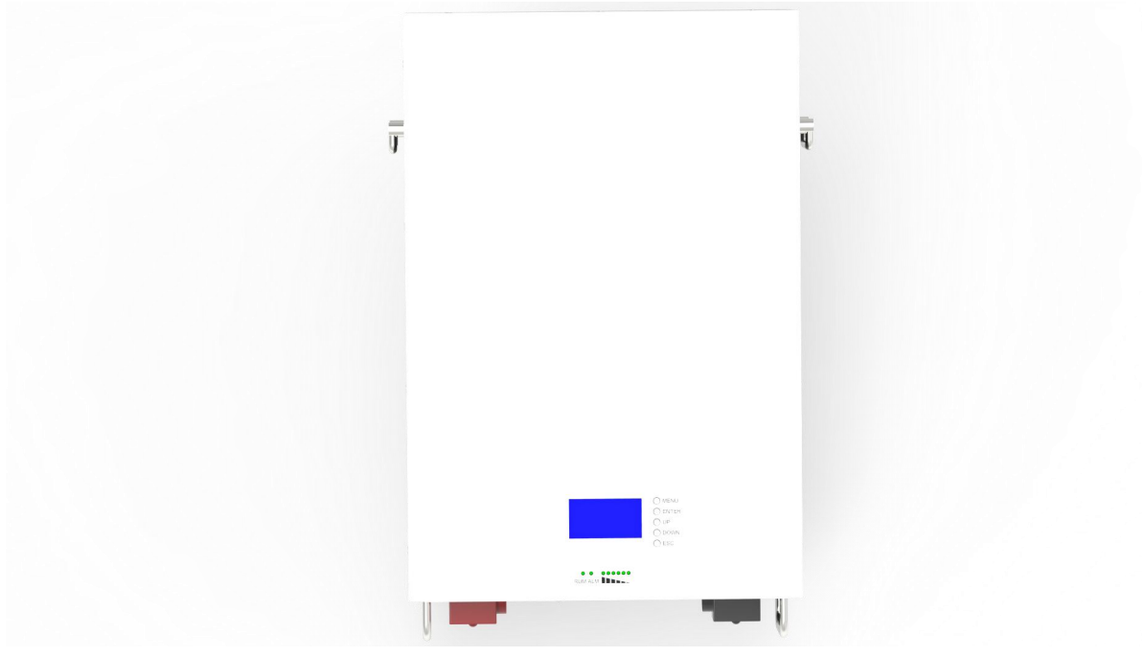
PKNERGY®
Energy Storage System

User manual



SHENZHEN PKNERGY ENERGY CO.,LTD
E-mail：sales@pknergy.com Website：http://www.pknergy.com

