

**Stacked
LiFePo4 Battery Pack
堆叠式
锂离子电池组系统**

**User Manual
用户手册**

51.2V320Ah- 16.384KWh

Version: 1.

Warning



Please comply with all warnings and operating instructions in this manual strictly. Save this manual properly and read carefully the following instructions before installing the unit. Do not operate this unit before reading through all safety information and operating instructions carefully.

请严格遵守本手册中的所有警告和操作说明。正确保存本手册，并在安装设备前仔细阅读以下说明。在仔细阅读所有安全信息和操作说明之前，请勿操作本装置。

1. Parameters of Battery 电池参数

1-1 Parameters of Battery Pack 单电池组参数

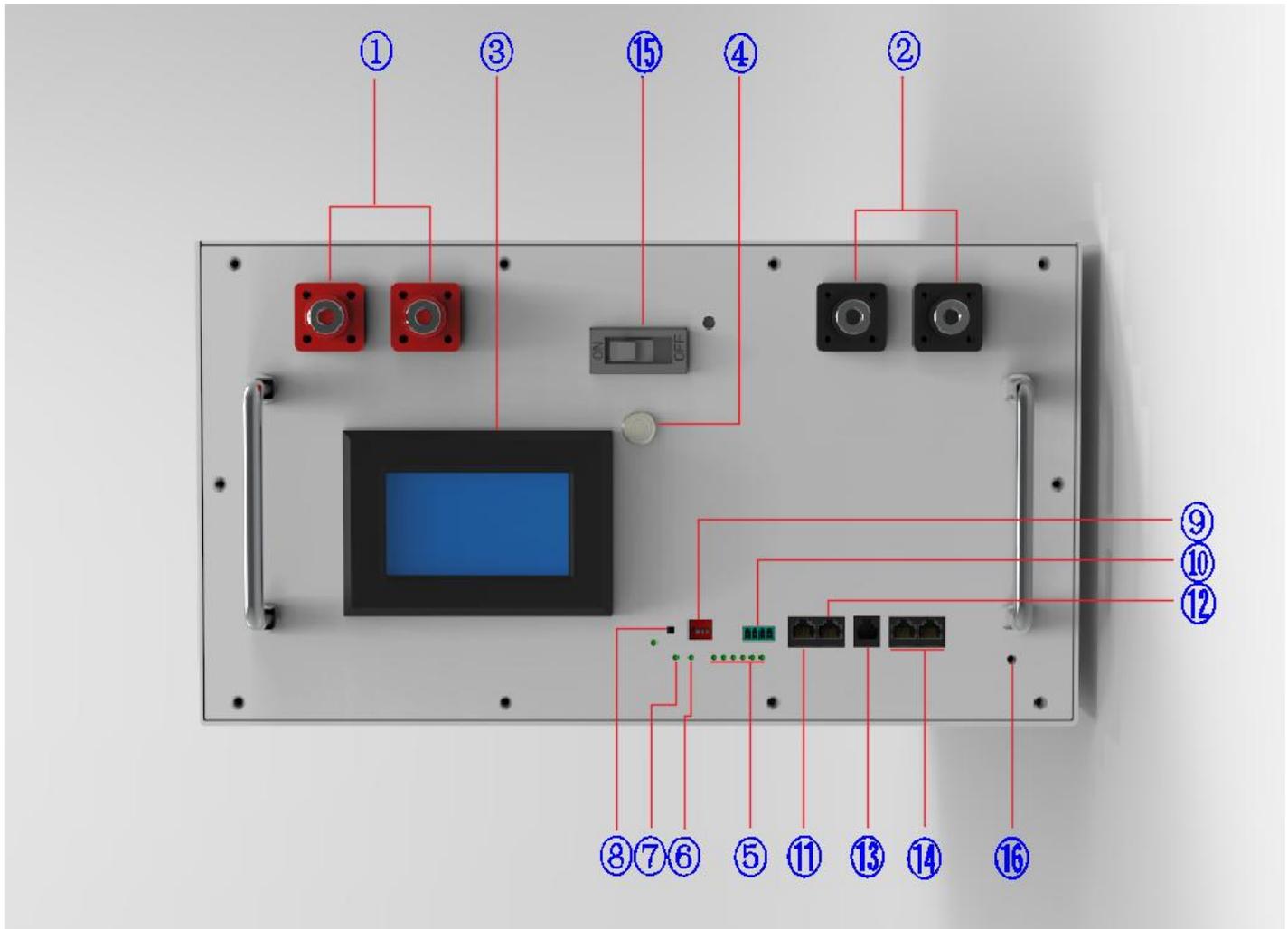
Model of battery pack 电池组型号	XDLP-51.2-320
Nominal voltage 标称电压	51.2V
Rated capacity 额定容量	320AH
Rated reserved energy 额定瓦时	16.384KWH
Standard charging current 标准充电电流	0.2C
Total charging cut-off voltage 充电截止电压	58.4
Cut-off voltage for cell charging 单体充电截止电压	3.65V
Standard discharging current 标准放电电流	0.2C
Maximum continuous discharging current 最大持续放电电流	200A
Cut-off voltage of discharging 放电截止电压	43.2V
Charging temperature range 充电温度范围	0°C ~ 60°C
Discharging temperature range 放电温度范围	-20°C ~ 60°C
Active balancing current 主动均衡电流	2A
Heating function 加热功能	Optional 选配
Single module Size (W×L×H) 单模组尺寸	770*480*255mm
Weight 1PCS重量	Single module 单模组约120kg±5%

**1-2 Technical Parameters of Battery Management System
(BMS) 电池管理系统 (BMS) 技术参数**

Items 项目	Details 详情细节	Standard 标准可设
Cell overcharge protection 电池过充电保护	Overcharge detection voltage 过充保护电压	3.6V
	Overcharge detection delay time 过充保护延迟时间	Typical:1.0s
	Overcharge release voltage 过充释放电压	3.54V
Cell over-discharge protection 电池过放电保护	Over-discharge detection voltage 过放保护电压	2.70V
	Over-discharge detection delay time 过放保护延迟时间	Typical:1.0s
	Over-discharge release voltage 过放恢复电压	2.65±0.1V or charge release
Over-current protection 过流保护	discharge Over-current protection current1 放电过电流保护电流1	200A
	discharge Over-current detection delay time 1 放电过电流保护延迟时间1	15S
	discharge Over-current protection current2 放电过电流保护电流2	210A
	discharge Over-current detection delay time2 放电过电流保护延迟时间1	≤500ms
	Charge OC protection current 充电过流保护	200A
Short circuit protection 短路保护	Short circuit protection current 短路保护电流	350A-400A
	Protection condition 保护条件	External load short circuit 外部负载短路
	Detection delay time 检测延迟时间	≤500us
	Protection release condition 保护释放条件	Charge release or reset 充电释放或重置

Temperature(T)) protection 温度保护	Charge high T protection 充电高温保护	70±5℃
	Charge high T recover 充电高温恢复	60±5℃
	Discharge high T protection 放电高温保护	60±5℃
	Discharge high T recover 放电高温恢复	70±5℃
	Charge low T protection 充电低温保护	-20±5℃
	Charge low T recover 充电低温恢复	-10±5℃
	Discharge low T protection 放电低温保护	-20±5℃
	Discharge low T recover 放电低温恢复	-10±5℃
Balance 均衡	Balance threshold voltage 均衡开启电压	3.50V
Communication 通讯	<p>It has RS485 and CAN standard communication interface, it can real-time monitoring the capacity of battery bank, the voltage, current, environment temperature, and charging/discharging current.</p> <p>具有RS485和CAN标准通讯接口，可实时监测电池组容量、电压、电流、环境温度、充放电电流</p>	
Alarm 报警	<p>It has over-temperature, over charge, under-voltage, over-current, short circuit alarmFunction.</p> <p>具有超温、过充、欠压、过流、短路报警功能</p>	

2. Panel operation instructions 面板操作说明



No. 序号	Description 说明	Silk-screen 丝印	Remark 备注
1	Battery + 电池正极	P+/P+	Positive terminal 电池正极
2	Battery - 电池负极	P-/P-	Negative terminal 电池负极
3	LCD 屏幕		Display screen 显示屏
4	Output ON/OFF电源开关	OFF/ON	
5	Electricity volume indicator电量指示灯	S0C	Display the battery's capacity容量显示灯
6	ALM alarm indicator light blinking 警示灯	ALM	Red- trouble-light on 警示灯
7	Run indicator light 运行指示灯	RUN	Display state information 显示状态信息
8	Reset button重置键	RST	Reset key 重置键
9	DIP switch 拨码开关	ADD	Display connection address 显示连接地址
10	DRY干接点	DRY	Dry contact干接点
11	RS485A port 485A端口	RS485A	RS-485connection port-A RS485 485连接接口
12	CAN port CAN端口	CAN	CAN communication port CAN通讯口
13	RS232 port 232端口	RS232	RS-232connection port 232连接接口
14	RS485B port 485B端口	RS485-2	RS485connection port-485连接接口
15	Circuit breaker 断路器	QF	Battery circuit breaker电池断路器
16	Ground wire 地线		Ground wire connection地线连接

3. Installation and Operation 安装操作

3-1. Single battery Installation 单电池安装

Installation and wiring must be performed in accordance with the local electric laws/regulations and execute the following instructions by professional personnel. 安装和布线必须按照当地电气法律/法规进行，并由专业人员执行以下指示

- 1) Make sure the mains wire and breakers in the building are in compliance with the standard of rated capacity of battery to avoid the hazards of electric shock or fire. 确保建筑物内的电源线和断路器符合蓄电池额定容量标准，避免触电或火灾危险
- 2) Switch off the mains switch in the building before installation 安装前关闭建筑物内的电源开关
- 3) Turn off all the connected devices before connecting to the battery 连接到电池前关闭所有连接的设备。
- 4) Prepare wires based on the following table 根据下表准备电线：

Model	Cables(AWG)	Cables(mm ²)
<50Ah	8	6

50Ah	6	16
100Ah	4	25
200/300/3 20AH	2	35

Table 1 Output Cables

NOTE : It is recommended to use suitable wire in above table or thicker for safety and efficiency.

注意：为了安全和高效，建议使用上表中的合适电线或更粗的电线

5) Set the battery pack breaker in "OFF" position and then install the battery pack.

将电池组断路器置于“关闭”位置，然后安装电池组

3-2 Installation of stacked batteries 堆叠电池安装



最多堆叠7个模组 Up to 7 modules can be stacked

堆叠电池安装示意图，具体情况按实际订单要求操

Stacked battery installation diagram, specific situation according to the actual order requirements operation

3-3.Installation Precautions安装注意事项

(1) Prior to installation, unpacking to check the quantity of the parts and battery appearance.
安装前开箱检查零件数量和电池外观

(2) Measure the battery voltage with a multimeter. The general factory voltage of the battery is 50V-53V . 用万用表测量电池电压。电池的出厂电压一般为50-53V.

(3) Prior to wiring, check the anode and cathode of the battery and the anode and cathode terminals shall not be connected reversely. 接线前应检查蓄电池的正负极，正负极端子不得接反

(4) During battery connection, please wear the protective gloves. When using such metal tools as torque wrench, please perform insulating packaging for them and two end of the metal tools such as torque wrench shall not contact the positive and negative terminals of the battery at the same time to avoid battery short-circuit. 连接电池时，请戴上防护手套。使用扭矩扳手等金属工具时，请对其进行绝缘包装，扭矩扳手等金属工具的两端不得同时接触电池的正负极，以免电池短路。

(5) Before the battery is connected with the externally connected equipment, make the equipment in a disconnected state, check whether the connecting polarity of the battery and total voltage are correct, connect the battery anode with the equipment anode and battery cathode with the equipment cathode and fix the connecting line. 电池与外接设备连接前，应先使设备处于断开状态，检查电池的连接极性和总电压是否正确，电池阳极与设备阳极、电池阴极与设备阴极连接，并固定连接线。

(6) During handling and placement, the battery must be handled gently. No dropping or impacting. The battery shall not be thrown or beaten to avoid damaging the battery or resulting in potential safety hazard. 在搬运和放置过程中，必须轻拿电池。无跌落或撞击。不得投掷或敲打电池，以免损坏电池或造成安全隐患。

(7) Do not touch the surface of the battery box with the sharp part of the tool to scratch or damage the battery box. 不要用工具的锋利部分接触电池盒表面，以免划伤或损坏电池盒。

(8) Do not disassemble the battery box without authorization. 未经授权，请勿拆卸电池盒。

(9) Do not put any article made of the metal conductive material together with the battery or assemble it into the battery box.

不要将任何由金属导电材料制成的物品与电池放在一起，也不要将其组装到电池盒中。

(10) Install it according to the selected installation mode根据所选安装模式进行安装:

Installation of standard cabinet (rack): Install the matching hanger for the battery pack and fix them in the standard cabinet and the tray protection is added for the battery box. 标准柜（架）安装：安装匹配的电池箱和支架或托盘固定在内部，标准是为保护电池箱

Stacking battery box installation: first place the base in the plane area, then stack the battery box according to the outer label number sequence, then the screw holes reserved for the upper and lower chassis are locked and fixed with screws,

堆叠式电池箱安装：先将底座放在平面区域，然后将电池箱按外标识编号顺序安放堆叠，再将上下机箱预留的螺丝孔，用螺丝锁紧固定，

Installation of wall-mounted box: Prior to installation, please ensure that the wall complies with the wall-mounted requirements; according to the location in the design plan, install the special wall-mounted box of the lithium battery; the battery pack is fixed in the wall-mounted box in a hanger manner. 壁挂箱安装：安装前，请确保壁挂符合壁挂要求；根据设计方案中的位置，安装锂电池专用壁挂箱；电池组以悬挂方式固定在壁挂箱中

Installation of integrated indoor and outdoor cabinets (boxes): Install them according to the installation specification for the customized integrated cabinet (box) 室内外综合柜（箱）安装：

按定制综合柜（箱）安装规范进行安装。

3-4 Operation Instruction for Installation 安装作业指导书

1) Prior to installation, please check whether the battery is normal.

安装前请检查电池是否正常？

Press the switch on the front panel RST for 1 second to start for startup. During startup, 4 capacity indicator lights on the front panel, ALM alarm indicator light (red) and RUN running indicator light light up. Check whether all indicator lights light up normally; then the ALM alarm indicator light goes out, the RUN running indicator light lights up and the capacity indicator light lights up according to the capacity.

