Customer's Name:

客户名称:

Spec.No.: DY-N8S24280A-001

Item Coding: Ver: A1

Date: 2024-06-06



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-N8S24280A-25.6V 280Ah

规格:_DY-N8S24280A-25.6V 280Ah

Approval	Checked	Draft
Customer		
Approval		

Product Specification History of specification

规格书修订记录

Date	Contents	Remarks
2024-6-06	首次发行	

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1. Scope 适用范围

The specification shall be applied to LiFePO4 rechargeable battery pack Of DY-N8S24280A-25.6V 280Ah 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-N8S24280A-25.6V 280Ah 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 P (常规		Remark (备注)				
	1	Rated Capacity	Typical (标称容量)	280Ah	Standard discharge (0.2C5A) after Standard charge				
		(额定容量)	Capacity Range (容量范围)	280~310Ah	(标准充电后 0.2C5A 标准放电)				
	2	Nominal Voltage (正常电压)	3.2	2V	Mean Operation Voltage (即工作电压)				
	3	Internal Impedance (内阻)	≤0.20 mΩ		≤0.20 mΩ		≤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)
Cell	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)	5.4:	5kg	APPROX				
単体电芯	6	Standard charge (标准充电)	Constant Curr Constant Vo 0.02CsA (持续电流 持续电压 截止电流:	tage 3.65V cut-off : 0.5C5A : 3.65V	Charge time : Approx2.0h				
	7	Rapid Charge 快速充电	Constant Current 1CsA Constant Voltage 3.65V 0.01CsA cut-off (持续电流: 1CsA 持续电压: 3.65V 截止电流: 0.01CsA		Charge time : Approx1.0h@≥10°C				
	8	Standard discharge (标准放电)	Constant curre end volta (持续电流 截止电压:	ge 2.5 V : 0.5C5A	140A				
	9	Maximum discharge current 最大放电持续电流	Constant current: 1CsA end voltage: 2.5 V (持续电流 1CsA 截止电压: 2.5V)		280A@≥0°C				

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

	No. (序号)	Item (项目)	General Pa (常规参		Remark (备注)
	1	Combination method (组合方式)	88	51P	
	2	Rated Capacity	Typical (标称容量)	280Ah	Standard discharge after Standard charge package)(标准充电后标准放电(针对电池
	_	(额定容量)	Minimum (最小容量)	278Ah	组))
	3	Factory Voltage (出厂电压)	25.6V-27.2	V(40-60%)	Mean Operation Voltage (即工作电压)
	4	Voltage at end of Discharge (放电终止电压)	20.8	V	Discharge Cut-off Voltage (放电截止电压)
	5	Charging Voltage (充电电压)	27.2-	-29.2V	
Package	6	Internal Impedance (内阻)	≤10mΩ		Internal resistance measured at DC after 50% charge (半电态下测量直流内阻)
电池组	7	Standard charge (标准充电)	Constant Current 56A(0.2C) Constant Voltage see No.5 0.02CA cut-off (持续电流: 56A(0.2C) 持续电压: 见序号 5 截止电流: 0.02CA)		Charge time : Approx 5 h (充电时间: 大约 5 个小时)
	8	Standard discharge (标准放电)	Constant curn end voltage (持续电》 截止电压: 「	see NO.4 流: 140A	
	9	Maximum Continuous Charge Current (最大持续充电电流)	200	A	≥10°C
	10	Maximum Continuous Discharge Current (最大持续放电电流)	200	A	≥10°C
	11	Operation Temperature Range	Charge(充电		60±25%R.H. Bare Cell
		(工作温度范围)	Discharge (放电		(单体电池储存湿度范围)
	12	Storage Temperature	Less than 12 months: -10~35°C (小于 12 月: -10~35°C) less than 3 months: -10~45°C (小于 3 个月: -10~45°C)		60±25%R.H.
		Range (储存温度范围)			at the shipment state (出货状态时的湿度范围)
			Less than 7 day (小于7天:		
	13	Dimensions (尺寸)	455*440*240) mm	Include Bracket
	14	Weight(重量)	Approx:	61.5kg	

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 8 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-B2A8S20P



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 1: big touch screen.							
L(长度)	L(长度) 455mm W(宽度) 440mm H(厚度) 240mm						
Terminal Height 端子高度 36mm		Handle Height 把手高度	38mm	Terminal type 端子型号	M8		
Screen 显示屏	0: 4 0: 1 /4 40 44 00						

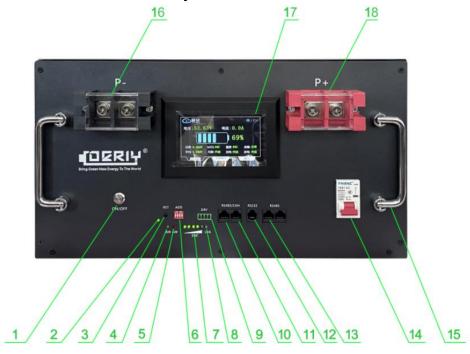






Model 2: Small LCD screen.								
L(长度)mm	L(长度)mm 455mm W(宽度) 440mm H(厚度) 240mm							
Terminal Height 端子高度	36mm	Handle Height 把手高度	38mm	Terminal type 端子型号	M8			
Screen 显示屏	Size:3.2inch (100*60mm included frame)							

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



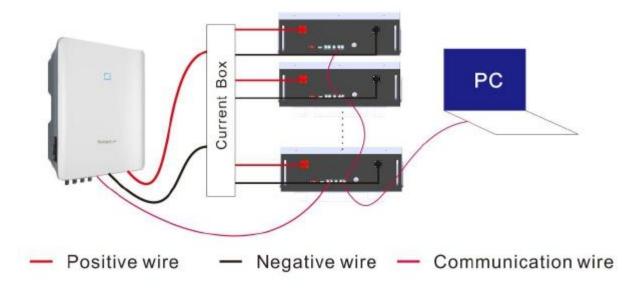
No.	Description	Silk-screen	Remark
1	Switch	ON/OFF	
2	Switch LED		Switch indicator
3	Reset	RST	For reset the battery
4	LED	RUN	Operation indicator
5	LED	ALM	Alarm indicator
6	Dial switch	ADD	Set the address
7	LED	SOC	Capacity indicator
8	LED	Link	
9	DRY port	DRY	
10	RS485 port	RS485/CAN	RS485 communication
11	CAN port	CAN	CAN communication
12	RS232 port	RS232	RS232 communication
13	RS485 port	RS485	RS485 communication
14	Air Switch		Fuses
15	Handle		
16	Input/Output	P-	Input/Output terminal
17	LCD Screen		
18	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)

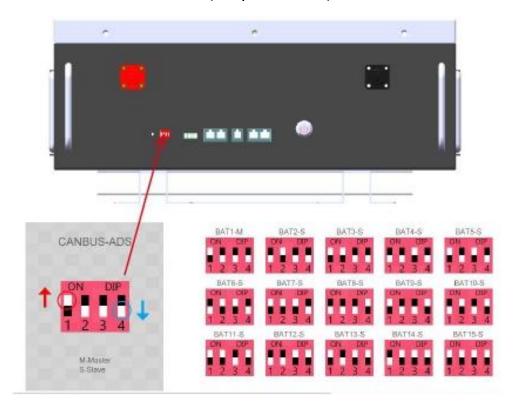
While in RS485 parallel communication, dial-up addresses of battery module are 1,2,3,4.....14,15; By this method, we can be allowed to read each data depending on battery module. Any battery other than address 0 can be connected to the host computer; FF polling mode used as consulting mode.