PKNERGY
Energy Storage System

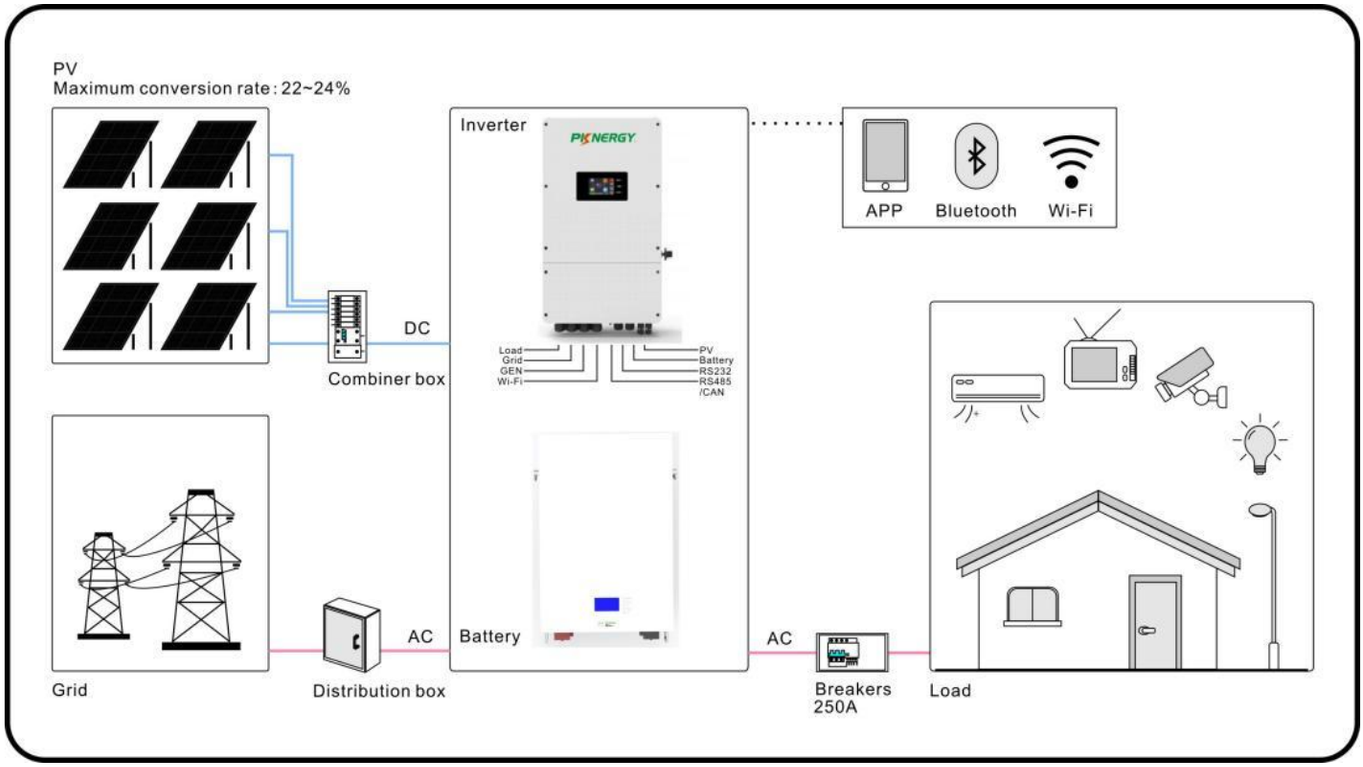
Table of Contents

SHENZHEN PKNERGY ENERGY CO.,LTD
address: 9th Floor,Block B,Hongrongyuan North Station Center No. 32, Mintar ing Road, Longhua District,Shenzhen China.
Tel：+86-755-86670672 Fax：+86-755-86670609 E-mail：sales@pknergy.com Website：http://www.pknergy.com

1. Introduction

The Energy storage pack is an essential component of the photovoltaic power generation system. It can provide electricity for the connected load, and it can also store photovoltaic solar modules, fuel generators, or wind energy generators by charging the remaining energy in case of emergency. When the sun goes down, energy demand is high, or there is a power outage, you can use the energy stored in the system to meet your energy needs at no additional cost. In addition, the energy storage Pack can help you achieve energy self-consumption and ultimately achieve the goal of energy independence.

According to different power conditions, the energy storage PACK can output power during peak power consumption, and can also store energy during low power consumption. Therefore, when connecting the matching photovoltaic modules or inverter arrays, external equipment is required to match the energy storage the working parameters of the pack to achieve the highest operating efficiency. For a simple diagram of a typical energy storage system.



