



**TECHNICAL USERMANUAL FOR
LiFePO4 RECHARGEABLE BATTERY**

48V100AH

Prepared By	Checked By	Approved By
QE1	QE	A

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Manufacturer reserves the right to alter or amend the design, model and specification without prior notice.



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.

Safety Precaution

1. When Using battery



Danger of High Voltage:

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



Using a special tool :

Working in high voltage and ac power, be sure to use a special tool instead of individual tools



Static - free:

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.



Disconnect the power supply in operation:

When operate the power supply, you must first cut off power supply, power operation is prohi

bited.



Dc short circuit dangerous:

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

2. While Charging



CAUTION

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.

3. When Discharging the Battery



DANGER

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.



CAUTION

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.

4 Parameters of Battery

4-1. Cell Type and Model

4-1-1 Cell Type: LiFePO4 rechargeable battery

4-1-2 Cell Model: 43184

4-1-3 Out dimension/cell :43.6mm (φ)×185mm(H) Cylindrical

4-1-3 Weight <1.37kg

4-1-4 Shell Material Aluminium

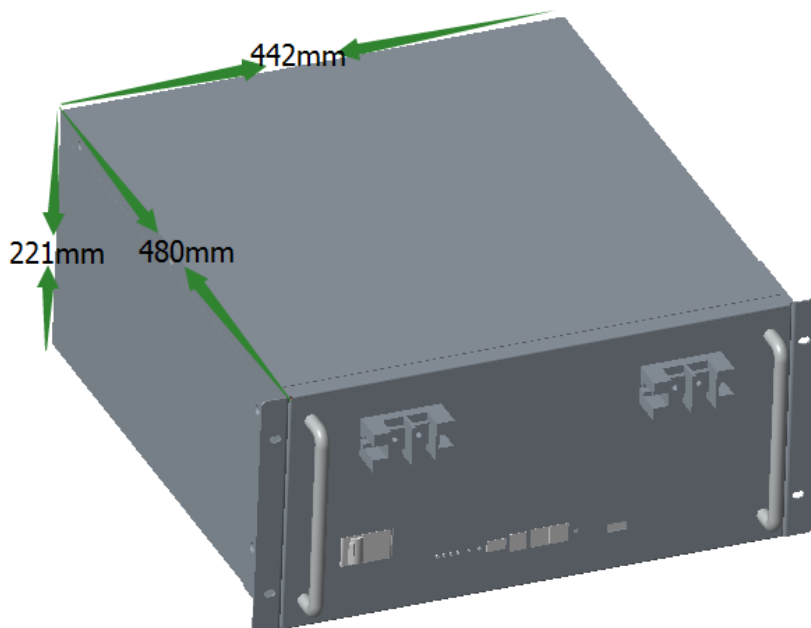
4-1-5 Internal resistance (Ac.1Khz) ≤1.30mΩ

4-2. Cell Performance

Item	Specification	Remark
4-2-1 Typical Capacity	20Ah	
Minimum Capacity	19Ah	0.2C discharge
4-2-2 Nominal Voltage	3.2V	
4-2-3 End Voltage	2.0V	
4-2-4 Charging Current (Std.)	0.5CA=10A	Ambient temperature 0~+45℃
4-2-5-1 Charging Current (Max.)	1CA=20A	Ambient temperature 0~+45℃
4-2-5-2 Peak charging current	2CA=40A	<30s
Item	Specification	Remark
4-2-1 Typical Capacity	20Ah	
Minimum Capacity	19Ah	0.2C discharge
4-2-2 Nominal Voltage	3.2V	
4-2-3 End Voltage	2.0V	
4-2-4 Charging Current (Std.)	0.5CA=10A	Ambient temperature 0~+45℃
4-2-5-1 Charging Current (Max.)	1CA=20A	Ambient temperature 0~+45℃
4-2-5-2 Peak charging current	2CA=40A	<30s

4-3 Parameters of Battery Pack

Model of battery pack	U-P48100X-6
Nominal voltage	48V
Rated capacity	100AH
Rated reserved energy	4800WH
Standard charging current	0.2C
Maximum continuous charging current	0.5C
Minimum continuous charging current	0.1C
Total charging cut-off voltage	54.0V
Cut-off voltage of charging monomer	3.60V
Standard discharging current	0.2C
Maximum continuous discharging current	1C(100A)
Cut-off voltage of discharging monomer	2.5V
Charging temperature range	-5℃~55℃
Discharging temperature range	-20℃~65℃
Dimension (W×D×H)	482*480*221mm (excluding hanger and amphenol connector)
Weight	58kg
Storage temperature	-20℃~45℃



4-4 Technical Parameters of Battery Management System (BMS)

Function	Item list	Set value	Setting range
Alarm of total voltage of battery	Over voltage-alarm	54.0±0.3V	Alarm value of total voltage under voltage To 65V
	Undervoltage alarm voltage	42.0±0.5V	20V to Alarm value of total voltage overvoltage
Battery overvoltage protection	Overvoltage protection voltage	55.5±0.3V	Recovery value of total voltage overvoltage to 65V
	Overvoltage recovery voltage	50.5±0.3V	Recovery value of total voltage undervoltage to Protection value of total voltage overvoltage
	Overvoltage recovery conditions	1. When the total voltage is lower than the recovery point, automatically recover charging. 2. When the total voltage is lower than the protection point and the capacity is ≤95% (regularly charging conditions: Charging once per day), recover charging.	
	Floating charge voltage	54.0±0.5V	
Battery undervoltage protection	Undervoltage protection voltage	37.5±0.5V	20V to Recovery value of total voltage undervoltage
	Undervoltage recovery voltage	43.5±0.5V	Protection value of total voltage undervoltage to Recovery value of total voltage overvoltage

	Undervoltage recovery conditions	The valid charging current is detected and the voltage is higher than the recovery point.	
Battery cell temperature alarm	High temperature alarm of battery cell	55±3℃	Low temperature alarm value of battery cell to 90℃
	Low temperature alarm of battery cell	0±3℃	-40℃ to High temperature alarm value of battery cell
No charging due to temperature of the battery cell	Charging high temperature protection	60±3℃	Recovery value of charging high temperature to 90℃
	Charging high temperature recovery	50±3℃	Recovery value of charging low temperature to Protection value of charging high temperature
	Charging low temperature protection	-5±3℃	-40℃ to Recovery value of charging low temperature
	Charging low temperature recovery	0±3℃	Protection value of charging low temperature to Recovery value of charging high temperature
No discharging due to temperature of the battery cell	Discharging high temperature protection	65±3℃	Recovery value of discharging high temperature to 90℃
	Discharging high temperature recovery	50±3℃	Recovery value of discharging low temperature to Protection value of discharging high temperature

	Discharging low temperature protection	-20±3℃	-40℃ to Recovery value of discharging low temperature
	Discharging low temperature recovery	0±3℃	Protection value of discharging low temperature to Recovery value of discharging high temperature
Ambient temperature alarm	High ambient temperature alarm	65±3℃	Alarm value of low ambient temperature to 90℃
	Low ambient temperature alarm	-10±3℃	-40℃ to Alarm value of high ambient temperature
BMS temperature protection	Mos-Over-Temperature Alarm (℃)	90±3℃	Recovery value of MOS high temperature to 90℃
	Mos-Over-Temperature Protection (℃)	115±3℃	-40℃ to High temperature alarm value of battery cell
	Mos-Over-Temperature Protection Release (℃)	85±3℃	Recovery value of charging low temperature to Protection value of charging high temperature
Ambient temperature protection	High ambient temperature protection	70±3℃	Recovery value of high ambient temperature to 90℃
	High ambient temperature recovery	50±3℃	Recovery value of low ambient temperature to Protection value of high ambient temperature