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)

Paper Carton 纸箱包装尺寸: Carton size: 550*600*380mm

Gross weight: 65Kg



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 K Ω /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°C 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 $23\pm2^{\circ}$ 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 $23\pm2^{\circ}$ 、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.
- 一 禁止以任何方式分解电池!
- Do not place the battery in a microwave oven or pressurized container.
- 一 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.
- 一 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-B2A8S20P



NO: JK/J.JK-B2A8S20P.01

Ver: V1.1

JK Smart BMS JK-B1A8S20P/JK-B2A8S20P

User Manual

Translated by Energiepanda.com from JK's original Chinese version

1 Overview

Li-ion battery intelligent BMS is a management system tailored for large-capacity series Li-ion battery pack, with functions of voltage acquisition, high-current active balancing, over-charge, over-discharge, over-current and over-temperature protection, coulomb meter, Bluetooth communication, GPS remote, etc. It can be applied to Li-ion, lithium iron phosphate (LiFePO4), LTO and other battery types.

JK BMS relies on the energy transfer type active balancing technology with independent intellectual property rights, which can achieve a maximum continuous 2A balancing current.

The high-current active balancing technology can maximize battery consistency, improve battery range and slow down battery aging.

JK BMS has smart Android and IOS APPs. APP can be connected to the BMS via Bluetooth to check the working status of the battery, modify the working parameters of the board, control the charging and discharging switches, etc. JK BMS is small in size, simple to operate and full-featured, and can be widely used in small sightseeing vehicles, mobility scooters, shared cars, high-power energy storage, base stations, backup power, solar power plants, etc.

2 Main technical specifications

2.1 The main technical specifications of JK-B2A8S20P are shown in Table 1.

Table 1 JK-B1A8S20P/JK-B2A8S20P specifications

	A 17
Technical Specifications	Model
	B1A8S-20P/B2A8S-20P
Li-ion battery strings	3~8
LiFePO4 battery strings	4~8
LTO battery strings	Not support
Balancing Mode	Active Balancing
Balancing Current	1A(JK-B1A8S20P)/2A(JK-B2A8S20P)
The Main Circuit	0.3mΩ
Resistance	
Continuous Discharge	200A
Current	2 /22

Maximum Discharge Current	350A
Overcurrent Protection (Adjustable)	10~200 A
Other Interfaces	RS485(customized)/CAN(customize d)/ Heating(customized)/ LCD display
Port Type	Common Port
Single Cell Voltage Range	1~5 V
Voltage Acquisition Accuracy	±5 mV
Overcharge Protection Voltage	1.2~4.35 V Adjustable
Overcharge Release Voltage	1.2~4.35 V Adjustable
Overcurrent Release Time	2~120S Adjustable
Over-discharge Protection Voltage	1.2~4.35 V Adjustable
Over-discharge Recovery Voltage	1.2~4.35 V Adjustable
Temperature Detection Ports	3
Temperature Protection	Yes
Short Circuit Protection	Yes
Coulometer	Yes
Bluetooth	Support android phone / iPhone
Gps ports	Support

2.2 Environmental conditions of use

- a) Operating Temperature Range: $-20^{\circ}\text{C} \sim 70^{\circ}\text{C}$;
- b) Power requirements: 10~40V.
- c) Power consumption: 25mA@40V in balanced state, 20mA@40V in unbalanced state

3 Connector and interface decription

3.1 Connectors, LED light location description

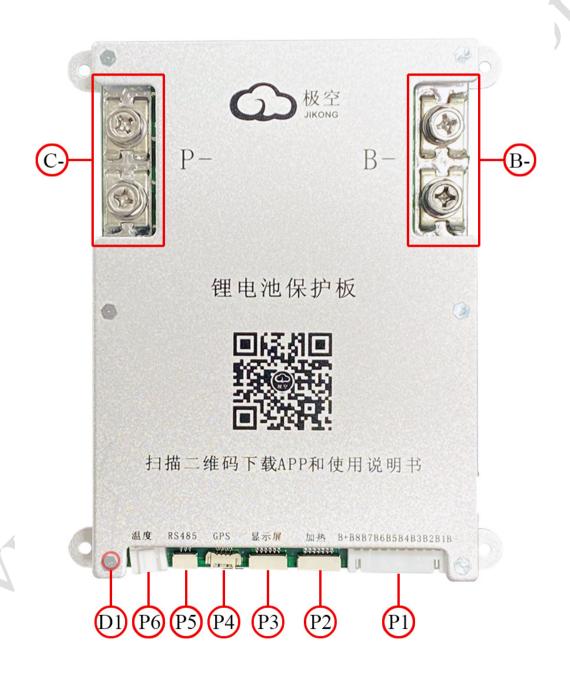


Figure 1 - JK-B1A8S20P/JK-B2A8S20P Connector

3.2 Connectors and LED definition description

Table 2 Connectors, LED Definition

			JK-B2A8S20P			
Connector	Pin Number	Name	Definition			
	1	В-	Negative battery terminal			
	2	B1	Positive pole of #1 cell			
	3	B2	Positive pole of #2 cell			
	4	В3	Positive pole of #3 cell			
	5	B4	Positive pole of #4 cell			
	6	B5	Positive pole of #5 cell			
	7	В6	Positive pole of #6 cell			
D1	8	В7	Positive pole of #7 cell			
P1	9	В8	Positive pole of #8 cell			
	10	B+	BMS power supply			
P2	Heating port	-	890			
P3	Display conne	ector				
P4	External GPS	module co	onnector			
P5	RS485/CAN	connector((Choose one of two)			
	1	Т1А	The first temperature sensor A pin			
	2	Т1В	The first temperature sensor B pin			
P6	3	T2A	The second temperature sensor A pin			
	4	T2B	The second temperature sensor B pin			
D1		th connection indicator. The indicator light is always on when the Bluetooth is				
C-		I to the BMS, and the indicator light flashes when the connection is disconnected. o external load or negative pole of charger				
В-		Connect the negative pole of the battery				

3.3 Product appearance



Figure 2 JK-B1A8S20P/JK-B2A8S20P Appearance

3.4 Product size

The dimensions of JK-B2A8S20P is 153 mm x 126 mm x 17.6 mm.

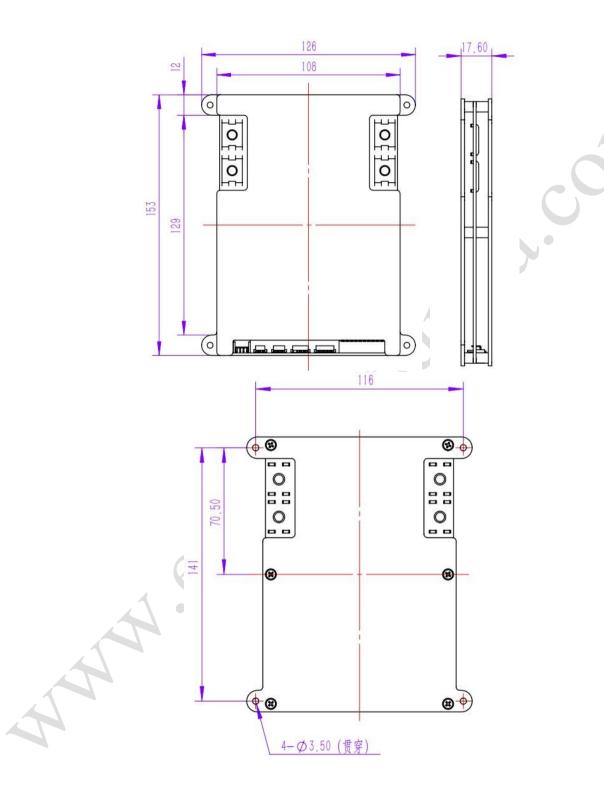


Figure 3 B2A8S20P Size

3.5 Weight

The weight of JK-B1A8S20P/JK-B2A8S20P BMS is 349g.

4 Installation method and precautions

- 4.1 Open box inspection and precautions are as follows.
- a) The boxes and BMS should be handled lightly and not inverted as much as possible.
- b) Before opening the box, pay attention to whether the packaging is intact, such as whether there are signs of impact, whether there is damage, etc.;

4.2 Wiring Diagram

The wiring of 4S and 8S is shown in Figure 4 and Figure 5.

