

**Wall-Mounted  
Lithium-ion Battery Pack**  
壁挂式  
锂离子电池组系统

**User Manual**  
用户手册

**51.2V200Ah- 10.24KWh**

**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	51.2V200AH
Nominal voltage 标称电压	51.2V
Rated capacity 额定容量	200AH
Rated reserved energy 额定瓦时	10.24KWH
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 of charging monomer 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	100A
Cut-off voltage of discharging 放电截止电压	43.2V
Charging temperature range 充电温度范围	0°C ~ 45°C
Discharging temperature range 放电温度范围	-20°C ~ 60°C
Single module Size(W×L×H) 单模组尺寸	850*520*150mm (excluding pylons) (不含挂架)
Weight 1PCS重量	Single module 单模组约100kg±5%

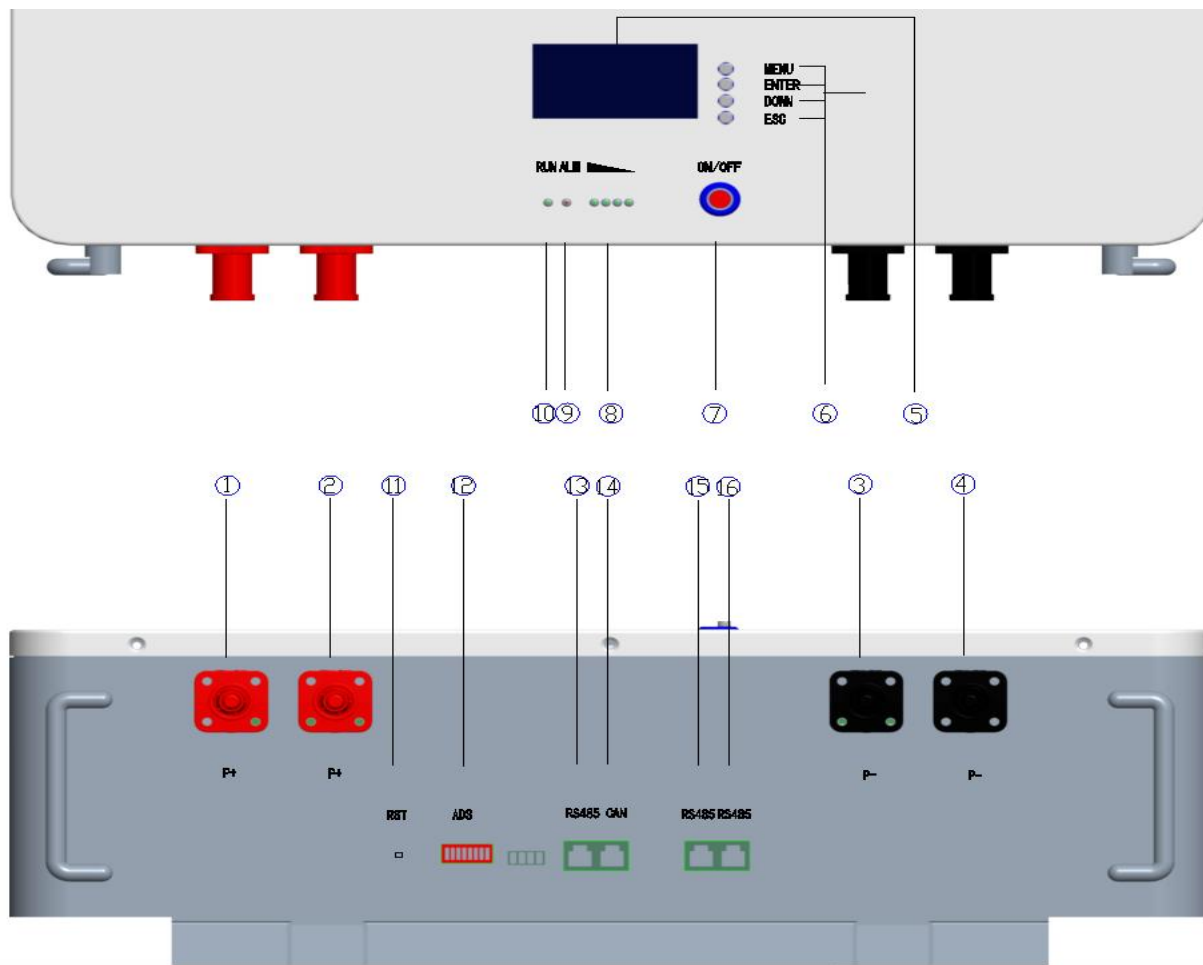
## 1-2 Technical Parameters of Battery Management System (BMS)

### 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	3.65V
	Overcharge detection delay time 过充保护延迟时间	Typical:1.0s
	Overcharge release voltage 过充释放电压	3.40V
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	2.90±V 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	110A
	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	120A
	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	110A
Short protection 短路保护	Short protection current 短路保护电流	412A
	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	55±5℃
	Charge high T recover 充电高温恢复	50±5℃
	Discharge high T protection 放电高温保护	60±5℃
	Discharge high T recover 放电高温恢复	60±5℃
	Charge low T protection 充电低温保护	-5±5℃
	Charge low T recover 充电低温恢复	0±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.	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 + 电池正极	P+/P+	Positive terminal 电池正极
3	Battery - 电池负极	P-/P-	Negative terminal 电池负极
4	Battery - 电池负极	P-/P-	Negative terminal 电池负极
5	LCD		Display screen 显示屏
6	LCD KEY		液晶显示键
7	Output ON/OFF	OFF/ON	Switch breaker
8	Electricity volume indicator	LED	Display the battery's capacity 容量显示灯
9	ALM alarm indicator light blinking	ALM	Red- trouble-light on 警示灯
10	Run indicator light	RUN	Display state information 显示状态信息
11	On/OFF button	RST	Reset key 重置键
12	ADS Dialer	ADS	Display connection address 显示连接地址
13	RS485A port	RS485A	RS-485 connection port-A RS485
14	CAN port	CAN	CAN communication port

15	RS485B port	RS485B	RS-485connection port-B RS485
16	RS485B port	RS485B	RS-485connection port-B RS485

### 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

**NOTE:** Do not use the wall receptacle as the input power source for the battery, as its rated current is less than the battery's maximum input current. Otherwise the receptacle may be burned and destroyed.

注意：不要使用壁挂式插座作为电池的输入电源，因为它的额定电流小于电池的最大输入电流。否则容器可能被烧毁

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(mm2)
<50Ah	8	6
50Ah	6	16
100Ah	4	25
200Ah	1-0	50

**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

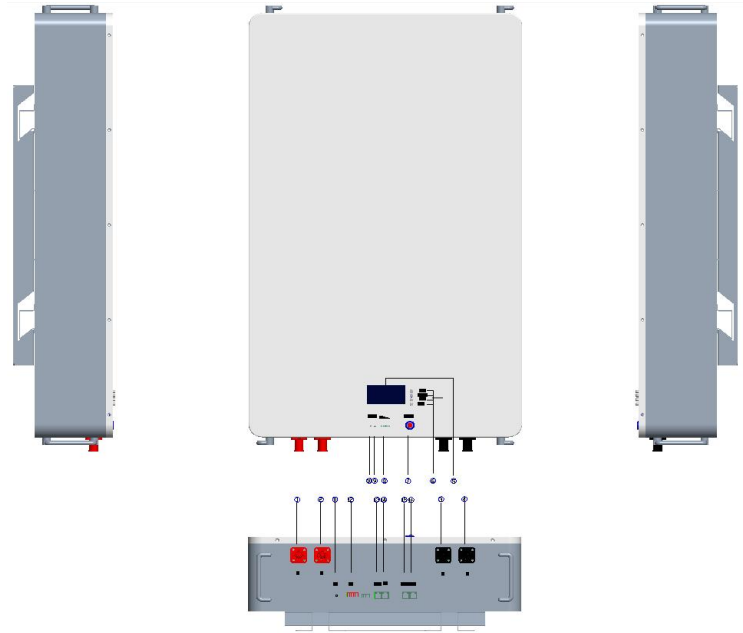
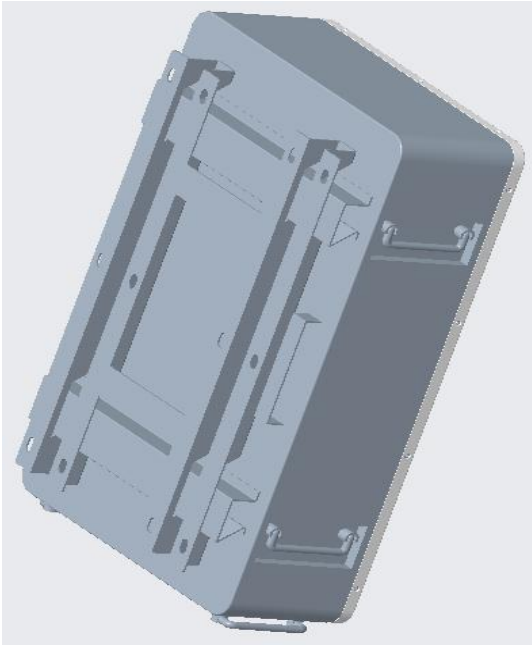
5) Put the terminal block cover back to the front panel of the battery.  
将接线板盖放回蓄电池前面板

**NOTE:** Set the battery pack breaker in "OFF" position and then install the battery pack.  
注意：将电池组断路器置于“关闭”位置，然后安装电池组



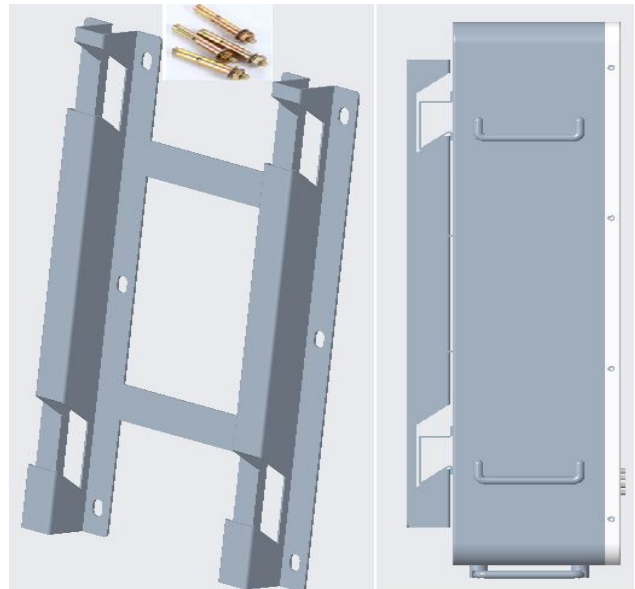
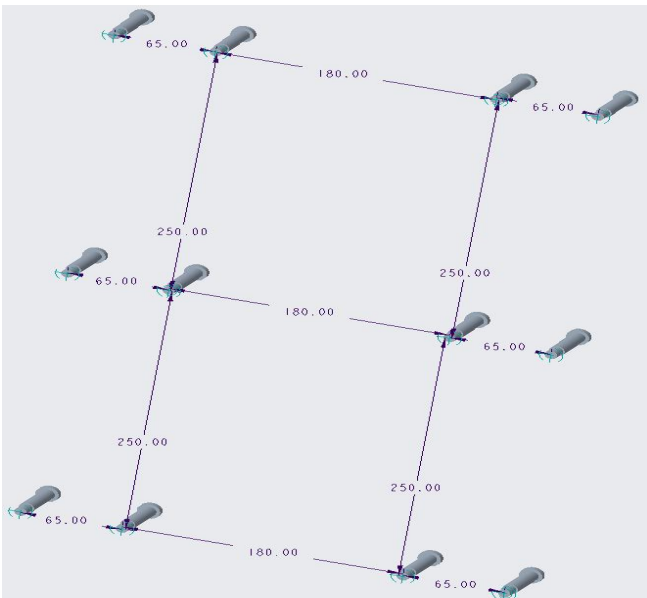


### 3-2 Wall mounted battery mount 壁挂电池安装



墙面按如下尺寸开12个孔，敲入膨胀螺丝，如下图所示  
According to the following size of the wall to open 12 holes,  
knock into the expansion screw, as shown in the following diagram

挂架用爆炸螺丝固定在墙上并拧紧螺丝，  
然后将电池机箱挂钩放到挂架对应的挂钩上即可  
The rack is fixed on the wall with the explosive screw  
and the screw is tightened, and then the battery case  
hook is put on the corresponding hook of the rack



壁挂电池安装示意图，具体情况按实际订单要求操作

Wall-mounted battery installation schematic diagram, the 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 is50V-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 undervoltage 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 25mm<sup>2</sup> copper wire.