If the ALM alarm indicator light flashes after startup, it means that the battery has an alarm. The newly installed battery seldom has alarm. The common alarm is the battery under voltage alarm (which is resulted from non-use of the battery for a long time). Such case may be removed after the battery is charged for 30min; if the alarm may not be removed, please press the reset key RST for 10S, until all LEDs light up for reset, execute the battery reset operation and confirm whether the alarm is removed. If the alarm is removed, the battery may be used normally. Otherwise the battery shall be reworked.

按前面板上的开关RST 1秒启动。启动时，前面板4个容量指示灯亮，ALM报警指示灯（红色），运行指示灯亮。检查各指示灯是否正常亮起，然后ALM报警指示灯熄灭，运行指示灯亮起，容量指示灯按容量亮起。如果启动后ALM报警指示灯闪烁，说明电池有报警。新安装的电池很少有报警。常见报警为电池欠压报警（长时间不使用电池导致）。这种情况可在电池充电30分钟，如果不能解除报警，请按内部复位键RST 10秒，直到所有LED亮起进行复位，执行电池复位操作，确认是否解除报警。如果警报解除，电池可以正常使用。否则，应返修加工电池。

2) For the battery which is normal after detection, please press the reset key RST for 3S

to execute the battery ON/OFF operation.

对于检测正常的电池，请按内部复位键RST 3秒，执行电池开/关操作。

Instructions of manual operation of the reset key RST 复位键RST的手动操作说明	Startup 启动	In the OFF state of BMS, press the key for 3S for startup;在BMS关闭状态下，按键3s启动
	Shutdown 关闭	In the non-standby state of BMS, press the key for 3S for shutdown;在BMS的非待机状态下，按键3s关机
	Reset 重置	In the non-standby state of BMS, press the key for 10S, until all LEDs light up for reset.在BMS的非待机状态下，按键10秒，直到所有LED亮起进行重置

Instructions: “Shutdown” and “standby” and “startup” and “activation” in Chinese have the same meaning.

说明：“关机”、“待机”，“启动”、“激活”中文含义相同

3) Installation of the lithium battery, wiring and startup 锂电池安装，布线和启动.

Make the battery pack in a standby state, install it in the battery cabinet one by one, the anode and cathode of the battery pack are connected respectively, which are connected to the switching mode power supply or UPS (Please note that the switching mode power supply and UPS shall be disconnected from the AC). Press the reset key RST of one of battery packs for 1S for startup. Such startup battery may activate other batteries which are connected in parallel (or press the reset key RST of each battery pack for 1S

successively) and the whole battery pack with high capacity enters the working state. Later, apply AC to the power supply equipment such as switching mode power supply and UPS to make the whole standby system run.

使电池组处于关机状态，逐个安装电池，电池组的正负极分别连接，与开关电源或UPS相连（请注意开关电源和UPS应与交流断开）。按其中一个电池组的RST 1秒启动。该启动电池可激活其他并联电池（或依次按下各电池组的RST 1秒），整个大容量电池组进入工作状态。随后对开关电源、UPS等供电设备进行交流，使整个备用系统运行。

The specification of the connecting line is selected according to the load current, with the common specifications of the connecting line as follows

连接线的规格根据负载电流选择，连接线的通用规格如下：

1) When the battery pack with the capacity of 200Ah or below is connected in parallel, it is suggested to select 25mm² copper wire.

1) 200Ah及以下电池组接入时并联，建议选用25mm²铜线。

2) When the battery pack with the capacity of 200Ah~320Ah is connected in parallel, it is suggested to select 35mm² or 50mm² copper wire.

2) 200Ah~320Ah蓄电池组并联时，建议选用35mm²或50mm²铜线。

3) When the battery pack with the capacity of 300Ah or above is connected in parallel, it is suggested to select 50mm² copper wire.

3) 容量为300Ah及以上的电池组并联时，建议选用50mm²铜线。

4) Note: We do not equip with the battery connecting line by default, which shall be selected according to the total capacity of the battery pack.

注：我们默认不配置电池连接线，根据电池组总容量选择

Lithium battery 锂电池	Copper core cable 铜芯电缆	Copper lug 铜鼻子	Remarks
48V50Ah	16mm ² /25mm ²	16-8/25-8	M8 copper lug is used for 48V50Ah
48V100Ah	16mm ² /25mm ²	16-8/25-8	M8 copper lug is used for 48V100Ah
48v200AH	35mm ²	35-8	M8 copper lug is used for 48V200Ah
48v300/320AH	50mm ²	50-8	M8 copper lug is used for 48V300/320Ah

Introduction to operation steps in detail according to the capacity required 根据所需容量详细介绍操作步骤:

5) Battery pack in parallel with the capacity of 200Ah or below (the wiring diagram is shown in Figure 1): 电池组并联，容量200Ah及以下（接线图所示）:

Step1: The battery pack is in the shutdown state, and the battery is mounted on the wall in turn; 步骤1: 使电池组处于关机状态，依次壁挂安装电池;

Step2: Disassemble the anode insulating cap of the neighboring batteries one by one, connect the anodes of up and own neighboring battery packs with the installation connecting line and screw on the anode insulating cap;

步骤2: 逐个拆卸相邻电池的正极绝缘帽，将上下相邻电池组的正极与安装连接线连接，并拧上正极绝缘帽;

Step 3: According to step 2, connect the cathode of the battery pack.

步骤3: 根据步骤2，连接电池组的负极

Step 4: Set the dial-up addresses of all battery modules from top to bottom one by one, which are 1000, 0100, 1100 and 0010 (the dial-up addresses are set according to the number of battery modules actually used) respectively; (this step may be skipped if there is no need to access to the remote monitoring platform).

步骤4: 从上到下依次设置所有电池模块的拨号地址，分别为1000、0100、1100和0010（拨号地址根据实际使用的电池模块数量设置）；（如果不需要访问远程MO，可以跳过此步骤。监测平台）。

Step 5: Perform the cascade connection to RS485 communication interface of the battery module with the RS485 connecting line; lead to the collector of the monitoring platform from the

CAN interface of the battery module with the address of 1000 with the CAN connecting line; (this step may be skipped if there is no need to access to the remote monitoring platform).

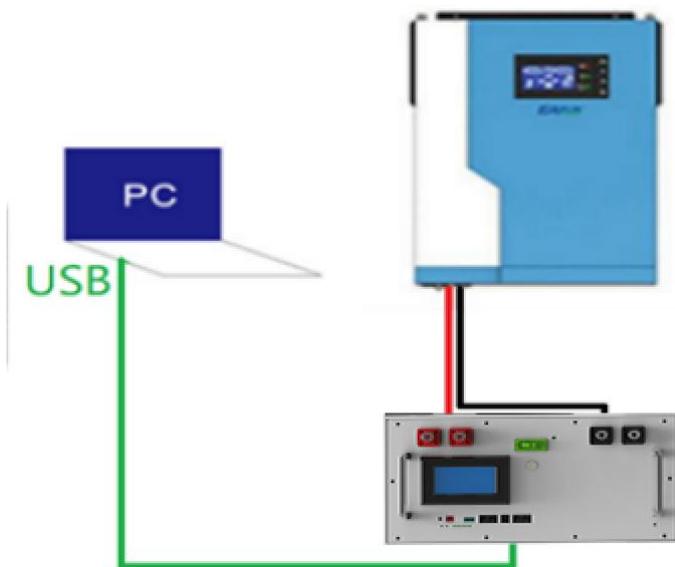
步骤5: 用RS485连接线串接电池模块的RS485通信接口; 用CAN连接线从地址为1000的电池模块的CAN接口引至监控平台的集电极; (不需要接入遥控器, 可跳过此步骤) 监控平台)

Step 6: Draw out two wires from the anode and cathode of a battery pack at the top or in the middle respectively as the main connecting line of the battery pack in parallel, which are connected with the switching mode power supply or UPS.

步骤6: 从电池组顶部或中部的正极和负极分别抽出两根电线, 作为电池组的并联主连接线, 与开关电源或UPS连接;

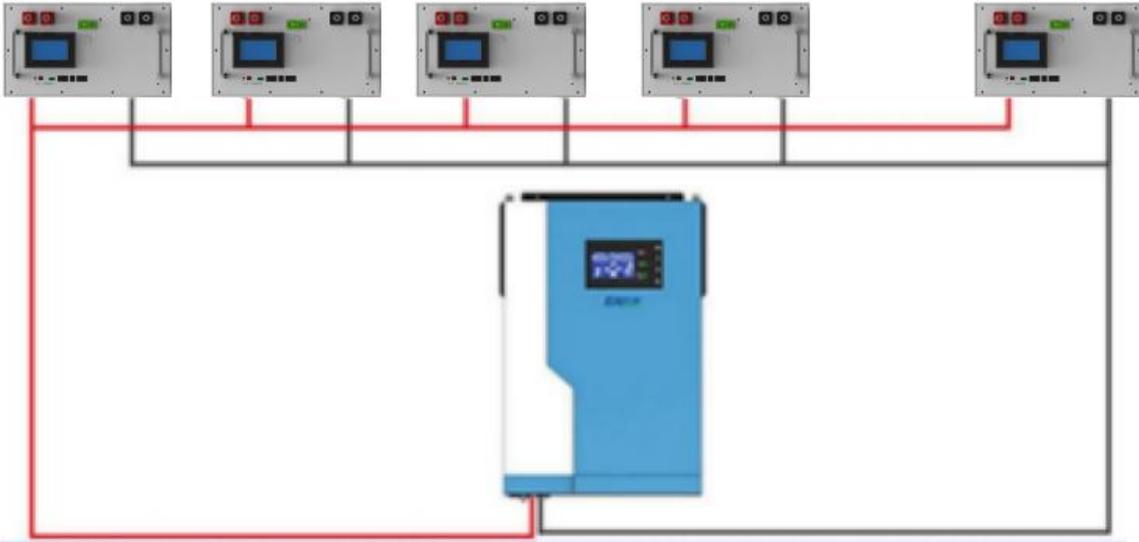
Step 7: Press the ON/OFF key of each battery pack for Reset and the whole battery pack with high capacity enters the working state.

步骤7: 按每个电池组的ON/OFF键复位, 整个大容量电池组进入工作状态



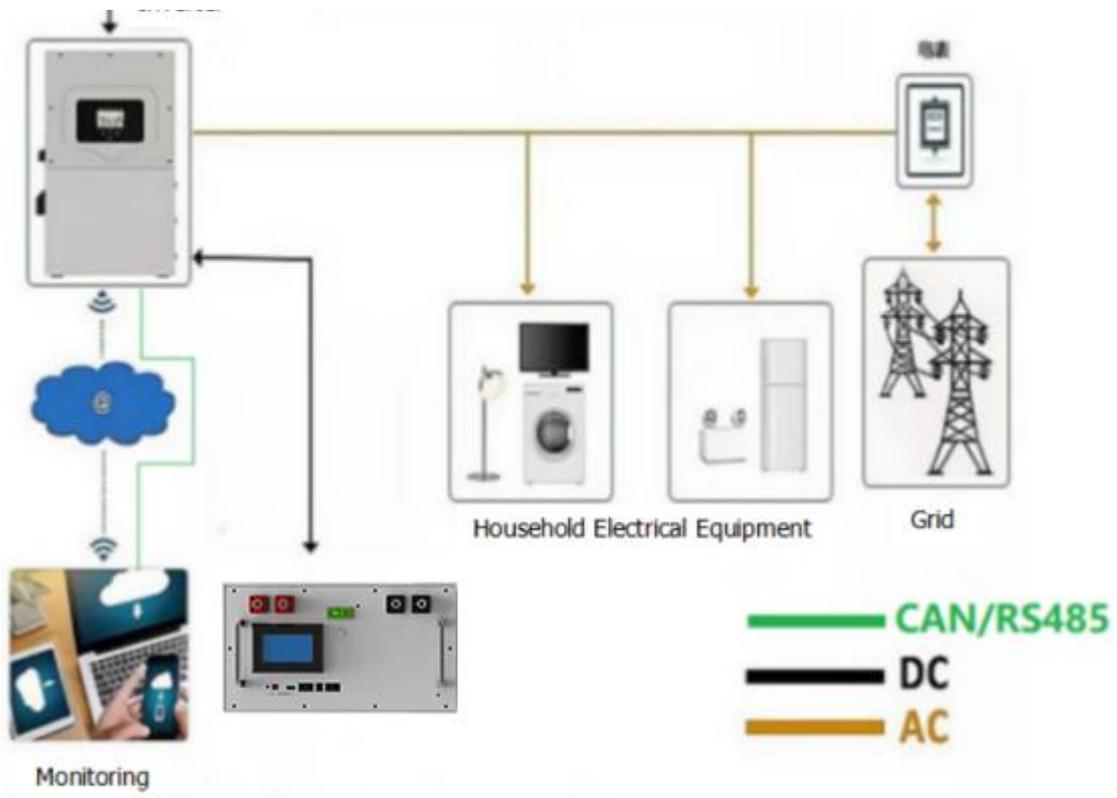
Stand-alone installation 单机安装

1 2 3 4 ... 16



Parallel machine installation 并机安装

3-5. System integration link installation topology diagram
系统集成连接安装拓扑图

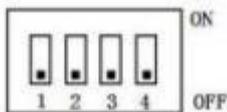


3-6. Communication instructions

通讯说明

(1) 储能通信地址的配置采用 4 位拨码开关，以二进制方式设置地址范围为 0 到 15。用户可通过这 4 位拨码开关轻松配置通信地址，但仅 1 到 15 的地址可用于上位机通信。以下为详细的配置方式表格：

(1) The configuration of the energy storage communication address adopts a 4-bit DIP switch, and the address range is set in binary format from 0 to 15. Users can easily configure communication addresses through these 4-digit dial switches, but only addresses 1 to 15 can be used for upper computer communication. The following is a detailed table of configuration methods:



地址(Address)	拨码开关位置(DIP switch position)			
	1	2	3	4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

