculated by the current protection board based on the high-precision SOC. The unit is AH.（This value needs to be updated after a complete discharge and charge

cycle of the battery）.

j) Remaining capacity

Remaining capacity indicates the remaining capacity of the current battery, unit: AH.

k) Cycle capacity

The cycle capacity indicates the cumulative discharge capacity of the battery, and the unit is AH.

l) Number of cycles

The number of cycles indicates the number of times that the current battery is fully charged, and the unit is: times.

m) Monomer average

Indicates the average voltage of the current battery cell, unit: V.

n) Maximum voltage difference

The maximum voltage difference represents the difference between the highest battery voltage and the lowest battery voltage of the entire battery. The unit is V.

o) Balance current

When the protection board turns on the balance function and reaches the balance condition, it displays the balance current in real time. Unit: A.

When the balance is performed, the status display area of the real-time status, blue represents a discharged battery, and red represents a charged battery. Balanced current negative current indicates that the battery is discharging, and blue flashes at this time, and balanced current positive current indicates that the battery is charging, and red flashes.

The protection board uses active balance technology. The principle of balance is to take power from high-voltage cells, store them on the protection board, and then put them on low-voltage cells.

p) MOS temperature

Real-time display the current temperature of the protection board power MOS, unit: ℃.

q) Battery temperature 1

When the temperature sensor 1 is not installed, "NA" is displayed. When the temperature sensor is installed, the temperature of the temperature sensor 1 is displayed in real time, and the unit is ° C.

r) Battery temperature 2

When the temperature sensor 2 is not installed, "NA" is displayed. When the temperature sensor is installed, the temperature of the temperature sensor 2 is displayed in real time, and the unit is ° C.

s) Heating status (if supported)

Under the condition that the protection board supports heating, the current heating switch status of the protection board is displayed in real-time, with the display content being "on" or "off".

t) Heating current (if supported)

Under the condition that the protection board supports heating, when the protection board heating is turned on, the current heating current is displayed in real time, unit: A;

u) ACC (if supported)

If the protection board supports ACC recognition function, the current status of ACC will be displayed here, with the display content being "on" or "off". When the protection board supports ACC recognition, the discharge output of the protection board can only be turned on when the ACC status is "on".

v) Charger (if supported)

If the protection board supports the charger recognition function, the current status of the charger will be displayed here, with the display content being "inserted" or "not inserted". In this case, the charger status needs to be "inserted" in order to turn on charging.

w) Pre charge state (if supported)

Indicates the current state of the discharge pre charge switch. When the displayed content is "On", the discharge pre charge switch is opened, and the battery passes through the pre charge switch and flows through the pre charge resistor to pre charge the controller. The pre charging time is the value set in the parameter settings for "discharge pre charging time". After the pre charging is completed, the protection board will automatically open the discharge switch.

x) SOH valuation (if supported)

Indicates the estimated battery health status of the current protection board.

y) Emergency time (if supported)

Under the condition of turning on the emergency switch, the remaining emergency time is displayed here. Unit: seconds (S).

Zone 2 in the figure represents the individual voltage region. Real time display of voltage data for each individual cell in the battery pack, with red indicating the lowest voltage cell and blue indicating the highest voltage cell.

Zone 3 in the figure represents the resistance area of the equalizing line. The balance line resistance is the balance line resistance obtained from the self inspection of the protection board. This value is only a preliminary calculation, in order to prevent incorrect connection or poor contact. When the balance line resistance exceeds a certain value, it will be displayed in yellow, and the balance cannot be turned on at this time.

5.3.3 Parameter setting

The parameter setting page is shown in Figure 18.

If you need to modify the working parameters of the protection board, you must first click the "Authorization Settings" button, enter the parameter setting password, and verify the parameter setting permissions. The factory default password for parameter settings is "123456". Only after correctly entering the parameter setting password can the parameters of the protection board be modified. The parameter setting password and device Bluetooth connection password are independent of each other.

On the parameter setting page, various working parameters of the protection board can be modified, and the definitions of each parameter are as follows.

a) One click lithium iron

Function this button can modify all the working parameters of the protection board to iron lithium battery parameters. The default values of the parameters are shown in Appendix 1.

b) One click to Li-ion

Function this button can modify all the working parameters of the protection board to the iron-lithium battery parameters. The default values of the parameters are shown in Appendix 2.

c) One click to LTO

This function button can modify all working parameters of the protection board to lithium titanate battery parameters. The default values of lithium titanate parameters are shown in the appendix.

d) Number of monomers

The number of cells indicates the number of cells of the current battery. Please set this value accurately before use, otherwise the protection board will not work normally.

e) Battery capacity

This value is the design capacity of the battery.

f) Trigger equalizing pressure difference

The trigger equalization pressure difference is the only parameter that controls the equalization. When the equalization switch is turned on, when the maximum pressure difference of the battery pack exceeds this value, the equalization starts and ends when the pressure difference falls below this value. For example, set the equalization trigger voltage difference to 0.01V, when the battery pack voltage difference is greater than 0.01V, the equalization will begin, and the equalization will end when the voltage drop is below 0.01V. (It is recommended that the balance trigger voltage difference of the battery above 50AH is 0.005V, and the balance trigger voltage difference of the battery below 50AH is 0.01V).

g) Voltage calibration

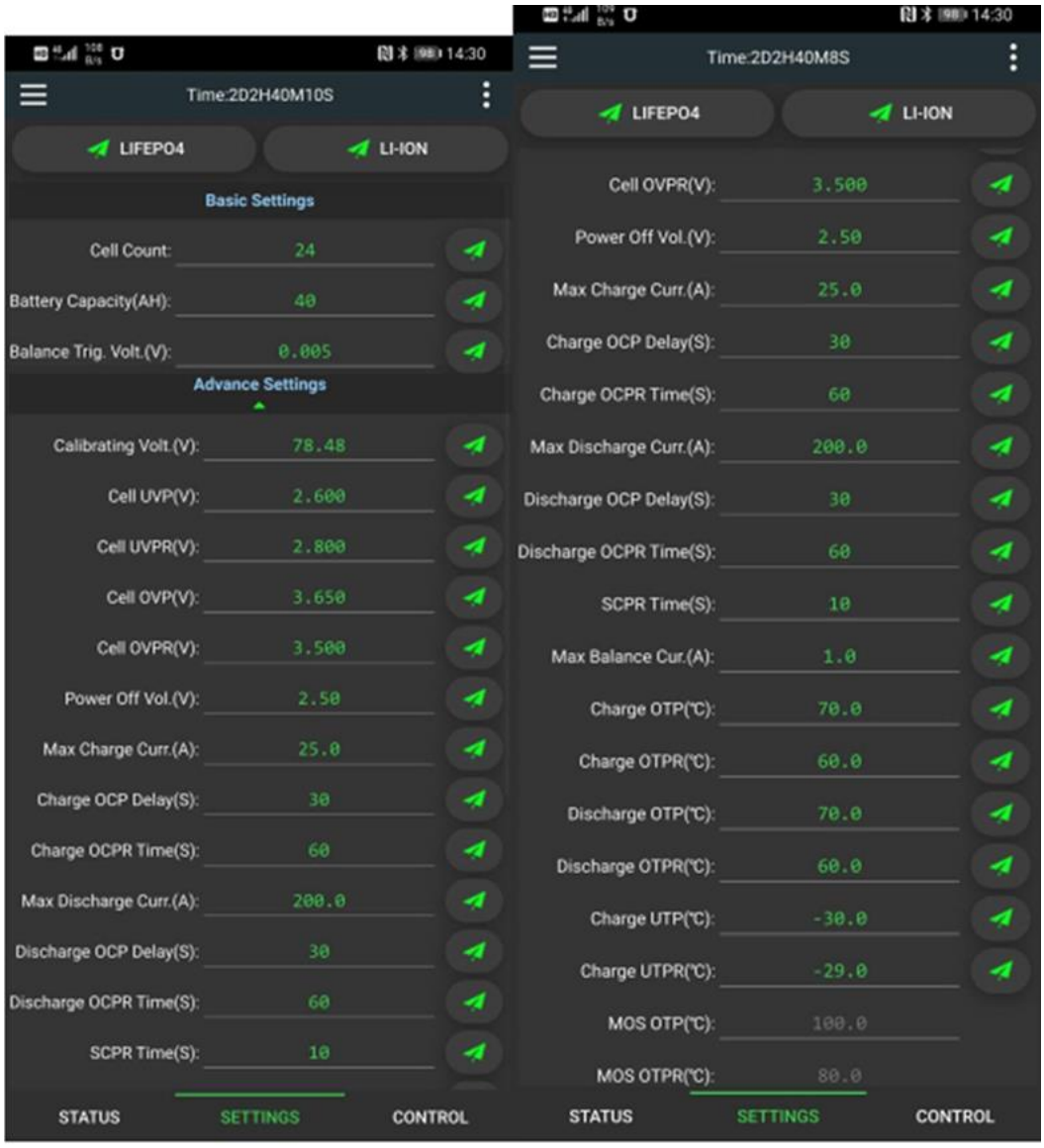
The voltage calibration function can be used to calibrate the accuracy of voltage collection on the protection board.

When there is an error between the total voltage collected by the protection board and the total voltage of the battery, the voltage calibration function can be used to calibrate the protection board. The calibration method is to fill in the current measured total battery voltage, and then click the 'Set' button after voltage calibration to complete the calibration.

h) Current calibration

The current calibration function can be used to calibrate the accuracy of current collection on the protection board.

When there is an error between the total current collected by the protection board and the actual current of the battery, the current calibration function can be used to calibrate the protection board. The calibration method is to fill in the current measured total battery current, and then click the 'Set' button after current calibration to complete the calibration.



i) "Single undervoltage protection", "Single undervoltage recovery"

"Single undervoltage protection" refers to the cut-off voltage of the cell. As long as the voltage of any cell in the battery pack is lower than this value, a "cell undervoltage alarm" is generated, and the protection board turns off the discharge MOS. At this time, the battery cannot Discharge, only charge. When the alarm is generated, only after the voltage values of all cells exceed the value of "cell voltage

recovery", the protection board releases the "cell undervoltage alarm" and turns on the discharge MOS at the same time.

j) "Single overcharge voltage", "Single overcharge recovery"

"Single overcharge voltage" refers to the saturation voltage of the battery cell. As long as the voltage of any single cell in the battery pack exceeds this value, a 'single overcharge alarm' is generated, and the protection board turns off the charging MOS, and the battery cannot be charged at this time. Can only be discharged. When the alarm occurs, only after the voltage value of all the cells is lower than the value of “cell overcharge recovery”, the protection board releases the “cell overcharge alarm” and turns on the charging MOS at the same time.

k) Automatic shutdown voltage

The automatic shutdown voltage indicates the minimum voltage at which the protection board works. When the voltage of the highest cell in the battery pack is lower than this value, the protection board closes. This value must be lower than the "cell undervoltage protection".

l) Equilibrium starting voltage

The equilibrium starting voltage is used to control the voltage stage of equilibrium. Only when the individual voltage exceeds this value and the maximum voltage difference of the battery pack exceeds the equilibrium triggering voltage difference, equilibrium will be triggered.

m) Maximum balanced current

The equilibrium current represents the continuous current during the process of energy transfer between the discharge of high voltage batteries and the charging of low voltage batteries. The maximum equilibrium current represents the maximum current during the energy transfer process, and the maximum equilibrium current should not exceed 0.1C.