1) 200Ah及以下电池组接入时并联，建议选用25mm<sup>2</sup>铜线。

2) When the battery pack with the capacity of 200Ah~300Ah is connected in parallel, it is suggested to select 35mm<sup>2</sup> or 50mm<sup>2</sup> copper wire.

2) 200Ah~300Ah蓄电池组并联时，建议选用35mm<sup>2</sup>或50mm<sup>2</sup>铜线。

3) When the battery pack with the capacity of 300Ah or above is connected in parallel, it is suggested to select 50mm<sup>2</sup> copper wire.

3) 容量为300Ah及以上的电池组并联时，建议选用50mm<sup>2</sup>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 pigtail 铜鼻子	Remarks
48V50Ah	16mm <sup>2</sup> /25mm <sup>2</sup>	16-8/25-8	M8 copper pigtail is used for 48V50Ah
48V100Ah	16mm <sup>2</sup> /25mm <sup>2</sup>	16-10/25-10	M10 copper pigtail is used for 48V100Ah

**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).

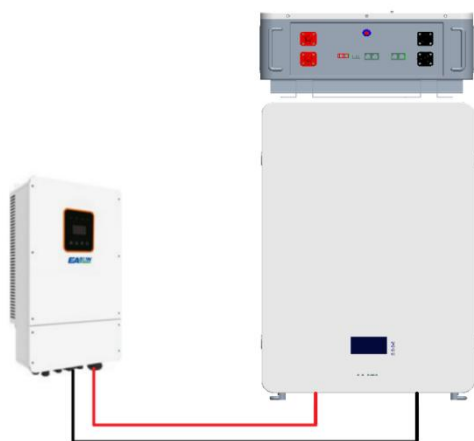
步骤5: 用RS485连接线串接电池模块的RS485通信接口; 用CAN连接线从地址为1000的电池模块的CAN接口引至监控平台的集电极; (如果需要接入遥控器, 可跳过此步骤) 监控平台)

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.

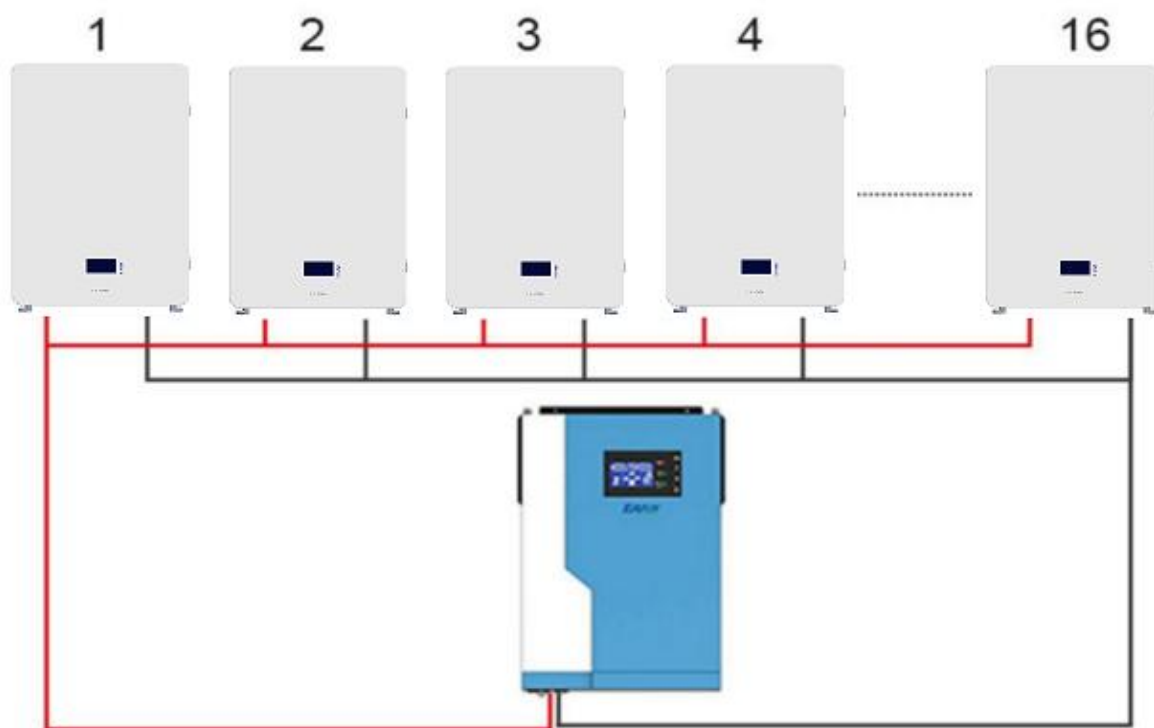
步骤6: 从电池组顶部或中部的正极和负极分别抽出两根电线, 作为电池组的并联主连接线, 与开关电源或UPS连接;

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



Parallel machine installation 并机安装

### 3-5. Connection mode for parallel communication 并行通信连接方式:

While in parallel communication, dial-up addresses of battery module are 1,2,3,4.....14,15,of which 1 stands for host computer, to which other batteries' data is uploaded; host computer conducts unified uploading, and host computer with dial-up code of 1 is required to connect with upper computer; polling mode used as consulting mode.

并行通信时，电池模块的拨号地址为1、2、3、4……14、15，其中1为主机，其它电池数据上传到主机；主机统一上传，要求拨号码为1的机与上位机连接；轮询方式作为咨询方式

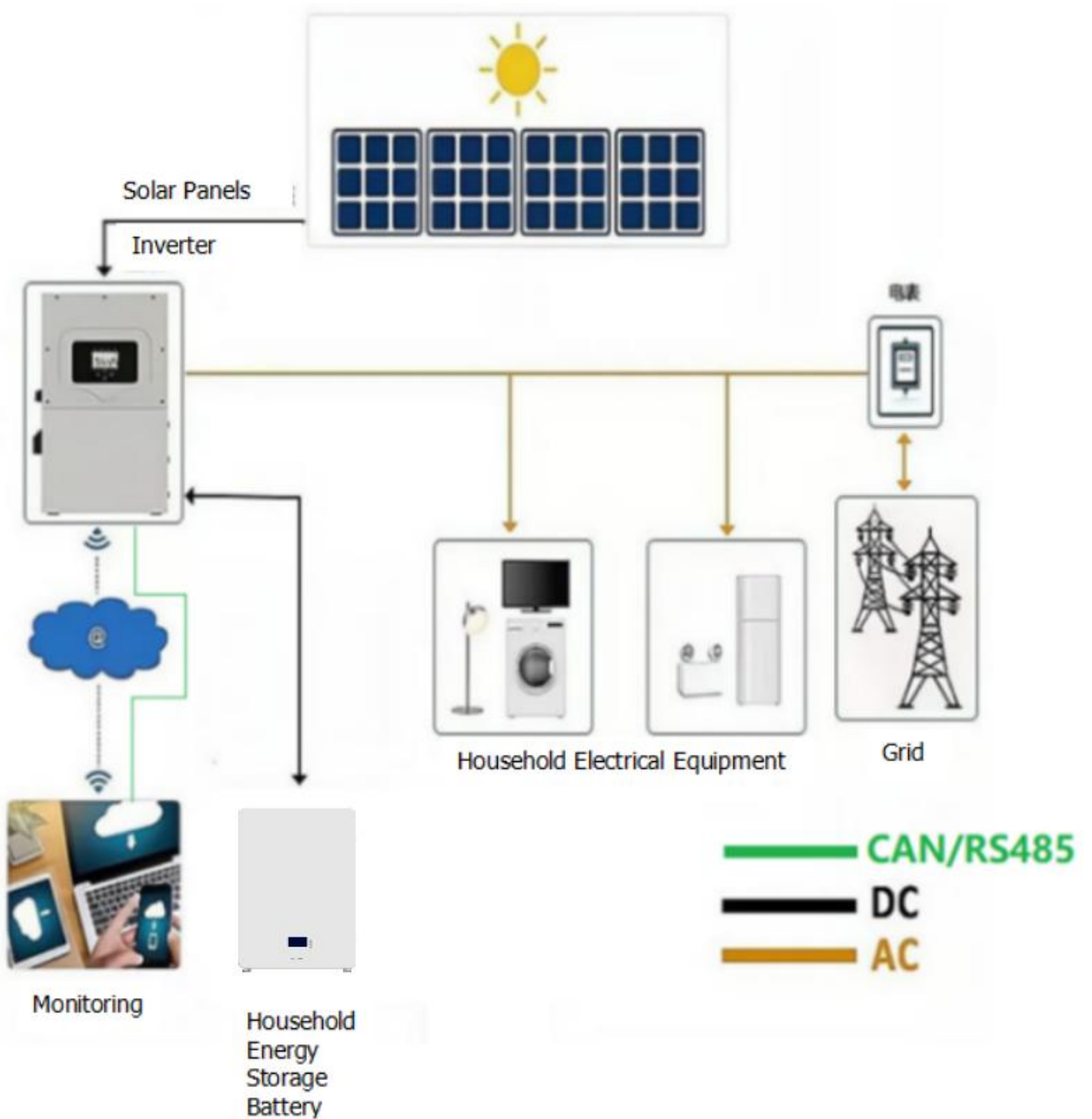
### 3-6. Reference table for parallel dial-up communication: 并机拨码通讯参照表:

Qty	Setting for parallel batteries								Tips
	Setting for dial addresses								
	#1	#2	#3	#4	#5	#6	#7	#8	
Single	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Single
Two pieces	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	First master
	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Second slave
Three pieces	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	First master
	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Second slave
	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Third Slave
***	***	***	***	***	***	***	***	***	***
***	***	***	***	***	***	***	***	***	***
16 pieces	OFF	OFF	OFF	OFF	ON	ON	ON	ON	First master
	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Second slave
	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Third Slave
	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	Fourth Slave
	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	Fifth Slave
	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	Sixth Slave
	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	Seventh Slave
	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	Eighth Slave
	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	Ninth Slave
	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	Tenth Slave
	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF	Eleventh Slave
	ON	ON	OFF	ON	OFF	OFF	OFF	OFF	Twelfth Slave
	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	Thirteenth Slave
	ON	OFF	ON	ON	OFF	OFF	OFF	OFF	Fourteenth Slave
	OFF	ON	ON	ON	OFF	OFF	OFF	OFF	Fifteenth Slave
	ON	ON	ON	ON	OFF	OFF	OFF	OFF	Sixteenth Slave



### 3-7. System integration link installation topology diagram

系统集成连接安装拓扑图



名称	修改日期	类型	大小
BatteryStudio_DataFiles	2022/10/20 16:26	文件夹	
Help	2022/10/20 16:26	文件夹	
AutoUpdater	2022/6/21 21:37	应用程序	180 KB
<b>BatteryStudio</b>	2022/10/17 18:38	应用程序	801 KB
BatteryStudio.exe.config	2022/10/14 0:03	CONFIG 文件	8 KB
DataBaseProtocol.dat	2022/10/18 13:58	DAT 文件	632 KB
libmupdf.dll	2013/5/11 23:28	应用程序扩展	3,131 KB
LiveCharts.dll	2020/10/14 14:36	应用程序扩展	149 KB
LiveCharts.Gear.dll	2020/10/14 14:36	应用程序扩展	84 KB
LiveCharts.Wpf.dll	2020/10/14 14:36	应用程序扩展	213 KB
LiveCharts.Wpf	2020/10/14 14:36	XML 文档	172 KB
LiveCharts	2020/10/14 14:36	XML 文档	216 KB
log4net.config	2022/6/25 10:49	CONFIG 文件	4 KB
log4net.dll	2022/1/22 15:46	应用程序扩展	270 KB
MoonPdfLib.dll	2022/1/22 15:46	应用程序扩展	56 KB
MouseKeyboardActivityMonitor.dll	2013/5/11 23:28	应用程序扩展	36 KB
MySQL.Data.dll	2022/1/22 15:46	应用程序扩展	421 KB
ProtocolUpdate	2022/10/18 13:58	XML 文档	1 KB
ZG.NetWork.dll	2022/1/22 15:46	应用程序扩展	42 KB
zxing.dll	2020/9/14 20:33	应用程序扩展	444 KB
zxing.presentation.dll	2020/9/14 20:33	应用程序扩展	20 KB
zxing.presentation	2020/9/14 20:33	XML 文档	10 KB
zxing	2020/9/14 20:33	XML 文档	547 KB

### 3-8.Upper machine

#### instructions 上位机说明选项

##### A、 Software source file

##### B、 Software running envirement 软件运行环境：

The software running on the PC and its compatible computer, using WINDOWS operation system.  
使用Windows操作系统在PC及其兼容计算机上运行的软件

##### C、 Software using steps 软件使用步骤：

( 1 ) Double click BatteryStudio icon can show the main interface of the software ( As shown in figure A ) 双击batterystudio图标可以显示软件的主界面 ( 如图 ) .