(2) 打开 APP “参数设置” 页面，检查 “设备地址” 显示和上述拨码开关设置一致，“串口 2 协议” 设置为 1。

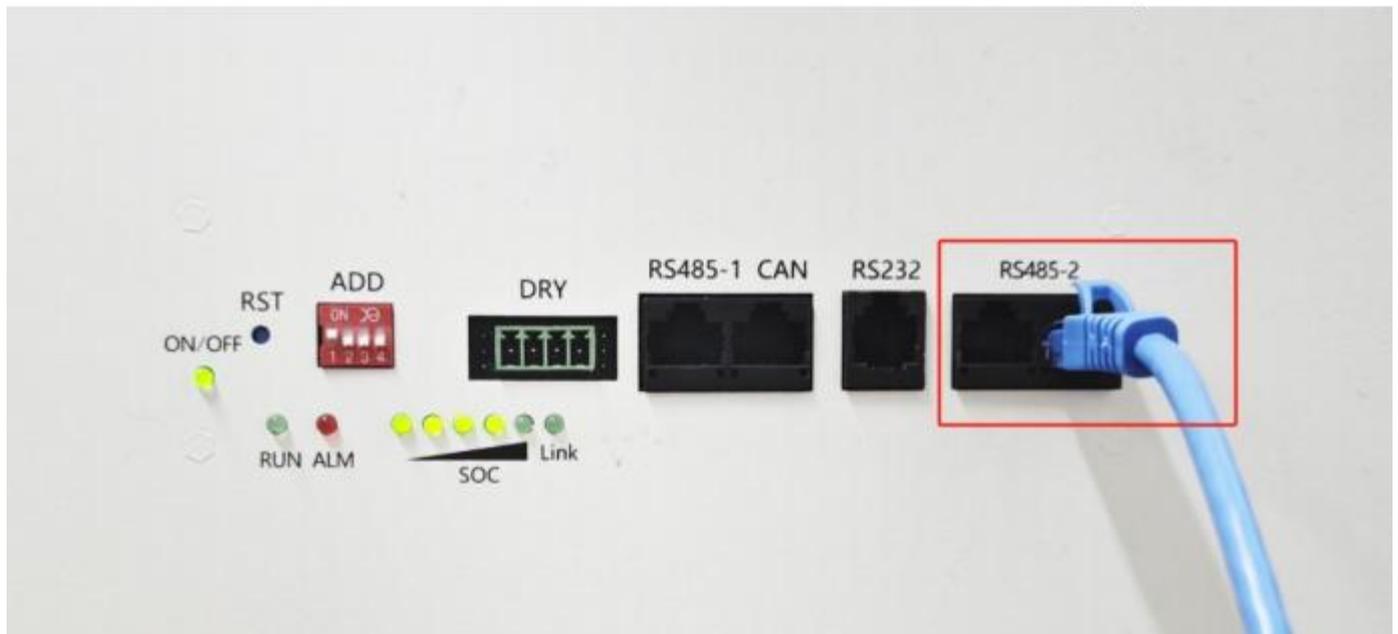
(2) Open the "Parameter Settings" page of the APP, check that the "Device Address" display matches the above dial switch settings, and set "Serial Port 2 Protocol" to 1.



3.7 连接方式(Connection method)

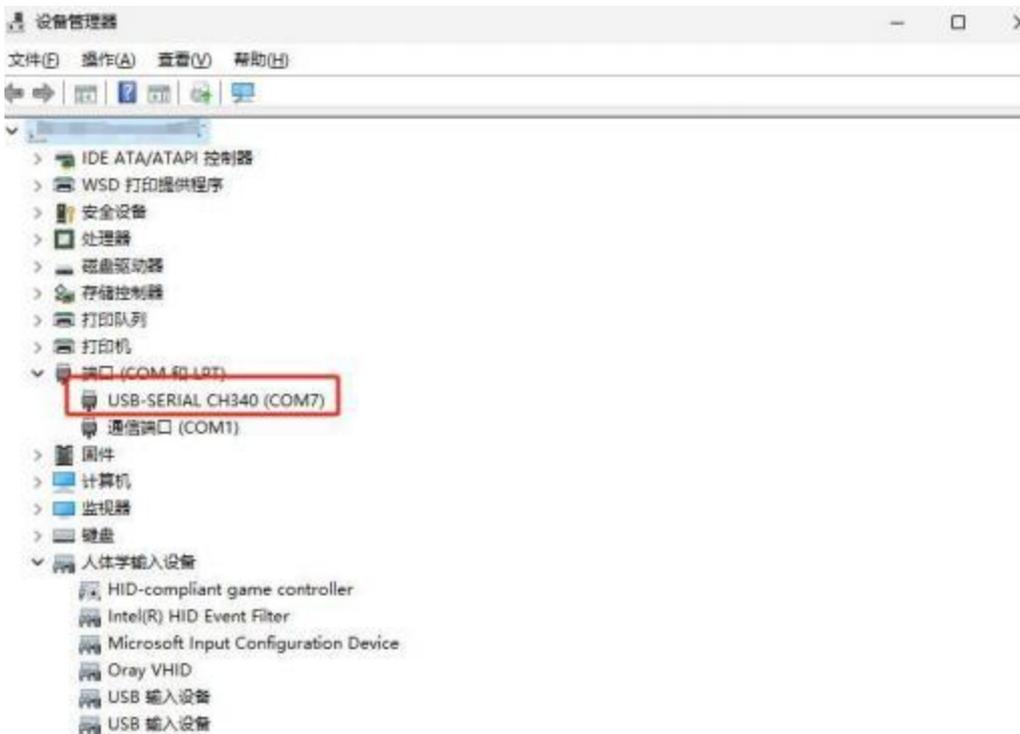
(1) 使用 USB 转 RS485 模块转接线连接 RS485-2 的 RJ45 接口上, 另一端连至电脑上。

(1) Connect the USB to RS485 module adapter cable to the RJ45 interface of RS485-2, and connect the other end to the computer.



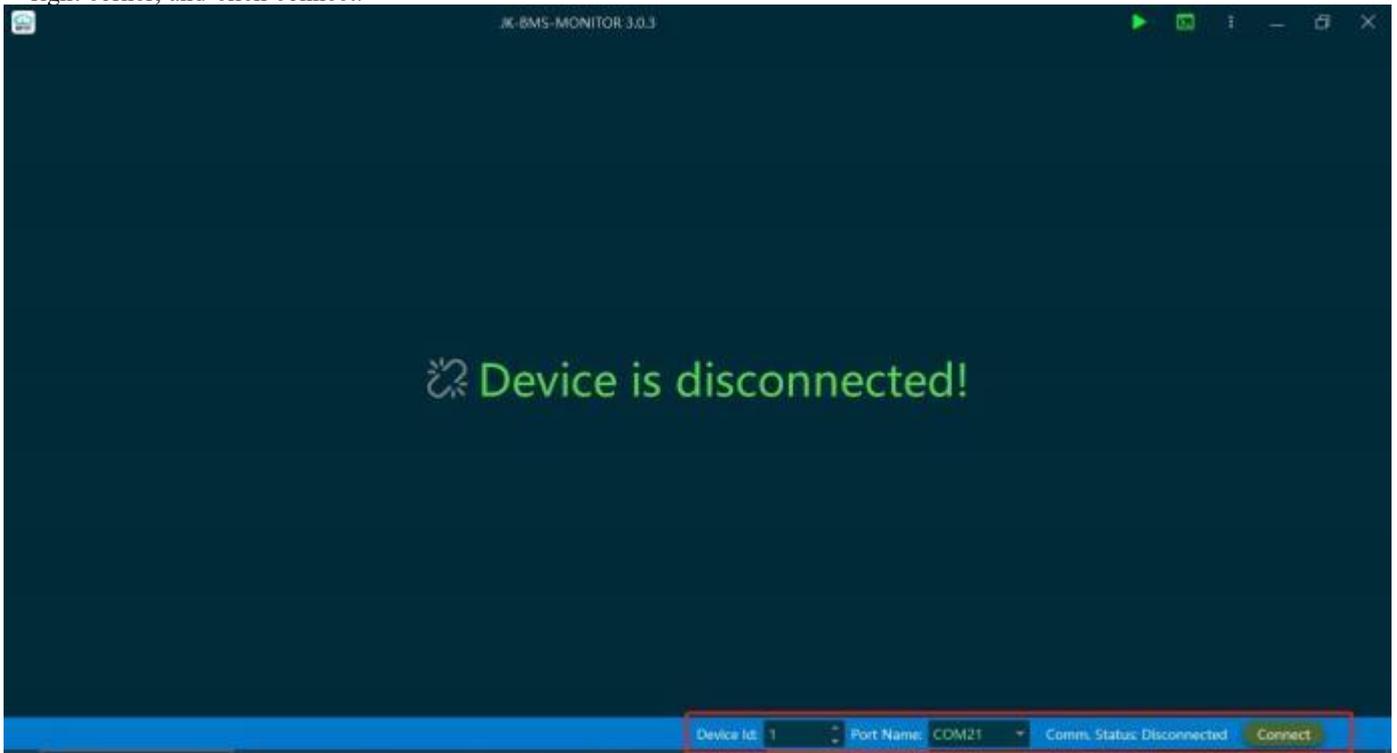
(2) 块插入电脑 USB 接口, 检查设备管理器中模块工作是否正常, 记住串口号 COM7。 (每台电脑的串口号可能不同, 只要是识别到了就是我们需要的串口。)

(2) Insert the module into the computer USB interface, check if the module in the device manager is working properly, and remember the serial port number COM7. (The serial port number of each computer may be different, as long as it is recognized it is the serial port we need.)



(3) 打开上位机软件，在右下角填入上述操作步骤的设备地址和串口号，点击连接即可。

(3) Open the upper computer software, fill in the device address and serial port number for the above operation steps in the lower right corner, and click connect.



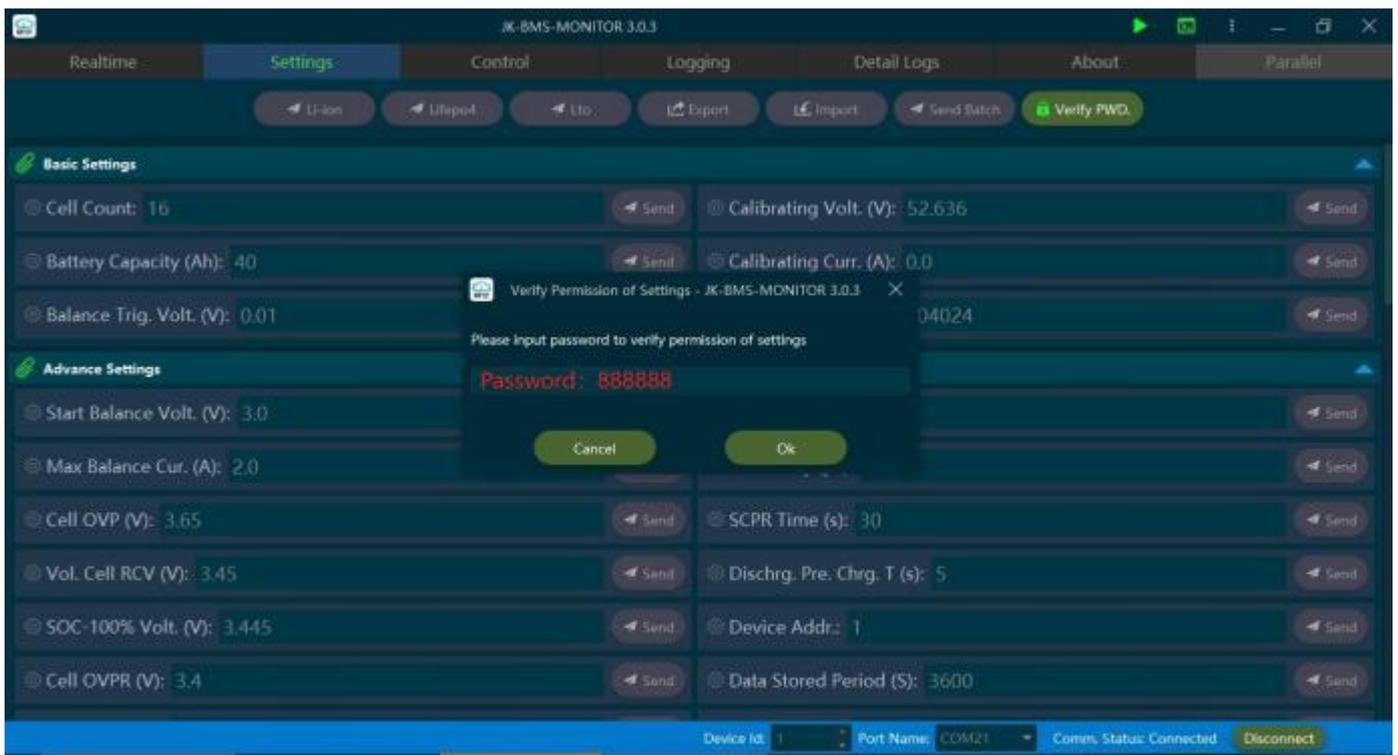
3.7、上位机设置(Upper computer settings)

(1) 实时状态页面，可查看电池电压、充电电流、异常告警、电池状态、均衡线组等。

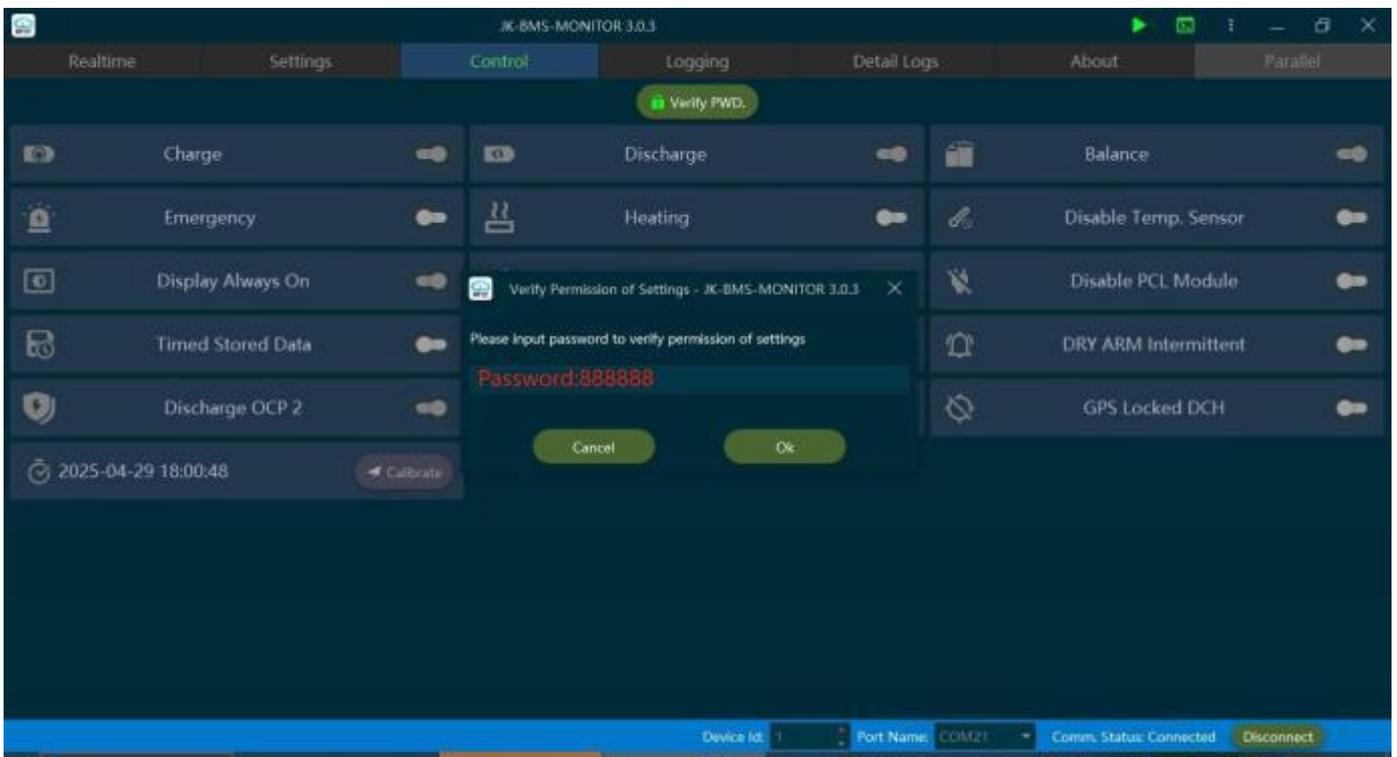
(1) Real time status page, which can view battery voltage, charging current, abnormal alarm, battery status, balance line group, etc.