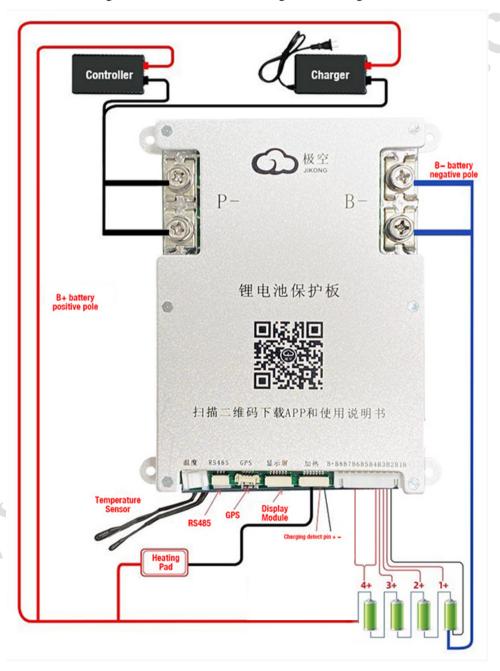


Figure 4 4S battery wiring diagram

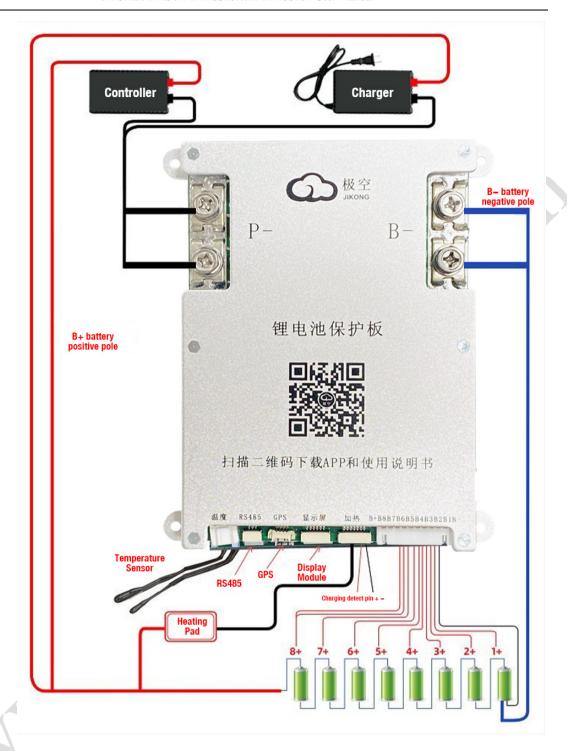


Figure 5 8S battery wiring diagram

4.3 APP installation

The QR code shown in Figure 6 can be scanned to obtain the mobile app that accompanies the product.



Figure 6 QR code for APP download

5 Instructions for use

5.1 Preparation and inspection before use

Before turning on the power supply, please make sure again that the cable connection is correct, that the power supply provided to the battery management system is within the required range, that the device is properly placed, that the circuit board is short-circuited, and so on, that the power supply of the battery management system can only be connected after making sure that it is correct, otherwise it may cause serious consequences such as abnormal work or even burning down.

5.2 BMS power up

After confirming the above operation is correct, you can power on the BMS, which has no power-on control switch and is designed for charging and activation mode (charger voltage is 5V higher than the battery voltage).

The BMS has no power-on control switch and is designed for charging activation mode $\frac{10}{22}$

(charger voltage is 5V higher than the battery voltage), i.e., after the battery assembly is completed, the charger needs to be connected to make the BMS power on and work.

5.3 APP APP operation instructions

5.3.1 Connect to BMS and set password

a) Connect to BMS

Firstly, turn on the Bluetooth on your phone, then open the app as shown in Figure 7. Click the icon on the top left corner to scan the device, wait until the scanning is finished, then click the name of the device you need to connect, such as "JK-B2A8S20P". When you connect for the first time, the APP will prompt you to input the password, the default password of the device is "1234" (the password of the setting parameter is "123456").

The APP will automatically record the password after the device is connected, so you don't need to enter the password for the next connection, and the device will be connected automatically after the APP is opened.

The password input interface is shown in Figure 8.



Figure 7 Scan Device

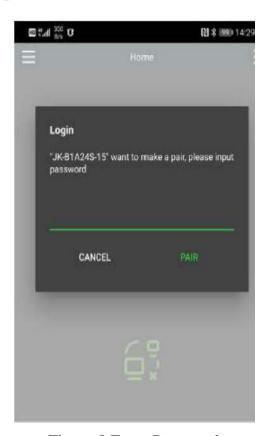


Figure 8 Enter Password

b) Change passwords and device name

Click the "pen" icon on the right side of the device list to change the device name and password.

Note that the device name only supports English or numbers.

The interface for changing the password is shown in Figure 9. To change the device password, you must first enter the old password, and only if the current password is correct then you can set the new password. After entering the new password twice, click 'OK' to finish



Figure 9 Change the device name

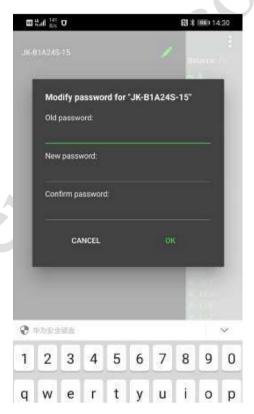


Figure 10 Change the password

5.3.2 Battery status view

The real-time status screen is shown in Figure 11.

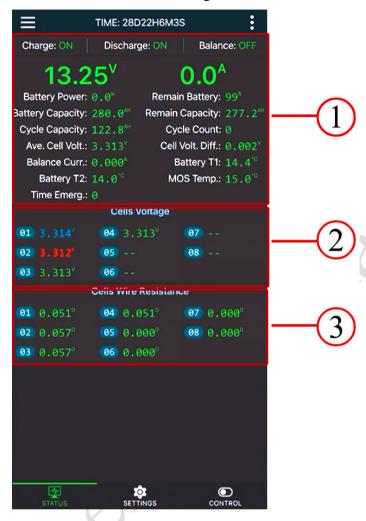


Figure 11 Real-time status screen

Zone 1 in the figure is the comprehensive information column of the battery. The parameters of each parameter are explained as follows.

a) Runtime

The total runtime from when the BMS was first powered on until now.

b) Charge

It's the status of BMS charging MOS. When "On" is displayed, it means the current BMS charging MOS is on and the battery is allowed to be charged; when "Off" is displayed, it means the current BMS charging MOS is off and the battery is not allowed to be charged.

c) Discharge

It's the status of the BMS discharge MOS. When "On" is displayed, it means the BMS discharge MOS is on and the battery is allowed to discharge; when "Off" is displayed, it means the BMS discharge MOS is off and the battery is not allowed to discharge.

d) Balance

It indicates the state of BMS Balance switch. When "On" is displayed, the BMS will balance the battery automatically when the balance trigger condition is reached; when "Off" is displayed, it means the balance is off and the BMS will not balance the battery.

e) Voltage

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

f) Current

The current shows the total battery current 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

Indicates the real-time power of the battery output or input, and its value is the current battery voltage multiplied by the current.

h) Remain Battery

Percentage of remaining battery capacity

i) Battery Capacity

It's the actual battery capacity calculated by the BMS. (This value is updated only after the battery has done a complete discharge and charge cycle).

j) Remain Capacity

It represents the current remaining capacity of the battery. Unit: AH

k) Cycle Capacity

Cycle capacity indicates the cumulative discharge capacity of the battery, unit: AH.