### 3-8-1.Software Overview 软件概述

It is an application software for monitoring and setting of lithium battery management system (BMS) . This multi-functional edition provides a one-stop monitoring and maintenance service for BMS users. Its main features are as follows:

Battery Studio V4.3 是一款用于锂电池管理系统 ( BMS ) 监控和设置的应用软件。此版本集合多种功能于一身，为 BMS 用户提供一站式监控和维护服务。其主要特性如下:

- ◆ Supports all BMS modules from Richpower
- ◆ Supports live monitoring of all BMS data
- ◆ Supports Single & parallel mode
- ◆ Supports real-time/history data storage/read
- ◆ Support data analysis
- ◆ Support upload and download BMS parameters
- ◆ Support online BMS program upgrade
- ◆ Support calibration for voltage & current
- ◆ Support uultilingual interface

### 3-8-2.Software Installation软件安装

This software is a green version without installation. User can unzip the software package to required path, then click to run 'Battery Studio.exe'. Unzip below file to computer.

本软件为免安装的绿色版本，用户可以将软件的压缩包解压至 计算机的所需位置，然后运行 Battery Studio.exe 文件即可使用。

将此文件包解压到文件夹。

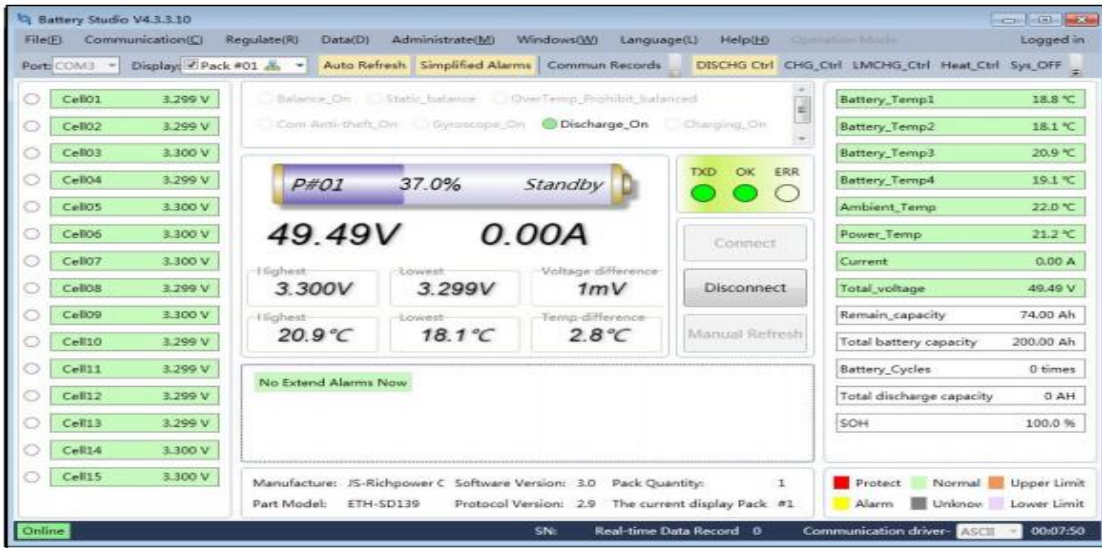


### 3-8-3. Use It quickly 快速使用

Double click the exe file in the software path to run the software  
双击运行软件目录中的执行文件即可打开软件。



The software interface is as follows.

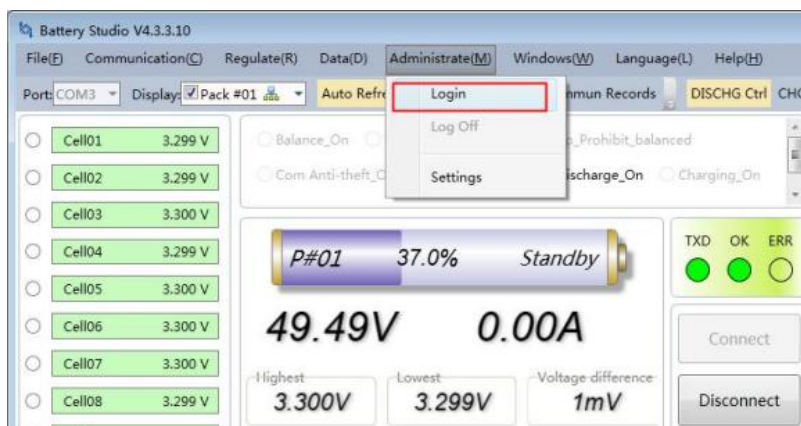


Connect BMS to computer via RS232 or RS485 serial port communication adapter, select correct port number, load corresponding BMS protocol provided by supplier, then click 'Connect' button on the HMI. The connection between BMS and HMI is then established.

使用 RS232 或 RS485 串口通讯线连接 BMS 与上位机，设置正确的串口，加载对应的通讯协议，然后单击主界面的“连接”按钮，即可建立上位机与 BMS 的连接。

### 3-8-4. User Login 用户登陆

Click 'Management' menu, select 'Login' option. 单击管理菜单，选择“登陆”选项。



Input password 888888 in the popup input box and press Enter key to login. You are allowed to modify parameters and upgrade the BMS after login.

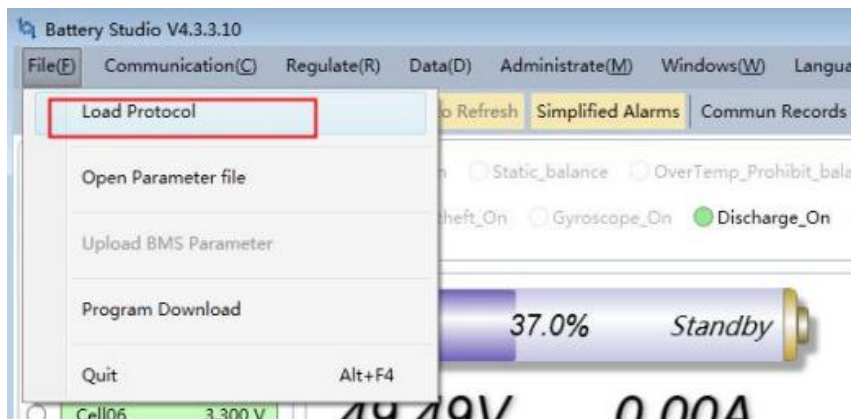
在弹出的输入框中输入登陆密码“888888”，按回车键确认即可登陆。登陆后可以参数修改和程序升级等操作。



### 3-8-5. Load Protocol 加载协议

Click 'File' menu, select 'Load protocol' option.

单击文件菜单，选择“加载协议”选项。



Select the corresponding protocol file in the pop-up window,

在弹出的窗口中选择相应的协议文件，

1. Online Automatic Load Protocol (this option downloads real-time updates for the server)

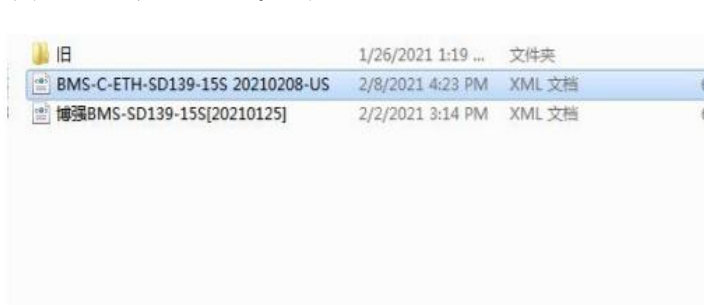
1. 联机自动加载协议（此选项为服务器下载实时更新）

2.If you know the BMS model, you can choose to manually select the model

2 如果你知道 BMS 型号的话，可以选择手动选择型号

3 local load protocol, if you have a local protocol, you can manually load the protocol. Click the OK button.

3 本地加载协议，如果您本地有协议，可以手动加载协议。点击“确定”按钮。



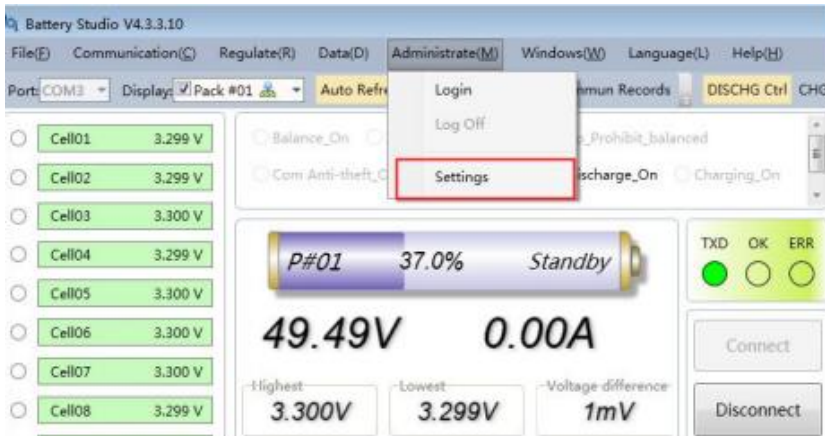
Protocol loaded successfully and you'll see below message. Click 'OK' to shut it

协议加载成功，系统弹出如下提示框。单击确定关闭即可。



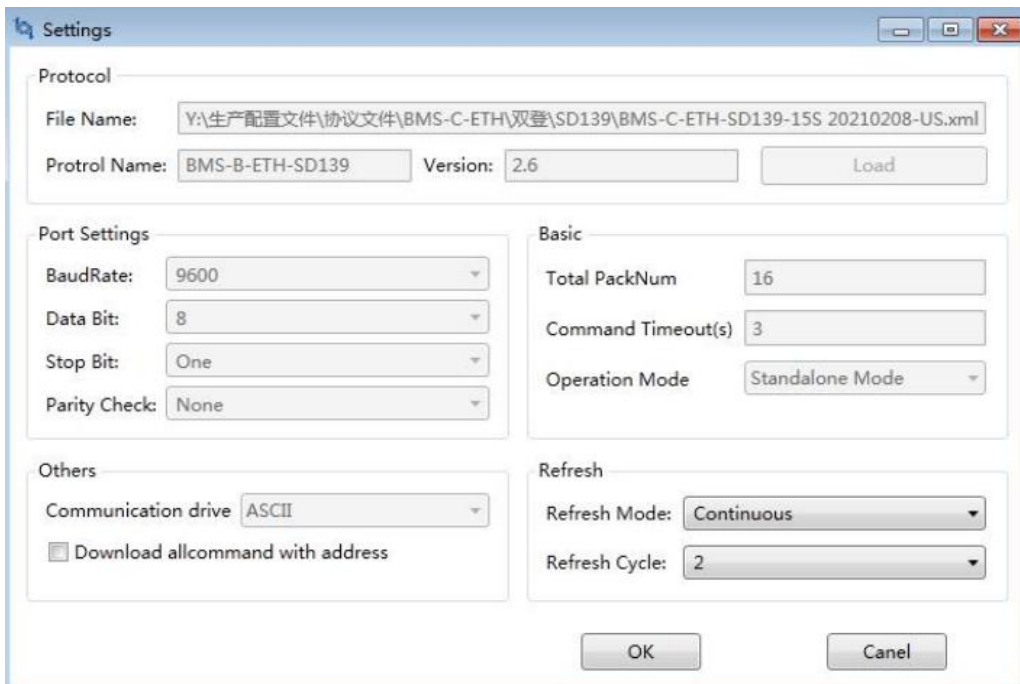
### 3-8-6. System Configuration 系统配置

Click 'Management' menu and select 'Configuration' option 单击管理菜单，选择“配置”选项



In the popup window you can find different configuration areas for setting the communication protocol, port, etc. The communication protocol area has the same protocol loading function as described in Section 5. Serial communication parameters can be configured in the port setting area. The default configuration is 9600 baud rate, 8 data bits, 1 stop bit and no parity bit.