2. Safety Warning

It is very important and necessary to read the user manual carefully before

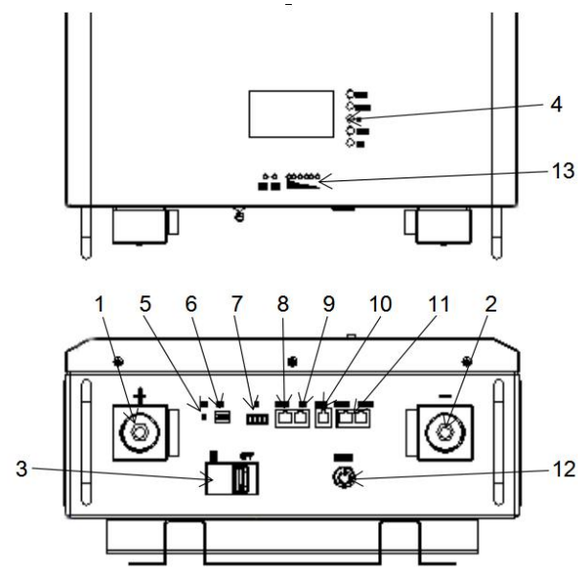
Installing or using the battery. Failure to follow any of the instructions or warnings in this document can result in electrical shock, serious injury, death, or may damage the battery and the whole system.

●If the battery is stored for a long time, it is requirement that they are charged every three to six months, and the SOC should be no less than 80%,after fully discharging,The battery needs to be recharged within 12 hours.

- Do not expose cable outside;Do not use cleaning solvents to clean the battery.
- All battery terminals must be disconnected before maintenance.
- Do not expose the battery to flammable or harsh chemicals or vapors.
- Do not paint any part of the battery, include any internal or external components.
- Do not connect battery with PV solar wiring directly.
- Any foreign object is prohibited to be inserted into any part of the battery.
- After unpacking, please check the battery and pack list first, if the battery is damaged or spare parts are missing, Please contact the dealer.
- Before installation, be sure to cut off the grid power and make sure the battery is in the turned-off mode;
- Wiring must be correct, do not mix-connect the positive and negative cables, and ensure no short circuit with the external device;
- It is prohibited to connect the battery with AC power directly;
- The BMS in the battery is designed for 24VDC/48VDC, DO NOT connect battery in series;
- It is prohibited to connect the battery with different type of battery;
- Please ensure the electrical parameters of battery system are compatible to inverter;
- Keep the battery away from fire or water.
- Our company will not bear any warranty claims for direct or indirect damage caused by violation of the above items.

3. Function interface description

No.	Description	Silk-screen
1	Output terminal	+
2	Output terminal	-
3	Circuit breaker switch	ON/OFF
4	LCD	MEUN/Enter/UP/ESC
5	Reset button	RST
6	Dial switch	ADS
7	Dry port	DRY CONTACT
8	RS485A Port	RS485A
9	CAN bus Port	CAN
10	RS232 Port	RS232
11	RS485B Port	RS485B/RS485B
12	E-Switch	ON/OFF
13	LED indicate	RUN/ALM/CAPACITY



SHENZHEN PKNERGY ENERGY CO.,LTD
address: 9th Floor,Block B,Hongrongyuan North Station Center No. 32, Mintar ing Road, Longhua District,Shenzhen China.
Tel：+86-755-86670672 Fax：+86-755-86670609 E-mail：sales@pknergy.com Website：http://www.pknergy.com

4. Installation the tool

Personal protective equipment:






Necessary installation tools






SHENZHEN PKNERGY ENERGY CO.,LTD
address: 9th Floor,Block B,Hongrongyuan North Station Center No. 32, Mintar ing Road, Longhua District,Shenzhen China.
Tel：+86-755-86670672 Fax：+86-755-86670609 E-mail：sales@pknergy.com Website：http://www.pknergy.com

5. Mounting the PACK

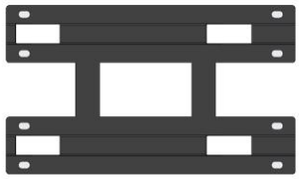
Material preparation:

Output line

Screw

Parallel communication

lineInverter communication line



Mounting brackets

Step 1:

Choose suitable firm wall with thickness greater than 100mm.

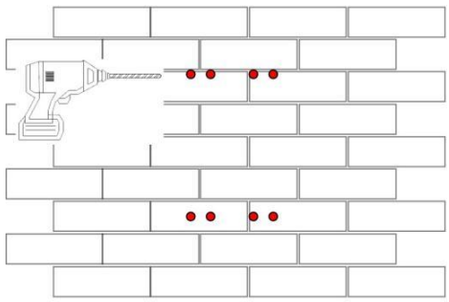
Use the mounting frame as a template, mark the hole position.