1) Cycle Count

It indicates the number of times the current battery has been charged.

m) Ave. Cell Volt

It indicates the current single cell average voltage of the battery. Unit: V.

n) Cell Volt. Diff

It indicates the difference between the highest cell voltage and the lowest cell voltage of the current whole battery. Unit: V

o) Balance Curr.

When the BMS turns on the balancing function and the balancing condition is reached, the balancing current display area shows the balancing current in real time, unit: A.

When the balancing is in progress, the real-time status of the single unit voltage display area, blue represents the discharged battery, red represents the battery being charged. The negative balance current indicates that the battery is discharging, at this time blue flashes, and the positive balance current indicates that the battery is charging, at this time red flashes.

JK BMS adopts active balancing technology. The principle of balancing is to take power from the high voltage cell, store it in the BMS, and then discharge it to the low voltage cell.

p) MOS Temp

Display the temperature of MOS in °C.

q) Battery T1

"NA" is displayed if temperature sensor 1 is not installed. If the temperature sensor 1 is installed, it is displayed in real time in °C.

r) Battery T2

"NA" is displayed if temperature sensor 2 is not installed. If the temperature sensor 2 is installed, it is displayed in real time in °C.

Zone 2 in the figure shows the cell voltage area. The voltage data of each cell in the pack is displayed in real time, where red indicates the cell with the lowest voltage and blue indicates the cell with the highest voltage.

Zone 3 of the diagram is to display the resistances of balancing wires. The balance wire resistance is the balance line resistance obtained from the BMS self-test, the value is only a preliminary calculation, the purpose is to prevent the wrong connection or poor contact, when the balance wire resistance exceeds a certain value, the display will be yellow, then can not open the balance.

Parameter Setting

The parameter setting page is shown in Figure 12.

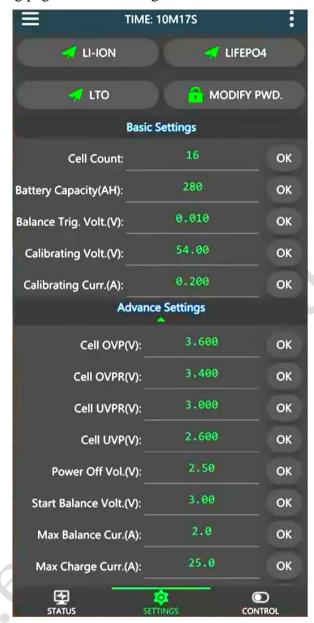


Figure 12 Parameter setting page display

If you need to modify the working parameters of the BMS, you must first click the "Authorize Settings" button and enter the parameter setting password to verify the parameter setting authority. The factory default password for parameter setting is "123456". You can only modify the parameters of the BMS after entering the password correctly. The parameter setting password and the device Bluetooth connection password are independent of each other.

The parameters of the BMS can be modified in the parameter setting page, and the definitions of each parameter are as follows.

a) Li-ion buttion

Click this button to change all the working parameters of BMS to Li-ion parameters, and the default values of Li-ion battery parameters are shown in the Appendix.

b) LiFePO4 button

Click this button to modify all working parameters of BMS to LiFePO4 battery parameters, the default values of LiFePO4 battery parameters are shown in the appendix.

c) LTO button

Click this button can change all the working parameters of BMS to LTO parameters. The default values of LTO battery are shown in the Appendix.

d) Cell Count

Cell count indicates the number of cells in the current battery pack, please set the value accurately before use, otherwise the BMS will not work properly.

e) Battery Capacity(Ah)

This value is the design capacity of the battery.

f) Balance Trig. Volt.(V)

With the balancing function enabled, when the maximum voltage difference of the cell pack exceeds this value and the current cell voltage exceeds the balancing start voltage, the BMS starts balancing the cell until the differential voltage is lower than this value or the cell voltage is lower than the balancing start voltage. For example, if you set the balancing trigger voltage difference to 0.01V, balancing will start when the cell pack voltage difference is greater than 0.01V and end when it is lower than 0.01V.

(It is recommended to set the balancing trigger differential to 0.005V for cells above 50AH and 0.01V for cells below 50AH).

g) Calibrating Volt.(V)

The voltage calibration function can be used to calibrate the accuracy of the BMS voltage collection.

When you find an error between the collected voltage and the actual voltage of the battery, you can use the voltage calibration function to calibrate the BMS.

To calibrate, fill in the current manually measured battery voltage, and then click the 'Set' button next to Voltage Calibration to complete the calibration.

h) Calibrating Curr.(A)

The current calibration function can be used to calibrate the accuracy of the BMS current collection.

When you find an error between the total current collected by the BMS and the actual current of the battery, you can use the current calibration function to calibrate the BMS.

To calibrate, fill in the current measured battery current, and then click the 'Set' button next to Current Calibration to complete the calibration.

i) Cell UVP(V), Cell UVPR(V)

The "Cell UVP(V)" is cell under-voltage protection which refers to the cut-off voltage of the cell. Whenever the voltage of any cell in the battery pack is lower than this value, the 'cell under-voltage alarm' is generated, and the BMS turns off the discharge MOS at the same time, so the battery cannot be discharged and can only be charged. After the alarm is generated, only when all the cell voltage value exceeds the value of "Cell UVPR(V)" which means cell under-voltage protection recovery, BMS will release the 'cell under-voltage alarm' and turn on the discharge MOS.

j) Cell OVP(V), Cell OVPR(V)

"Cell OVP(V)" is cell over-voltage protection. As long as the voltage of any cell exceeds this value, the "Battery Over-voltage Alarm" will be generated and the BMS will turn off the charging MOS at the same time, so the battery cannot be charged, but only discharged. After the alarm is generated, only when the voltage of all cells is below the "Cell OVPR(V)" value, the BMS will release the "Battery Over-voltage Alarm" and turn on the charging MOS.

k) Power Off Vol.(V)

The "Power Off Vol.(V)" indicates the minimum voltage at which the BMS will operate and the BMS will shut down when the highest voltage of the cell in the battery pack falls below this value. This value must be lower than the "cell under-voltage protection".

1) Max Charge Curr.(A), Charge OCP Delay(S), Charge OCPR Time(S)

When charging the battery pack, the current exceeds the "MAX Charge Curr.(A)" and the duration exceeds the "Charge OCP Delay(S)" time, the BMS generates a "charge over-current alarm" and turns off the charging MOS. After the time of "Charge OCPR Time(S)", the BMS will release the charge over-current alarm and turn on the charging MOS again.

Example: Set the "Max Charge Curr.(A)" to 10A, "Charge OCP Delay(S)" to 10 seconds, and "Charge OCPR Time(S)" to 50 seconds. If the charging current exceeds 10A for 10 seconds in a row during charging, the BMS will generate a 'charging over-current alarm' and turn off the charging MOS at the same time. 50 seconds after the alarm is generated, the 'charging over-current alarm' will be released and the BMS will turn on the charging MOS again.

m) Max Discharge Curr.(A), Discharge OCP Delay(S), Discharge OCPR Time(S)

When discharging the battery pack, the current exceeds the "Max Discharge Curr.(A)" and the duration exceeds the "Discharge OCP Delay(S)" time, the BMS generates the "discharge over-current alarm" and turns off the discharge MOS at the same time. After the time of "Discharge OCPR Time(S)", BMS will release the "Discharge Over-current Alarm" and turn on the Discharge MOS again.

Example: Set the "Max Discharge Curr.(A)" to 100A, "Discharge OCP Delay(S)" to 10 seconds, and "Discharge OCPR Time(S)" to 50 seconds. If the discharge current exceeds 100A for 10 seconds, the BMS will generate the 'discharge over-current alarm' and turn off the discharge MOS. 50 seconds after the alarm is generated, the 'discharge over-current alarm' will be released and the BMS will turn on the discharge MOS again.

n) SCP Delay(us), SCPR Time(S)

When short-circuit protection occurs, the short-circuit protection is released after the time set by "SCPR Time(S)"...

o) Start Balance Vol.(V)

The Start Balance Vol.(V) is used to control the voltage phase of balancing. Balancing will be triggered only when the cell voltage exceeds this value and the maximum voltage difference between the cells exceeds the balancing trigger voltage difference.

p) Max Balance Cur.(A)

The balancing current indicates the continuous current of discharging the high-voltage cell and charging the low-voltage cell during the energy transfer. The Max Balance Cur.(A) indicates the maximum current in the energy transfer process, and the maximum balancing current should not exceed 0.1C.