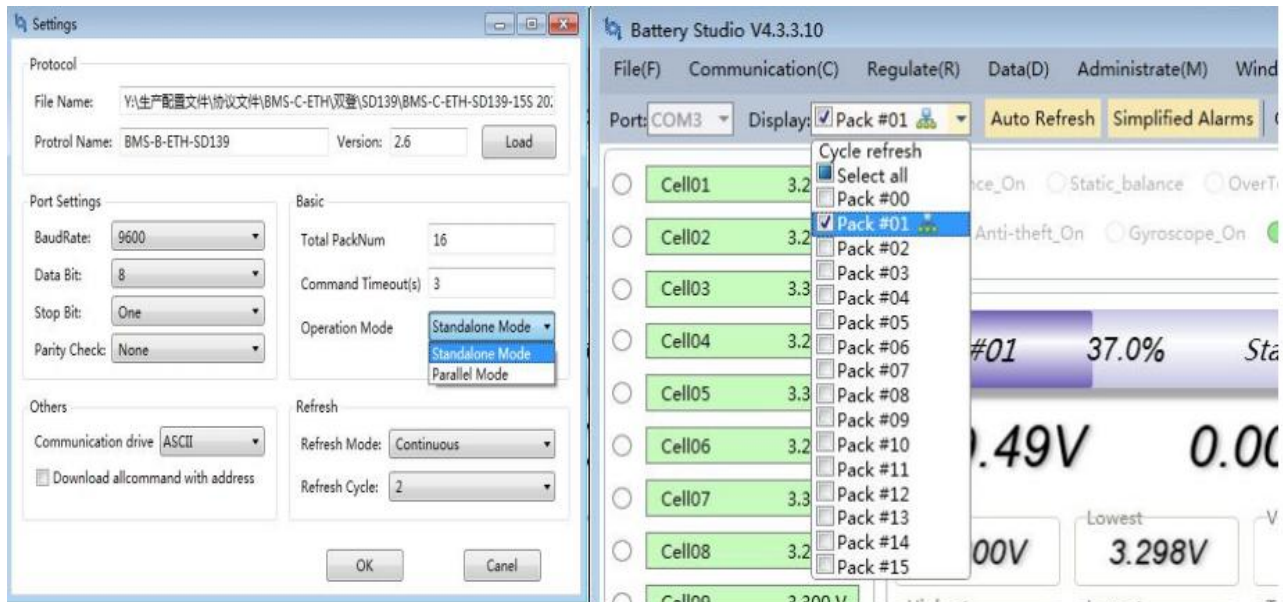
在弹出的窗口中，可以看到包括通讯协议、端口设置等多个可配置的区域，其中，通讯协议与第5节的加载协议功能一样。端口设置区域可以配置串口通讯参数，默认的配置为9600波特率，数据位8位，停止位1位，无奇偶校验位



### 3-8-7.Stand-alone Mode单机连接

After loading correct protocol and system configuration, BMS can be connected to HMI. Click drop-down menu in software interface to select correct serial port, and click check box for 'Pack #01' in the drop-down menu next to it. Make sure the BMS is switched on and the dial address switch is set to address 0. Click 'Connect' button to connect BMS to HMI.

在正确的加载协议及系统配置之后，即可开始连接 BMS。点击确定在软件主界面选择正确的通讯端口，并勾选 Pack #01。BMS 处于开启状态，拨码开关拨 0。点击主界面“连接”按钮，即可将单个 BMS 连接至上位机。



After the HMI is connected, the main interface of the software can display all kinds of data and status.

上位机连接之后，软件主界面能显示各种遥测遥信数据和状态。



As shown in the figure above, the sampling voltage of each cell is displayed on the left side of the main interface, general voltage and current of the battery pack is displayed in the middle area,

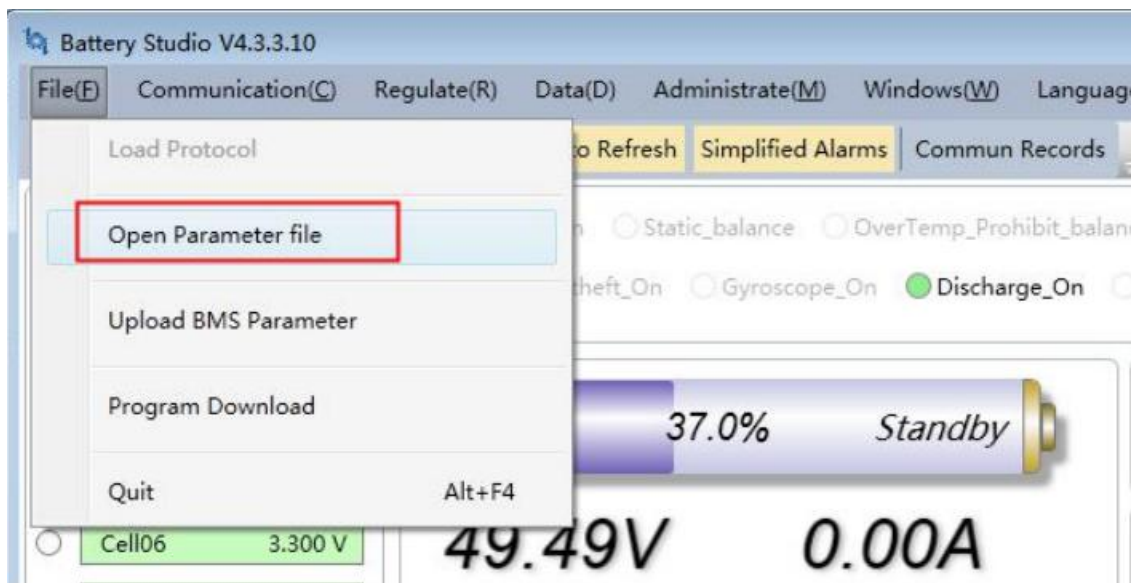
and the state of charge and battery pack status are displayed on the top. Temperature, voltage, current, capacity, cycle times and other information are displayed on the right side. At the bottom of the middle there is the alarm information box, in which all alarm protection information will be displayed.

如上图，上位机主界面左侧显示各串单体采样电压，正中区域显示整个 Pack 的总电压和电流，上方有 Pack 编号以及荷电状态及电池包的状态。右侧显示温度、电压、电流、容量、循环次数等信息。中间下方为告警信息框，所有的告警保护等信息将在此框中显示。

### 3-8-8.Modify Parameter修改参数

After connecting to the BMS and logging in the system, you can download the configured parameter file to BMS, or upload the BMS parameters for individual modification and then download them to BMS again. The method is as follows. Click the file menu and select the "open parameter file" option

在连接 BMS 且登陆了系统之后，可以进行将配置好的参数文件下载到 BMS 中，也可以上传 BMS 参数进行个别修改后重新下载到 BMS 中。方法如下。点击文件菜单，选择“打开参数文件”选项。



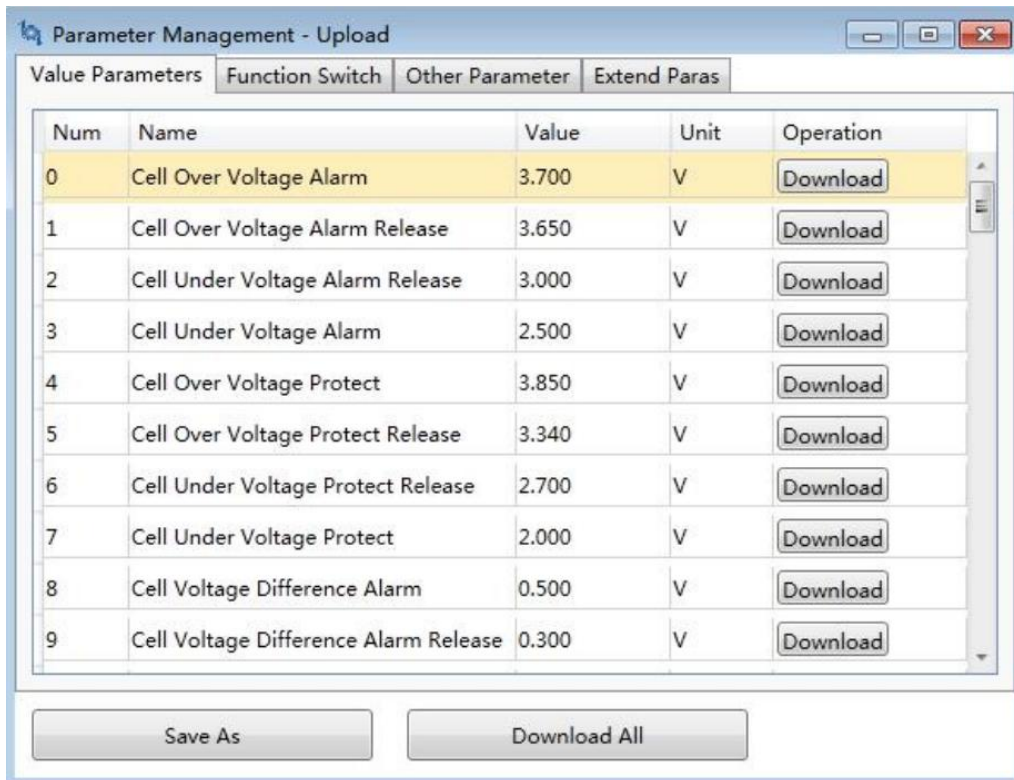
Select the correct configuration parameter file in the pop-up file selection box. Click the open button.

在弹出的文件选择框中选择正确的配置参数文件。点击打开按钮



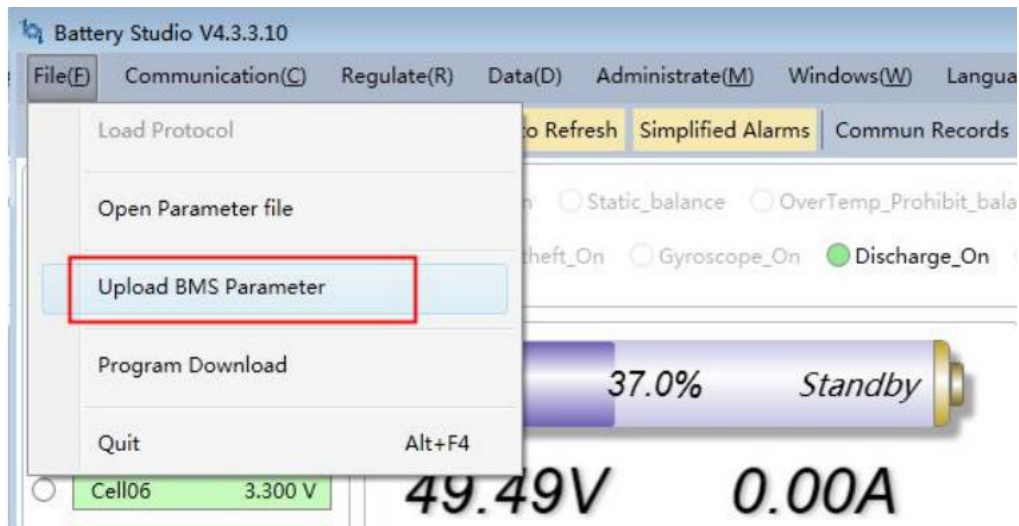
Check the settings and click "Download all parameters" button. The configuration parameters will be downloaded to BMS and become effective immediately.