	Low ambient temperature protection	-20±3℃	-40℃ to Recovery value of low ambient temperature
	Low ambient temperature recovery	0±3℃	Protection value of low ambient temperature to Recovery value of high ambient temperature
Charging overcurrent alarm	Charging current alarm	55±1A	3A to Protection value of charging overcurrent
Charging overcurrent protection	Charging current protection	60±1A	Alarm value of charging current to 60A
Charging current limiting function	Charging current limiting	20A	It may be set to be 0, i.e. close the charging current limiting function.
Discharging overcurrent alarm	Discharging current alarm	110±1A	Protection value of discharging overcurrent to 3A
Discharging overcurrent protection	Discharging protection current	130±1A	130A to Alarm value of discharging current
Output short-circuit protection	Short-circuit protection current	350A	300Us(can be adjustable)
	Short-circuit protection locking	Continuous output short circuit and exceed the overcurrent locking times	
	Short-circuit unlocking	Continuous charger	
Automatic recovery of overcurrent	60S	1 S to 60S	
Sustainable voltage	100V(DC)	10S	
Continuous overcurrent locking	The overcurrent event with the time interval of no more than 5min is called continuous overcurrent.		
	3 times	One to 100 times	

Equilibrium function of battery cell	Charging equilibrium of battery cell	Cut-in conditions: State of valid charging current		
	Equilibrium cut-in voltage	3,450mV	3,000mV to 4,500 mV	
	Voltage difference of equilibrium cut-in	50mV	Voltage difference value after equilibrium to 100mV	
	Voltage difference after equilibrium	30mV	10mV to Voltage difference value of equilibrium cut-in	
	Equilibrium current	80mA		
	Equilibrium high temperature prohibition	50℃	Prohibition value of equilibrium low temperature to 70℃	
	Equilibrium low temperature prohibition	0 ℃	-20 ℃ to Prohibition value of equilibrium high temperature	
	Static equilibrium of battery cell	Cut-in conditions: All non-discharging states		
	Estimate based on the voltage of the battery cell			
	After over voltage protection, when the rest capacity of the battery is reduced to 95% below or meets the regular charging conditions (charging once per day), recover charging if the voltage is lower than the over voltage protection setting point.			
Manual key setting	In the shutdown state of BMS, press the key for 1S for startup.			
	In the non-standby state of BMS, press the key for 3S for shutdown.			
	In the non-standby state of BMS, press the key for 10S, until all LEDs lights up for reset.			
BMS power consumption management	Maximum standby time: 4h (The AC does not discharge, without valid discharging current).			
Power consumption of normal running	<30 mA			
Static total power consumption	Max150uA	Type 100uA		

5. Basic Block Diagram

- There are Battery cells and BMS board inside, before connecting the terminal, please read the diagram, and make sure the output is no short or other abnormal connection.