(2) 参数设置页面，默认状态下无法修改任何参数，需要通过“授权设置”进行更改。保护板出厂默认密码：“888888”
 (2) The parameter settings page cannot modify any parameters by default and needs to be changed through "Authorization Settings". The default password for the protective board at the factory is "888888".

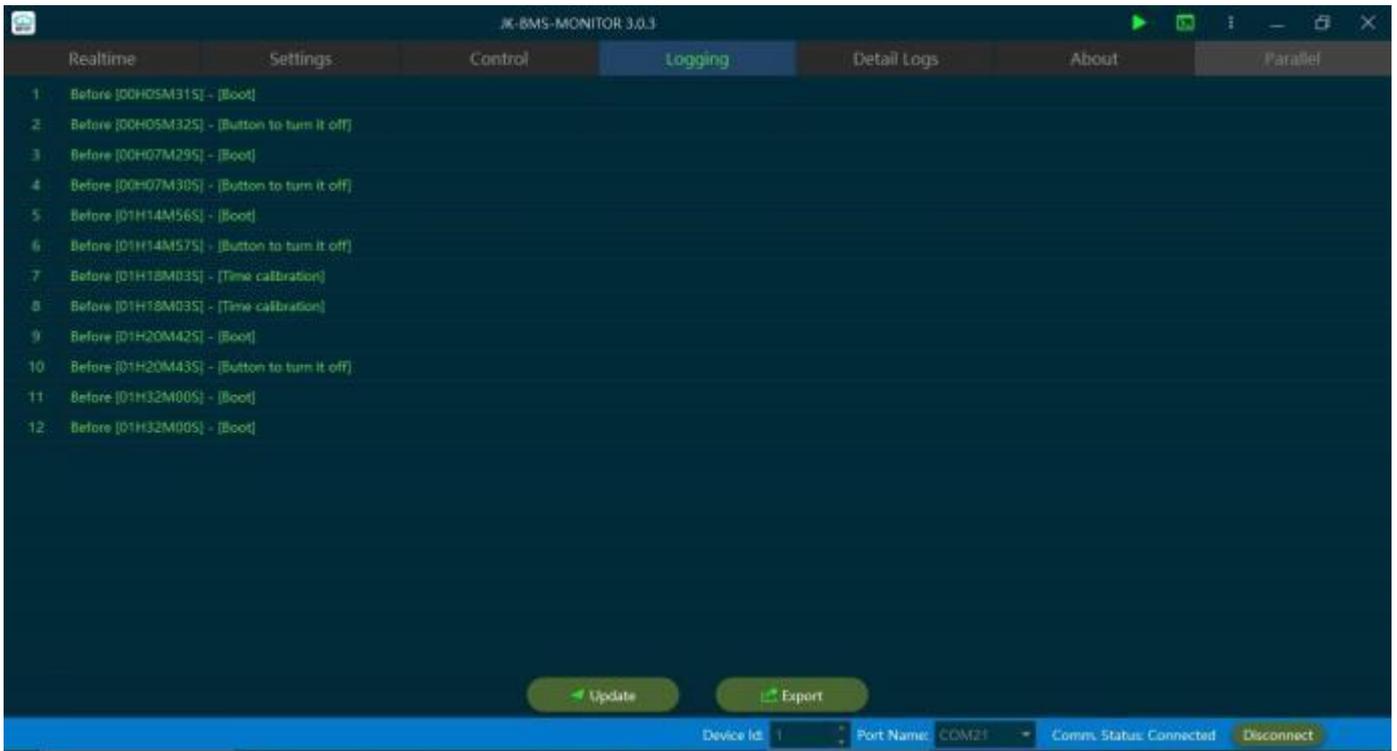


(3) BMS 控制页面，默认状态下无法修改设置，需要通过“授权设置”进行更改。保护板出厂默认密码：“888888”。
 (3) The BMS control page cannot modify settings by default and needs to be changed through "Authorization Settings". The default password for the protective board at the factory is "888888".



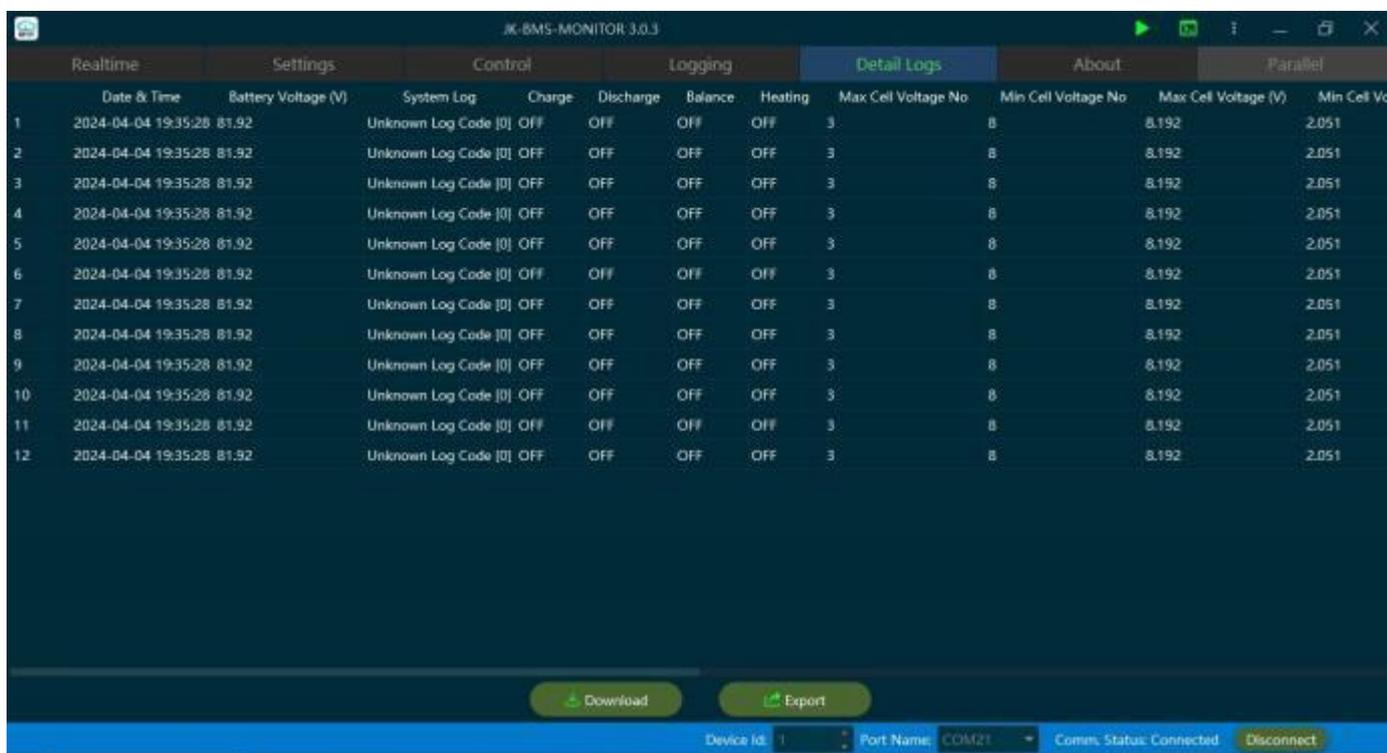
(4) 系统日志页面，“更新日志”按钮可将 BMS 内部日志更新到上位机显示，导出日志按钮 可将当前所有日志导出至电脑指定文件夹内，格式为 xlsx，使用 excel 等软件可查看。

(4) On the system log page, the "Update Log" button can update the internal logs of the BMS to the upper computer for display. The Export Log button can export all current logs to the specified folder on the computer in the format of xlsx, which can be viewed using software such as Excel.



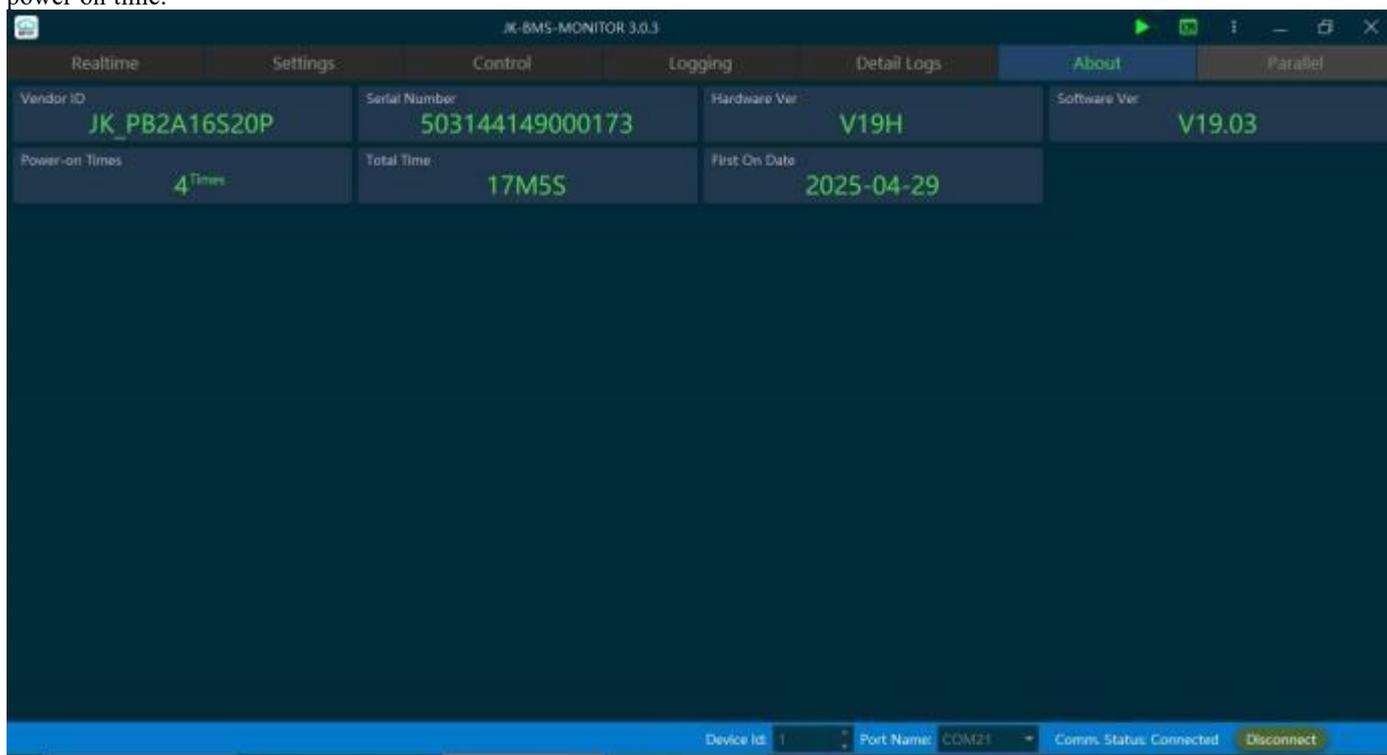
(5) 故障下载页面，“故障下载”按钮可将 BMS 内部故障日志更新到上位机显示，“导出故障”按钮可将当前显示的所有故障日志导出至电脑指定文件夹内，格式为 xlsx，使用 excel 等软件可查看。

(5) On the fault download page, the "Fault Download" button can update the BMS internal fault logs to the upper computer for display. The "Export Fault" button can export all currently displayed fault logs to the specified folder on the computer, in the format xlsx, which can be viewed using software such as Excel.