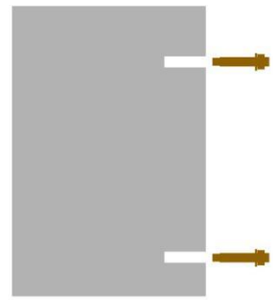
Drill 8 holes according to the hole position, it is ø10 with depth 80mm.

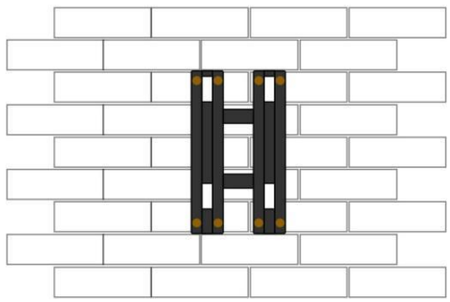
Hammer the M10 screws to the above holes, and screw the nut.

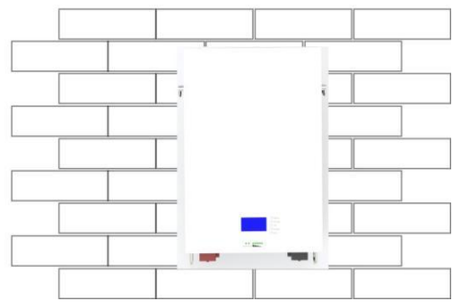
Raise the battery to slightly above the hook, while maintaining the battery balance.

Secure the battery to the wall through a hook.









A falling device can cause serious or even fatal damage: never install the battery on the hook screw unless you ensure that the hook screws are firmly installed on the wall and after a thorough inspection.

SHENZHEN PKNERGY ENERGY CO.,LTD

address: 9th Floor,Block B,Hongrongyuan North Station Center No. 32, Mintar ing Road, Longhua District,Shenzhen China.

Tel：+86-755-86670672 Fax：+86-755-86670609 E-mail：sales@pknergy.com Website：http://www.pknergy.com

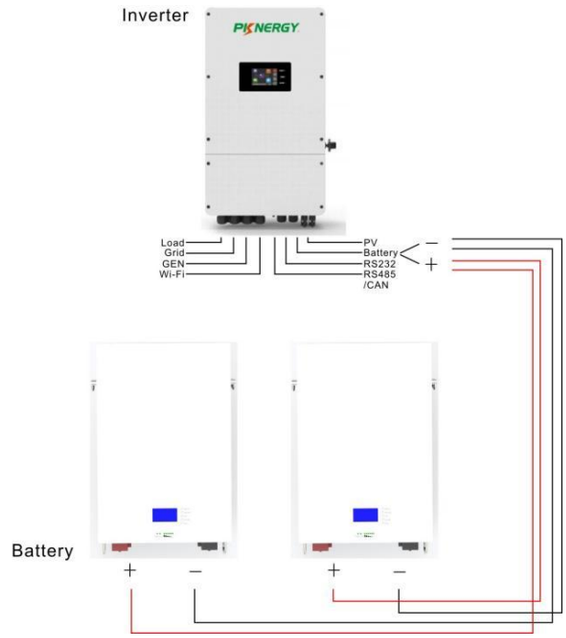
Step 2:

Parallel use of battery：

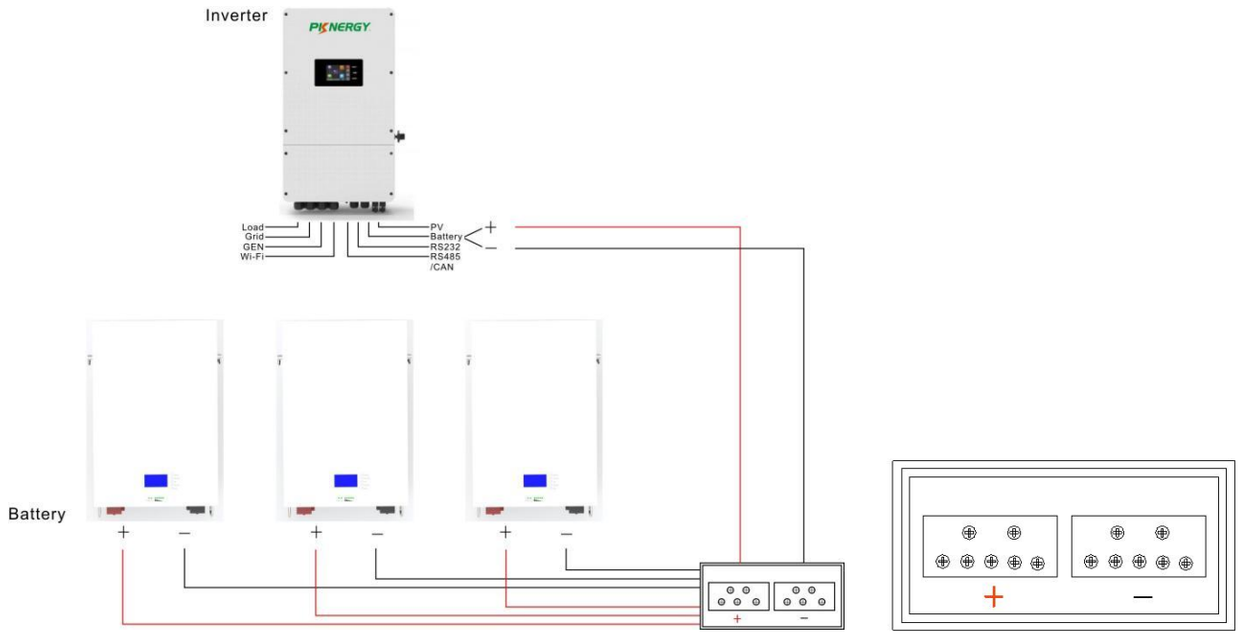
When the battery needs to be used in parallel, the maximum connection is 16 units, but we recommend using 2-4 units according to the application, please select the appropriate accessories:

The positive/negative electrode of each battery is directly converging at the battery input end of the inverter.

The two batteries should be connected in parallel first. The battery near the inverter is the main output and connected to the battery input terminal of the inverter. The wire required for the confluence is not included in the standard package.



More than 3 batteries in parallel require the use of an additional bus box not included in the standard package：