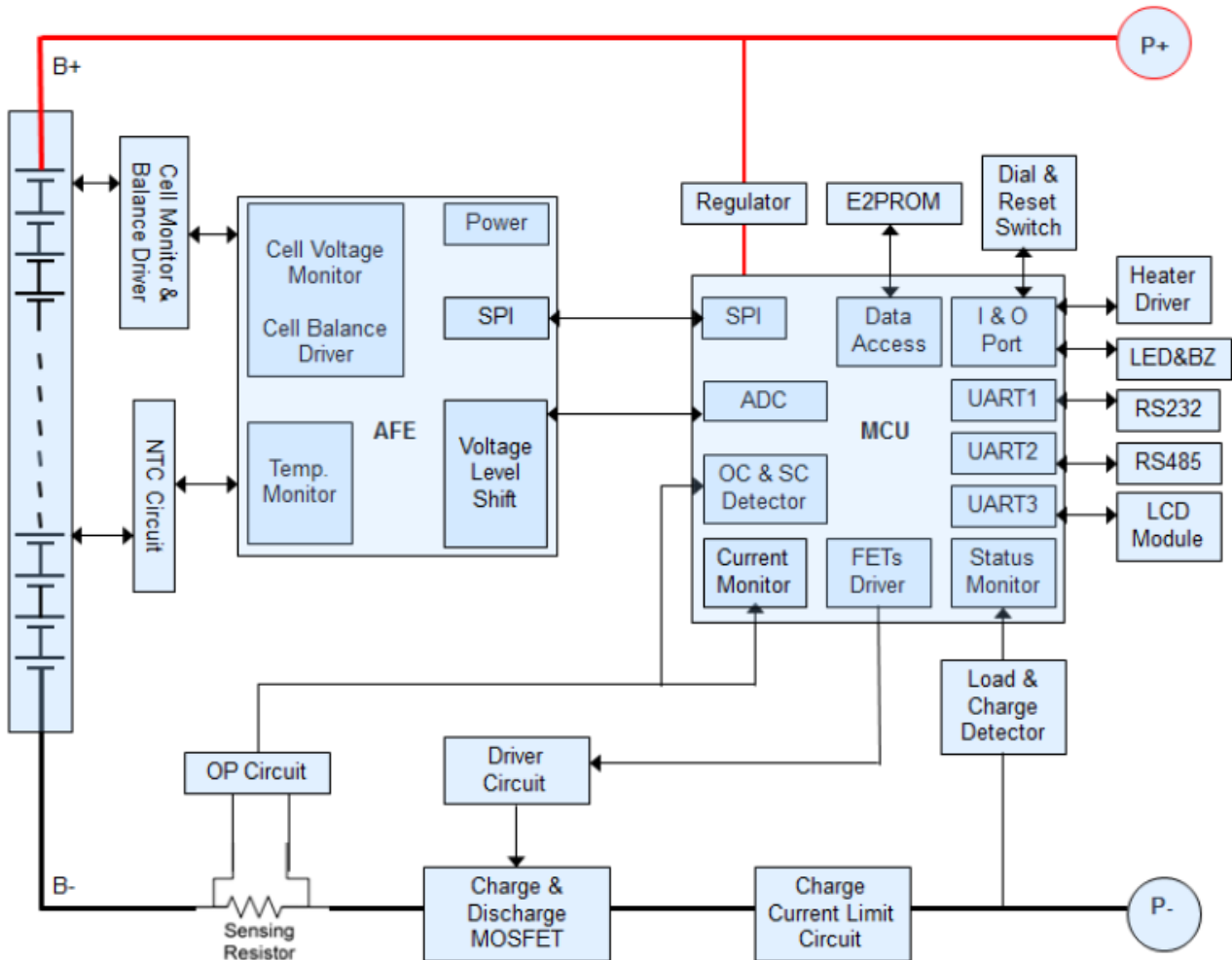


Fig1 Battery Block Diagram

6. Installation and Operation

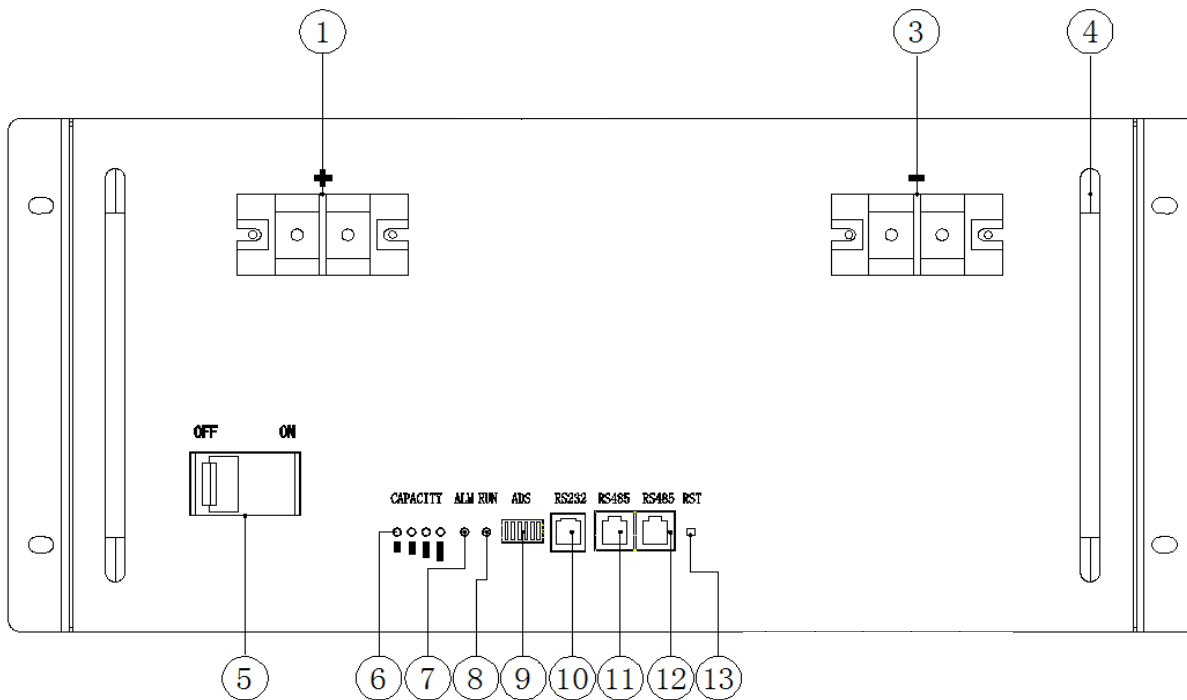
6-1. Unpacking and Inspection

Unpack the package and check the package contents. The shipping package contains:

- One Battery
- Two mounting bracket
- A small bag of screws and nuts

NOTE: Before installation, please inspect the unit. Be sure that nothing inside the package is damaged during transportation. Do not turn on the unit and notify the carrier and dealer immediately if there is any damage or lacking of some parts. Please keep the original package in a safe place for future use.

6-2. Panel View



No.	Description	Functional Description
1	Battery +	Positive terminal
2	LCD display	-----
3	Battery -	Negative terminal
4	Handle	Handling
5	Air switch	On/OFF button
6	Display the battery's capacity	Electricity volume indicator
7	Display state information	ALM alarm indicator light blinking
8	Red- trouble-light on	Run indicator light OFF
9	Display connection address	ADS Dialer
10	RS-232 connection port RS232	RS232 to PC
11	RS-485connection port-B RS485	RS485 communication interface
12	RS-485connection port-B RS485	RS485 communication interface
13	Reset key	

6-3. Single battery Installation

Installation and wiring must be performed in accordance with the local electric laws/regulations and execute the following instructions by professional personnel.

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.

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.

2) Switch off the mains switch in the building before installation.

3) Turn off all the connected devices before connecting to the battery.

4) Prepare wires based on the following table:

Model	Cables(AWG)	Cables(mm2)
<50Ah	8	6
50Ah	6	16
100Ah	4	25

Table 1 Output Cables

NOTE 1: It is recommended to use suitable wire in above table or thicker for safety and efficiency.

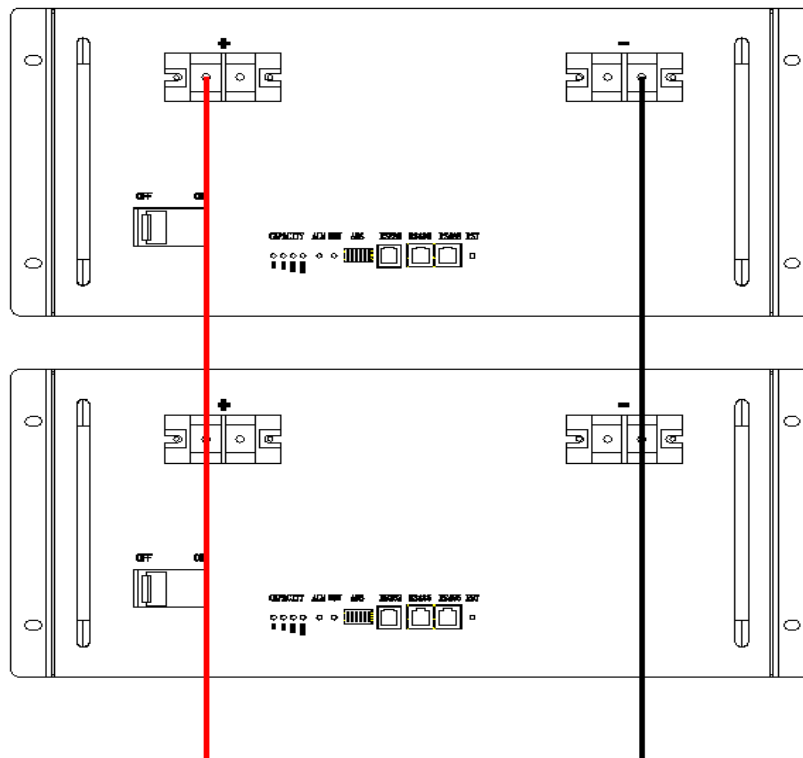
5) Put the terminal block cover back to the front panel of the battery.

NOTE: Set the battery pack breaker in "OFF" position and then install the battery pack.

6-4. Software Installation

For optional computer system protection, install battery monitoring software to fully configure battery shutdown and other setting value.

6-5. Installation of Battery in Parallel



6-6 Installation Precautions

- (1) Prior to installation, unpacking to check the quantity of the parts and battery appearance.
- (2) Install the hanger and handle and measure the battery voltage with a multimeter. The general factory voltage of the battery is 51.5V-53.5V.
- (3) Prior to wiring, check the anode and cathode of the battery and the anode and cathode terminals shall not be connected reversely.
- (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.
- (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.
- (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

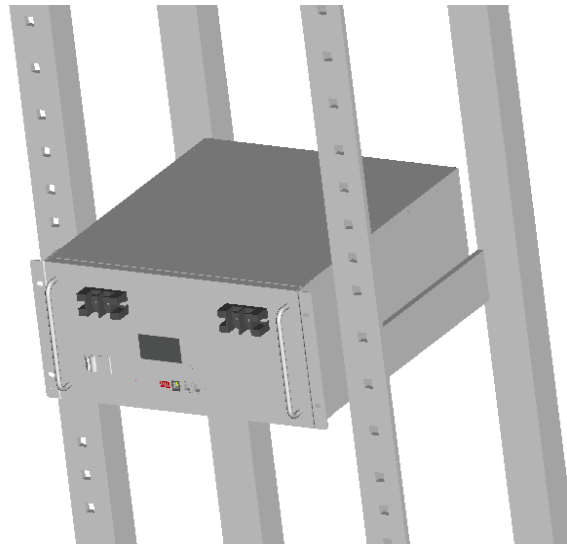
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hazard.