For example: The balancing current for 20AH battery should not exceed 20*0.1=2A.

q) Charge OTP(°C), Charge OTPR(°C)

When the battery temperature exceeds the "Charge OTP($^{\circ}$ C)" value during charging, the BMS generates the "Charge Over Temperature Protection" alarm and turns off the charging MOS. When the temperature falls below the "Charge OTPR($^{\circ}$ C)", the BMS release the "Charge Over Temperature Protection" alarm and turns on the charging MOS again.

r) Charge UTP(°C), Charge UTPR(°C)

When the battery temperature is lower than the "Charge UTP($^{\circ}$ C)" value during charging, the BMS generates the "charge low temperature protection" alarm and turns off the charging MOS. When the temperature is higher than "UTPR($^{\circ}$ C)", BMS will release the 'charge low temperature protection' alarm and turn on the charging MOS.

19 /22

s) MOS OTP(°C), MOS OTPR(°C)

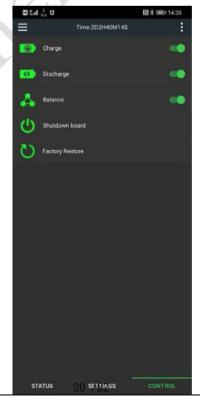
When the MOS temperature exceeds the "MOS OTP(°C)" value, the BMS generates the "MOS over-temperature" alarm and turns off the charging and discharging MOS, so the battery cannot be charged or discharged. After the MOS temperature is lower than the "MOS OTPR(°C)" value, the BMS will release the "MOS over-temperature" alarm and turn on the charging and discharging MOS at the same time (the MOS over-temperature protection value is 75°C and the MOS over-temperature recovery value is 65°C, these two values are the factory default values and cannot be changed).

Attention.

Any parameter modification, please refer to the manual, inappropriate parameters may make the BMS not work normally, or even burn the BMS. After any parameter modification, you need to click the "Set" button to finish sending the parameter, and the protection board will make a "tick" sound when it receives the parameter successfully.

BMS control page

The BMS control page is shown in Figure 13. The BMS control allows you to switch on/off and restore factory settings for the charging function, discharging function, and balancing function of the BMS.



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Figure 13 BMS control page

5.4 Safety protection measures and precautions

BMS itself does not exist high voltage, will not cause electric shock injury to the body.

Before use, please read the instruction manual carefully, according to the correct wiring diagram of different strings, connect the balancing wires one by one from the negative pole to the positive pole. Check the connection again with multimeter before plug the balancing wires into the BMS.

Do not allow private modification of the BMS power wires, it will cause the BMS overcurrent uneven and burn the BMS.

6 Transportation and Storage

6.1 Transportation

After packing, the products are not directly affected by rain and snow and under violent collision and bumps, and can be transported by usual means of transportation. It is not allowed to be put together with corrosive materials such as acid and alkali during the transportation process.

6.2 Storage

The packaged products should be stored in a permanent warehouse with a temperature of $0^{\circ}\text{C} \sim 35^{\circ}\text{C}$ and a relative humidity of not more than 80%, and the warehouse should be free of acid and corrosive gases, strong institutional vibration and impact, and strong magnetic fields.

Appendix Default parameters of "one-click Li-ion", "one-click LiFePO4" and "one-click LTO"

No.	Parameters	Li-ion	LiFePO4	LTO	Unit
1	Cell Under-voltage Protection	2.9	2.6	1.8	V
2	Cell Under-voltage Protection Recovery	3.2	3.0	2.0	V
3	Cell Overcharge Voltage Protection	4.2	3.6	2.7	V
4	Cell Overcharge Protection Recovery	4.1	3.4	2.4	V
5	Voltage Difference of Trigger Balancing	0.01	0.01	0.01	v
6	Auto shutdown voltage	2.8	2.5	1.7	V
7	Charging Over-current Protection Delay	30	30	30	Second
8	Charging Over-current Protection Release Time	60	60	60	Second
	Discharge Over-current Protection Delay	30	30	30	Second
10	Discharge over-current protection Release Time	60	60	60	Second
11	Short Circuit Protection Release Time	60	60	60	Second
12	Charge Over-temperature Protection	60	60	60	°C
13	Charge over-temperature Recovery	55	55	55	$^{\circ}$
14	Discharge Over-temperature Protection	60	60	60	$^{\circ}$
15	Discharge Over-temperature Recovery	55	55	55	℃
16	Charging Under-temperature Protection	-20	-20	-20	°C
17	Charging Under-temperature Recovery	-10	-10	-10	°C
18	MOS Over-temperature Protection	75	75	75	°C
	MOS Over-temperature Protection Recovery	70	70	70	°C

1. Overview

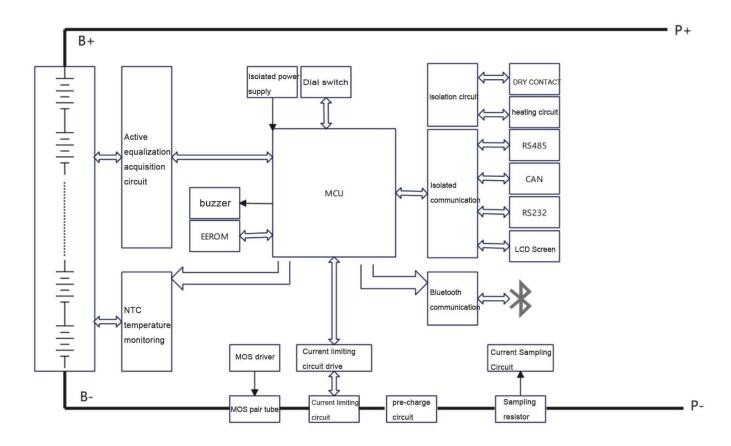
With the rapid growth of the renewable energy storage market, the demand for battery management systems is increasing. This product is an intelligent lithium battery protection board for energy storage applications. It adopts precise detection technology to protect the energy storage battery from overcharging, 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
- APP remote operation
- Support PC upper computer operation Information screen display
- Information screen display
- High precision voltage acquisition
- High precision current collection
- Isolate power circuits
- •4-way temperature detection protection MOS temperature detection protection

- LED status indication
- Overvoltage and overcurrent protection
- Support RS485 CAN RS232 communication
- Battery capacity estimation
- Accurate time logging
- Short circuit 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	Inc	dicator items	Factory default parameters	ls it possible to set	Notes
		Supports batteries	li-ion, lifepo4, LTO	Yes	
1	Number of strings	Support string count	7~16、8~16 、14~16	Yes	
		Equalizing trigger voltage difference voltage	10mV	Yes	
2	Individual	Individual overcharging protection voltage	3600mV	Yes	
	overcharging protection	Single overcharge recovery voltage	3550mV	Yes	
		Individual undervoltage protection voltage	2600mV	Yes	
3	Individual undervoltage	Single unit undervoltage recovery voltage	2650mV	Yes	
	protection	Single unit undervoltage automatic shutdown voltage	2500mV	Yes	
	4 Active balancing function	Equalizing voltage difference triggering voltage	10mV	Yes	All parameters
4		Balanced starting working voltage	3000mV	Yes	are lifepo4 parameters
		Maximum balanced current	1A	Yes	
		Maximum charging current	25A	Yes	
	Overall	Charging overcurrent delay	2s	Yes	
5	overcharge protection	Charging overcurrent alarm cleared	60s	Yes	
		Charging overcurrent limiting current	10A	No	
	O vo so II	maximum discharge current	150A	Yes	
6	Overall overvoltage	Discharge overcurrent delay	300s	Yes	
	protection	Discharge overcurrent alarm cleared	60s	Yes	
		Short circuit protection current	300A	No	
7	Short circuit protection	Short circuit protection delay	20us	Yes	
	p. 30000011	Short circuit protection released	60s	Yes	