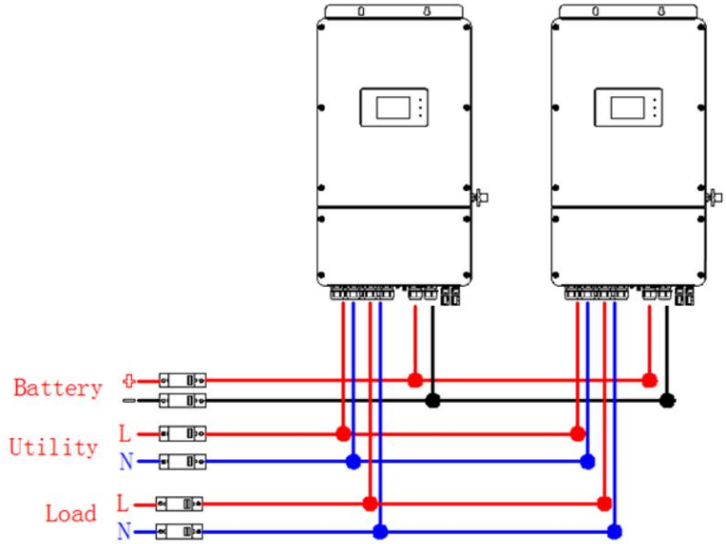


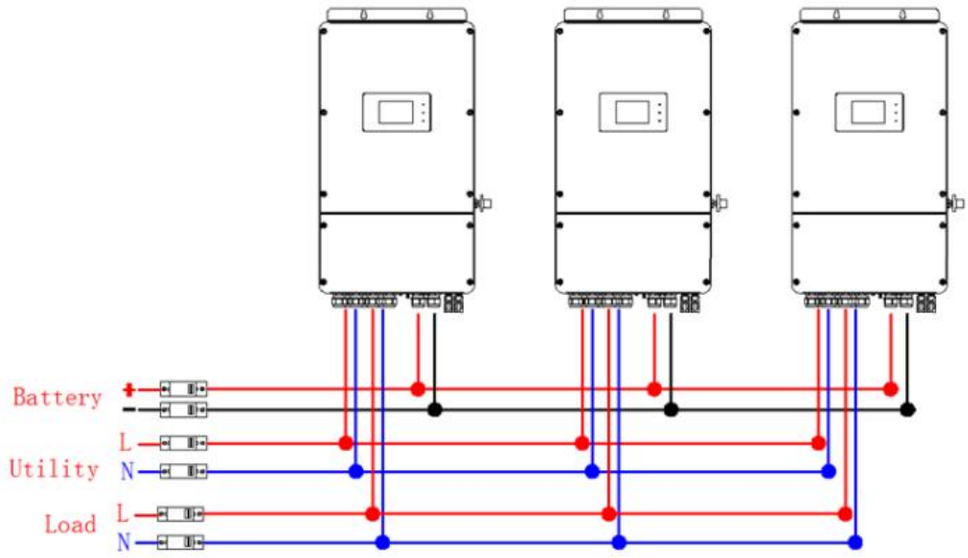
SHENZHEN PKNERGY ENERGY CO.,LTD

address: 9th Floor,Block B,Hongrongyuan North Station Center No. 32, Mintar ing Road, Longhua District,Shenzhen China.

Tel：+86-755-86670672 Fax：+86-755-86670609 E-mail：sales@pknergy.com Website：http://www.pknergy.com

Step 3:The battery is connected to the inverter





SHENZHEN PKNERGY ENERGY CO.,LTD
address: 9th Floor,Block B,Hongrongyuan North Station Center No. 32, Mintar ing Road, Longhua District,Shenzhen China.
Tel：+86-755-86670672 Fax：+86-755-86670609 E-mail：sales@pknergy.com Website：http://www.pknergy.com

PKNERGY
Energy Storage System

6. LED working status

SYS status	Abnormal event	ON/ OFF	RUN	ALM	Capacity LED						Description
		●	●	●	●	●	●	●	●	●	
Shutdown	Dormancy	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	/
Standby	Normal	ON	Flash 1	ON	According to capacity indicator						Dormancy
	Warning	ON	Flash 1	Flash 3							Module low voltage
Charge	Normal	ON	ON	OFF	According to the highest capacity indicator LED flashes 2						ALM does not flicker
	Warning	ON	ON	Flash 3							
	Over Voltage Protection	ON	ON	OFF	ON	ON	ON	ON	ON	ON	There is no mains power, and the indicator turns to standby
	Over current Temperature Protection	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop charging
Discharge	Normal	ON	Flash 3	OFF	According to capacity indicator						/
	Warning	ON	Flash 3	Flash 3							/
	Under Voltage Protection	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Stop discharging
	Over current Short circuit Temperature Reverse connection Protection	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop discharging

Flash mode	ON	OFF
Flash1	0.25s	3.75s
Flash2	0.5s	0.5s
Flash3	0.5s	1.5s

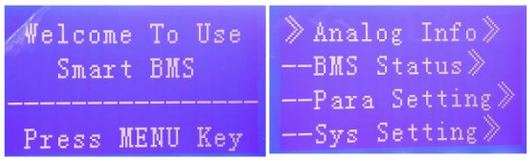
SHENZHEN PKNERGY ENERGY CO.,LTD
address: 9th Floor,Block B,Hongrongyuan North Station Center No. 32, Mintar ing Road, Longhua District,Shenzhen China.
Tel：+86-755-86670672 Fax：+86-755-86670609 E-mail：sales@pknergy.com Website：http://www.pknergy.com