(7) Do not touch the surface of the battery box with the sharp part of the tool to scratch or damage the battery box.

(8) Do not disassemble the battery box without authorization.

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



(10) Install it according to the selected installation mode:

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.

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.

Installation of integrated indoor and outdoor cabinets (boxes): Install them according to the installation specification for the customized integrated cabinet (box).

6-7 Operation Instruction for Installation

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

Press the reset key RST on the front panel for 3S for startup. During startup, 4 capacity indicator lights on the front panel, ALM alarm indicator light (red) and RUN running indicator light light up.

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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.

2) For the battery which is normal after detection, please press the reset key RST for 3S to execute the battery ON/OFF operation.

Instructions of manual operation of the reset key RST	Startup	In the OFF state of BMS, press the key for 3S for startup;
	Shutdown	In the non-standby state of BMS, press the key for 3S for shutdown;
	Reset	In the non-standby state of BMS, press the key for 10S, until all LEDs light up for reset.

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

3) Installation of the lithium battery, wiring and startup.

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 3S 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 3S 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.

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

- 1) When the battery pack with the capacity of 200Ah or below is connected in parallel, it is suggested to select 16mm² copper wire.
- 2) When the battery pack with the capacity of 200Ah~300Ah is connected in parallel, it is suggested to select 16mm² or 25mm² copper wire.
- 3) When the battery pack with the capacity of 300Ah or above is connected in parallel, it is suggested to select 25mm² copper wire.

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.

Lithium battery	Copper core cable	Copper pigtail	Remarks
48V50Ah	16mm ² /25mm ²	16-8/25-8	M8 copper pigtail is used for 48V50Ah sing pack of battery binding post
48V100Ah	16mm ² /25mm ²	16-10/25-10	48V100Ah M10 copper pigtail is used for 48V100Ah sing pack of battery binding post

Introduction to operation steps in detail according to the capacity required:

- **Battery pack in parallel with the capacity of 200Ah or below (the wiring diagram is shown in Figure 1):**

Step 1: Make the battery pack in the standby state and install it in the battery cabinet successively.

Step 2: 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.

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

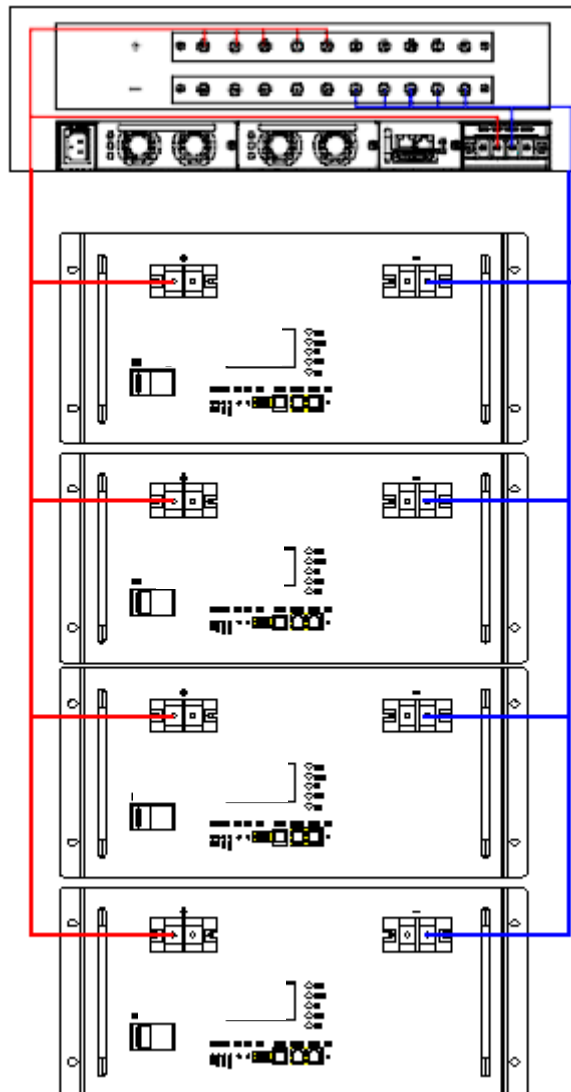
Step 4: Set the dial-up addresses of all battery modules from top to bottom one by one, which are 1000, 0100, 1100 and 0010 (the dial-up addresses are set according to the number of battery

modules actually used) respectively; (this step may be skipped if there is no need to access to the remote monitoring platform).

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 RS232 interface of the battery module with the address of 1000 with the RS232 connecting line; (this step may be skipped if there is no need to access to the remote monitoring platform).

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.

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



Wiring Diagram of Battery Pack in Parallel with Capacity of 400Ah or Below

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- **Battery pack with the capacity of 300Ah~400Ah in parallel:**

Step 1: Make the battery pack in the standby state and install it in the battery cabinet successively.

Step 2: Disassemble the anode insulating cap of the battery pack one by one, connect the anode of each battery pack to the anode busbar at the battery cabinet side with the installation connecting line with the same length and screw on the anode insulating cap.

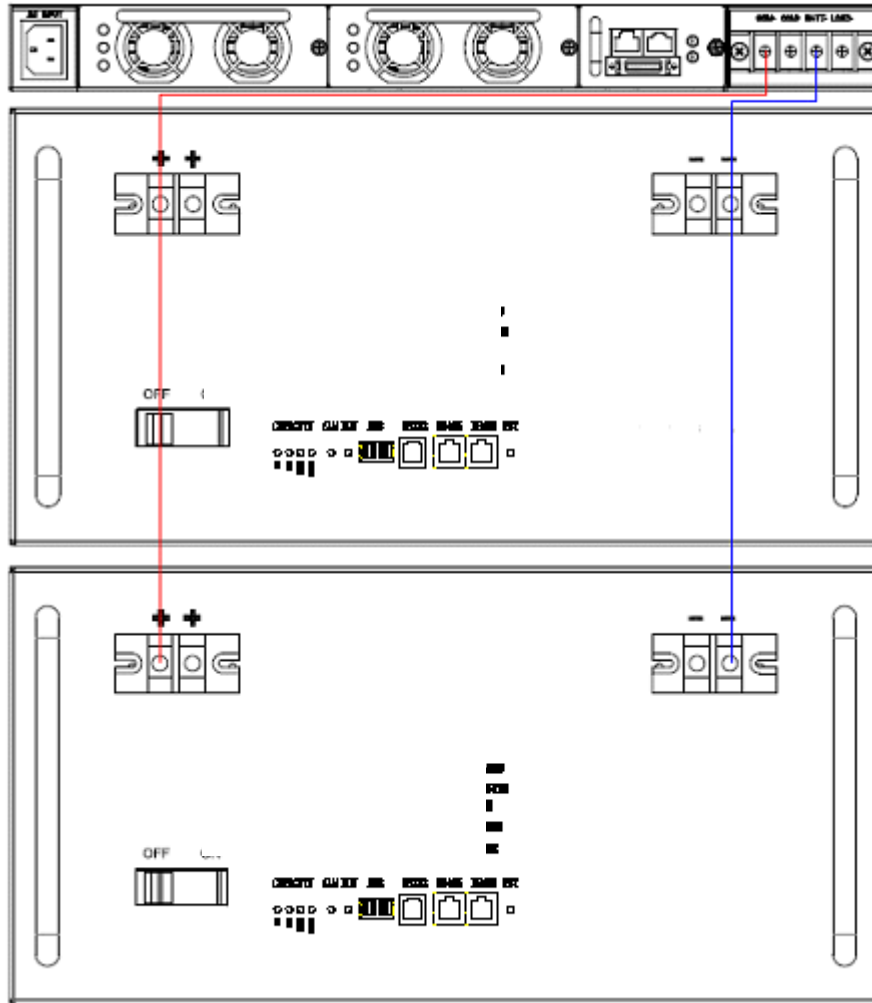
Step 3: According to step 2, connect the cathode of the battery pack.