		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	
8	temperature protection	Low temperature protection during charging	20°C	Yes	All parameters are lifepo4
		Low temperature recovery during charging	10°C	Yes	parameters
	MOS over temperature protection MOS over temperature recovery	100°C	Yes		
		· ·	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					
	normal	turn on	turn on	turn off		Base	ed on batte	ery level dis	splay	
charge	Over current/over temperature/over voltage/ charging failure	turn on	turn on	flicker	Based on battery level display					
	normal	turn on	turn on	turn off		Base	ed on batte	ery level dis	splay	
discharge	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

S	itate		Charge				Discharge						
Capacity is	ndicator light	L6	L5	L4	L3	L2	L1	L6	L5	L4	L3	L2	L1
	0~16.6%	turn off	turn on	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
alastriaity (%)	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
electricity (%)	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 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					

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.

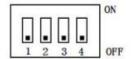
8.3 RS485 communication

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.

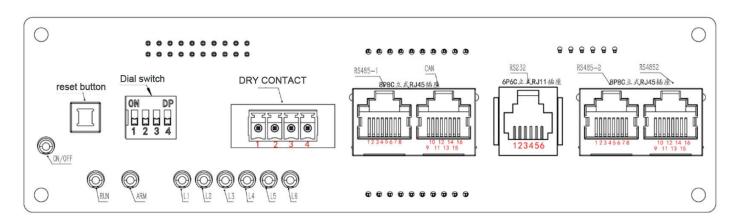
8. 4 DIP switch settings

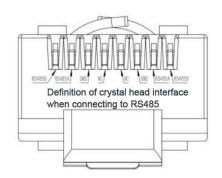
When multiple battery packs are used in parallel, the battery packs need to be set to different addresses through a dial switch for normal use. The following dial switch address table.

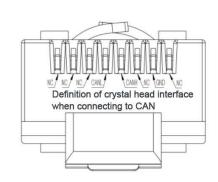


Address		Dial switch posit	tion	
d e	1	2	3	4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	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	31 and Colvit Conduct under alarm conditions
3	COM2	\$2 and COM2 conduct under low battery conditions
4	S2	S2 and COM2 conduct under low battery conditions

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	

JK-PB BMS Manual JKBMS

Catalog

V15 New Features

² ESS BMS

3 Inverter



V15 New Features

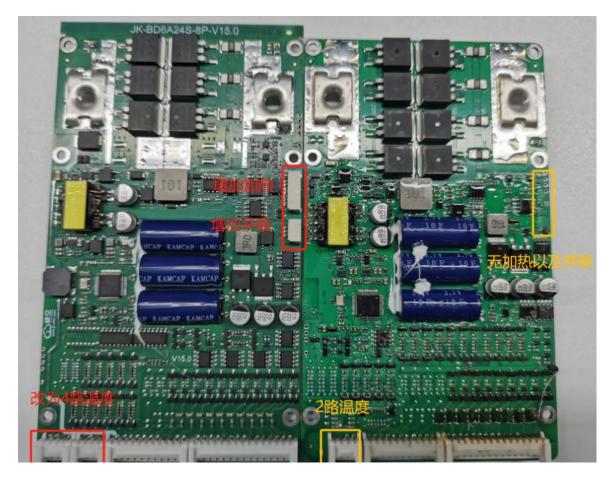


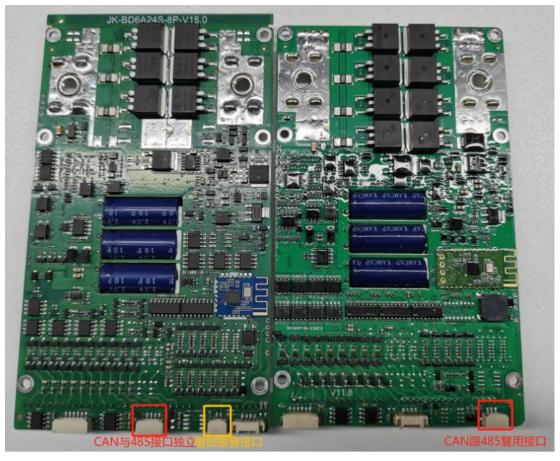
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Upgrade items of V15 BMS compared to V11 BMS

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





2

ESS BMS

1.ESS BMS Wiring

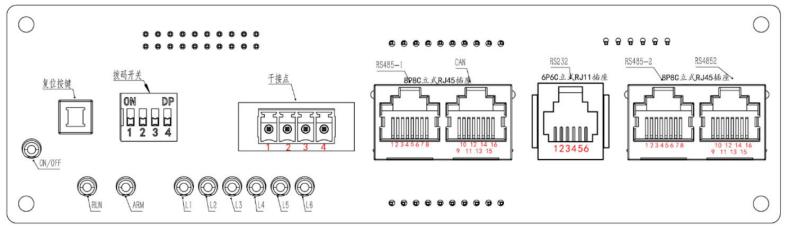
2.Communication RS485 CAN —



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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	一 有告警状况下 S1 和 COM1 导通
2	S1	一 有音音状况下SI和COMII 子通
3	COM2	─ 低电量状况下 S2 和 COM2 导通
4	S2	一 似电里状况下 S2 和 COM2 于通

CAN 和 RS485-1 接口定义

RS485-采用 8P8	C 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

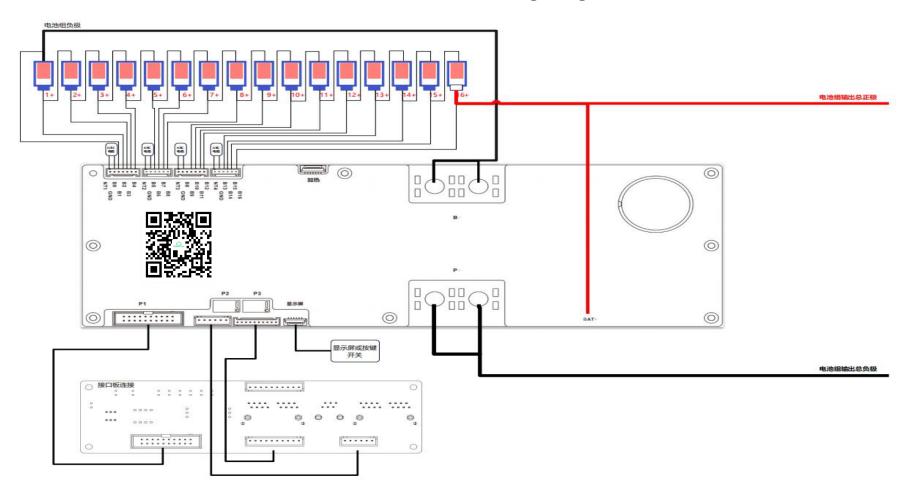
RS232-采用 6P6C 立式 RJ11 插座							
引脚序号	引脚定义	备注					
1, 2, 6	NC						
3	RS232_TX						
4	RS232_RX						
5	GND						

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

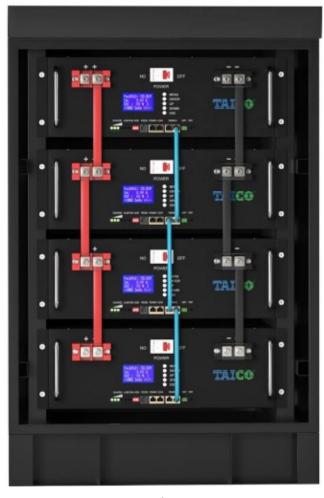
ESS BMS WIRING

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





Batteries in parallel



- 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;