For example, a 20AH battery should not exceed 20 * 0.1=2A.

n)"Maximum charging current", "Charging overcurrent delay", "Charging overcurrent release"

When charging the battery pack, when the current exceeds the "maximum charging current" and the duration exceeds the "charge overcurrent delay" time, the protection board generates a 'charging

overcurrent alarm' and turns off the charging MOS at the same time. After the alarm occurs, after the “charge overcurrent release” time elapses, the protection board releases the charge overcurrent alarm and restarts the charging MOS. Example: Set "Maximum Charging Current" to 10A, "Charge Overcurrent Delay" to 10 seconds, and "Charge Overcurrent Release" to 50 seconds. During the charging process, the charging current exceeds 10A for 10 seconds. The protection board will generate a 'charging overcurrent alarm' and turn off the charging MOS at the same time. 50 seconds after the alarm is generated, the 'charging overcurrent alarm' will be cancelled and the protection board will turn on the charging MOS again.

o) "Maximum discharge current", "Discharge overcurrent delay", "Discharge overcurrent release"

When discharging the battery pack, if the current exceeds the "maximum discharge current" and the duration exceeds the "discharge overcurrent delay" time, the protection board will generate a "discharge overcurrent alarm" and turn off the discharge MOS. After the alarm is generated, after the "discharge overcurrent release" time, the protection board releases the "discharge overcurrent alarm" and restarts the discharge MOS.

Example: Set "Maximum discharge current" to 100A, "Discharge overcurrent delay" to 10 seconds, and "Discharge overcurrent release" to 50 seconds. During the discharge process, if the discharge current exceeds 100A for 10 seconds, the protection board will generate a ‘discharge overcurrent alarm’ and turn off the discharge MOS. 50 seconds after the alarm is generated, the ‘discharge overcurrent alarm’ will be released and the protection board will restart the discharge MOS.

p) Short circuit protection delay

When the protection board detects that the current exceeds 600A and the duration exceeds the "short circuit protection delay" time, the protection board generates a "short circuit alarm" and corresponding charging and discharging switches. After the alarm is generated, after the "short circuit protection is released" time, the protection board will release the "short circuit protection alarm" and restart the charging and discharging switch.

For example, set the "Short Circuit Protection Delay" to 1000 microseconds and the "Short Circuit Protection Release" to 50 seconds. During the charging and discharging process, if the current is continuously 1000 microseconds and 600A, the protection board will generate a 'short circuit

protection alarm'. At the same time, the corresponding charging and discharging switch will be triggered. 50 seconds after the alarm is triggered, the 'short circuit protection alarm' will be released, and the protection board will restart the charging and discharging switch. (It is recommended to use the factory default settings unnecessarily; setting the short-circuit protection to '0' indicates that the short-circuit protection is turned off)

q) Release of short circuit protection

After the short circuit protection occurs, after the time set for 'short circuit protection release', the short circuit protection is released.

r) "Charging over temperature protection", "Charging over temperature recovery"

During the charging process, when the battery temperature exceeds the value of "charging over-temperature protection", the protection board will generate a warning of "charging over- temperature protection" and the protection board will turn off the charging MOS. After the alarm is generated, when the temperature is lower than the "charging over temperature recovery", the protection board will release the "charging over temperature protection" warning, and at the same time restart the charging MOS.

s) "Discharge over temperature protection" and "Discharge over temperature recovery"

During the discharge process, when the battery temperature exceeds the value of "discharge over temperature protection", the protection board generates a warning of "discharge over temperature protection", and at the same time, the protection board closes the discharge switch. After the alarm is generated, when the temperature drops below the "discharge over temperature recovery" level, the protection board will release the "discharge over temperature protection" warning and restart the discharge switch.

t) "Charging low temperature protection", "Charging low temperature recovery"

During the charging process, when the battery temperature is lower than the value of "charging low temperature protection", the protection board will generate a "charging low temperature protection" warning, and the protection board will close the charging MOS. After the alarm is generated, when the temperature is higher than the "charging low temperature recovery", the protection board releases the "charging low temperature protection" warning, and at the same time restarts the charging MOS.

u)"MOS over-temperature protection", "MOS over-temperature recovery"

When the MOS temperature exceeds the value of "MOS over temperature protection", the protection board generates a "MOS over temperature alarm" and closes the charge and discharge MOS, and the battery cannot be charged or discharged. After the alarm is generated, after the MOS temperature is lower than the value of "MOS over temperature recovery", the protection board will release the "MOS over temperature alarm", and at the same time turn on the charge and discharge MOS **(MOS over temperature protection value is 75°C, MOS over temperature recovery value 65°C, these two values are factory default values and cannot be modified).**

v) Device address (if supported)

The device slave address used to configure the protection board.

w) Discharge pre charge time (if supported)

When the protection board supports the discharge pre charge function, this value is used to control the closing time of the discharge pre charge switch, in seconds. After the pre charging of discharge is completed, the discharge switch is automatically turned on to start discharging.

x) User private data (user data)

In the application of power exchange in iron structures, the first 12 digits of the BT code are filled in here. The BT code in the Tiejia Power Exchange Protocol has a total of 24 digits, with the last 12 digits being the Bluetooth name.

For example, the BT code of the battery is BT207204012YMLD220815001; Then fill in the user's private data in the first 12 digits of BT207204012Y, and fill in the Bluetooth name in the last 12 digits of MLD220815001.

y) Connection line resistance

Connection line resistance is used for multi box batteries, not for single box batteries. Please consult the supplier for specific usage methods **(note that the connection line resistance is not substantially related to the equalization line resistance on the real-time data page).**

Attention:

Please refer to the manual for any parameter modifications. Improper parameters may cause the protection board to malfunction or even burn out. After modifying any parameter, you need to click the "Set" button after the parameter to complete the parameter. After the protection board successfully receives the parameter, it will emit a "drip" sound.

5.3.4 BMS control

The BMS control page is shown in the figure 19. Through BMS control, the charging function, discharge function, equalization function, and emergency switch of the protection board can be switched on and off.

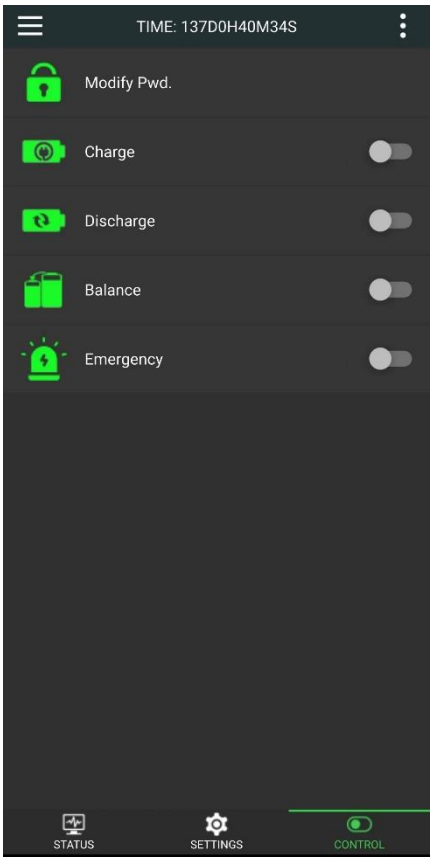


Figure 19. BMS Control page

Ay) Charg switch

To control the charging switch of the protection board on or off.

Az) Discharge switch

Used to control the opening or closing of the discharge switch on the protective board.

Ba) Equalization switch

Used to control whether the balance function of the protection board is turned on or off.

Bb) Emergency switch

Regardless of any battery failure, opening the emergency switch can open the charging and discharging function, allowing users to use the battery in an emergency manner. After the emergency switch is turned on, it automatically turns off within 30 minutes, without the need for the user to turn it off themselves (**after turning on the emergency switch, the battery loses any protective function, and do not turn on this switch unless necessary).**

BC) Heating switch

Under the condition that the protection board supports heating, when the heating conditions are met, **the charger can only be detected or the heating switch can be turned on for heating.**

Bd) Temperature sensor shielding

Turn on the temperature sensor shielding switch, and at this time, the protection board ignores temperature related alarms (this function is commonly used in cases where the temperature sensor is damaged for some reason).

Be) GPS heartbeat detection

After turning on the GPS heartbeat detection function, the protection board will detect the connection status of the GPS. When the GPS is disconnected from the protection board for more than 24 hours, the protection board will turn off the charging and discharging switch and generate an alarm of "GPS disconnection" (this function is usually used for GPS anti disassembly detection).

Bf) Multiplexing port switching

This function can switch the output function of the multiplexing port on the protection board, with the switching options being "RS485" or "CAN" (corresponding functions need to be supported by the protection board hardware).

6 Safety protection measures and precautions

Before use, please carefully read the user manual and follow the wiring diagram corresponding to the number of strings. Connect from the negative pole to the positive pole, and after connecting the equalizing wire, confirm with a multimeter again. Only after confirming that there are no errors can the protective board be inserted.

The default password for the protection board is "1234", and the default authorization password is "123456". After connecting the mobile app to the protection board, **please modify the connection password in a timely manner to prevent malicious connections by others.**

Appendix Default parameters of "One-click Lithium Iron", "One-click Ternary" and "One- click Lithium Titanate

No.	Parameter	Ternary default	Lithium iron default	Lithium titanate default	Unit
1	Single undervoltage protection	2.9	2.6	1.8	V
2	Monomer undervoltage protection recovery	3.2	3.0	2.0	V
3	Single overcharge voltage	4.2	3.6	2.7	V
4	Monomer overcharge protection recovery	4.1	3.4	2.4	V
5	Trigger equalizing pressure difference	0.01	0.01	0.01	V
6	Automatic shutdown voltage	2.8	2.5	1.7	V
7	Charge overcurrent protection delay	30	30	30	S
8	Charge overcurrent protection release time	60	60	60	S
9	Discharge overcurrent protection delay	30	30	30	S
10	Discharge overcurrent protection release time	60	60	60	S
11	Short circuit protection release time	60	60	60	S
12	Charging over temperature protection temperature	60	60	60	℃
13	Charging over temperature recovery temperature	55	55	55	℃
14	Discharge over temperature protection temperature	60	60	60	℃
15	Discharge over temperature recovery temperature	55	55	55	℃
16	Charging low temperature protection temperature	-20	-20	-20	℃
17	Charging low temperature recovery temperature	-10	-10	-10	℃
18	MOS over temperature protection temperature	75	75	75	℃
19	MOS over temperature protection recovery temperature	70	70	70	℃