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).

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 RS232 interface of the battery module with the address of 1000 with the RS232 connecting line; (this step may be skipped if there is no need to access to the remote monitoring platform).

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.

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

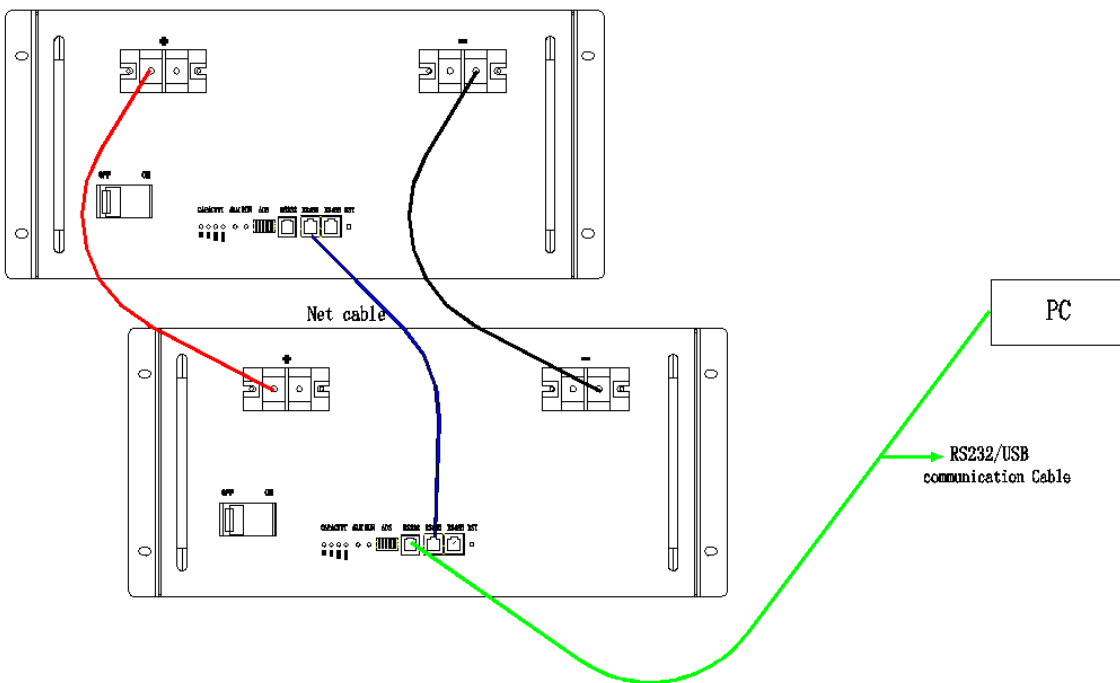
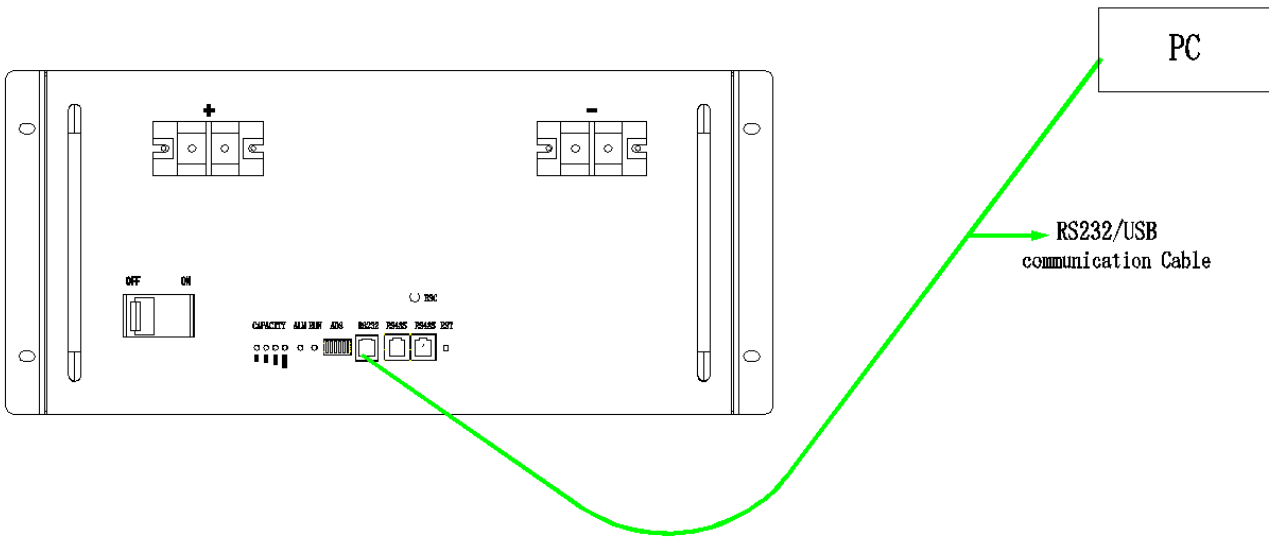


Wiring Diagram of Battery Pack in Parallel with Capacity of 200Ah~300Ah

6-8. Circuit breaker of battery circuit is set to OFF, connect it to switch power supply, and output voltage of switch power supply is set to 52.5-54V, current set to 0.2C; after all settings done, switch the circuit breaker ON.