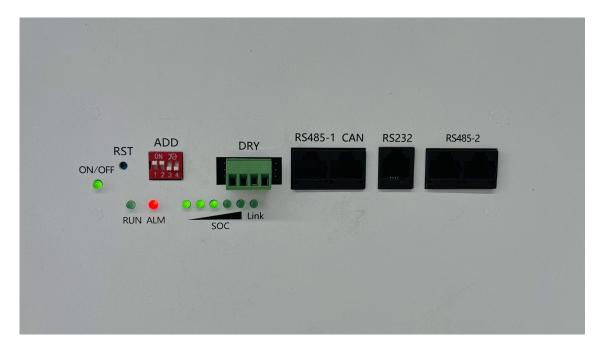
图1

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;

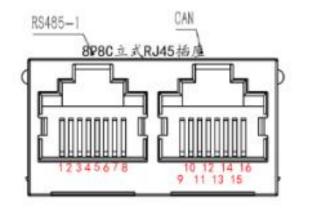
RS232: RS232 communication interface;

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

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

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	

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14:16	::	!! 令 58
三 运行时间	间: 48天19时35分11秒	
→ 一键三元		铁锂
✓ 一键钛酸锂	₫ 修改设	置密码
数据存储周期(S):		设置
RCV保持时间(H):	12.0	设置
EVENTO I	选择CAN协议	
000 - 极空BMS	S CAN接口协议(250K)V	0
001 – 德业低压	储能CAN通信协议 V1.0	0
002 – 派能低压	CAN通信协议V1.2	0
显 003 – 古瑞瓦特	低压CAN通信协议REV	0
显 004 - 维克多_0 显	CAN通信协议I_20170717	0
005 - SEPLOS_		0
006 - 极空BMS	SCAN接口协议(500K)V	0
007 – 英威腾低	压版BMS通信协议V1.02	0



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;



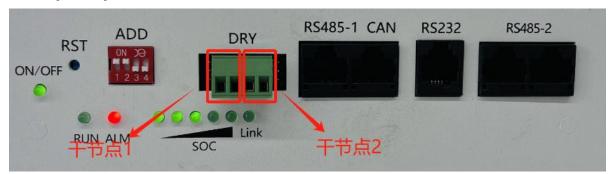


Dry contact trigger source and display alarm





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;



PC SOFTWARE

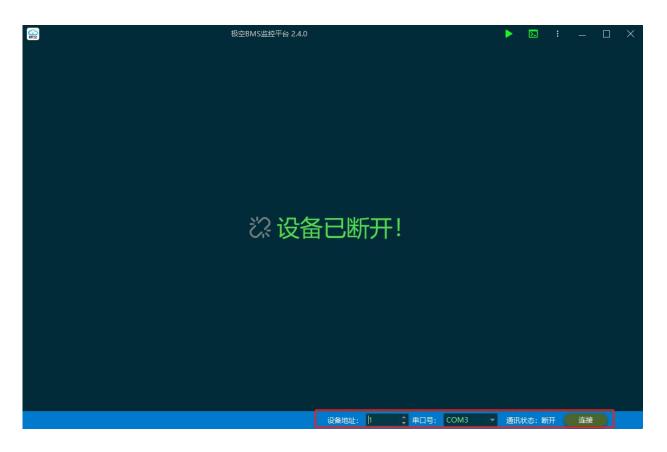
Use of PC software

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;

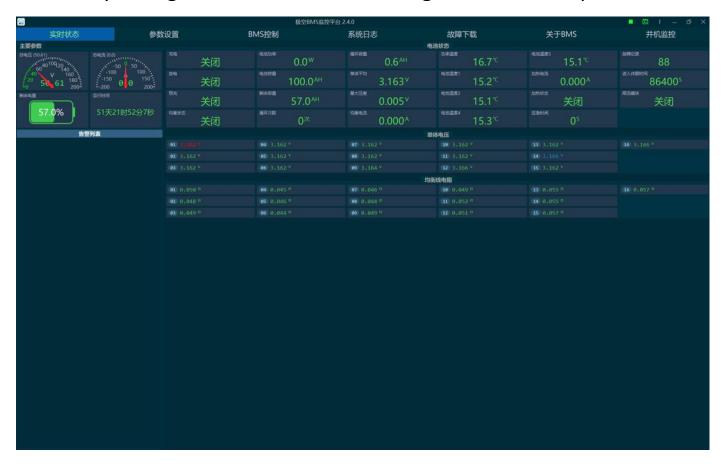
2.

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;

☑ 文明状态 ② 参数设置 ② BMS控制 ⑥ SAGE
→ 放射下板 () 外于6MS オー型三元 オー提供提 オー提供能管 ■ 授权设置 常用设置 单体数量 (串): 8 电压校准 (V): 27.957 电池容量 (AH): 40 验证设置参数权限 - 极空8MS监控平台 2.2.0 均衡触发压差 (V): 0.01 请输入密码验证设置参数权限 详細設置 均衡起始电压 (V): 3.0 執症 最大均衡电流 (A): 2.0 放电过温恢复 (°C): 60.0 单体过充电压 (V): 4.2 充电低温保护 (*C): -20.0 SOC-100%电压(V): 4.18 充电低温恢复 (°C): -10.0 MOS过温保护 (°C): 100.0 单体过充恢复 (V): 4.18 单体欠压恢复 (V): 2.85 MOS过温恢复 (°C): 80.0 連讯状态: 直接 野开直接

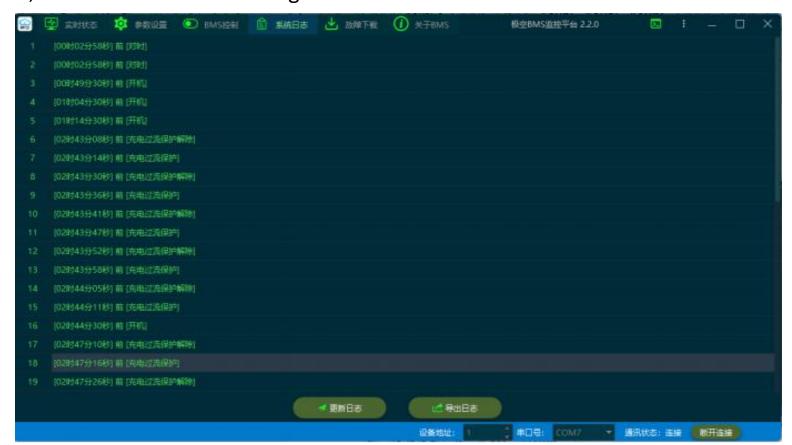
BMS control

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.