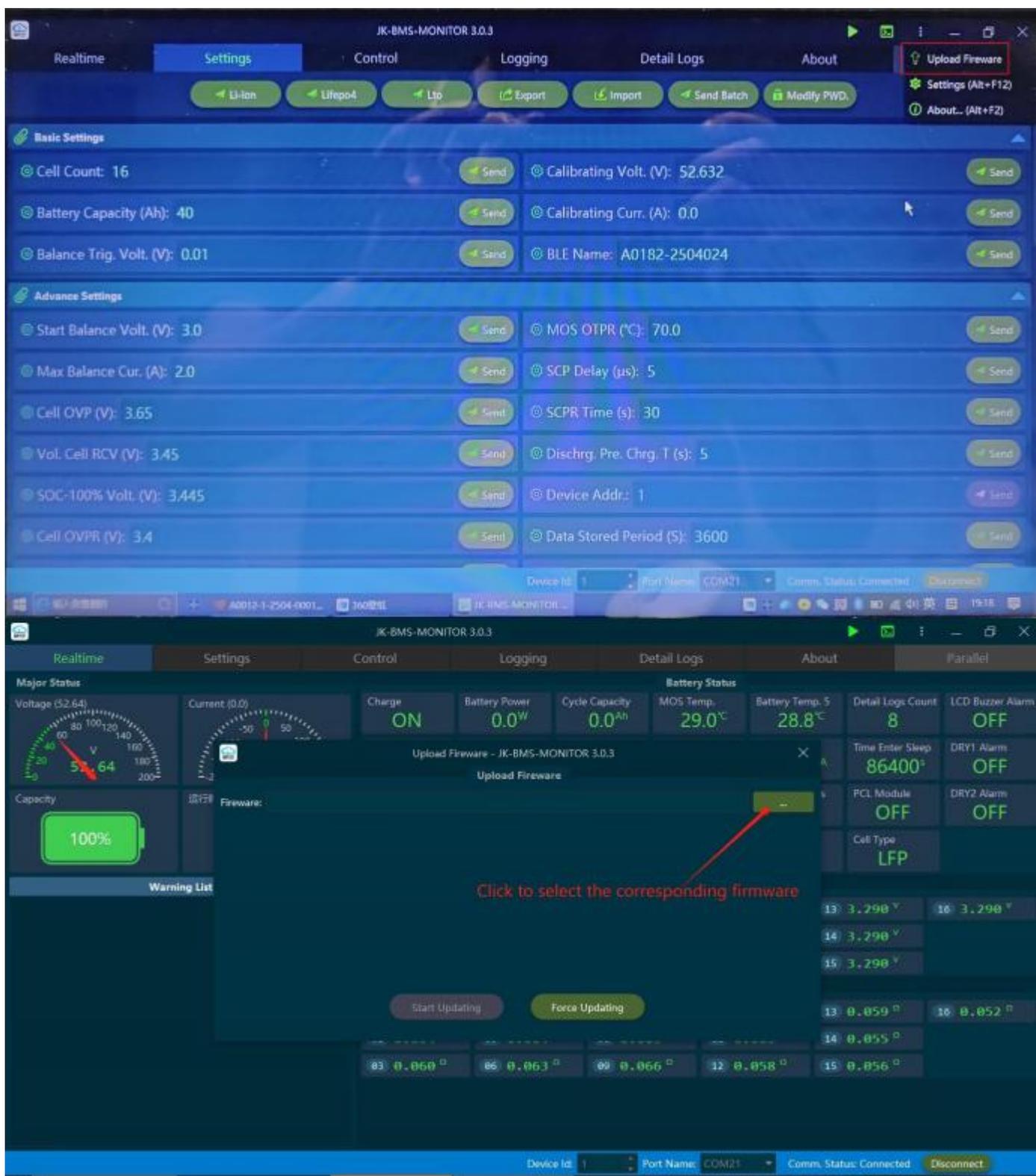
(6) 关于 BMS 页面，展示产品的基本信息：型号、硬件版本、软件版本、上电时间等信息。

(6) Regarding the BMS page, display basic product information such as model, hardware version, software version, and power on time.



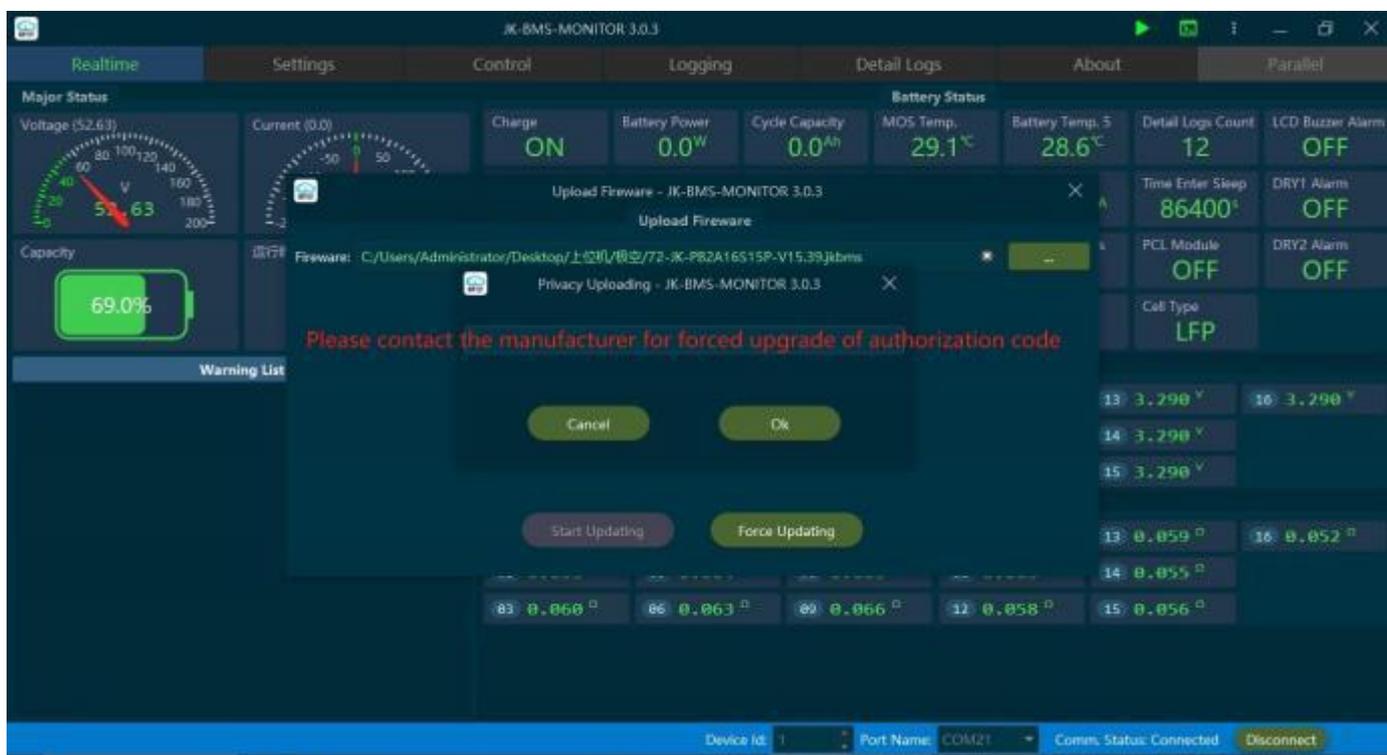
(7) 固件升级功能，点击上位机右上角图标，点击“升级固件”，选择对应的固件即可正常升级，进度条结束则表示此次升级完成。

(7) Firmware upgrade function, click on the icon in the upper right corner of the upper computer , click "Upgrade Firmware", select the corresponding firmware to upgrade normally, and the progress bar ends to indicate that the upgrade is completed.



(8) 强制升级功能，当设备变成砖后以及需要强制修改固件的情况下，可使用强制升级功能。选择强制升级的固件，点击强制升级，填入保护板原厂提供升级授权码，点击确定。再按下储能系统上 RST 复位按键，等待升级即可。

(8) The forced upgrade function can be used when the device becomes a brick or when firmware modification is required. Select the firmware to be forcibly upgraded, click on Force Upgrade, fill in the upgrade authorization code provided by the protection board manufacturer, and click OK. Press the RST reset button on the energy storage system again and wait for the upgrade.



3.8 故障排除(Troubleshooting)

- (1) 检查模块、电脑、储能系统之间连线是否正确。
- (1) Check if the connections between the module, computer, and energy storage system are correct.
- (2) 检查 USB 转 RS485 驱动程序是否安装。
- (2) Check if the USB to RS485 driver is installed.
- (3) 通过手机 APP 检查保护板设置，保护板地址以及通信协议选择是否正确。
- (3) Check the protective board settings, address, and communication protocol selection through the mobile app to ensure they are correct.

3.9 并机功能使用说明(Instructions for using the parallel function)

并机功能是指多台储能系列保护板通过RS485总线的方式来实现上位机同时监控多台BMS信息，所以使用并机功能需要准备的工具有：USB转RS485串口线、极空上位机。

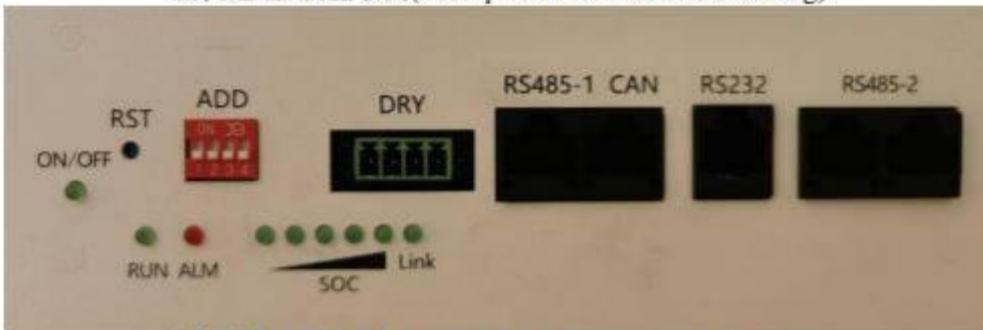
The parallel function refers to the use of multiple energy storage series protection boards to achieve simultaneous monitoring of multiple BMS information by the upper computer through the RS485 bus. Therefore, the tools required to use the parallel function include USB to RS485 serial port cable and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

并机功能最大支持16台BMS，由此需要给各个BMS设置地址，地址从0→15共计16台，地址为0的

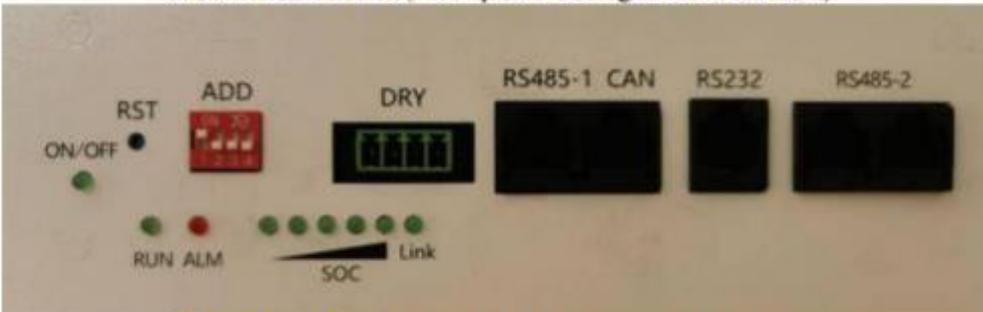
BMS为主机，1→15为从机，上位机与主机之间通过USB转RS485串口线连接，BMS地址通过拨码开关来设置，具体设置方法见5.2-拨码开关设置。

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

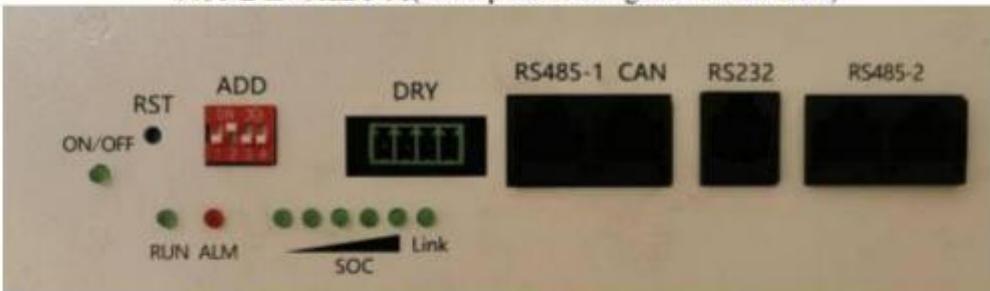
主机地址0设置示例(Example of Host Address 0 Setting)



从机地址1设置示例(Example of Setting Slave Address 1)



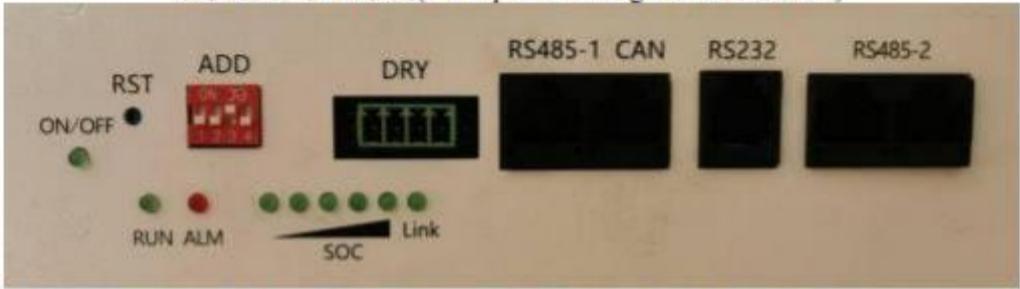
从机地址2设置示例(Example of Setting Slave Address 2)



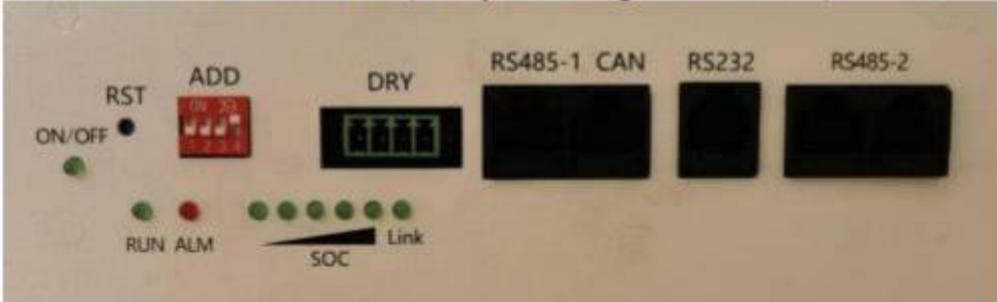
从机地址3设置示例(Example of Setting Slave Address 3)



从机地址4设置示例(Example of Setting Slave Address 4)