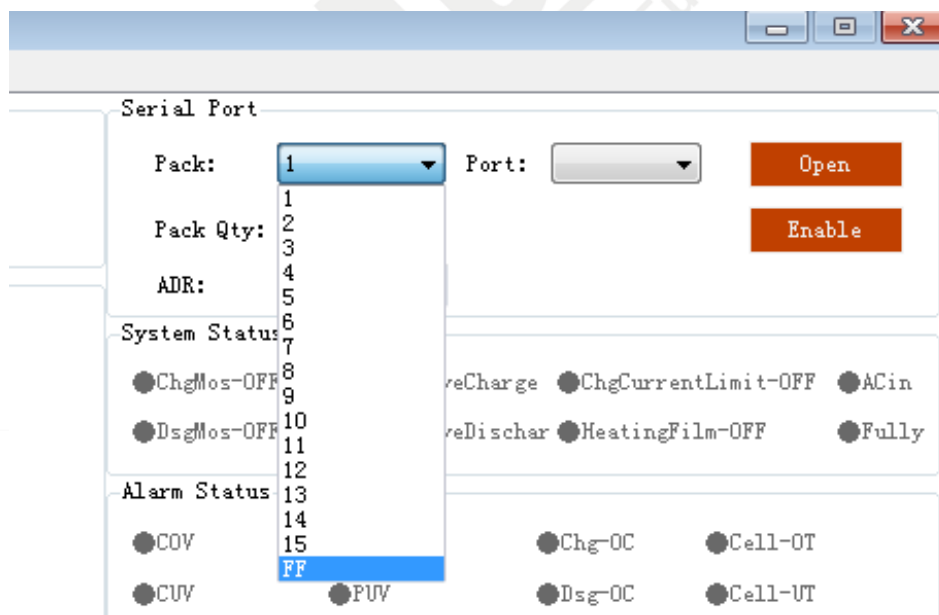
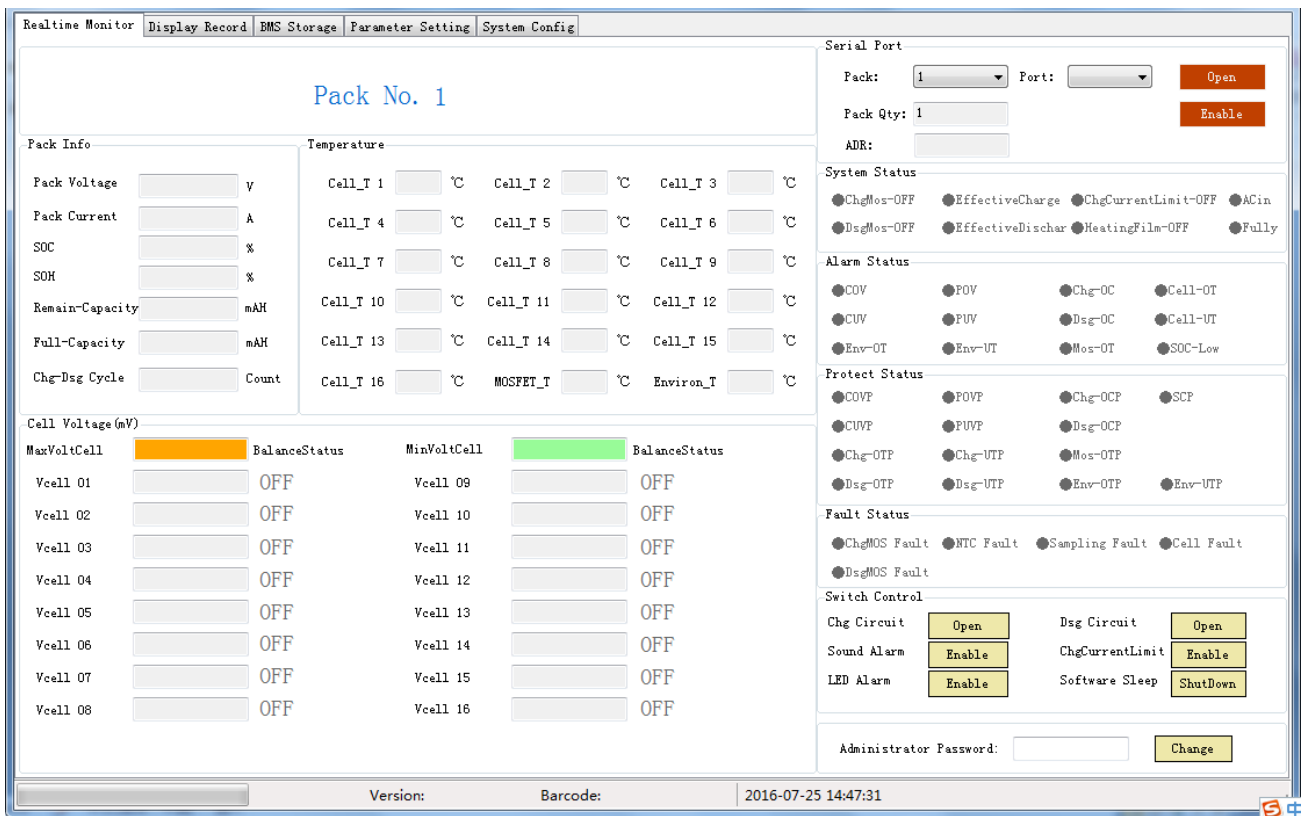
6-9. Connection mode for parallel communication

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; FF polling mode used as consulting mode.



RS232 Parallel Communication

6-10. Monitor Software interface



6-11 Upper machine instructions

A、 Software source file:

Name of software source file : BmsTools.exe 、 BmsTools.exe.config 、 Language.xml 、 LogParams.xml、 MultiLanguage.dll、 ParamSetting.xml six documents in total.

B、 Software running envirement:

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The software running on the PC and its compatible computer, using WINDOWS operation system.

C、Software using steps:

(1) Double click BmsTools.exe icon can show the main interface of the software (As shown in figure A) .