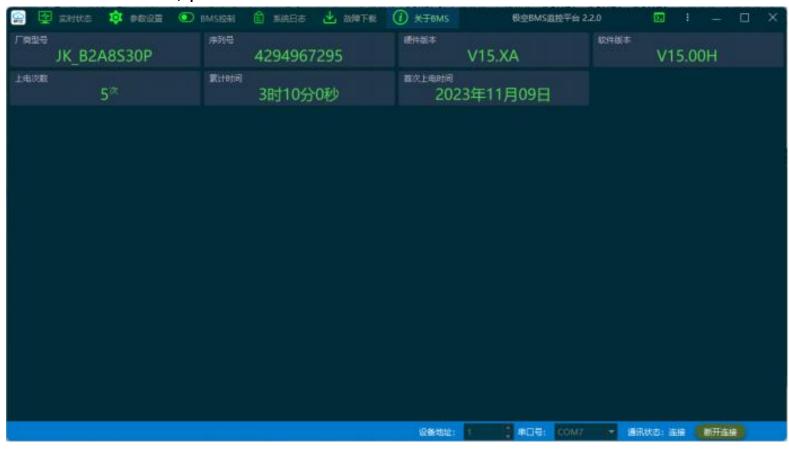
Faulty download

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

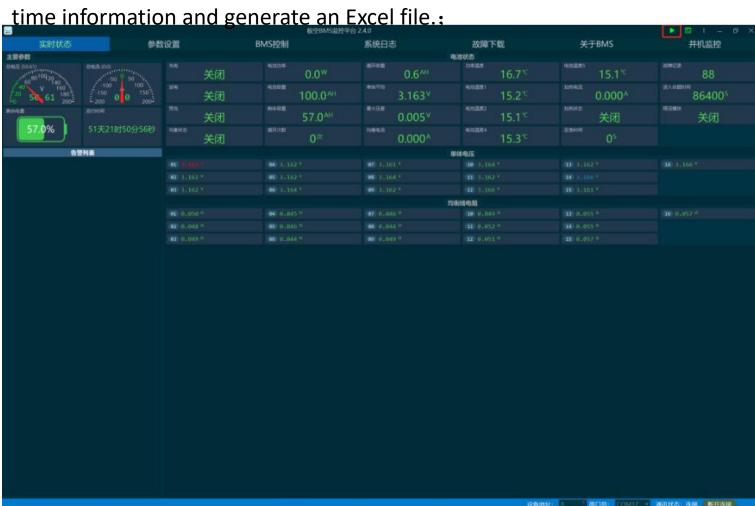
On the parallel monitoring page, you can view relevant information such as real-time parameters and configuration parameters of the host and each slave.;





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-



Real-time data logging

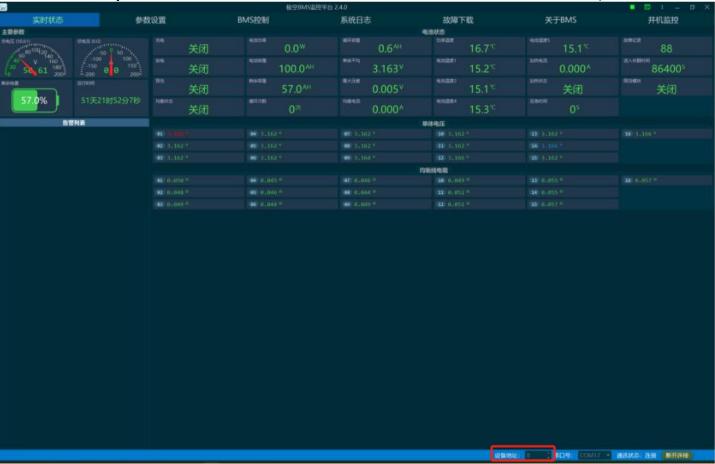
2. The save path can be set in the picture below. Click the three dots in the upper right corner and then set the button to see;



Upgrade firmware

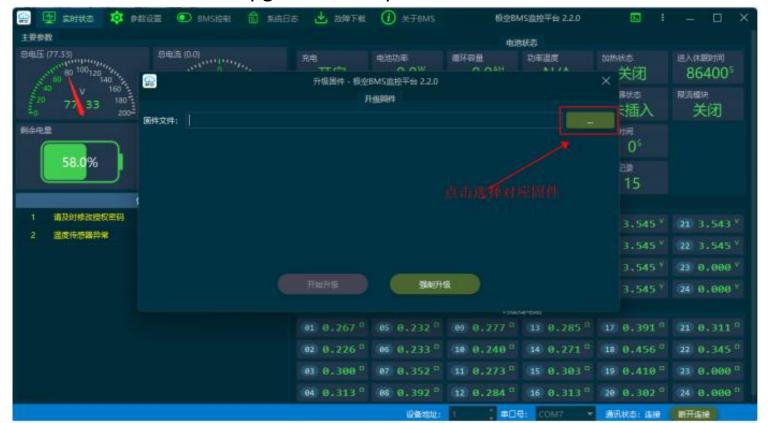
1. Firmware upgrade function. When upgrading firmware, BMS needs to be set as a slave (the address

cannot be 0) and cannot communicate with other BMS hosts.;



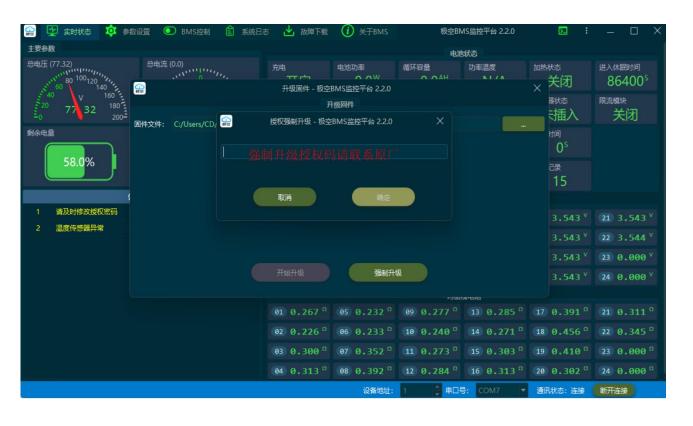
Upgrade firmware

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.;









Inverter

Inverter wiring

Inverter settings



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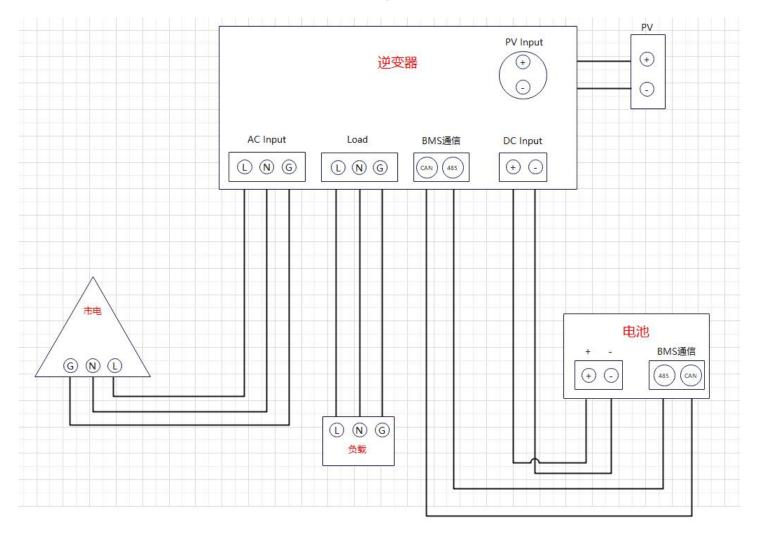
Inverter introduction

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)



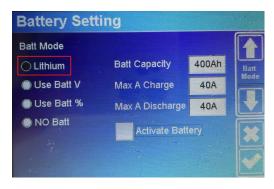
❖ 德业 (Deye)parameter settings

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



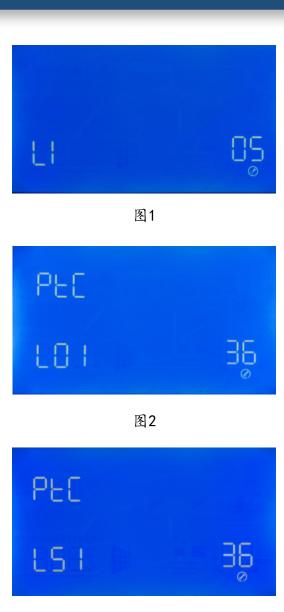




❖ 古瑞瓦特(Growatt)parameter settings

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);





❖ 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





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❖ 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

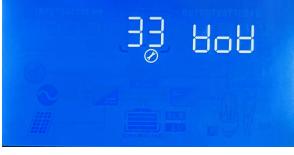
Figure 2;

4. Set 39 items to BMS, as shown in

Figure 3;



图1







❖ 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;