JK-PB BMS Manual

JKBMS

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Catalog

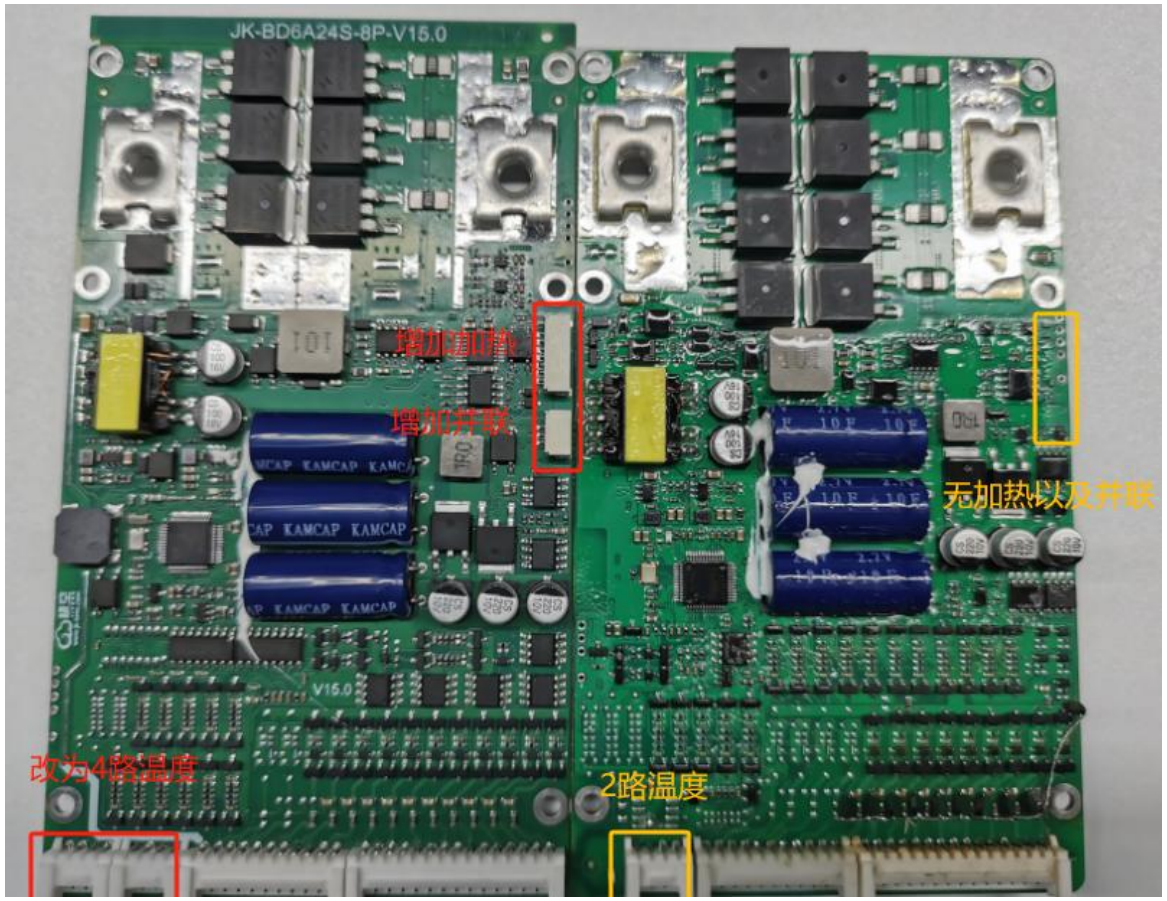
1

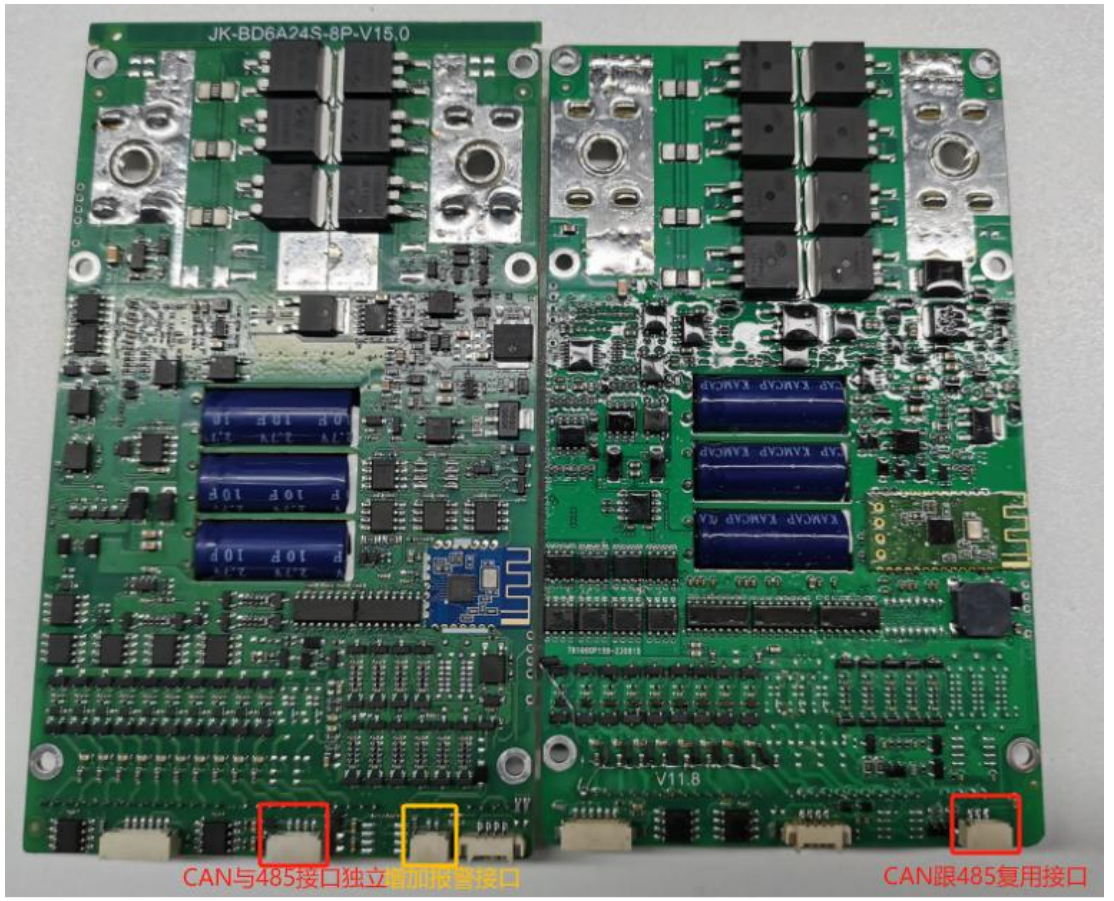
V15 New Features

❖ Upgrade items of V15 BMS compared to V11 BMS

Version	GPS interface	Temperature collection	LCD interface	Heating function	CAN&RS485	Alarm function	Parallel function
V11	support	2cable	support	some have	pick one of two	not support	not support
V15	support	4cable	support	all support	all can be use in same time	all support	all support

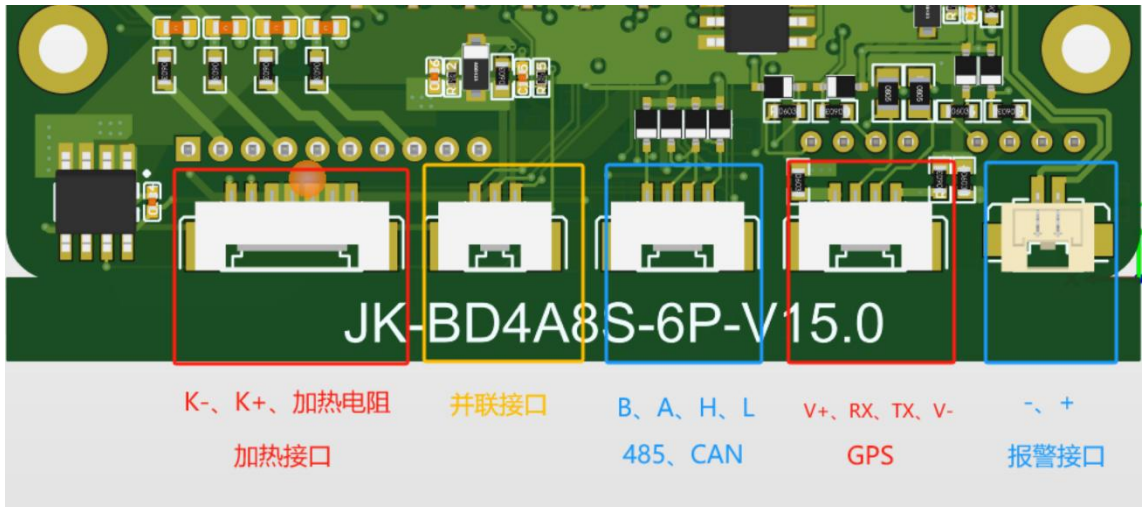
❖ Upgrade items of V15 BMS compared to V11 BMS（sample by 6P）



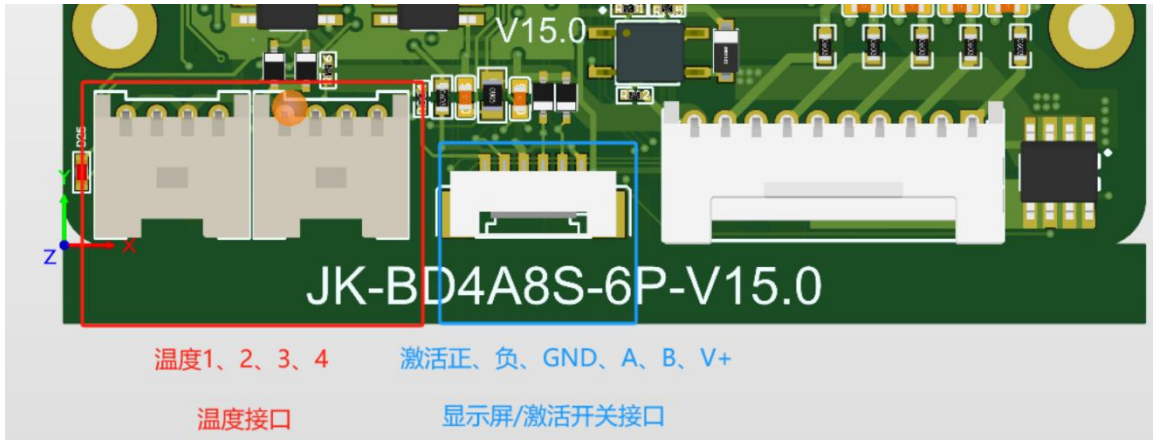


❖ Interface definition comparison

V15背面



V15正面



V11

2

ESS BMS

1.ESS BMS Wiring

2.Communication RS485 CAN

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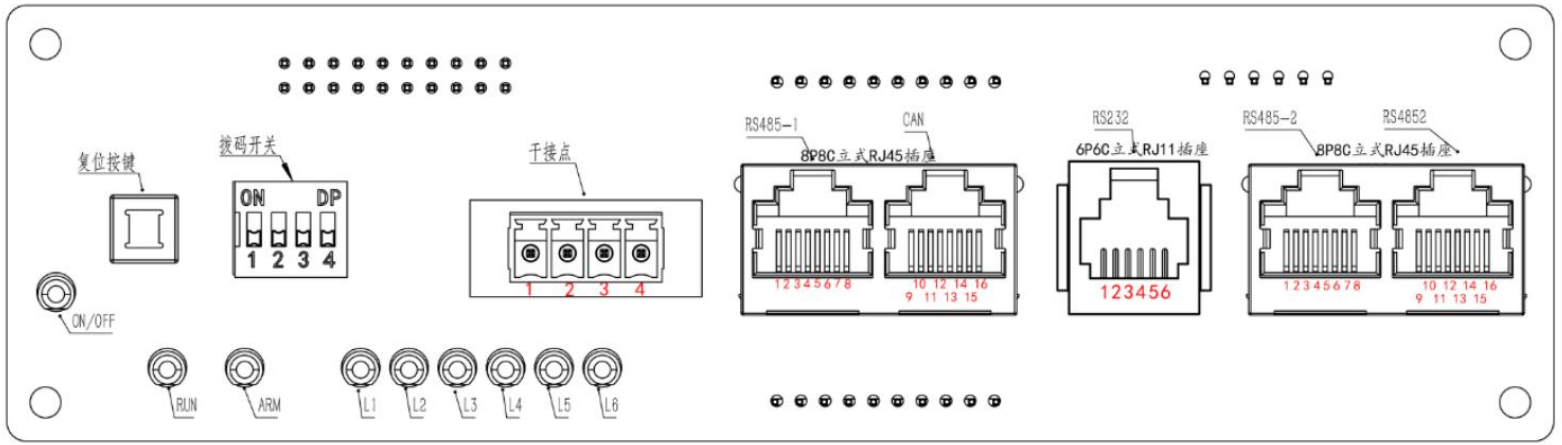
❖ Adpater board definition