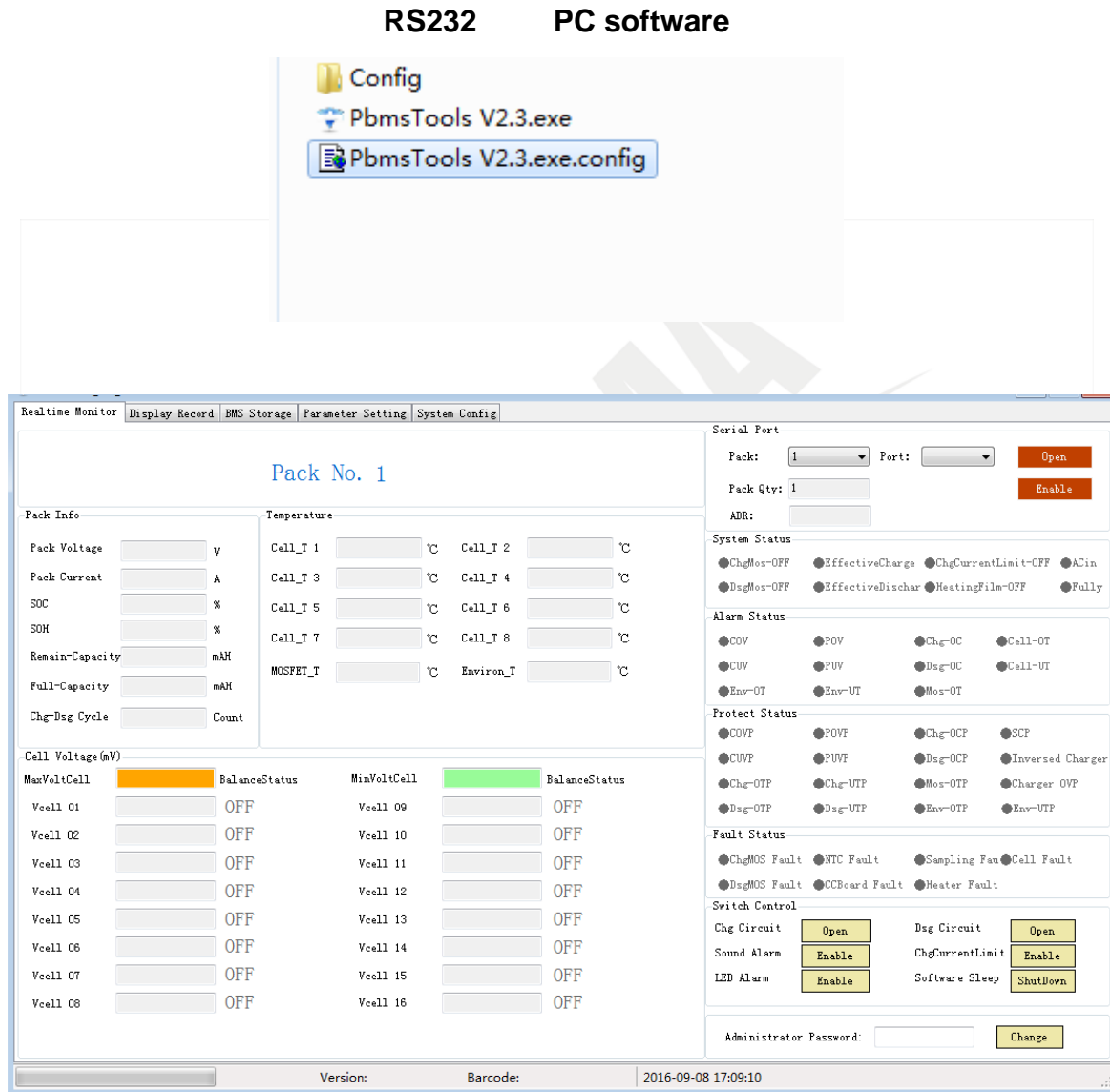


Figure A: Real-time Monitoring

(2) Open the main interface (As shown in figure A), the software automatically search serial port, and automatically open, real-time read battery voltage, power, temperature, and protection of the state of battery parameters.

Operating authority is divided into general rights and administrator privileges.

(3) In the display record TAB(As shown in figure B),there are two checkboxes, display and automatic

storage.

Check the display option, can real-time display the various parameters of the battery.

Check the automatic storage option, can automatically storage the parameters of the battery in the excel table. The file in the software under the current file path of the data folder, storage file name named after pack number and time. 比 For example packNo1_20150306145010.xls.

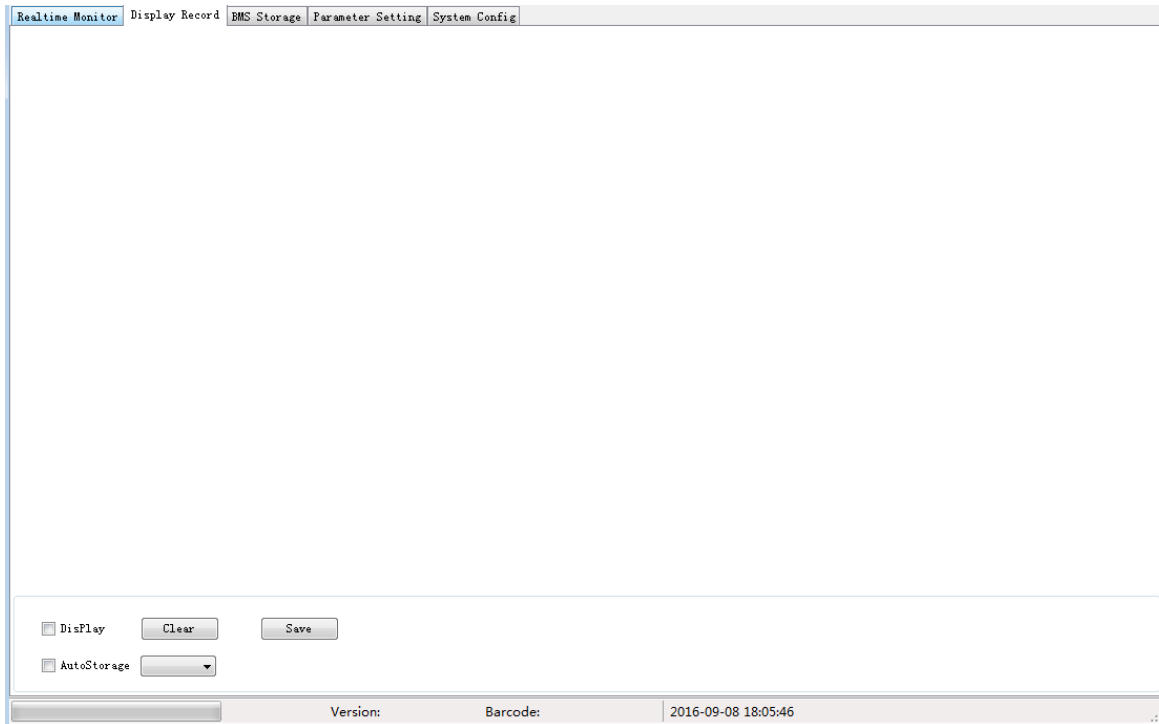


Figure B: Display record

(4) In storage record TAB(As shown in figure C), can read the battery protective plate storage of records, the records content including record the protection and alarm and restore the category and time of occurrence, records includes fault categories and fault occurs monomer voltage, total voltage, charge/discharge capacity, charge/discharge current, temperature, etc. In addition to normal record protection and alarm and recovery information, but by setting, record battery parameters within a certain period of time.: Monomer voltage , total voltage, charge/discharge capacity, charge/discharge current, temperature, etc.