在弹出的参数管理窗口中核对一下各项配置参数，无误后单击“下载全部”按钮，配置参数将会全部下载进 BMS 中并生效。



Click the file menu and select 'upload BMS parameters' option.

单击文件菜单，选择“上传 BMS 参数”选项。



The software will read the configuration parameters in BMS and display them in the pop-up parameter management window.

上位机将会读取 BMS 中的配置参数，并显示在弹出的参数管理窗口中。



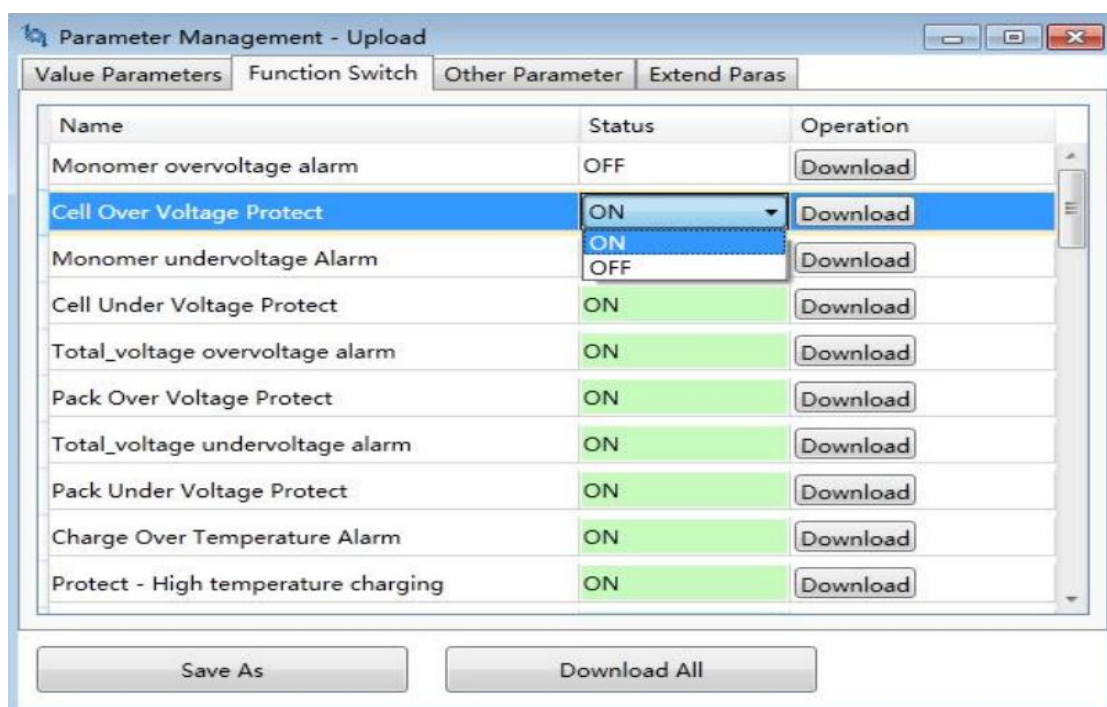


In the parameter management window, click the value you want to modify, enter appropriate parameters in the text box, and then click the "Download all" button below to download all parameters into BMS. **If you click the "download" button on the right side of each parameter, only a single parameter will be downloaded into BMS, and the parameters modified in a single time cannot be saved after the BMS is powered off.**

在参数管理窗口中，单击想要修改的数值，在文本框中输入合适的参数后，单击下方的“下载全部”按钮可以将所有参数全部下载进 BMS 中；**如果单击各个参数右侧的“下载”按钮，只会将单个参数下载进 BMS，且 BMS 断电后该单次修改的参数不能保存。**

In addition to numerical parameters, you can also click the "function switch" tab in the window to operate and download the function switch. The method is the same as above.

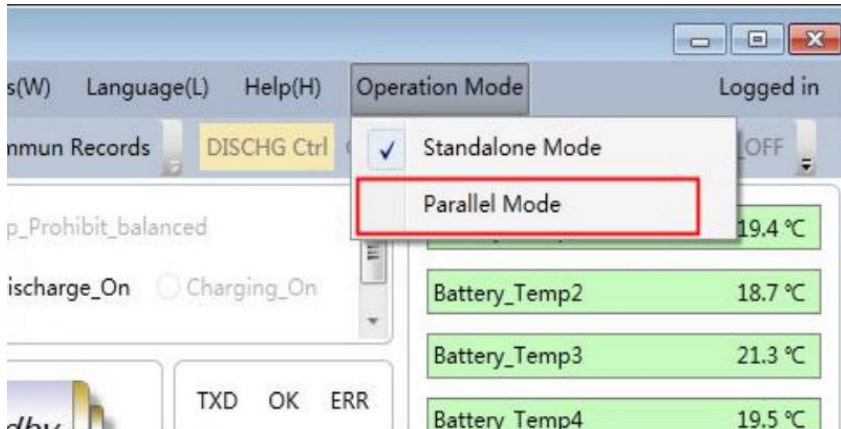
除了数值参数，还可以单击窗口中的“功能开关”选项卡，对功能开关进行操作和下载方法同上



### 3-8-9.Parallel Connection并机连接

After login, the software will show 'Operation mode'in the menu. Select 'Parallel mode'and following the instructions. BMS can be connected via RS485 bus parallel connection. Set the dial address switch from address '2'. The total number of packs and specific pack numbers can be selected in the drop-down menu.

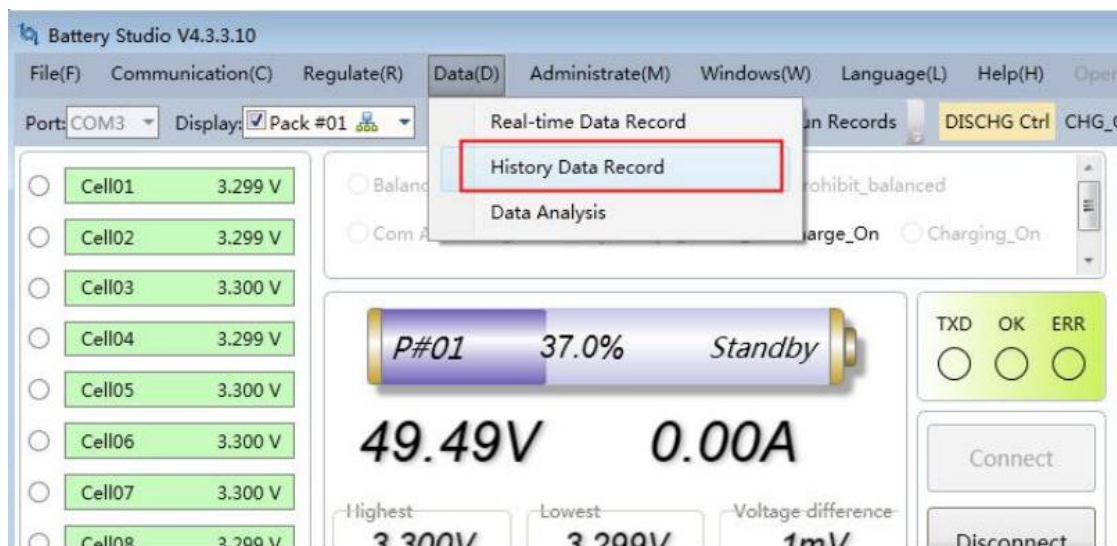
“管理--登录(密码 888888 )”后，上位机会显示运行模式，选择并机模式之后按提示操作即可，BMS 可以通过 485 总线并机连接，若加载完协议后，BMS 的拨码开关从地址 2 拨起。上位机可设置窗口中设置 pack 总数，上位机主界面上面勾选需要显示的 Pack 编号



### 3-8-10.View history data and realtime data查看历史数据和实时数据

Click the data menu and select the history data record option.

单击数据菜单，选择“历史数据记录”选项



Click "read all records" button in the pop-up window, and the HMI will read all the history data stored in BMS and display them in the following window. Click Save button to export and save the record data to an excel file.

在弹出的窗口中单击“读全部记录”按钮，上位机将会读取 BMS 存储的全部历史数据并显示在如下窗口中。单击保存按钮可以将记录数据导出保存为 EXCEL 文件。

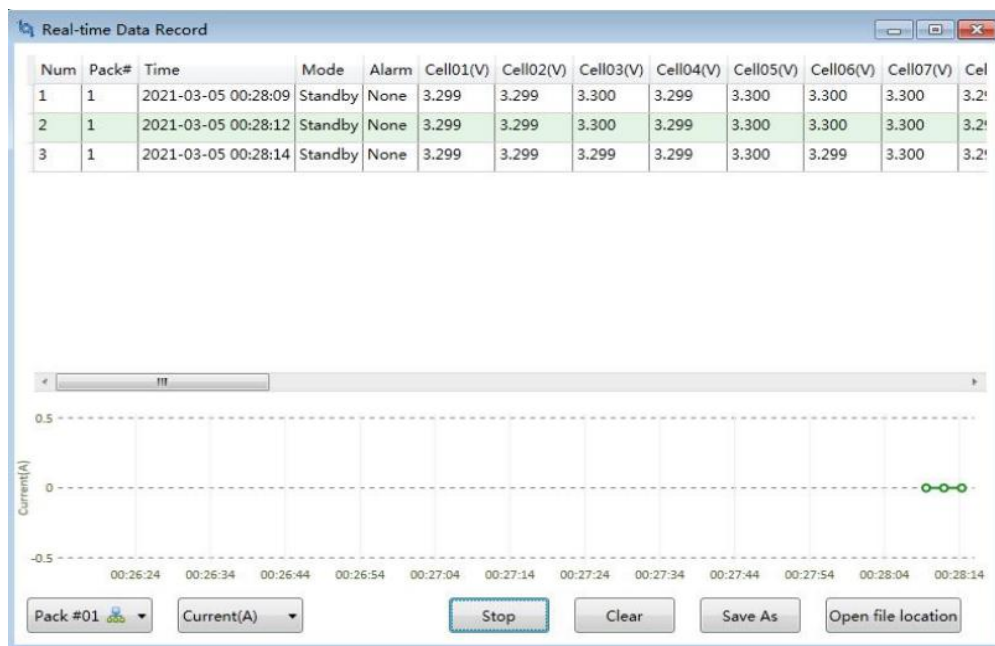
Historical Data

ReadNumbers 100    Read    Read the First    Read the Next    **Read All**    Save

Num	Time	Mode	Current(A)	Totalvoltage(V)	Remaingcapacity(Ah)	Alarm
1	2021-03-03 13:14:26	Standby	0.00	49.50	74.00	None
2	2021-03-03 12:55:30	Standby	0.00	49.49	1.91	SOC Alarm
3	2021-03-03 11:55:33	Standby	0.00	49.49	1.94	SOC Alarm
4	2021-03-03 10:55:37	Standby	0.00	49.49	1.97	SOC Alarm
5	2021-03-03 09:55:40	Standby	0.00	49.50	2.00	SOC Alarm
6	2021-03-03 09:15:24	Shutdown	0.00	0.52	2.00	NTC Failure alarm Monomer undervolta
7	2021-03-03 09:10:43	Standby	0.00	0.57	2.00	NTC Failure alarm Monomer undervolta
8	2021-03-03 09:10:23	Standby	0.00	1.51	2.00	Monomer undervoltage Alarm Cell Und
9	2021-03-02 14:29:10	Standby	0.00	45.07	3.56	Environment Over Temperature Alarm S
10	2021-03-02 14:29:09	Standby	0.00	45.07	3.56	Environment Over Temperature Alarm
11	2021-03-02 14:29:04	Float	0.00	45.07	3.56	Environment Over Temperature Alarm
12	2021-03-02 14:29:03	Float	0.00	45.07	3.56	Environment Over Temperature Alarm S
13	2021-03-02 14:28:27	Charge	71.75	45.07	2.87	Environment Over Temperature Alarm
14	2021-03-02 14:28:26	Standby	0.00	45.07	2.85	Environment Over Temperature Alarm
15	2021-03-02 14:28:25	Float	0.00	45.07	2.85	Environment Over Temperature Alarm E
16	2021-03-02 14:28:24	Charge	71.89	45.07	2.85	Environment Over Temperature Alarm E
17	2021-03-02 14:28:23	Charge	71.77	45.07	2.83	Environment Over Temperature Alarm
18	2021-03-02 14:27:57	Charge	8.01	45.07	2.32	None

Click data menu and select the "real-time data recording" option. HMI will read the real-time data of BMS and scroll in the window. Click the pause button to export and save the record data as Excel file by clicking the Save button.