干接点接口定义

引脚序号	引脚定义	备注
1	COM1	有告警状况下 S1 和 COM1 导通
2	S1	
3	COM2	低电量状况下 S2 和 COM2 导通
4	S2	

CAN 和 RS485-1 接口定义

RS485-采用 8P8C 立式 RJ45 插座		CAN-采用 8P8C 立式 RJ45 插座	
引脚序号	引脚定义	引脚序号	引脚定义
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 接口定义

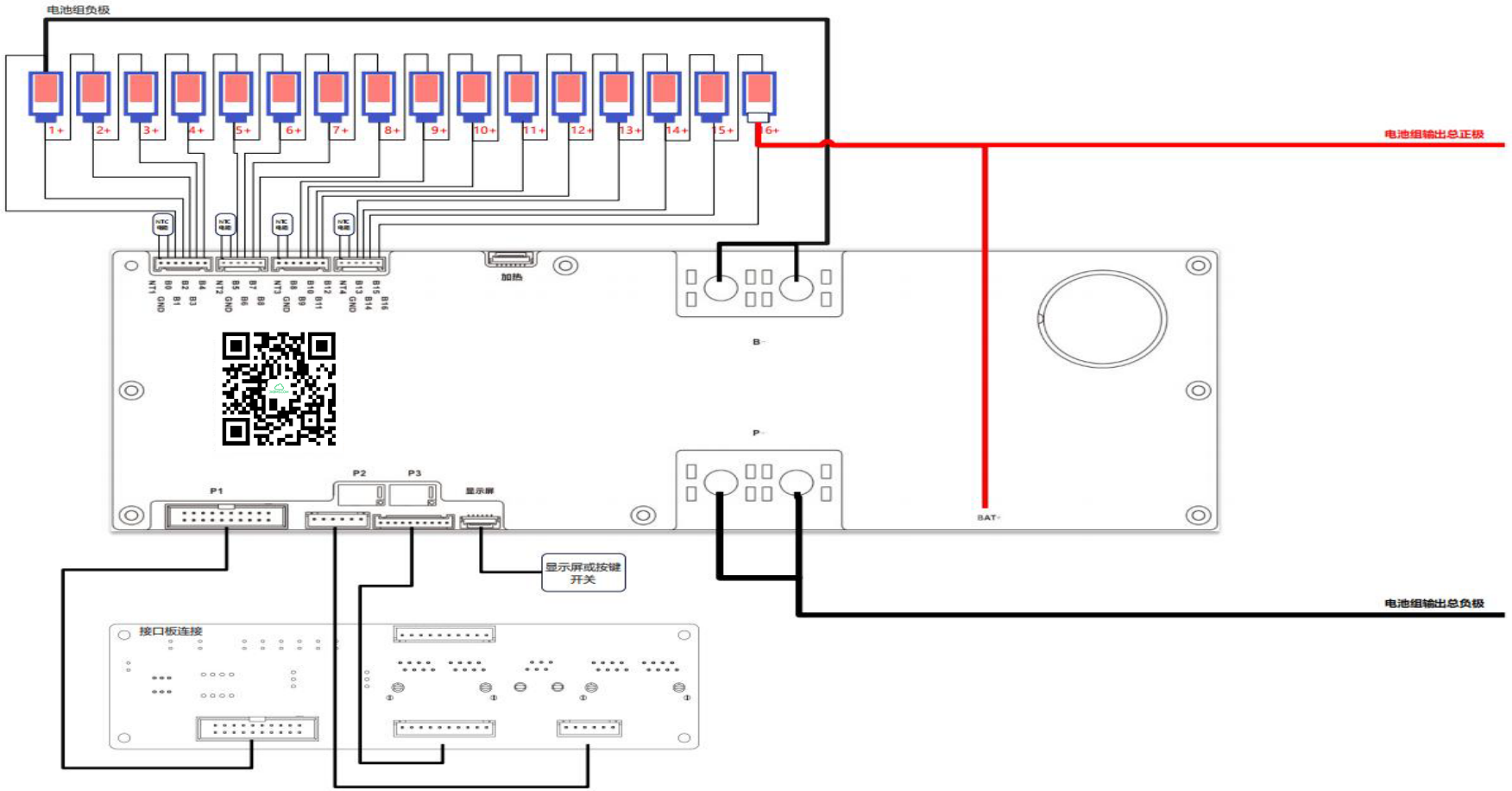
RS232-采用 6P6C 立式 RJ11 插座		
引脚序号	引脚定义	备注
1、2、6	NC	
3	RS232_TX	
4	RS232_RX	
5	GND	

RS485-2 并联接口定义

RS485-采用 8P8C 立式 RJ45 插座		RS485-采用 8P8C 立式 RJ45 插座	
引脚序号	引脚定义	引脚序号	引脚定义
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

ESS BMS WIRING

JK-PBxA16S-10P/15P/20P Active balance BMS Wiring Diagram



❖ Batteries in parallel

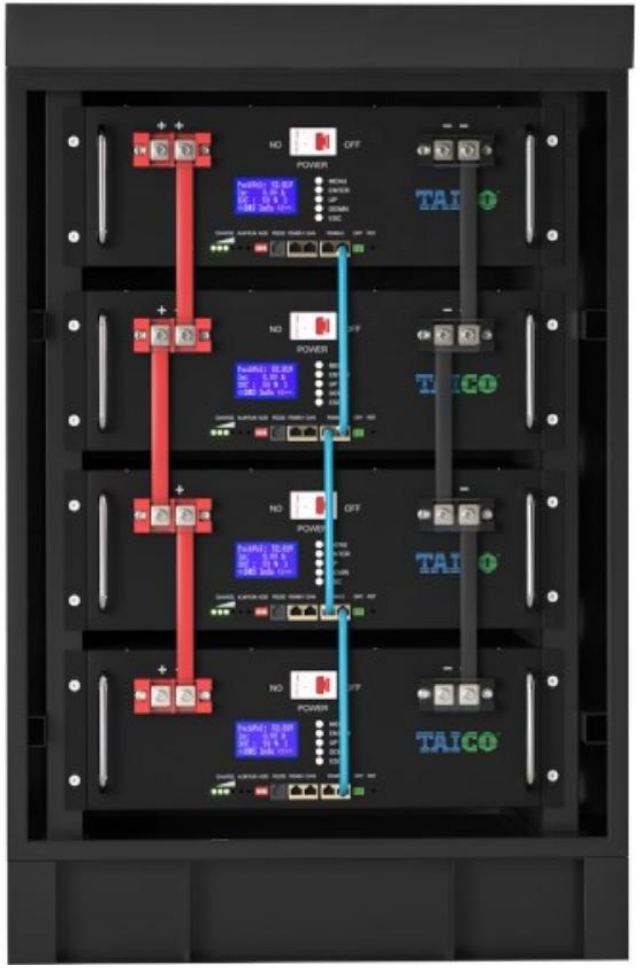


图1

1.Batteries in parallel， + to +， - to -；

2.Each battery pack previously communicated through the RS485-2 interface， In a parallel battery pack system, one and only one master is required (the device address is set to 0), the rest are slaves and the addresses of the slaves cannot be the same.

ESS BMS Address settings

ESS BMS Address settings：

1.ESS BMS adpater broad（picture 1）have 4 DIP switches for setting device address；

2.ON means open， OFFmeans close；

3.The actual corresponding address values of 1, 2, 3, and 4 on the DIP switch are 1, 2, 4, and 8; then add the values dialed to the ON position to calculate the device address.， picture2；

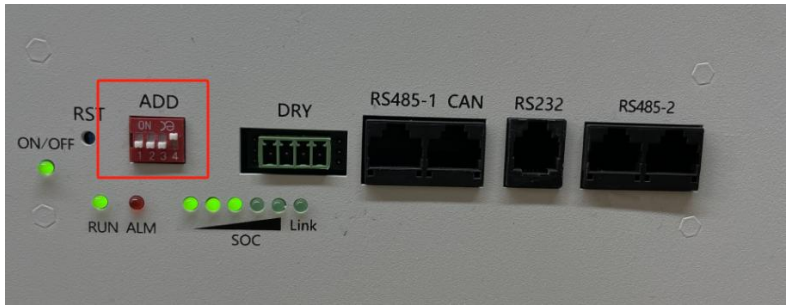
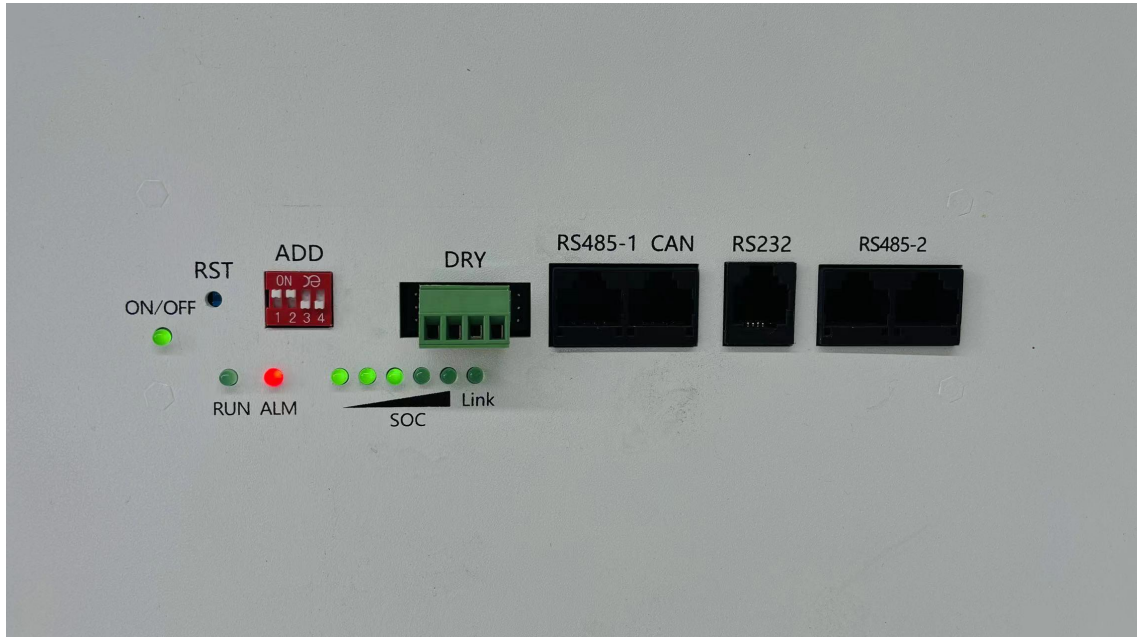