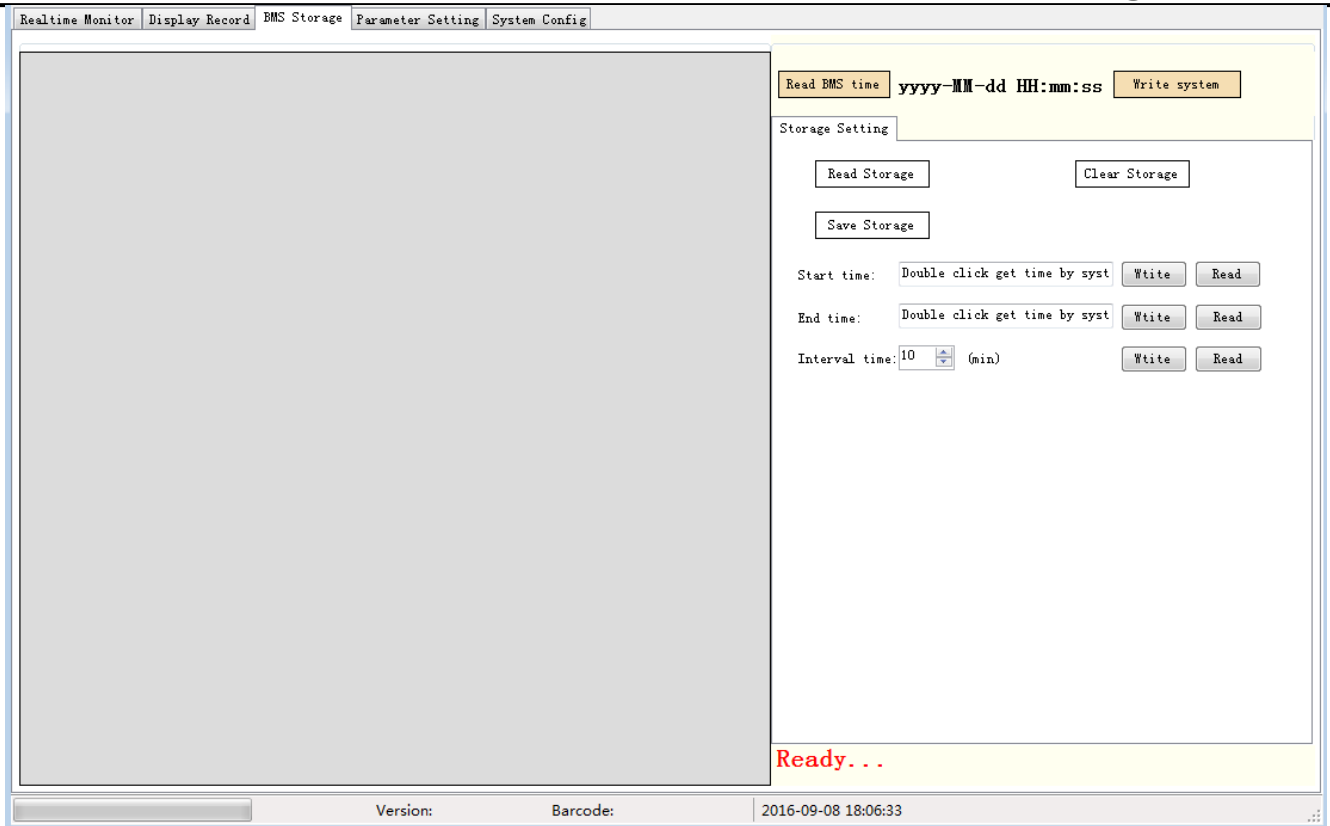


Figure C: Storage record

(5) In the parameter settings TAB(As shown figure D),the TAB for the battery parameters.

Read the parameter I: Read all the parameters of the battery

Write in parameter : Write all the parameters of the battery

Restore default: Restore the default parameters for battery

Import parameters: Export the current battery parameters, for the XML file format.

Expoer parameters: The parameters of the import file format for the XML to the current TAB

Figure D: Parameter Settings

(6) In the system configuration TAB(As shown in figure E),the TAB for battery calibration, parameters setting, the battery calibration and setting up the battery system parameters need administrator privileges.

Figure E: System Configuration

6-12 Address Switch function(Only in Parallel)

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

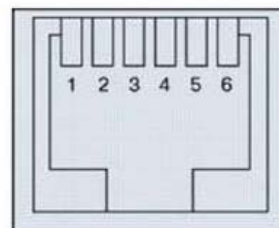


address	Dial switch						Remark
	#1	#2	#3	#4	#5	#6	
0	OFF	OFF	OFF	OFF	NC	NC	Use alone
1	ON	OFF	OFF	OFF			Set to Pack1 (master)
2	OFF	ON	OFF	OFF			Set to Pack2
3	ON	ON	OFF	OFF			Set to Pack3
4	OFF	OFF	ON	OFF			Set to Pack4
5	ON	OFF	ON	OFF			Set to Pack5
6	OFF	ON	ON	OFF			Set to Pack6
7	ON	ON	ON	OFF			Set to Pack7
8	OFF	OFF	OFF	ON			Set to Pack8
9	ON	OFF	OFF	ON			Set to Pack9
10	OFF	ON	OFF	ON			Set to Pack10
11	ON	ON	OFF	ON			Set to Pack11
12	OFF	OFF	ON	ON			Set to Pack12
13	ON	OFF	ON	ON			Set to Pack13
14	OFF	ON	ON	ON			Set to Pack14
15	ON	ON	ON	ON	Set to Pack15		

6-13 Communication Function



RS485 interface



RS232 interface

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

RS232 Terminal Port	Definition
Pin3	BMS Transmit, PC Receive
Pin4	BMS Receive, PC Transmit
Pin2,5	GND
Pin1,6	NC

RS232 Communication Port Definition

7. Operations

7-1. LED Indicators

LED Indicators:

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







PACK Status	Normal/Alarm/Protection	RUN	ALM	SOC Indication LEDs				Remark
								
Power Off	Sleep	OFF	OFF	OFF	OFF	OFF	OFF	All off
Standby	Normal	Flash 1	OFF	Indication by SOC				Standby state
	Alarm	Flash 1	Flash 3	(The top SOC Led Flash 2)				Cell low voltage
Charge	Normal	ON	OFF	Indication by SOC				ALM Led on when Cell over-charge voltage Alarm
	Alarm	ON	Flash 3	(The top SOC Led Flash 2)				
	Over Charge Protection	ON	OFF	ON	ON	ON	ON	If no mains supply, LED as standby
	Temperature. Over-current Fault Protection	OFF	ON	OFF	OFF	OFF	OFF	Close charge
Discharge	Normal	Flash3	OFF	Indication by SOC				
	Alarm	Flash3	Flash 3					
	Under Discharge Protection	OFF	OFF	OFF	OFF	OFF	OFF	Close discharge
	Temperature. Over-current. Short Circuit Fault Protection	OFF	ON	OFF	OFF	OFF	OFF	Close discharge
Fault		OFF	ON	OFF	OFF	OFF	OFF	Close charge Close discharge

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.

7-2. Buzzer Operation(Optional)

Model	Description and Status
Fault	Buzzing 0.25S per 1Sec
Protection	Buzzing 0.25S per 2Sec(expect for over-charge protection)
Alarm	Buzzing 0.25S per 3Sec(expect for over-charge alarm)

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

7-3. Reset key function

Mode	Pressing and Holding time		
	0-3Sec	3-6Sec	>6Sec
Normal	Indication by SOC	Transfer to Sleeping mode	Reset
Sleeping Mode	Wake up from Sleeping mode		

2) Battery parameters collection page

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

4.2 Key description

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

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.

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.

4) In a dormant state, press any key, can activate the screen.

3.3 Dormancy/shutdown

Under normal operation condition, with no keystrokes 1 minutes later, system will enter a state of

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dormancy/shutdown.

Shutdown/dormancy state, press any key, screen can be activated.

8. Troubleshooting

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

Symptom	Possible cause	Remedy
No indication and alarm in the front display panel	Sleeping mode	Press Reset to normal mode
No indication and alarm in the front display panel even Reset still no	Battery voltage too low	Charge battery immediately
Red LED Flashing when Standby	Battery cell low voltage	Charge battery immediately
Red LED Flashing when charging	Alarm for protection when charging	BMS show alarm, protect and adjustment
Red LED Flashing when Discharging	Battery too low and will shutdown	Charge battery immediately
RED LED Lighting continuous	Battery wrong	Need to repair

9. Storage and Maintenance

9-1. Storage

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:

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

9-2. Maintenance




The battery system operates with hazardous voltages. Repairs may be carried out only by qualified maintenance personnel.





Even after the unit is disconnected from the mains, components inside are still connected to the battery cells which are potentially dangerous.





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.


 Only 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.


 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.


 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.

 When replace the batteries, install the same number and same type of batteries.

 When replace the parallel batteries, make sure the new battery is full charged.

 Do not open or destroy batteries. Escaping electrolyte can cause injury to the skin and eyes. It may be toxic.

 Please replace the fuse only with the same type and amperage in order to avoid fire hazards.

 Do not disassemble the battery system.

10. Product Responsibilities and Consulting

1) We will not be liable for the accidents resulting from operation breaking this specification and user manual.

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) The shelf life of this product is within 24 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.