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

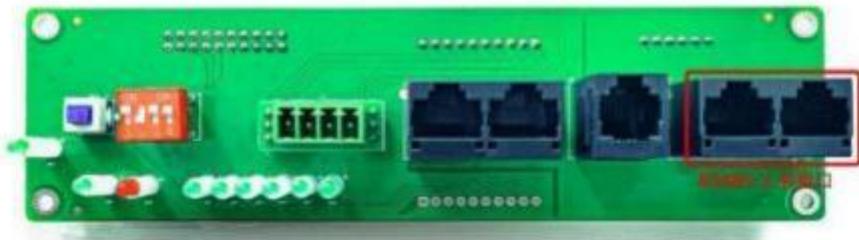


上位机与BMS主机之间的RS485-2通过USB转RS485串口线连接，然后BMS的RS485-2之间相互使用RJ45插头的网线连接（RS485-2有两个RJ45插座，主机一个插座插入串口线连接到上位机，另一个通过网线与从机连接，从机之间的RS485-2通信接口依次通过网线连接），具体操作示意图如下：

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

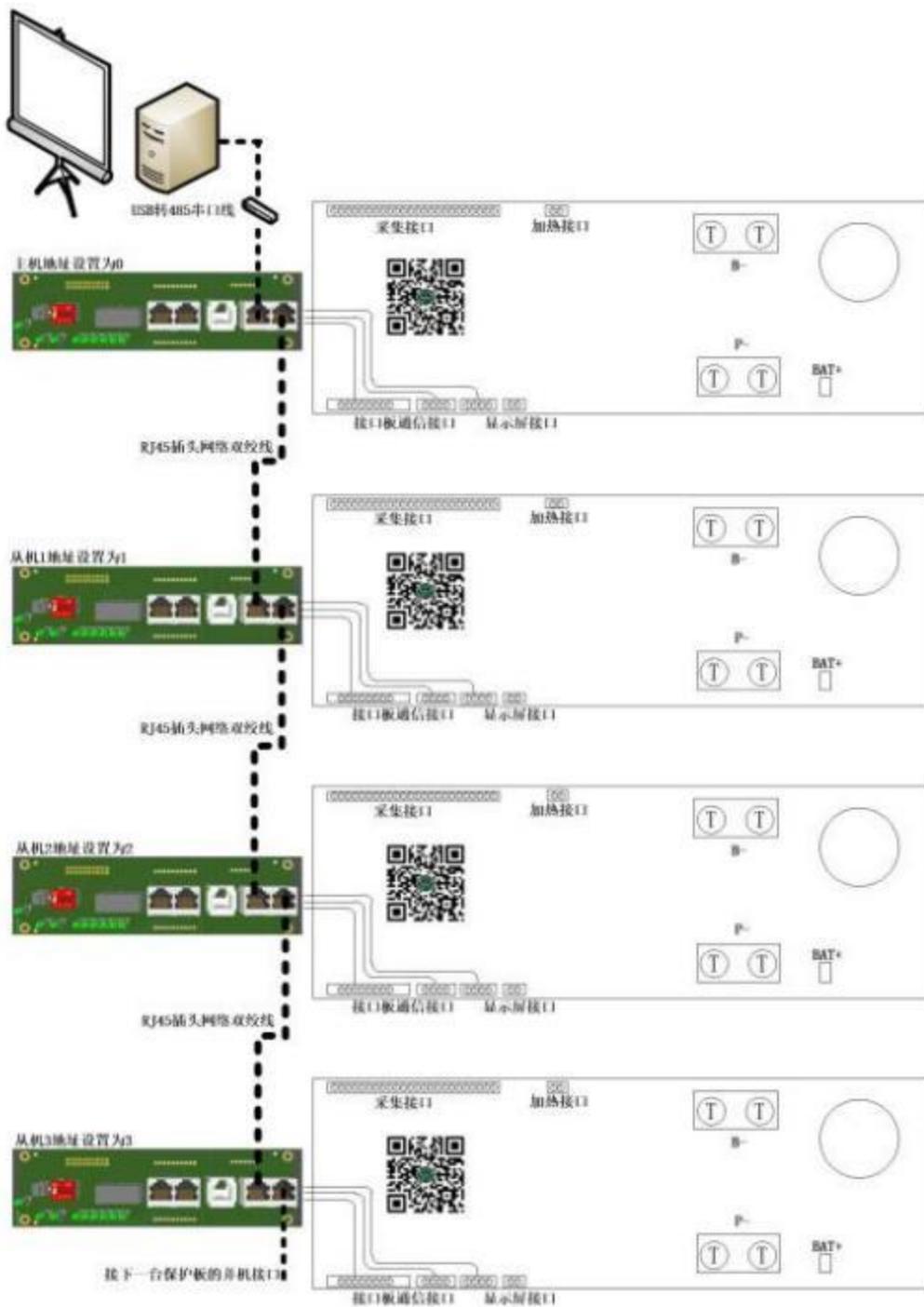


USB转RS485连接线 (RJ45接口)



极空储能系列保护板并机监控示意图

Protection board and parallel monitoring schematic diagram of the Extreme Sky Energy Storage Series BMS



通信线连接正确后，打开极空上位机，选择对应的串口，点击连接即可

Protection board and parallel monitoring schematic diagram of the Extreme Sky Energy Storage Series

3-10. APP安装 (APP installation)

通过扫描下图所示的二维码可以获取与产品配套的手机APP

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



手机APP 链接二维码

Mobile APP link QR code

1 下载APP Download the APP.

iOS APP 下载 iOS APP download:

<https://apps.apple.com/cn/app/%E6%9E%81%E7%A9%BAbms/id142572569>



Jikong BMS 4+

Battery balancing management system software

Pengzhang

Designed specifically for iPhone

★★★★★ 3.4 • 67 ratings

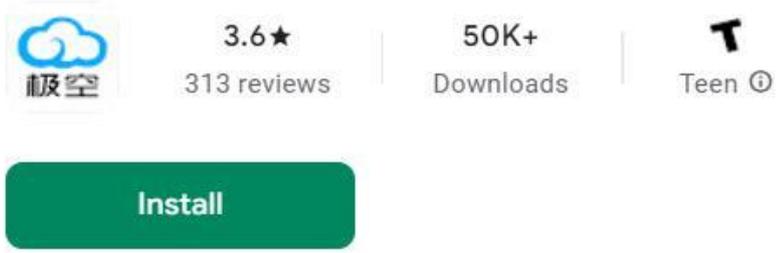
free

Android APP下载 Android APP
https://play.google.com/store/apps/details?id=com.jktech.bms&hl=en_US&gl=US

JK BMS

JK-BMS

"JK BMS" APP is a management software for active balance series products.



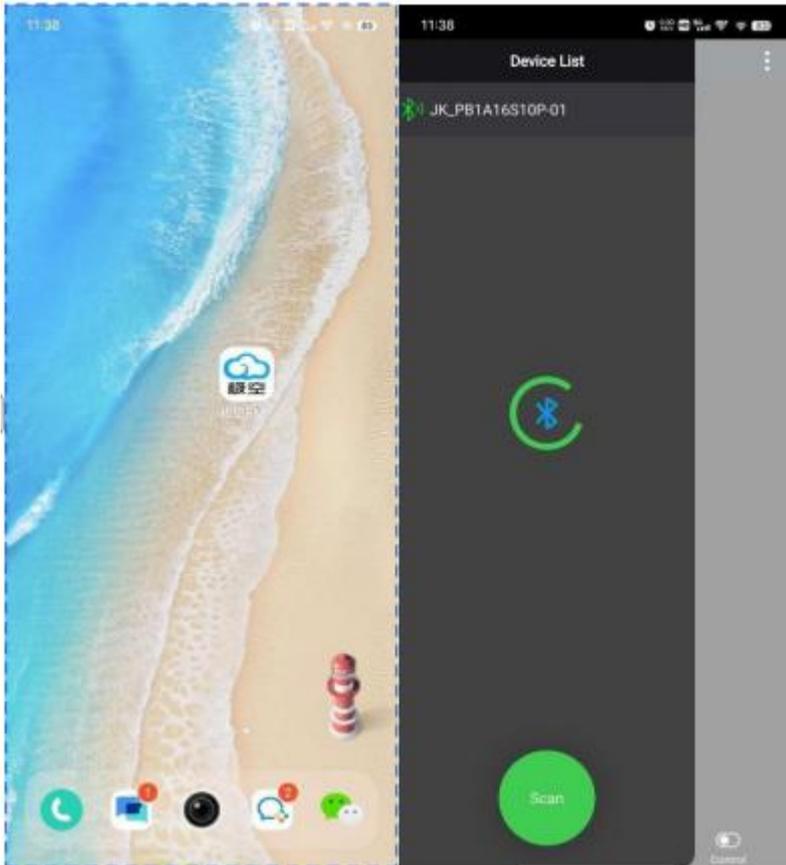
极空 3.6★ 313 reviews 50K+ Downloads Teen ⓘ

Install

2 连接APP ConnecttheAPP.

DownloadtheAPPonmobileasinstructedandopentoconnect.

按照指示在手机上下载APP并打开以连接

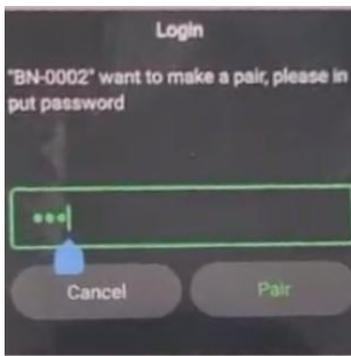


P. S.蓝牙ID可以按照客户指示进行更正

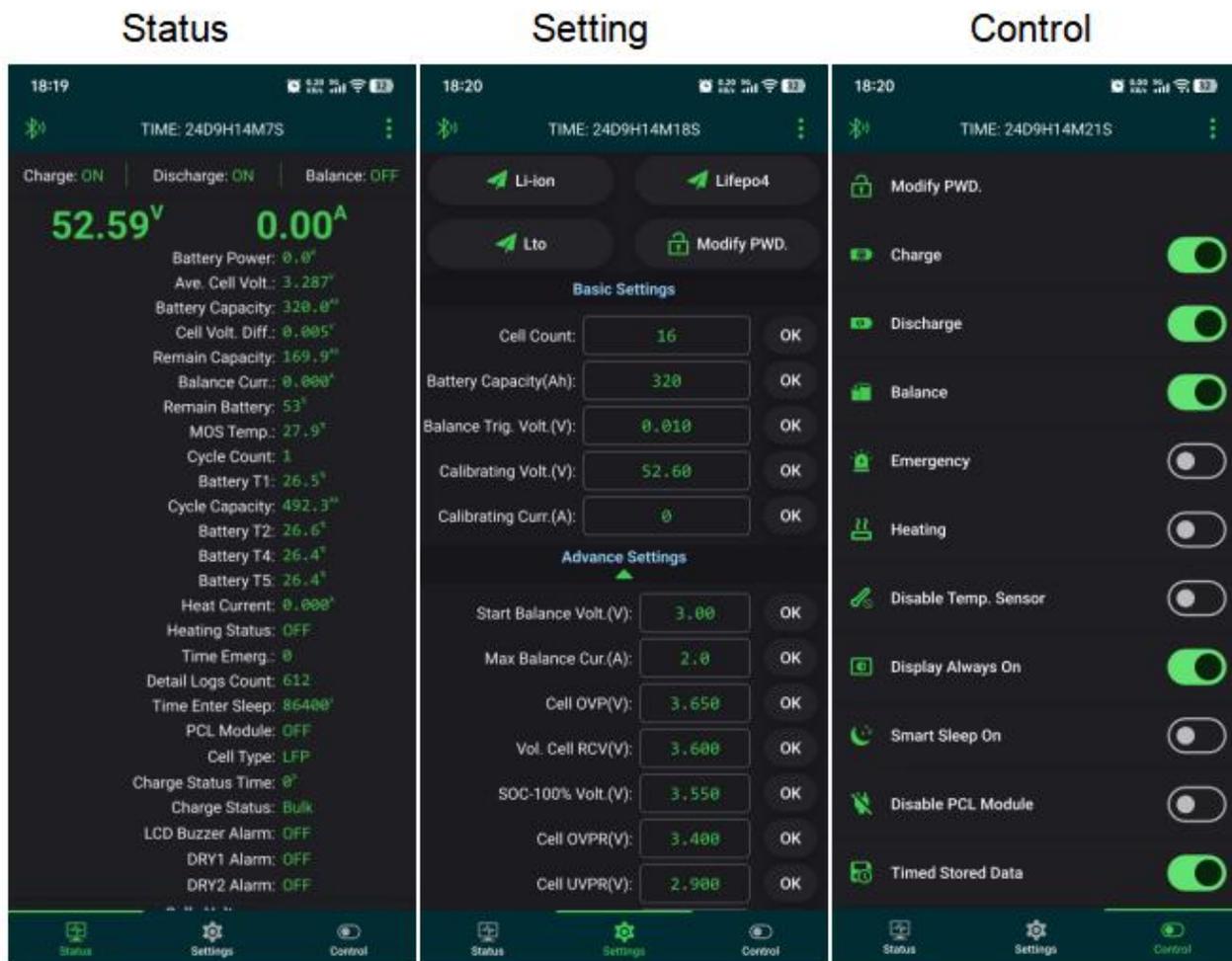
P.S. Bluetooth ID can be corrected according to customer instructions

2.2 输入用户密码1234，以访问电池应用。

Enter the user password 1234 to have access to the battery app.



3 APP界面概述 Overview of the APP interface

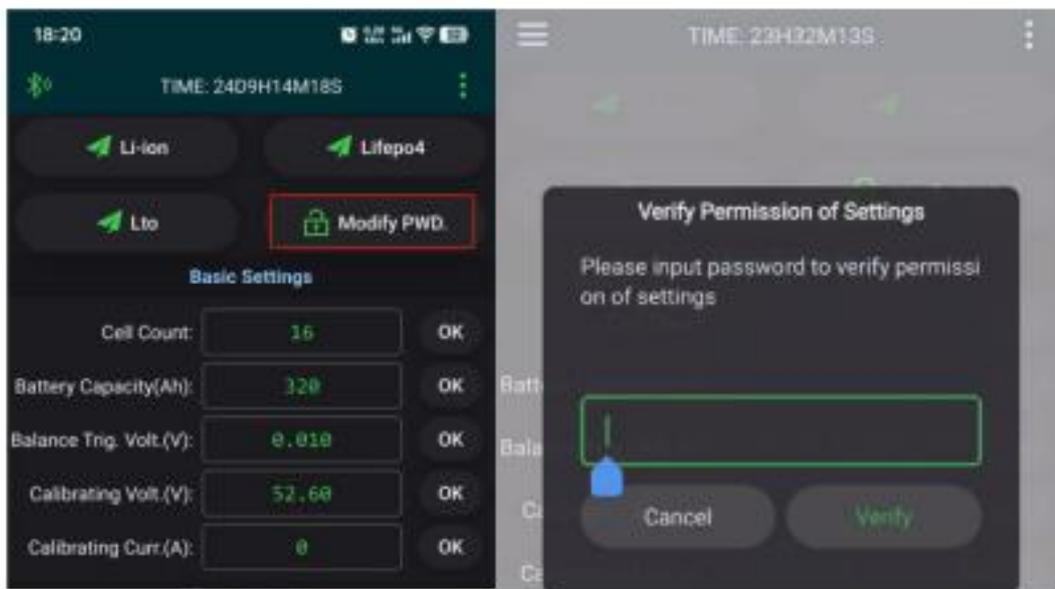


备注：默认密码 “888888 P.S.Default password “888888” ..