图1

地址	拨码开关位置			
	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

图2

❖ Adpater broad



ON/OFF： Power Indicator；

RST： Reset button, after clicking, BMS will restart；

ADD： BMS address setting；

RUN： Indicates that the BMS is running normally；

ALM： Fault indicator light, only system faults do not include user-defi

SOC： Light up the indicator light；

Link： When connected in parallel, the host and slave will flash after successful communication；

DRY： Dry node, used by customers to connect some external alarm equipment；

CAN： CAN communication interface；

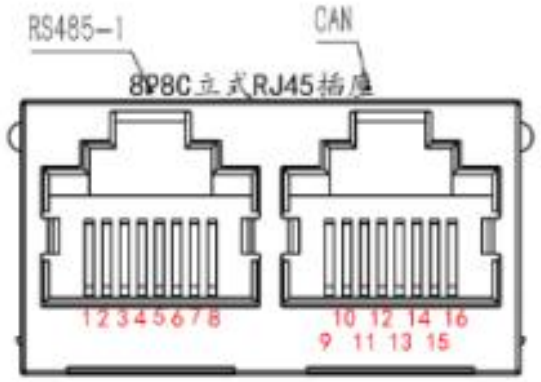
RS232： RS232 communication interface；

RS485-1： RS485 interface to communicate with the inverter, optional

RS485-2： RS485 interface, communication interface during parallel op

ESS BMS COMMUNICATION

BMSCommunication interface definition：



CAN 和 RS485-1 接口定义

RS485-采用 8P8C 立式 RJ45 插座		CAN-采用 8P8C 立式 RJ45 插座	
引脚序号	引脚定义	引脚序号	引脚定义
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


14:15
运行时间：48天18时35分59秒
一键三元
一键铁锂
一键钛酸锂
修改设置密码
设备地址: 0
数据存储周期(S): 864000 设置
RCV保持时间(H): 12.0 设置
RFV保持时间(H): 12.0 设置
用户数据: Input Userdat 设置
用户数据2: Input Userdat 设置
串口1协议: 0 设置
串口2协议: 11
CAN协议: 10 设置
显示器报警触发源: 0 设置
显示器报警触发值: 0 设置
显示器报警恢复值: 0 设置
干节点1触发源: 0 设置
干节点1触发值: 0 设置
实时状态
参数设置
BMS控制


14:15
运行时间：48天18时35分59秒
一键三元
一键铁锂
一键钛酸锂
修改设置密码
设备地址: 0
选择串口协议
000 - 4G-GPS远程模组通用协议V2.4
001 – 极空BMS RS485 Modbus通用协...
002 – 小牛U系列通用协议
003 – 铁塔换电柜通用协议V1.1
004 – 沛城RS485 Modbus V1.3
005 – 派能低压储能RS485协议V3.3
006 – 古瑞瓦特RS485通信协议_1xSxx...
007 – 日月元逆变器与485通信协议20...


14:16
运行时间：48天19时35分11秒
一键三元
一键铁锂
一键钛酸锂
修改设置密码
数据存储周期(S): 864000 设置
RCV保持时间(H): 12.0 设置
选择CAN协议
000 – 极空BMS CAN接口协议(250K)V...
001 – 德业低压储能CAN通信协议 V1.0
002 – 派能低压CAN通信协议V1.2
003 – 古瑞瓦特低压CAN通信协议REV...
004 – 维克多_CAN通信协议I_20170717
005 - SEPLOS_CAN通信协议_V1.0
006 – 极空BMS CAN接口协议(500K)V...
007 – 英威腾低压版BMS通信协议V1.02

❖ Current limiting module

ESS BMS Current limiting function：

1.The current limiting function is mainly used to balance the voltage between battery packs when connected in parallel；

2.The current limit is 10A；

3.The triggering conditions of the current limiting module (the charging prohibition current limiting needs to be turned off, as shown in Figure 1) are charging overcurrent and charging short circuit protection.；

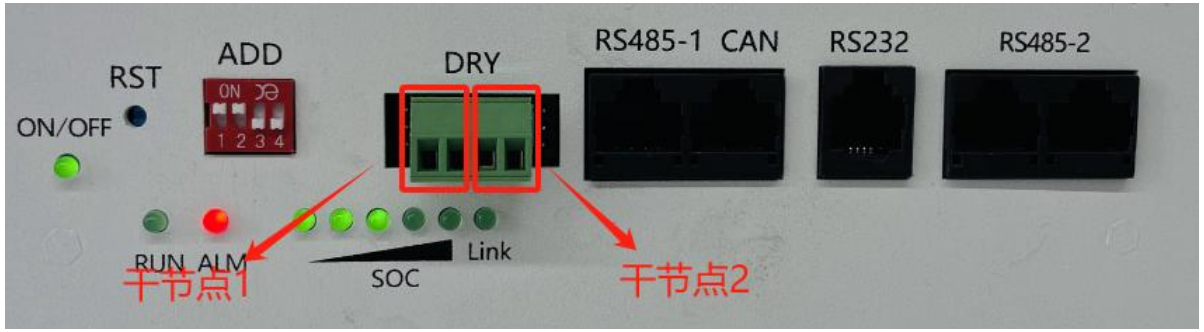
4.The end condition is that the current limit size is less than 5A；

图1

❖ Dry contact trigger source and display alarm

图1

图2



Dry contact function：

1.Users can connect external alarm equipment (picture 3), such as LEDs, buzzers, etc；

2.Some alarm function settings can be customized (such as low battery, battery overvoltage, cell overvoltage, etc， picture2）；

Monitor alarm：

The display alarm is similar to the dry node, and the user can define the alarm function by himself， Then alarm through the buzzer on the display；

3

PC SOFTWARE

- Use of PC software
- BMS firmware upgrade

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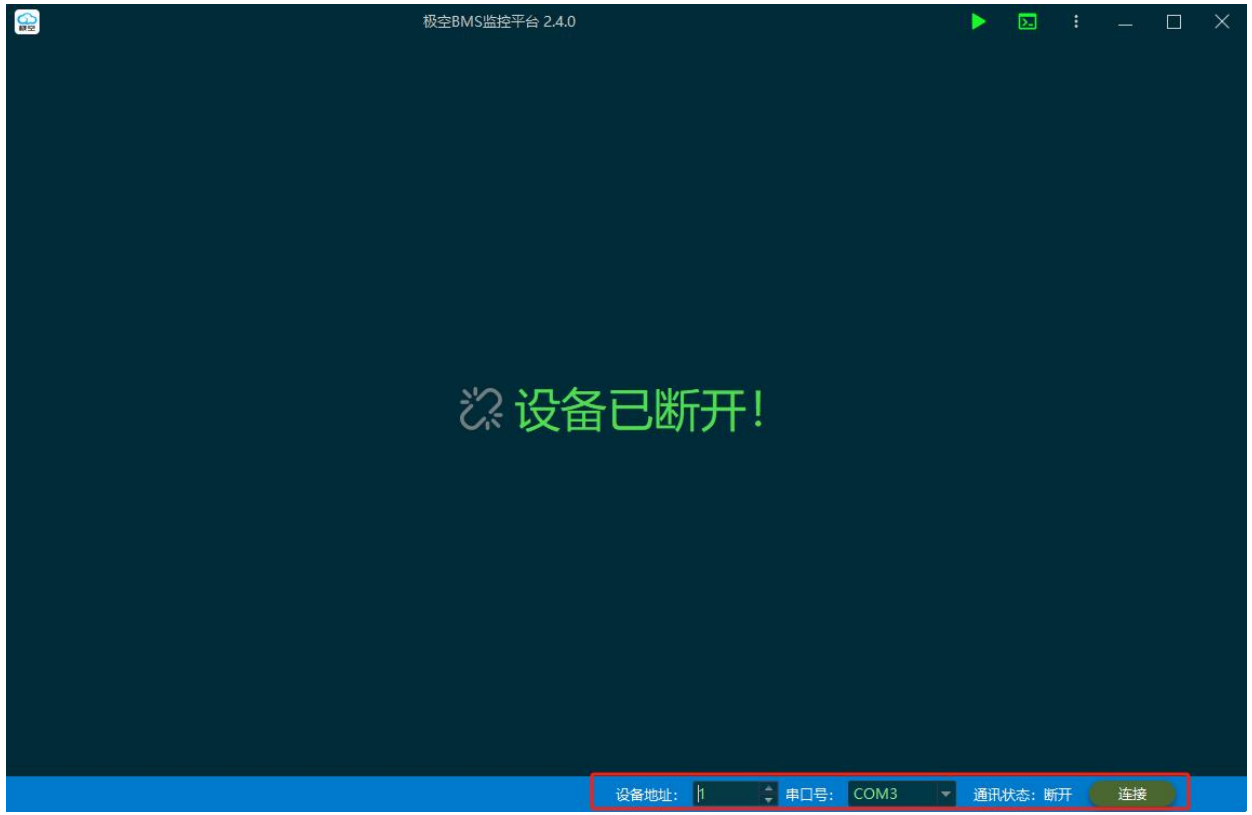
❖ pc software connect



Steps to Connect Devices：

1.Use USB to RJ45 cable to connect ESS BMS and computer；

2.