单击数据菜单，选择“实时数据记录”选项，上位机将会读取 BMS 的实时数据并滚动显示窗口中。单击暂停按钮，可以按保存按钮将记录数据导出保存为 EXCEL 文件。



### 3-8-11. Calibration 校准

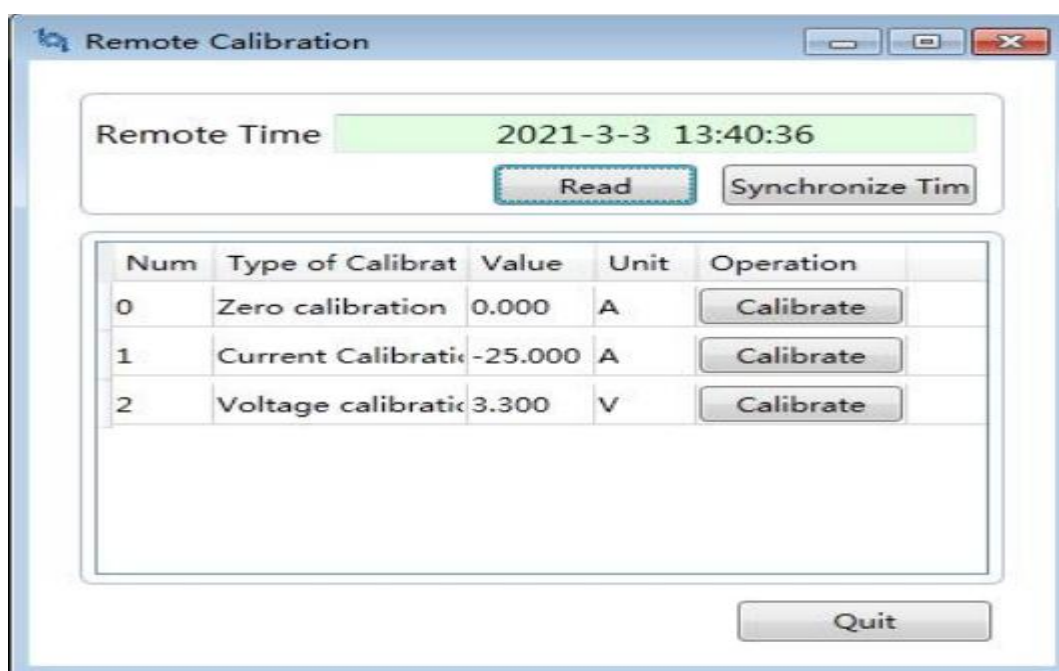
Click 'Control' menu and select 'Calibration' option.

单击控制菜单选择“执行校准”选项。



In the pop-up window, you can read the BMS time, synchronize the local time to BMS, calibrate the zero current of BMS, current calibration, voltage calibration, etc.

在弹出的窗口中可以进行读取 BMS 时间、同步本机时间到 BMS、BMS 零点电流校准、电流校准、电压校准等操作。



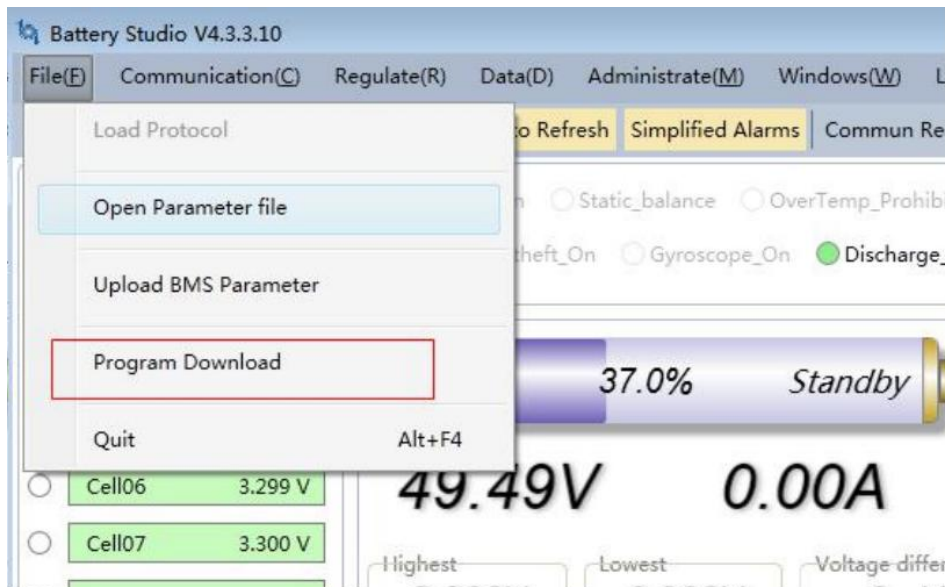
It should be noted that the zero point calibration should be carried out without charging and discharging current; the current calibration should be carried out under the 0.5c precise current discharge state; the voltage calibration should be carried out under the sampling voltage of 3.300v for each BMS cells

注意，零点校准应在无充放电电流情况下进行；电流校准应在 按钮选择加载 ehex 格式的程序文件。0.5C 精准电流放电状态下进行；电压校准应在 BMS 各串采样电压为 3.300V 下进行。

### 3-8-12. Program upgrade 程序下载

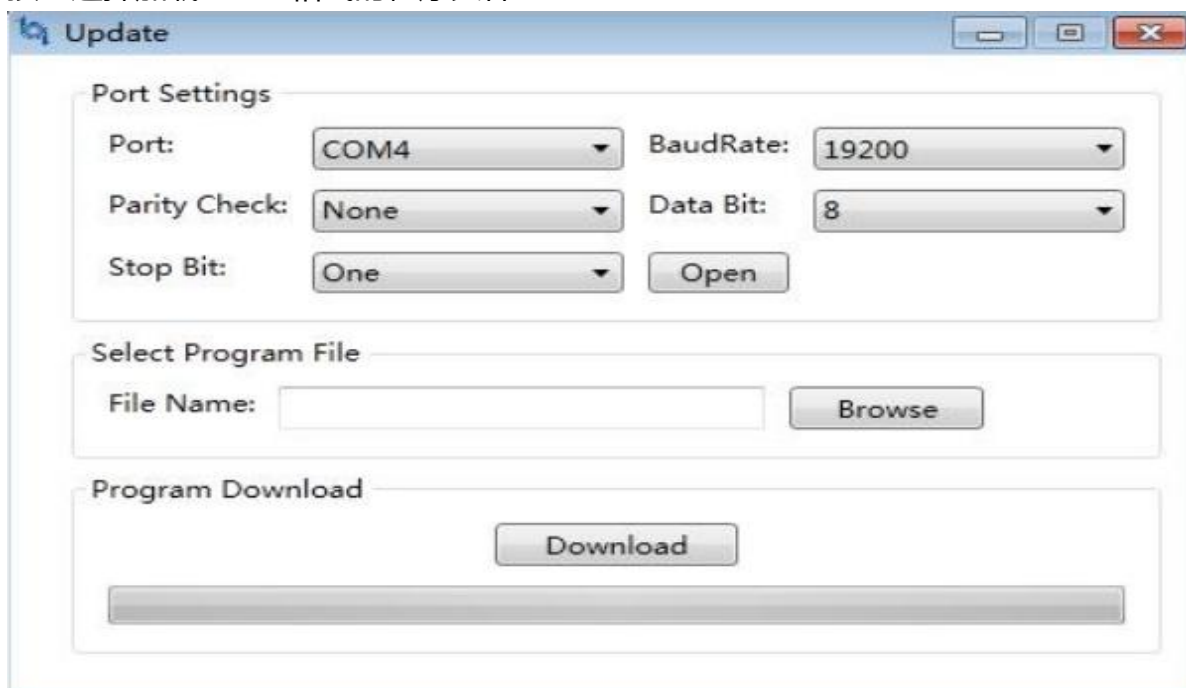
The HMI supports downloading the upgrade program into BMS through 232 or 485 serial port. Usually, the BMS for shipment is a 485 boot program, which needs to be connected with 485 serial port. Click 'file' menu and select the program download option.

上位机支持通过 232 或 485 串口将升级程序下载进 BMS 中。通常出货的 BMS 烧录的都是 485 的 Boot 程序，要用 485 串口进行连接。单击文件菜单，选择“程序下载”选项



In the pop-up update window, set the correct port and baud rate (9600 or 19200 depending on the specific model), click the "open" button to open the serial port, and press the "Browse" button to select and load the program file in ehex format.

在弹出的 Update 窗口中，设置正确的端口、波特率（9600 或 19200 视具体型号而定），按“开启”按钮打开串口，按“浏览”注意，零点校准应在无充放电电流情况下进行；电流校准应在按钮选择加载 ehex 格式的程序文件。



Press and hold the BMS reset key for more than 8 seconds until the indicator light shows the flow light status. At this time, click the "download" button. When the download progress bar appears, you can release the reset key.

按住 BMS 复位键 8 秒以上直到指示灯显示为流水灯状态，此时单击“下载”按钮，出现下载进度条时可以松开复位键



The following prompt will appear after the download is completed.

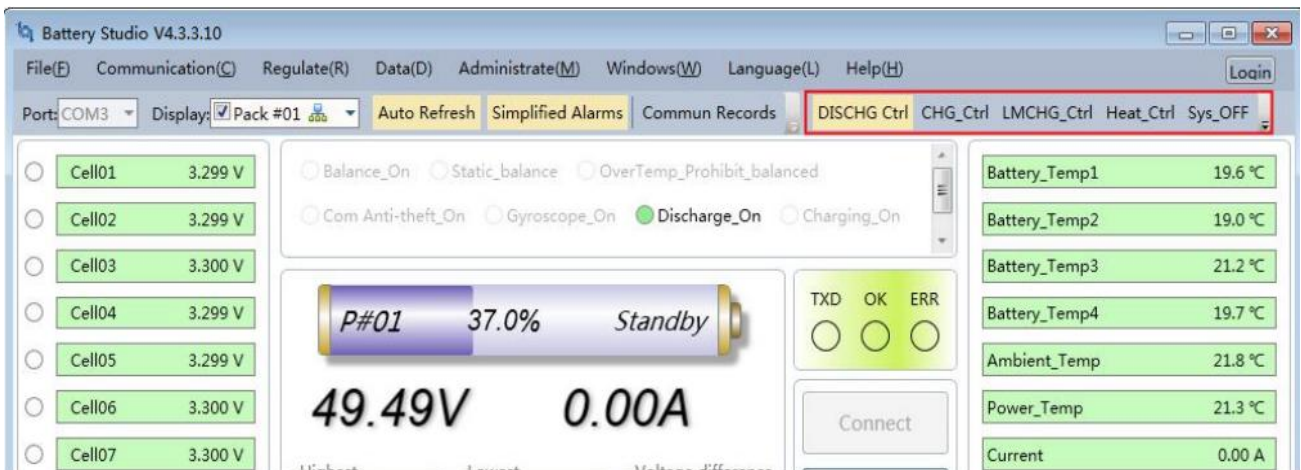
下载完成后会出现如下提示。



### 3-8-13.Remote Control Commands遥控命令

In the upper part of the main interface there are several remote control command buttons, including discharge control, charging control, current limiting control, heating control, system shutdown, etc. Click the corresponding button to perform the corresponding action.