4-修改设置 Modification Setting

您可以在设置界面的参数中进行修改。点击验证密码。输入888888。

You can modify the parameters in the interface of Settings. Click Verify PWD. Enter admin or 888888.



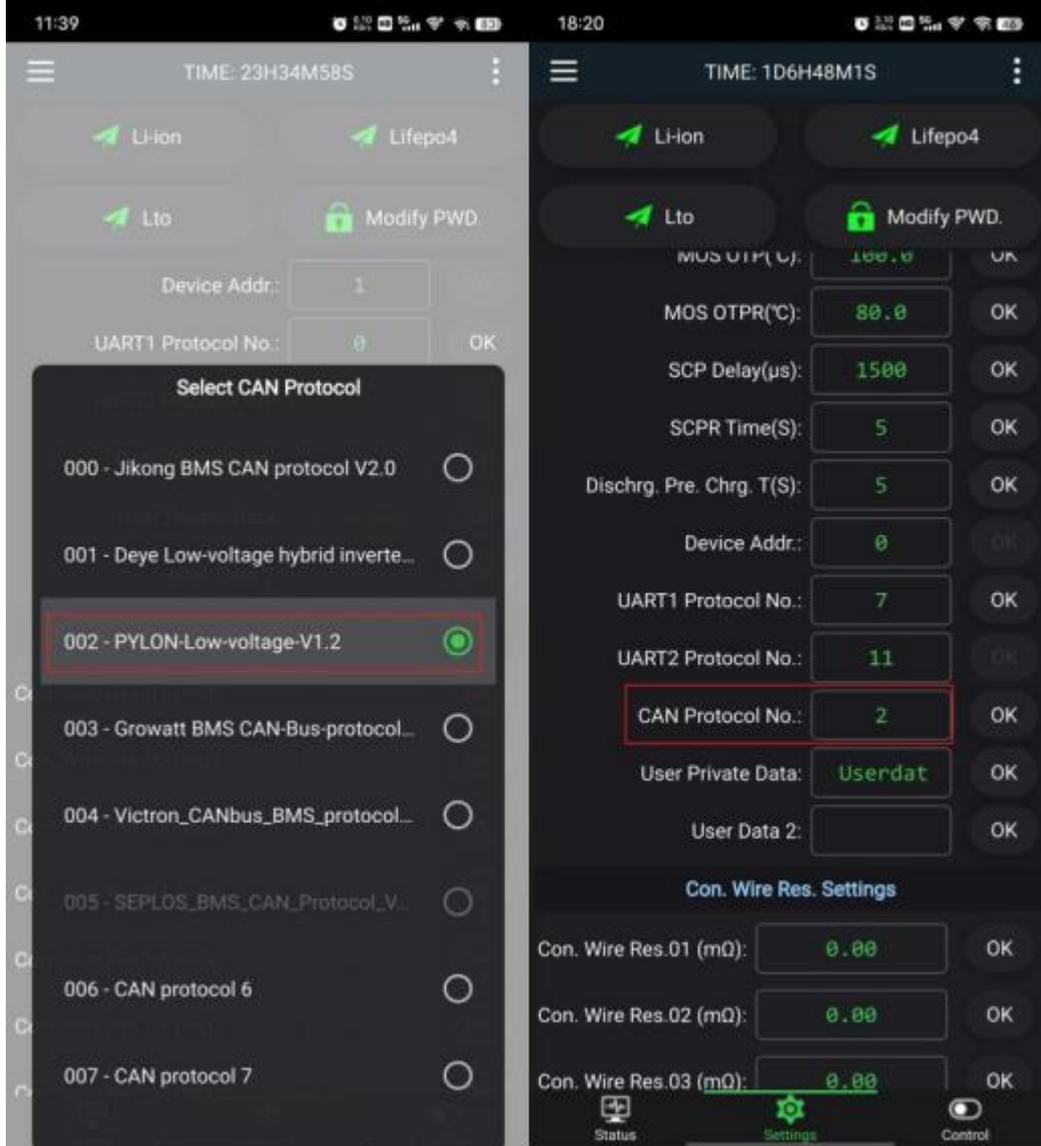
4.1 如何修改通信协议以适应您的逆变器类型。

How to modify the communication protocol to your inverter type.

我们的默认协议是CAN协议：“004-Victron_CANbus_BMS_协议...”

Our default protocol is CAN protocol：“004-Victron_CANbus_BMS_Protocol...”

如果你的逆变器是Growatt，你可以选择“003 -Growatt BMS CAN总线协议...”，然后点击确定。If your inverter is Growatt, you can select “003 -Growatt BMS CAN-Bus-protocol...” and then click OK.



4.2如何修改为正确的容量。您可以输入320到电池容量（安时）并点击确定。
66/2000

How to modify to the correct capacity. You can enter 320 to the battery capacity (amp hours) and click OK.



Li-ion

Lifepo4

Lto

Modify PWD.

Basic Settings

Cell Count: 16 OK

Battery Capacity(Ah): 320 OK

Balance Trig. Volt.(V): 0.010 OK

Calibrating Volt.(V): 52.60 OK

Calibrating Curr.(A): 0 OK

Advance Settings

Start Balance Volt.(V): 3.00 OK

Max Balance Cur.(A): 2.0 OK

Cell OVP(V): 3.650 OK

Vol. Cell RCV(V): 3.600 OK

SOC-100% Volt.(V): 3.550 OK

Cell OVPR(V): 3.400 OK

Cell UVPR(V): 2.900 OK

3.11 Definition of indicator lights

LED 指示灯定义

LED说明(LED description)

状态 (status)	正常/告警/保护 (Normal, alarm, or Protection)	ON/OFF F指示	RUN	ALM	L1	L2	L3	L4	L5	L6	说明 (Instructions)
关机 (Power Off)	正常(normal)	OFF									
Balance	正常(normal)	ON	闪烁 (flicker)	OFF	依据电量显示(Battery based display)					OFF	
充电 (charging)	正常(normal)	ON	闪烁 (flicker)	OFF	依据电量显示(Battery based display)					OFF	
	过流\过温\过压 \充电失败(Over current, over temperature, over voltage, charging failure)	ON	闪烁 (flicker)	闪烁 (flicker)	依据电量显示(Battery based display)					OFF	
放电 (discharge)	正常(normal)	ON	闪烁 (flicker)	OFF	依据电量显示(Battery based display)					OFF	
	过流\过温\欠压 \放电失败(Over current, over temperature, under voltage, discharge failure)	ON	闪烁 (flicker)	闪烁 (flicker)	依据电量显示(Battery based display)					OFF	
其他告警 (Other alarm)	密码未修改\短路\温度异常 (Password not changed \short circuit \ temperature	ON	闪烁 (flicker)	闪烁 (flicker)	依据电量显示(Battery based display)					OFF	

abnormal)											
备注：当设备地址设置为0时做主机，最后一颗LED灯 L6闪烁。当设为其他值时做从机熄灭，从机和主机通信成功后闪烁											
Note: When the device address is set to 0, the last LED indicator L6 blinks. If the value is set to other values, the slave is off and blinks after the communication between the slave and the host is successful.											
备注：ON代表LED状态为亮，OFF代表LED状态为熄灭。											
Note: ON indicates that the LED is on, OFF indicates that the LED is off.											

电量LED说明 (Power LED Description)

状态(status)		充电(charging)					放电(discharge)				
容量指示灯(capacity indicator light)		L5	L4	L3	L2	L1	L5	L4	L3	L2	L1
电量(Electric quantity)%	0~20%	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON
	20~40%	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	ON	ON
	40~60%	OFF	OFF	ON	ON	ON	OFF	OFF	ON	ON	ON
	60~80%	OFF	ON	ON	ON	ON	OFF	ON	ON	ON	ON
	80~100%	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON

备注：ON代表LED状态为亮，OFF代表LED状态为熄灭
 Note: ON indicates that the LED is on, OFF indicates that the LED is off

3-12 显示屏说明 (Display instructions)

一、显示屏外观 Appearance of the display screen



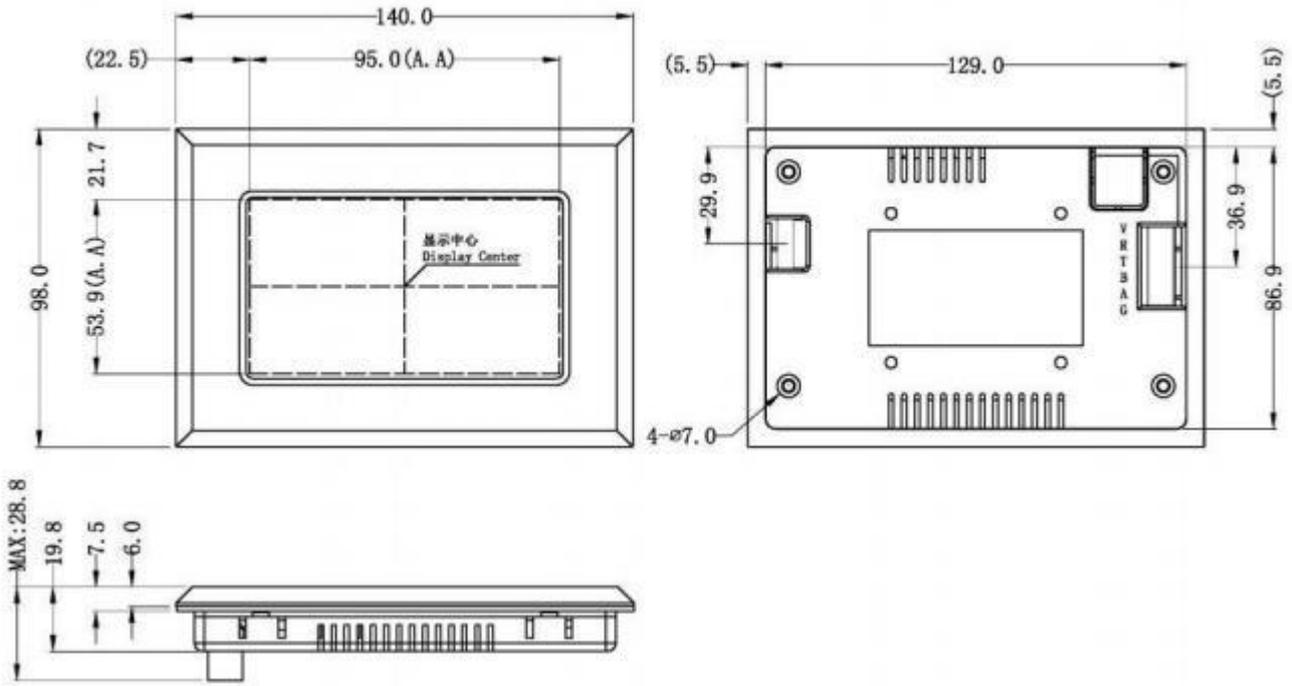
二、规格参数 Specifications and parameters

参数 parameter	数据 Data
显示屏类别 Display category	TFT
尺寸/分辨率 Size/resolution	95.0mm (W) × 53.9mm (H) / 480*272
显示色彩 Display color	65K 真彩色 65K true color
背光类型/亮度 Backlight type/brightness	LED/300nit/m2
可视角度 L/R/U/D Viewing angle L/R/U/D	70° /70° /50° /70°
工作温度/存储温度 Operating temperature / storage temperature	-20~+70°C / -30~+85°C
SD 卡接口 SD card interface	SD/SDHC

三、供电电源 Power supply

参数 parameter	最小值 Minimum	最大值 Maximum
供电电压 (带电源反接保护) Supply voltage (with reverse polarity protection)	6V	36V
功耗 Consumption power	1.4W (12V@116mA)	

四、LED尺寸图 LED size chart



五、画面介绍 Picture introduction

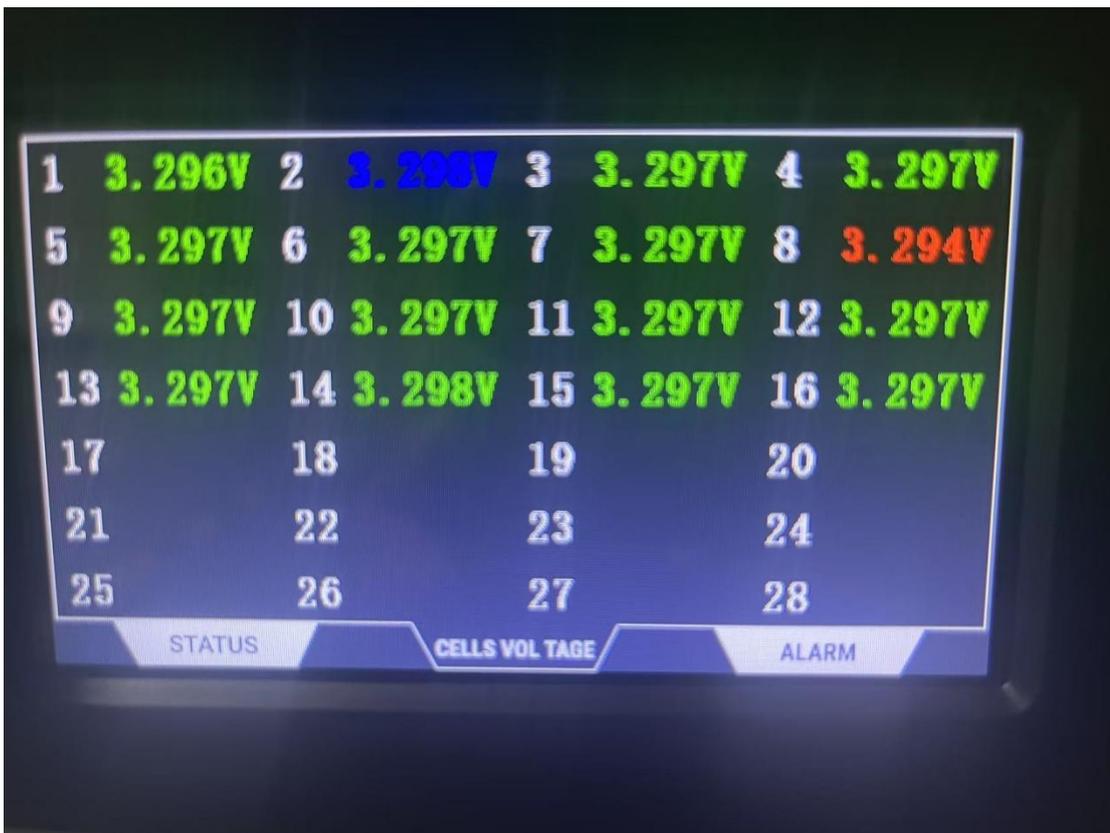


1. 开机画面可看到实时状态，可看到压差、MOS温度、电池温度、故障异常、平均电压、主动均衡状态、充电状态、放电状态等信息

The startup screen shows real-time status, including pressure difference, MOS temperature, battery temperature, fault anomalies, average voltage, active balancing status, charging status, discharging status, etc.