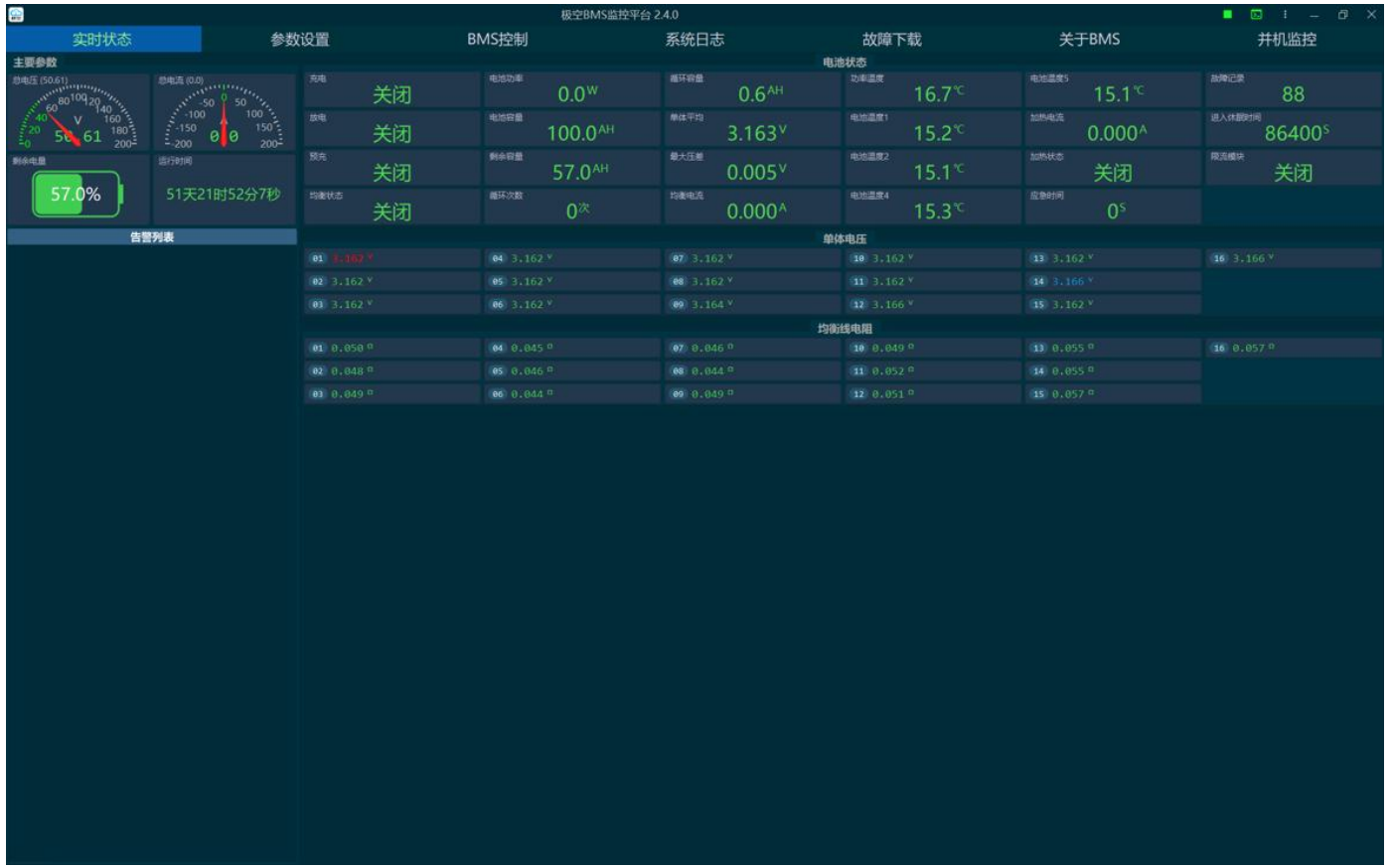
Set the upper computer device address to the energy storage BMS dialing address；

3.Select the corresponding port number；

4.Just click to connect；

❖ Real time status

In the real-time status interface, you can see real-time information related to the battery, such as battery voltage, current, SOC, cell voltage, etc.（as the picture show）；



Parameter settings

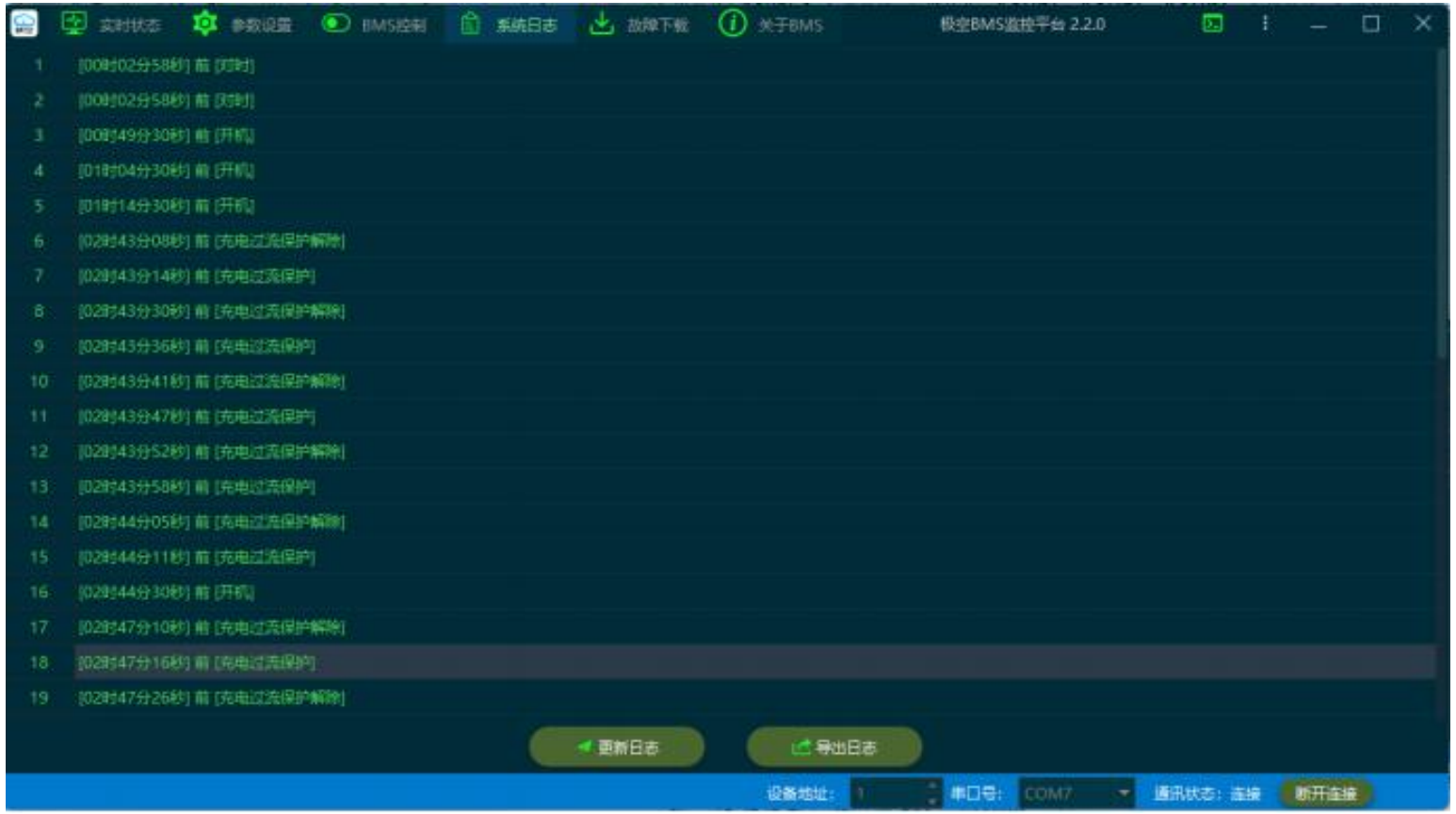
In the parameter setting interface, parameters such as the number of battery strings, cell overvoltage, cell undervoltage, charging overcurrent, and discharging overcurrent can be set, but an authorization password is required. The default is 123456；

BMS control

In the control interface, you can control the battery charging switch, discharge switch and other control operations. The default authorization password is 123456；

System log

On the system log page, the "Update Log" button can update the BMS internal logs to the host computer for display. The Export Log button can export all current logs to a designated folder on the computer in the format of xlsx, which can be viewed using excel and other software.。

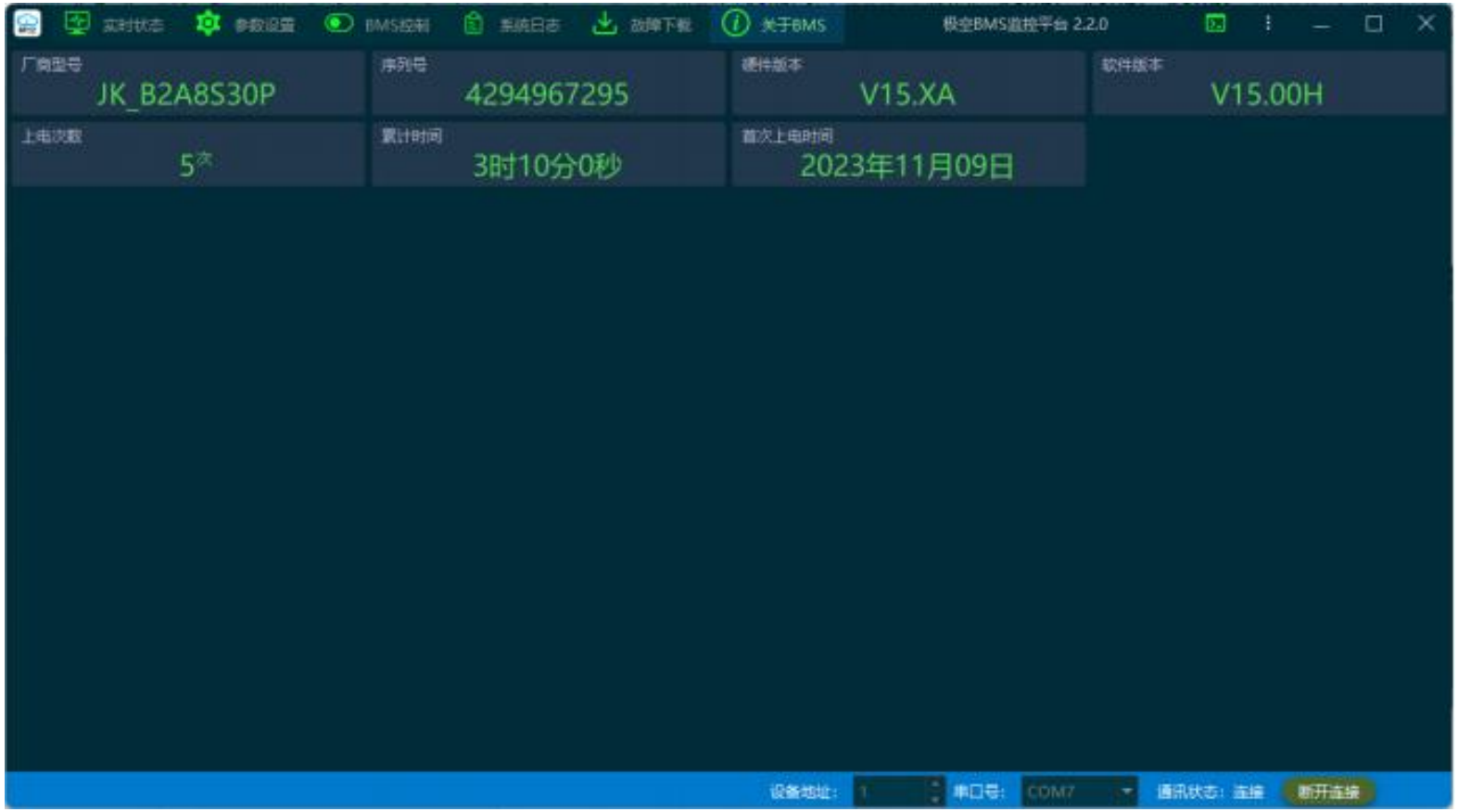


❖ Faulty download

On the fault download page, the "Fault Download" button can update the BMS internal fault log to the host computer for display. The "Export Fault" button can export all currently displayed fault logs to a designated folder on the computer in the format of xlsx, using software such as excel. Available to view。

About BMS

About BMS page, showing basic information of the product: model, hardware version, software version, power-on time and other information。



❖ Parallel monitoring

On the parallel monitoring page, you can view relevant information such as real-time parameters and configuration parameters of the host and each slave.；