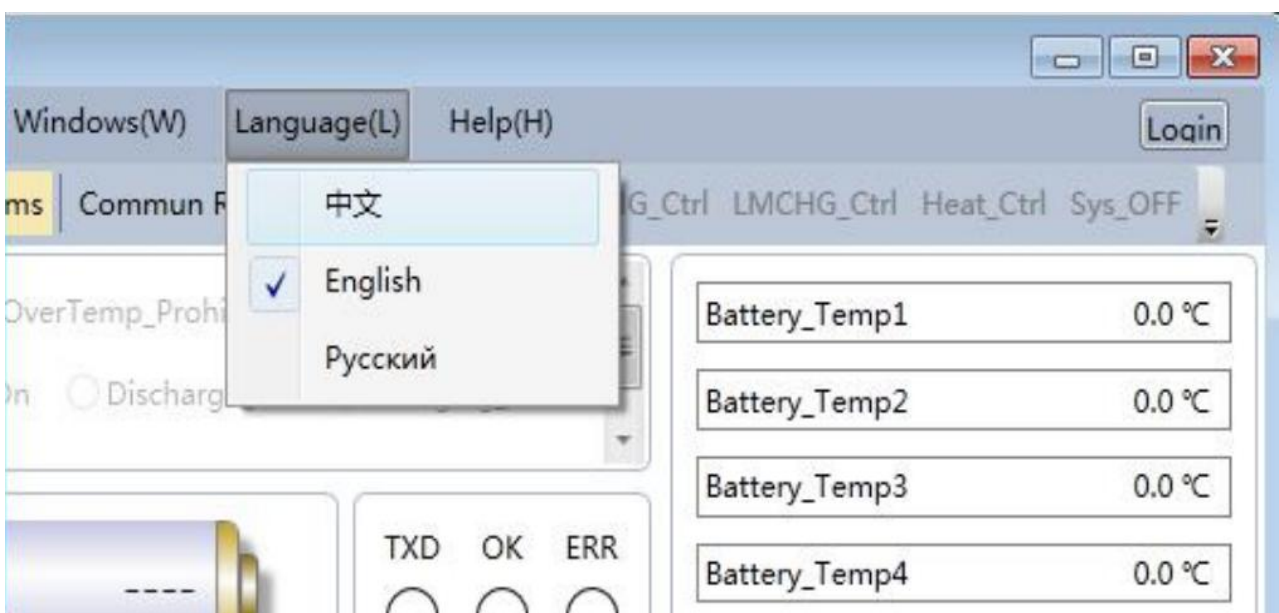
在上位机主界面上部，有若干个遥控命令，包括放电控制、充电控制、限流控制、加热控制、系统关机等。按相应按钮可以执行相应动作



### 3-8-14.Switch language切换语言

Click language menu to select Chinese, English and Russian options. (the latest version is automatically adjusted according to the computer system language, no manual selection is required.)

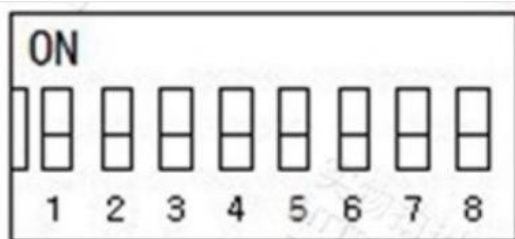
单击语言，可选择中文、英文、俄文选项。（最新版为根据计算机系统语言来自动调整，不需要手动选择）



### 3-9 Address Switch function(Only in Parallel)地址切换功能（仅并行）

When battery work in parallel, main pack and slave packs need address as follows:

当电池并联工作时，主电池组和从电池组需要如下地址：



Slave battery setting (Table 6)

NO.	Dial address				Tips
	#1	#2	#3	#4	
1	ON	OFF	OFF	OFF	Pack1
2	OFF	ON	OFF	OFF	Pack2
3	ON	ON	OFF	OFF	Pack3
4	OFF	OFF	ON	OFF	Pack4
5	ON	OFF	ON	OFF	Pack5
6	OFF	ON	ON	OFF	Pack6
7	ON	ON	ON	OFF	Pack7
8	OFF	OFF	OFF	ON	Pack8
9	ON	OFF	OFF	ON	Pack9
10	OFF	ON	OFF	ON	Pack10
11	ON	ON	OFF	ON	Pack11
12	OFF	OFF	ON	ON	Pack12
13	ON	OFF	ON	ON	Pack13
14	OFF	ON	ON	ON	Pack14
15	ON	ON	ON	ON	Pack15

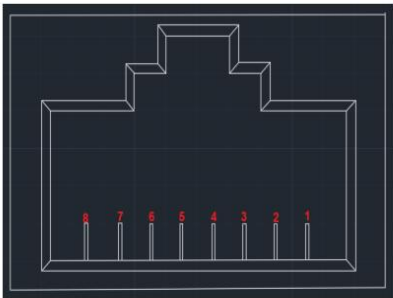
Master battery setting (Table 7)

NO.	Dial address				Tips
	#5	#6	#7	#8	
2	ON	OFF	OFF	OFF	2 pcs in parallel
3	OFF	ON	OFF	OFF	3 pcs in parallel
4	ON	ON	OFF	OFF	4 pcs in parallel
5	OFF	OFF	ON	OFF	5 pcs in parallel
6	ON	OFF	ON	OFF	6 pcs in parallel
7	OFF	ON	ON	OFF	7 pcs in parallel
8	ON	ON	ON	OFF	8 pcs in parallel
9	OFF	OFF	OFF	ON	9 pcs in parallel
10	ON	OFF	OFF	ON	10 pcs in parallel
11	OFF	ON	OFF	ON	11 pcs in parallel
12	ON	ON	OFF	ON	12 pcs in parallel
13	OFF	OFF	ON	ON	13 pcs in parallel
14	ON	OFF	ON	ON	14 pcs in parallel
15	OFF	ON	ON	ON	15 pcs in parallel



### 3-10 Communication Function 通讯功能

- **CAN 接口**  
CAN interface



- **独立 RS485 接口 (不可与 232 同时存在)**  
Stand-alone RS485 interface (not compatible with 232)

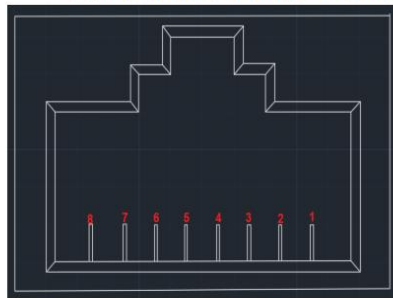


Fig8 Communication Port Interface

RS485 Terminal Port	Definition
Pin1,8	RS485_B
Pin2,7	RS485_A
Pin3,6	GND
Pin4,5	NC

RS485 Communication Port Definition

CAN Terminal Port	Definition
Pin4	CAN_H
Pin5	CAN_L
Pin3,6	GND
Pin1,2,7,8	NC

CAN Communication Port Definition

# 4.Operations LED操作

## 4-1. LED Indicators LED指示灯

### LED Indicators:

There are 6 LEDs on front panel to show the battery working status

前面板上有6个LED指示灯，用于显示电池的工作状态：

系统状态 System status	运行状态 Running status	RUN	ALM	Power LED 电量 LED				说明 Description
关机 Turnitoff	欠压保护，休眠 Under-voltage protection, dormancy	灭 Extinguish	灭 Extinguish	灭 Extinguish	灭 Extinguish	灭 Extinguish	灭 Extinguish	全灭 All Out
待机 Standby	正常 Normal	闪 1 Flash 1	灭 Extinguish	灭 Extinguish				待机状态 Standby
	告警 Warning	闪 1 Flash 1	闪 1 Flash 1					
浮充 Floating charge	正常 Normal	常亮 Chang Liang	灭 Extinguish	根据电量常亮 According to the electricity always bright				
	告警 Warning	常亮 Chang Liang	闪 2 Flash 2					
	保护 Protection	常亮 Chang Liang	灭 Extinguish	常亮 Chang Liang	有此功能状态 Have this functional status			
充电 Charge	正常 Normal	常亮 Chang Liang	灭 Extinguish	依据电量指示 According to the electricity indication				最高 LED 闪 2 Highest LED flash 2
	告警 Warning	常亮 Chang Liang	闪 2 Flash 2					
	温度过流保护 Temperature overcurrent protection	常亮 Chang Liang	常亮 Chang Liang	依据电量常亮 According to the electricity always bright				充电器在线 Charger online
	温度过流保护 Temperature overcurrent protection	灭 Extinguish	常亮 Chang Liang	灭 Extinguish				充电器不在线 The Charger is not online
	过压保护 Over-voltage protection	常亮 Chang Liang	灭 Extinguish	常亮 Chang Liang				市电在常亮, 无市电 LED 恢复待机 City power in constant light, no city power LED recovery standby
放电 Discharge	正常 Normal	闪 3 Flash 3	灭 Extinguish	依据电量常亮指示 According to the electricity always bright				依据电量常亮指示 According to the charge constant light indication
	告警 Warning	闪 3 Flash 3	闪 3 Flash 3					
	温度过流保护 Temperature overcurrent protection	灭 Extinguish	常亮 Chang Liang	灭 Extinguish				停止放电 Stop the discharge
	过压保护 Over-voltage protection	灭 Extinguish	灭 Extinguish	灭 Extinguish				停止放电 Stop the discharge
	短路/反接保护 Short Circuit/reverse connection protection	灭 Extinguish	常亮 Chang Liang	灭 Extinguish				
	失效保护 Failure protection	闪 1 Flash 1	闪 1 Flash 1	闪 1 Flash 1				6个LED全闪 6 leds all flash 1
	非工作状态 Non-working state	闪 1 Flash 1						有告警功能 Warning function
	充电状态 Charging status	闪 2 Flash 2						
	放电状态 Discharge state	闪 3 Flash 3						

Fig7 LED Operating Status

Flash	ON	OFF
Flash1	0.25Sec	3.75Sec
Flash2	0.5Sec	0.5Sec
Flash3	0.5Sec	1.5Sec

**NOTE:** LED function can be set by monitor software, the default if on.

LED功能可由监控软件设置，默认为打开

#### 4-2. Buzzer Operation(Optional)

蜂鸣器操作（可选）

Model 模式	Description and Status 描述和状态
Non-working state 非工作状态	Flash 1
Charging status 充电状态	Flash 2
Discharge state 放电状态	Flash 3

NOTE: Buzzer function can be set by monitor software, the default if off.

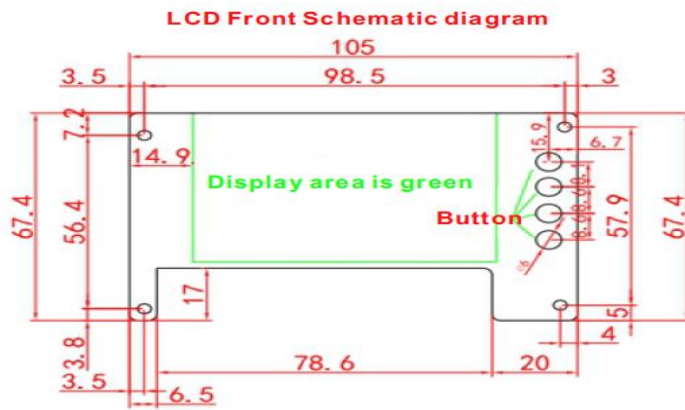
注：蜂鸣器功能可由监控软件设置，默认为关

#### 4-3. Reset key function 复位键功能

Model 模式	Pressing and Holding time 按压持续时间		
	0-3Sec	3-6Sec	>6Sec
Normal 正常模式	Indication by SOC SOC指示	Transfer to Sleeping mode 转换为休眠模式	Reset 重置
Sleeping Mode 休眠模式	Wake up from Sleeping mode 从休眠模式唤醒		