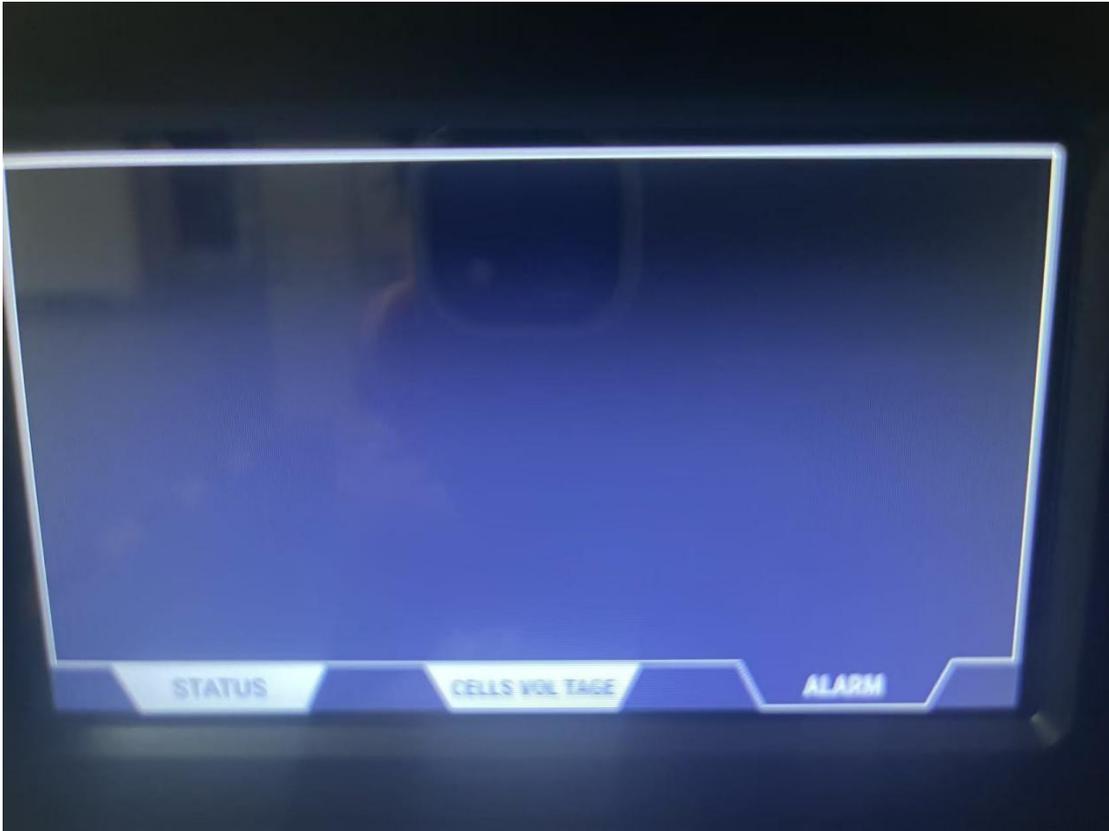
2. 支持四国语言切换 (中、英、泰、越)

Support four languages switching (Chinese, English, Thai, Vietnamese)



点击单体电压可以看见每节电芯的电压

Click on the single cell voltage to see the voltage of each cell



点击故障可看到故障异常原因

Click on fault to see the cause of fault abnormality

3.13 Active equalization 主动均衡

保护板采用主动均衡技术，均衡的原理是将高电压的电芯能量转移到低电压的电芯中，通过保护板这一媒介实现能量转移。用户在使用均衡功能之前需要设置电池基本参数，需要下载极空BMS-APP，下载之后在极空APP中参数设置页面设置电池类型，默认参数见第四章。设置完成电池类型后在常用设置中设置电池基本参数，包括单体数量、电池容量、触发均衡压差(可保持默认)、电压校准、电流校准等。

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

用户可在APP的参数设置中自行设置均衡触发压差(mV)，均衡打开时，当电池包中任意两串电池压差大于设定值时均衡自动打开，压差小于设置值后关闭。默认均衡电流为最大值1A/2A，用户可根据自己电池容量来调整，建议均衡电流不超过电池容量(C)的0.2C。如无需均衡功能，可在APP的BMS控制页中将均衡开关设置为关闭状态。

Users can set the balance trigger pressure difference (mV) in the parameter setting of the APP. When the balance is turned on, the balance will be turned on automatically when the pressure difference of any two strings of batteries in the battery pack is greater than the set value, and the balance will be turned off when the pressure difference is less than the set value. The default balance current is 1A/2A. Users can adjust the balance current according to their own battery capacity. It is recommended that the balance current not

exceed 0.2C of the battery capacity (C). If you do not need the balancing function, you can set the balancing switch to off in the BMS control page of the APP

5.0 Safety Precaution 安全预防措施

5.1 When Using battery 使用电池时



Danger of High Voltage 高压危险

The high voltage power supply offer the equipment power, wet object contact high voltage power supply directly or indirectly , can cause fatal danger.

高压电源直接或间接为设备供电，湿物接触高压电源，会造成致命危险。



Using a special tool 使用专用工具

Working in high voltage and ac power, be sure to use a special tool instead of individual tools. 在高压和交流电源下工作，一定要使用专用工具而不是单独的工具。



Static - free 无静电

Static electricity would damage veneer on the electrostatic sensitive components, before touching the plug - in, circuit board or chips, be sure to use correct electrostatic prevention measures.

静电会损坏静电敏感部件上的贴面，在接触插头、电路板或芯片之前，请务必使用正确的静电防护措施。



Disconnect the power supply in operation 断开运行电源

When operate the power supply, you must first cut off power supply, power operation is prohibited. 操作电源时，必须先切断电源，严禁带电操作。



Dc short circuit dangerous 直流短路危险

Power system provides dc regulated power supply. Dc short circuit could cause fatal damage to the equipment.

电力系统提供直流稳压电源。直流短路会对设备造成致命的损坏

5.2 While Charging 电池充电时

CAUTION 注意

The temperature range over which the battery can be charged is 0°C to 45°C. Charging the battery at temperatures outside of this range may cause the battery to become hot or to break. Charging the battery outside of this temperature range may also harm the performance of the battery or reduce the battery's life expectancy.

可对蓄电池充电的温度范围为0°C至45°C。在此温度范围之外对蓄电池充电可能会导致蓄电池发热或断裂。在该温度范围之外对蓄电池充电也可能会损害蓄电池的性能或降低蓄电池的预期寿命。

5.3 When Discharging the Battery 电池放电时

DANGER 危险

Do not discharge the battery using any device except for the specified device. When the battery is used in devices aside from the specified device it may damage the performance of the battery or reduce its life expectancy, and if the device causes an abnormal current to flow, it may cause the battery to become hot and cause serious injury.

不要使用指定设备以外的任何设备放电。当电池用于指定设备以外的设备时，可能会损坏电池的性能或降低电池的预期寿命，如果设备导致异常电流流动，可能会导致电池发热并造成严重伤害

CAUTION 注意

The temperature range over which the battery can be discharged is -20°C to 60°C. Use of the battery outside of this temperature range may damage the performance of the battery or may reduce its life expectancy.

电池可放电的温度范围为-20°C至60°C。在此温度范围之外使用电池可能会损坏电池的性能或降低电池的预期寿命。

5.4 Safety Gear 安全防护装备

			
Insulated gloves 绝缘手套	Safety goggles 安全护目镜	Safety shoes 安全鞋	Safety Helmet 安全头盔

6.0 Troubleshooting故障排除

If the battery does not operate correctly, please solve the problem by using the table below.

如果电池不能正常工作，请使用下表解决问题

Symptom症状	Possible cause可能原因	Remedy处理方法
No indication and alarm in the front display panel前显示面板无指示和报警	Sleeping mode 休眠模式	Press Reset to normal mode 按RST键到正常模式
No indication and alarm in the front display panel even Reset still no reaction 前显示面板无指示和报警，即使复位仍无反应	Battery voltage too low 电池电压过低	Charge battery immediately 立即给电池充电
Red LED Flashing when Standby 待机时红色运行灯闪烁	Battery cell low voltage 电池单节电压低	Charge battery immediately 立即给电池充电
Red LED Flashing when charging 充电时红色运行灯闪烁	Alarm for protection when charging 充电报警	BMS show alarm, protect and adjustment BMS显示警报、保护和调整
Red LED Flashing when Discharging 放电时红色运行灯闪烁	Battery voltage too low and will shutdown 电池低电压告警即将保护	Charge battery immediately 立即给电池充电
RED LED Lighting continuous 红色运行灯一直常亮	Battery wrong 电池错误	Need to repair 需要维修

7.0 Storage and Maintenance 储存和维护

7-1. Storage 存储

Before storing, charge the battery at least 7 hours. Store the Battery covered and upright in a cool, dry location. Recommend long-term storage temperature is 15 °C -25 °C . During storage, recharge the battery in accordance with the following table 储存前，请至少给电池充电7小时。将电池盖好直立存放在阴凉干燥的地方。建议长期储存温度为15 °C-25 °C。在存放期间，请按照下表对电池重新充电：

Storage Temperature	Recharge Frequency	Charging Duration
0°C - 40°C	Every 3 months	1-2 hours

7-2. Maintenance 维护

 The battery system operates with hazardous voltages. Repairs may be carried out only by qualified maintenance personnel. 电池系统在危险电压下工作。维修只能由合格的维修人员进行。

 Even after the unit is disconnected from the mains, components inside are still connected to the battery cells which are potentially dangerous 即使在装置与电源断开连接后，内部部件仍与可能存在危险的电池连接。

 Before carrying out any kind of service and/or maintenance, disconnect the batteries and verify that no current is present and no hazardous voltage exists in the terminals. 在进行任何类型的维修和/或维护之前，断开电池并确认端子中没有电流和危险电压。

 Only major persons are adequately familiar with batteries and with the required precautionary measures may replace batteries and supervise operations. Unauthorized persons must be kept well away from the batteries. 只有专业人员才能充分熟悉电池和所需的预防措施，可更换电池并监督操作，未经授权的人员必须远离电池。

 Verify that no voltage between the battery terminals and the ground is present before maintenance or repair. In this product, the battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground. 确认电池端子和接地之间没有电压，然后维护或修理。在本产品中，电池电路不与输入电压隔离。电池端子和接地之间可能会产生危险电压。

 Batteries may cause electric shock and have a high short-circuit current. Please remove all wristwatches, rings and other metal personal objects before maintenance or repair, and only use tools with insulated grips and handles for maintaining or repairing. 电池可能会导致触电并产生高短路电流。在维护或修理前请全部取掉手表、戒指和其他金属个人物品，只能使用带绝缘握把和手柄的工具进行维护或修理。

 When replace the batteries, install the same number and same type of batteries. 更换电池时，请安装相同数量和类型的电池



When replace the parallel batteries, make sure the new battery is full charged. 更换并联电池时，确保新电池充满电



Do not open or destroy batteries. Escaping electrolyte can cause injury to the skin and eyes. 不要打开或损坏电池。电解液溢出会对皮肤和眼睛造成伤害

8.Product Responsibilities and Consulting 产品责任和咨询

- 1) We will not be liable for the accidents resulting from operation breaking this specification and user manual.我们对因操作违反本规范和用户手册而导致事故不承担责任.
- 2) We will not send separate notice, provided that the contents of this specification are changed due to improvement of product quality or technological upgrading; provided that you want to understand the latest information of this product, please contact us

本说明书内容如因产品质量的提高或技术的升级而发生变化，恕不另行通知；如您想了解本产品的最新信息，请与我们联系。

- 3) The shelf life of this product is within 60 months after it is delivered; we will maintain the product, which is in the warranty period for free of charge, provided that it has any product quality problems within the specified operation range; we may replace the relevant parts, if we fail to maintain it, so as to achieve the purpose of sustainable use without performance

reduction; our after-sales service personnel will propose the specific maintenance and

troubleshooting methods.本产品的保质期为交货后60个月内，产品在保修期内，如有任何产品，我们将免费维修。在规定的操作范围内出现质量问题；如果我们不能维护，我们可以更换相关部件，以达到持续使用的目的而不降低性能；我们的售后服务人员将提出具体的维护和故障排除方法。

In case of any questions, please contact us: +86-13020256650

如有任何疑问，请联系我们：+86-13020256650

Appendix: 附件

Tools 工具

The following tools are required to install the battery pack

安装时请准备如下工具



electric screw driver 电动螺丝刀



Phillips screwdriver bit
十字螺丝刀批头



M10 / M12 套筒



Forklift 叉车



M8开口扳手



液压钳



钳流表 Clamp meter



剥线钳 Stripper



斜口钳 Slanting pliers



卷尺 Tape measure



美工刀 Box Cutter



钉锤 Nai_Hammer