Real-time data logging

1.Click the triangle icon in the upper right corner. If it changes to a square, it will start to save real-time information and generate an Excel file.;

❖ Real-time data logging

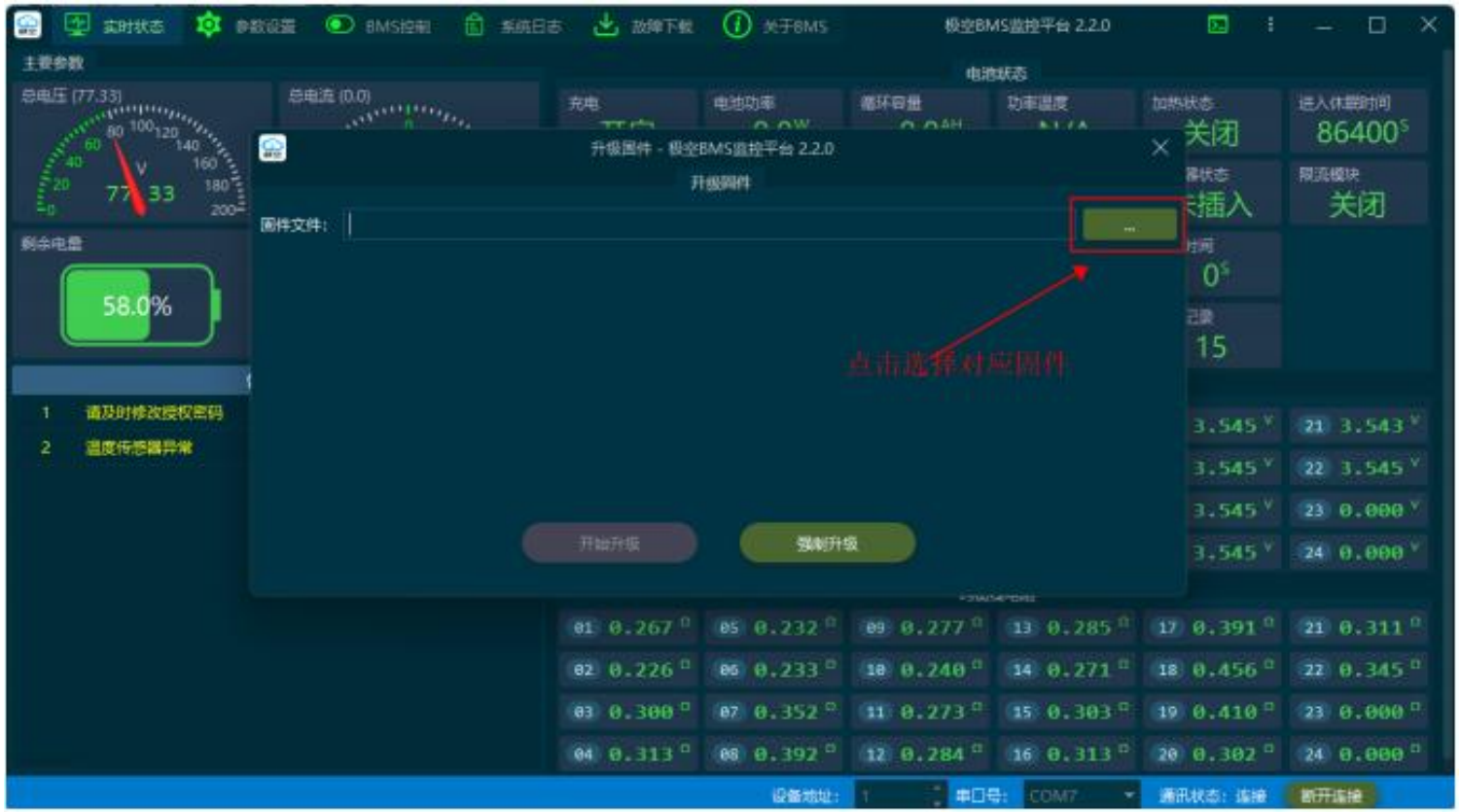
2.The save path can be set in the picture below. Click the three dots in the upper right corner and then set the button to see；

❖ Upgrade firmware

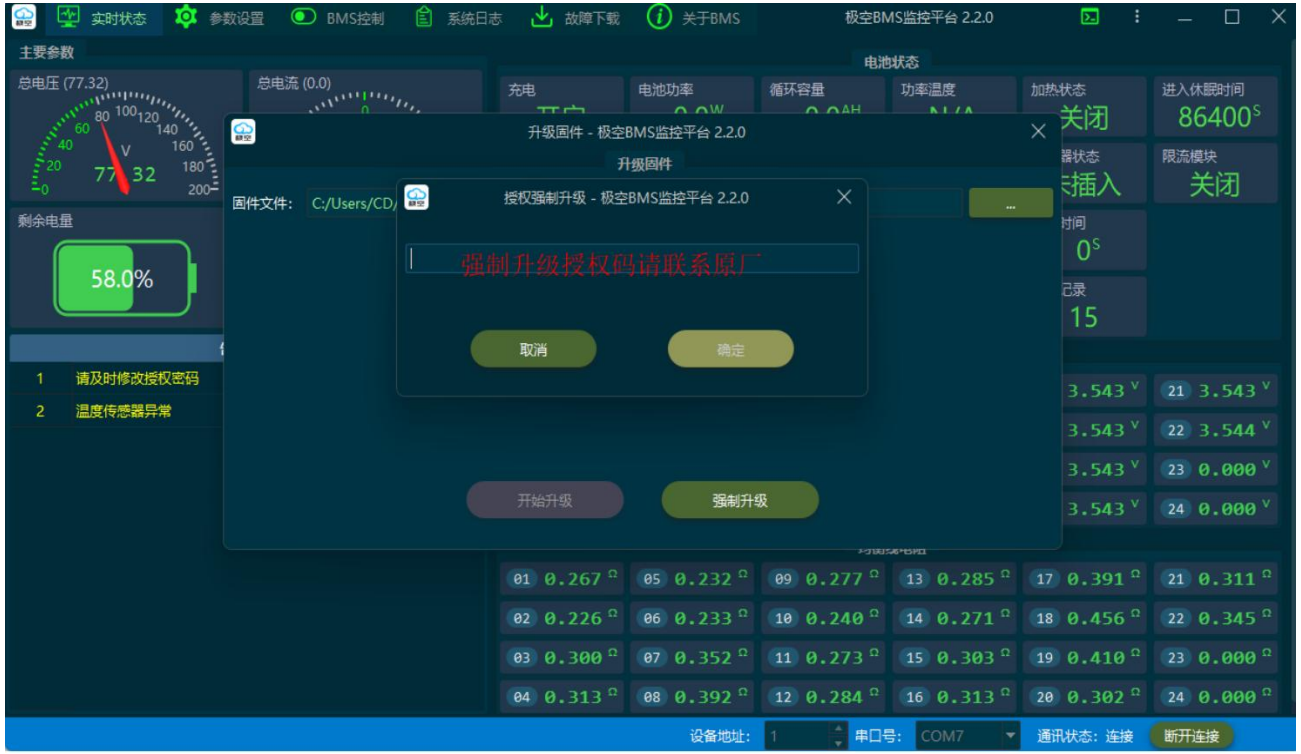
1.Firmware upgrade function. When upgrading firmware, BMS needs to be set as a slave (the address cannot be 0) and cannot communicate with other BMS hosts.；

❖ Upgrade firmware

2.Then click on the three-point mutation in the upper right corner of the host computer, click "Upgrade Firmware", select the corresponding firmware, click Start Upgrade to start the upgrade normally, and the end of the progress bar indicates that the upgrade is completed.。



❖ Forced upgrade



1.Click on the three point mutations in the upper right corner of the host computer ;

2.Click "Upgrade Firmware", select the corresponding firmware, and click Force Upgrade;

3. Fill in the authorization code (please contact the original manufacturer if you need an authorization code);

4.The end of the progress bar indicates that the upgrade is completed.

❖ Upgrade failed

What to do after an upgrade fails：

1.Repeat the forced upgrade operation；

2.Keep pressing the activation switch (as shown in Figure 1) or the display switch (as shown in Figure 2)；