#### 7-4 Display function instruction

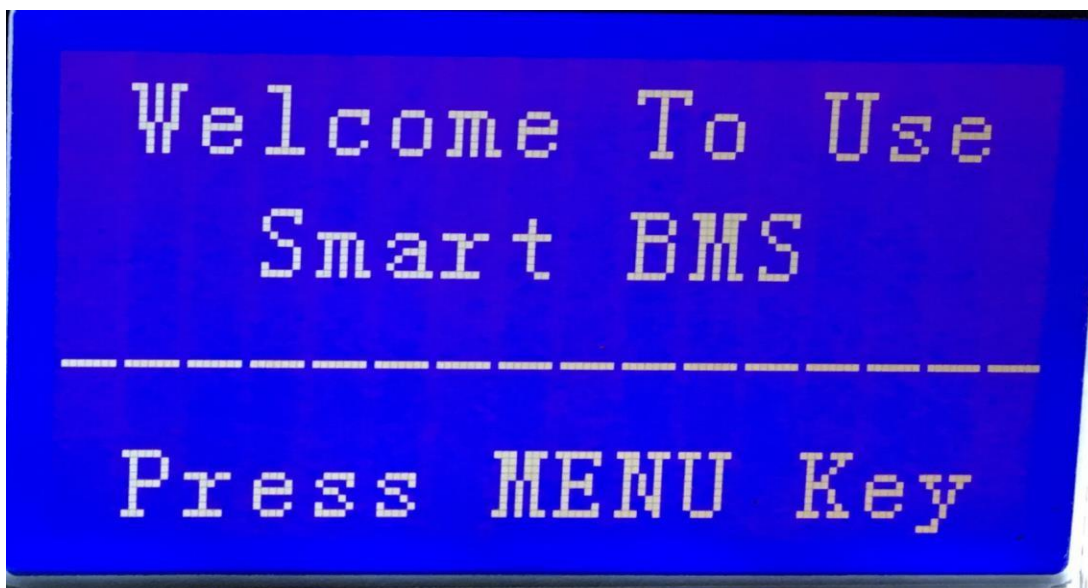
### 1) LCD Size chart LCD尺寸表



### 2) Reference of real figure 实数参考



### 3) Display rendering 显示渲染

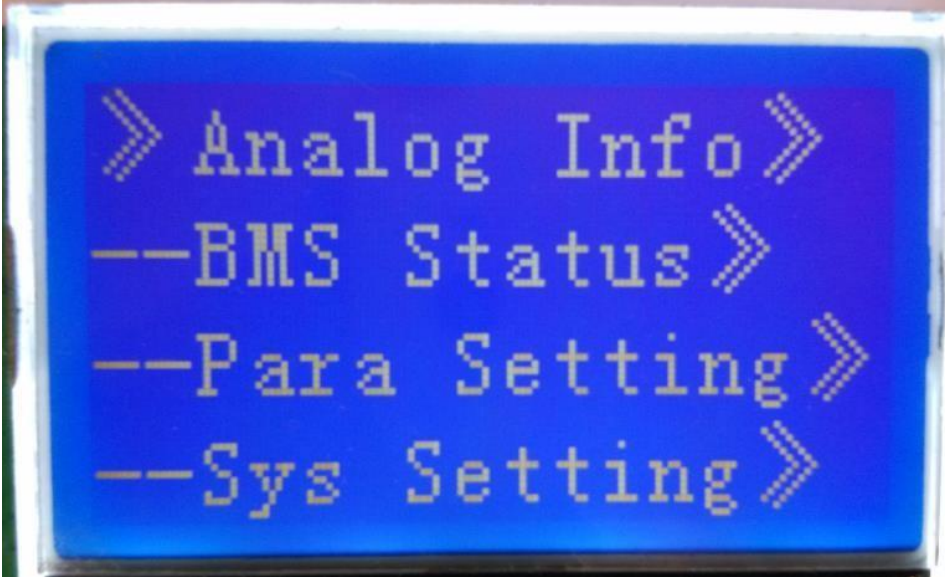


#### 4) Functional Specifications 功能规格

##### 4.1 Interface introduction 接口介绍

###### 1) Main menu page 主菜单页

Electricity/dormancy activated, will show the welcome screen, press the MENU button to enter the main menu page. As shown in the figure below : 启动电源/休眠, 将显示欢迎屏幕, 按菜单按钮进入主菜单页面。如下图所示:



###### 2) Battery parameters collection page 电池参数采集页面

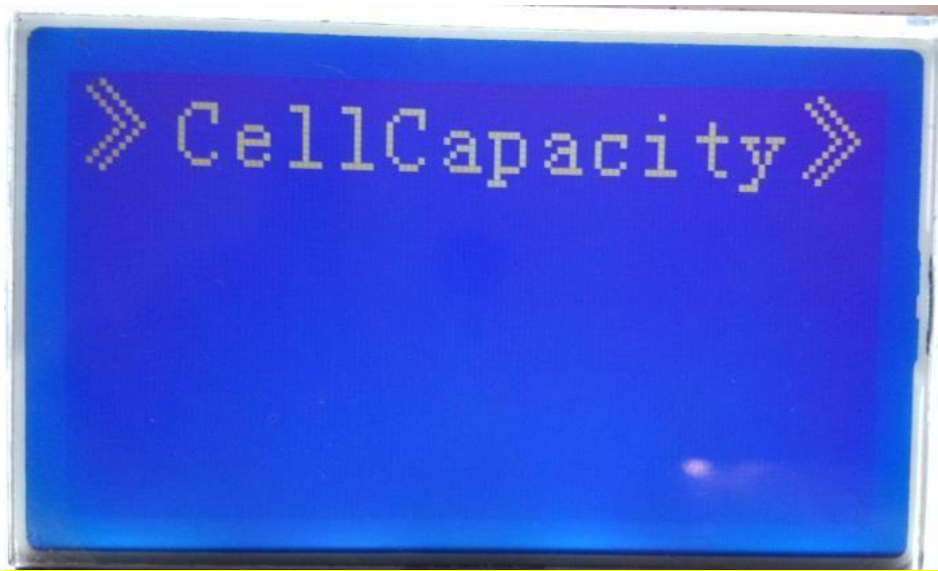
When the cursor "»" is point to "Battery Parameters Acquisition" , press ENTER key will enter into the page of "Battery Parameters Acquisition" , As shown in the figure below : 当光标 "»" 指向 "电池参数采集" 时, 按Enter键进入 "电池参数采集" 页面, 如下图所示:



--T1: 26.1°C  
--T2: 26.2°C  
--T3: 26.6°C  
--T4: 26.2°C

--PCB\_T: 27.4°C  
--ENV\_T: 27.4°C

--Cell01: 3333 mV  
--Cell02: 3333 mV  
--Cell03: 3331 mV  
--Cell04: 3329 mV



### 3) Battery status page 电池状态页

When the cursor "»" is point to "Battery Status" , press ENTER key will enter into the page of "Battery Status" , As shown in the figure below :

当光标 "»" 指向 "电池状态" 时，按Enter键进入 "电池状态" ，如下图所示

```
» Status: Idle
--Record»
--BMS Status»
```

```
» SCP: 0
--O/UTP: 0
--OCP: 0
--UVP: 7
```

```
» OVP: 0
```



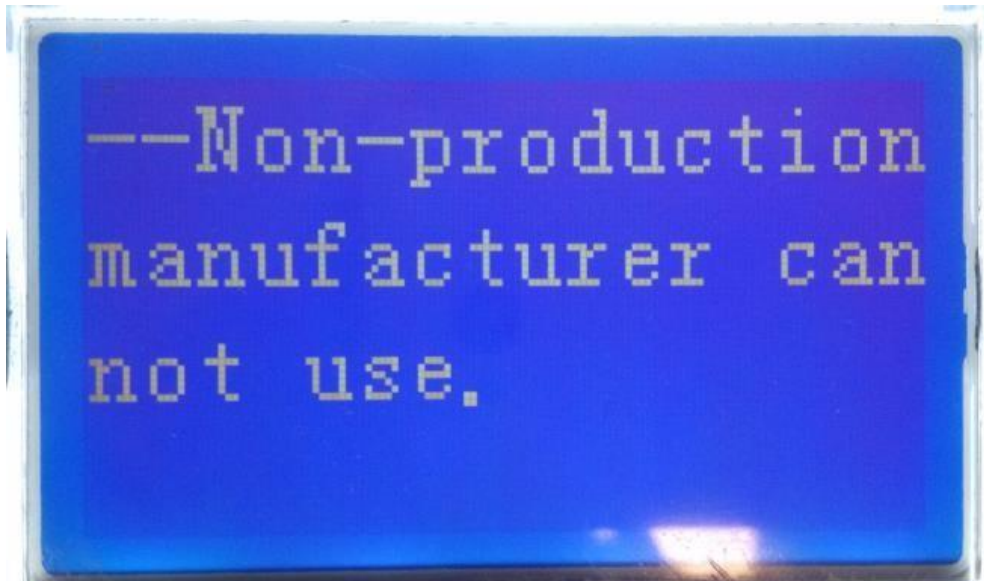
```
>> OT : N
--OTP: N
--OV: N
--OVP: N
```

```
>> UV : N
--UVP: N
--OC: N
--OCP: N
```

```
>> SCP: N
--Failure: N
```

#### 4) Parameter Settings参数设置

Screen can not set parameters屏幕无法设置参数

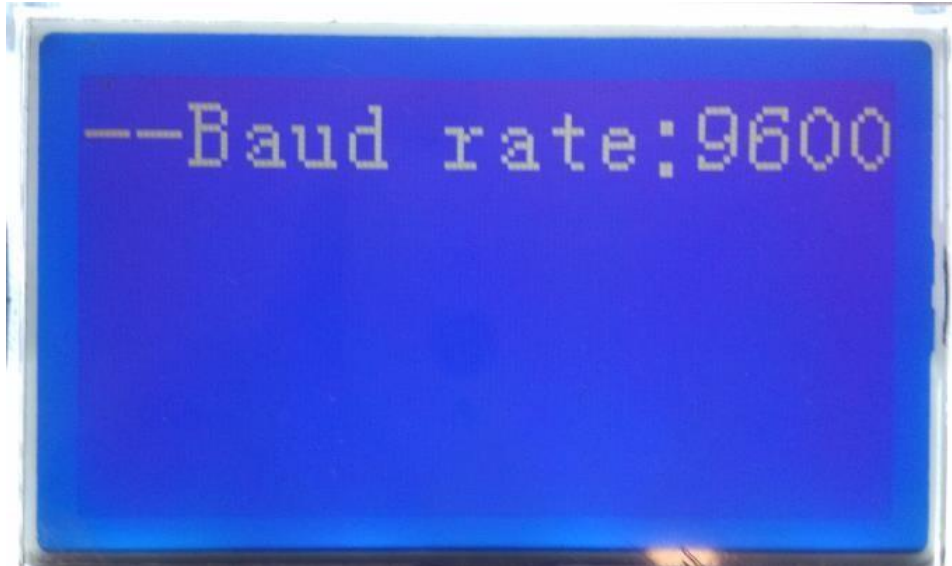


#### 5) System Settings Page

系统设置页

Baud Rate : 9600 do not

set波特率: 9600



Key description 按键描述

1) SW1----NEMU , SW2----ENTER , SW3----DOWN , SW4 ESC.

- 1) SW1----NEMU, SW2----回车, SW3----向下, SW4--退出。
- 2) Each item is "》" or "--" as a beginning , among them "》" shows the current cursor position ,  
press UP or DOWN key can move the cursor position ; with "》" end of the project , the content of the said project has not shown, press ENTER key can enter the corresponding page.
- 2) 每项以"》"或"--"开头, 其中"》"表示当前光标位置, 按向上或向下键可以移动光标位置;  
随着"》"项目结束, 所述项目的内容没有显示, 按Enter键可以进入相应的页面。
- 3) Press ESC key can be returned at the next higher level directory ; In any position ,  
press NEMU key can return to the main menu page.
- 3) 按Esc键可在上一级目录下返回; 在任何位置按Nemu键可返回主菜单页。
- 4) In a dormant state, press any key, can activate the screen.
- 4) 在休眠状态下, 按任意键, 即可激活屏幕

#### Dormancy/shutdown休眠/关闭

Under normal operation condition, with no keystrokes 1 minutes later, system will enter a state of dormancy/shutdown.Shutdown/dormancy state , press any key , screen can be activated.

在正常工作状态下, 1分钟后无按键, 系统进入休眠/关机状态。关机/休眠状态, 按任意键, 屏幕即可激活。

## 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 e quipment.

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.

3) 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。

4) 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 Nail Hammer