3.Press the reset switch RST (as shown in Figure 3) and release it；

4.Wait for the progress bar to end, indicating that the upgrade is complete.；

图1

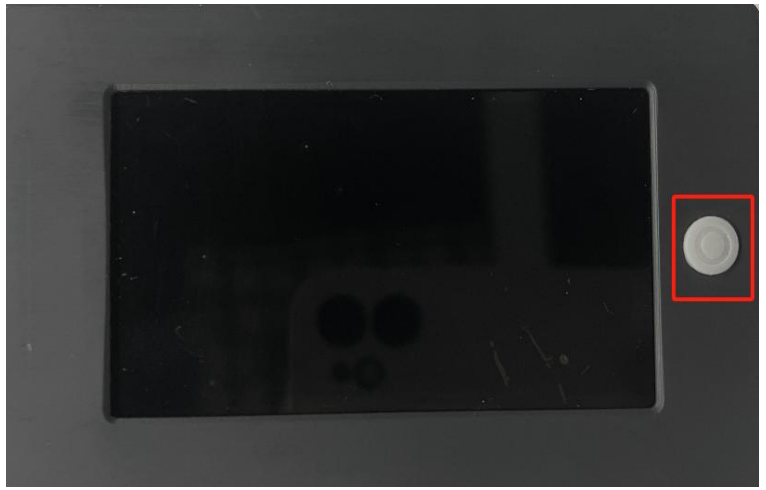


图2

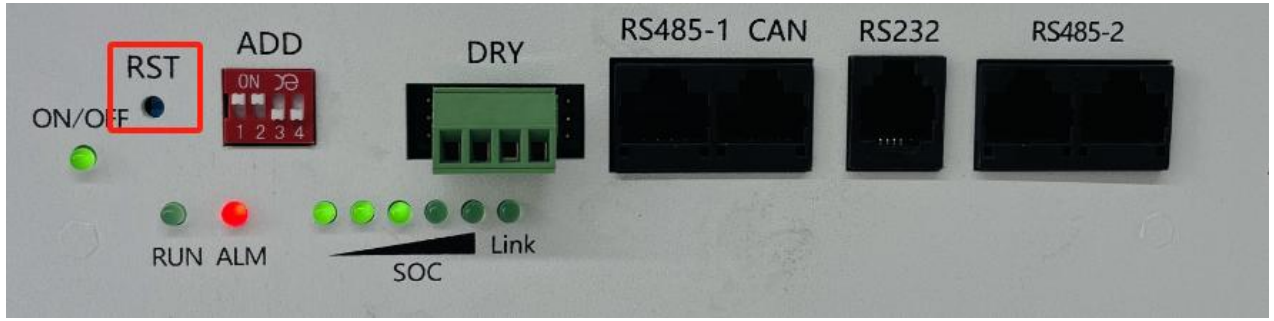


图3

3

Inverter

- Inverter wiring
- Inverter settings

❖ Inverter introduction

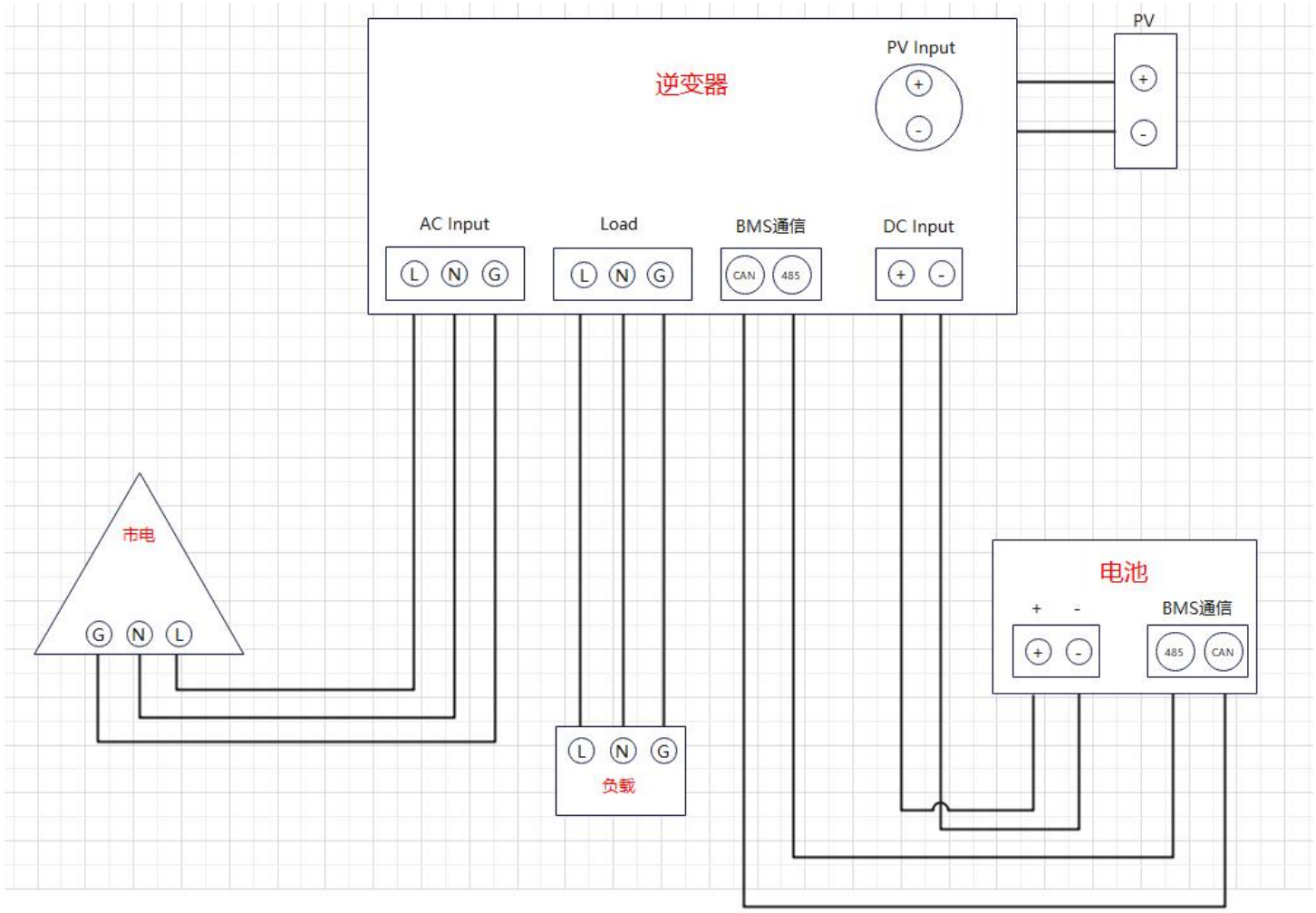
The main function of inverter wiring:

1.Alternating current (AC) to direct current (DC), convert the mains power into direct current through the inverter and store it in the battery;

2.Direct current (DC) to alternating current (AC), convert the direct current stored in the battery into alternating current for household electricity consumption;

3.Direct current (DC) to direct current (DC), storing the electrical energy generated by photovoltaics into batteries;

❖ Inverter wiring



Main components of inverter wiring：

1.Battery

2.load

3.photovoltaic

4.Mains power

Inverter settings

目前适配的逆变器需要设置的品牌：

1.德业 (Deye)

2.古瑞瓦特(Growatt)

3.日月元(Voltronic)

4.硕日(SRNE)

5.美世乐(MUST)

6.固德威(GoodWe)

目前适配的逆变器不需要设置的品牌：

1.英威腾(INVT)

2. 维克托(Victron)

不确定：

1.SMA

2.派能(Pylon)

❖ 德业 (Deye)parameter settings

Inverter setup steps：

1.Go to the settings page (Figure 1)

2.Click on Battery Setting and set it to Lithium (Figure 2)；

3.Click Advanced Function and set BMS _Err_Stop (Figure 3);

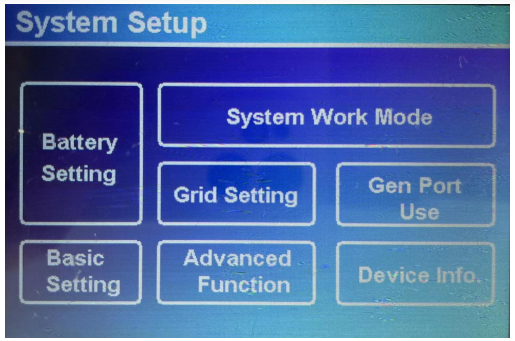


图1

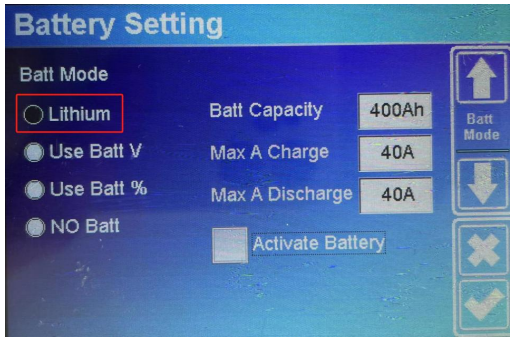


图2

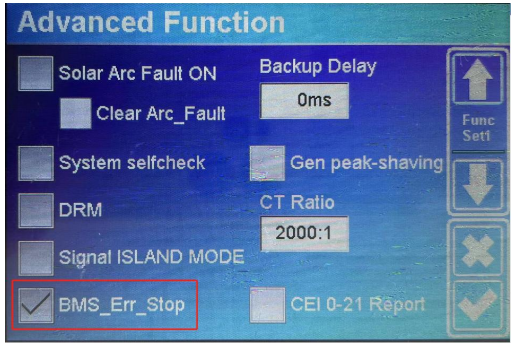


图3

❖ 古瑞瓦特(Growatt)parameter settings

Inverter setup steps:

1. Press and hold the Enter key to enter setting mode

2. Set item 05 to LI (as shown in Figure 1);

2. After successful setting, it will jump to item 36;

3. If RS485 communication is used, set item 36 to L01 (as shown in Figure 2); if CAN communication is used, set item 36 to L51 (as shown in Figure 3);

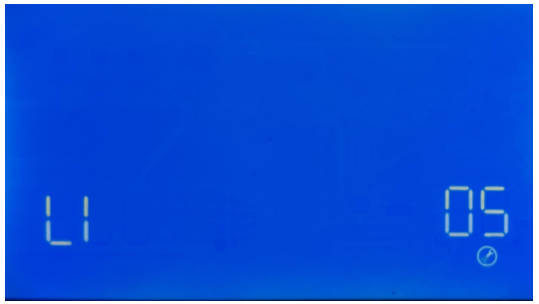


图1

图2

图3

❖ 日月元(Voltronic)parameter settings

Inverter parameter settings:

1. Press and hold the SET button to enter the setting page;

2. Set item 05 to LIB, as shown in Figure 1

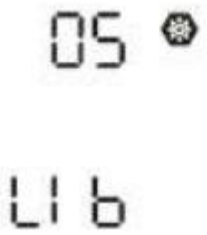


图1

- 固德威(Goodwe)参数设置

❖ 硕日(SRNE)parameter settings

Inverter parameter settings:

1. Press and hold the SET button to enter the setting page;

2. Set 32 items into BMS, as shown in Figure 1;

3. Set item 33 to WOW, as shown in Figure 2;

4. Set 39 items to BMS, as shown in Figure 3；

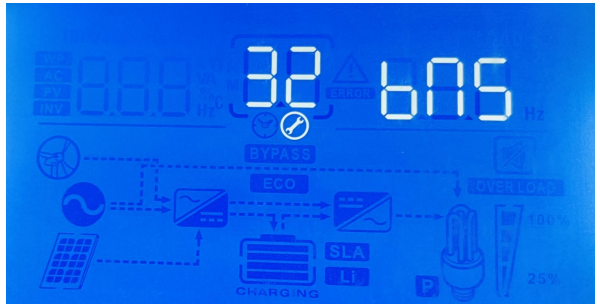


图1

图2

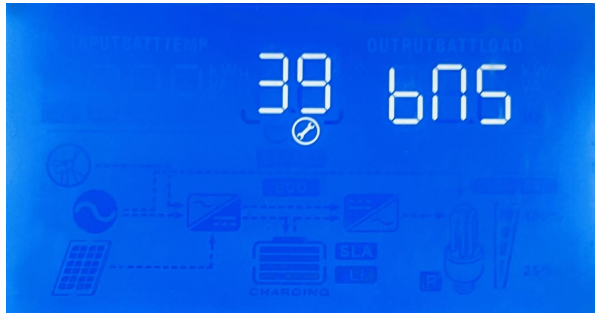


图3

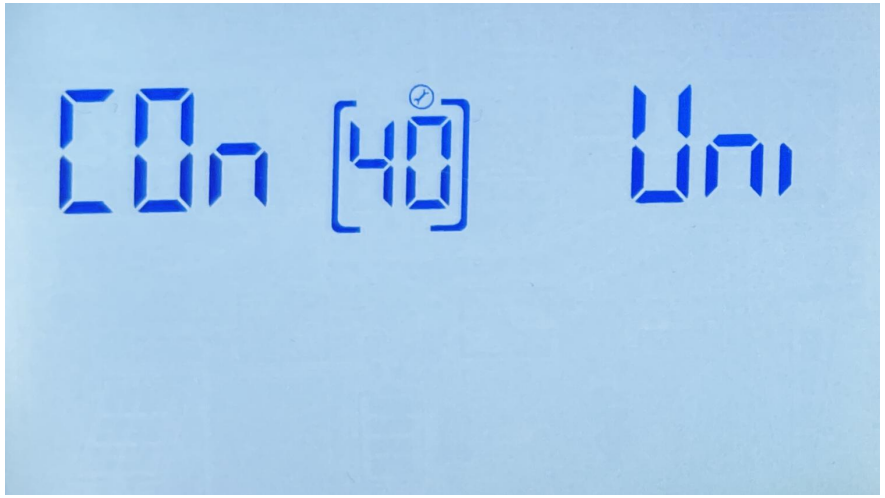
❖ 美世乐(MUST)parameter settings

Inverter setup steps:

1. Press and hold the Enter key to enter the settings page

2. Use the Enter key to switch between 40 items;

3. Set the setting items as shown in the picture, otherwise blind charging will be performed according to the inverter settings;



Thank you