7. LCD screen display

① Display rendering

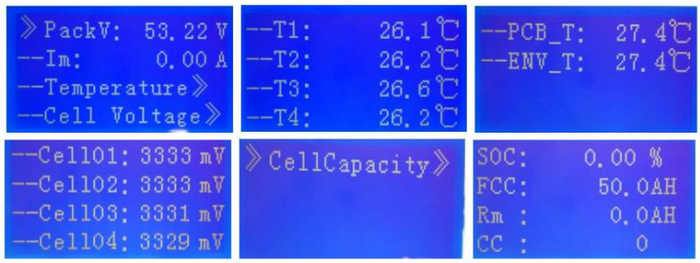
② Main menu page

After BMS is activated, will show the welcome screen, press the “MENU” button to enter the main menu page. As shown in the figure below:



③ Battery parameters page

When the cursor“》”is point to“Battery Parameters Acquisition”press “ENTER” key will enter the page of“Battery Parameters Acquisition”As shown in the figure below:



When the cursor “》”is point to”Battery Status”press “ENTER” key will enter the page of “Battery Status”,As shown in the figure below:

SHENZHEN PKNERGY ENERGY CO.,LTD
address: 9th Floor,Block B,Hongrongyuan North Station Center No. 32, Mintar ing Road, Longhua District,Shenzhen China.
Tel：+86-755-86670672 Fax：+86-755-86670609 E-mail：sales@pknergy.com Website：http://www.pknergy.com

Parameter Settings

Screen can not set parameters Baud Rate:9600 ,Can not be set.

Key description

①SW1----MENU,SW2----ENTER,SW3----UP,SW4----DOWN, SW5----ESC.

②Each 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.

③Press "ESC" key can be returned at the next higher level directory;In any position, press" MENU" key can return to the main menu page.

④when BMS inter sleep mode, press any key, can activate the screen.

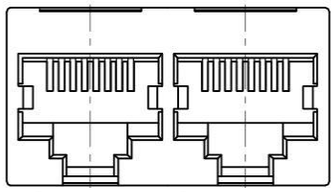
Inter standby mode , with no keystrokes 1 minutes later, LCD will enter Shutdown mode press any key,screen can be activated.

8. Connection mode for communication

RS485 interface for communication with upper computer;With CAN interface, CAN carry out multi-machine parallel communication.(RS485 baud rate 19200,CAN baud rate 500K)

When the host (the dialing address 1、2、3 and is OFF) CAN communicates only with the inverter, when the code 6 is on, it can support the pylontech protocol，the code 5 and 6 are on, it supports the Guerrero watt protocol.

9. RS485/CAN Interface definition



RS485 and CAN

RS485(8P8C)		CAN(8P8C)	
DJ45	illustrate	DJ45	illustrate
1、8	RS485-B	9、10、11、14、16	NC
2、7	RS485-A	12	CANL
3、6	GND	13	CANH
4、5	NC	15	GND

SHENZHEN PKNERGY ENERGY CO.,LTD
address: 9th Floor,Block B,Hongrongyuan North Station Center No. 32, Mintar ing Road, Longhua District,Shenzhen China.
Tel：+86-755-86670672 Fax：+86-755-86670609 E-mail：sales@pknergy.com Website：http://www.pknergy.com

10. Parallel interface

BMS battery packs communicate in parallel via RS485 bus, and can also communicate with devices with RS485 bus, while RS232 interface realizes communication with PC or other intelligent terminals, human-computer interaction RS485 bus parallel connection of any battery pack information, multi-machine parallel bus interface See the figure
below.

11. BMS RS232 communication instructions

The BMS can communicate with the host computer through the RS232 interface, so that the host computer can monitor and set various information of the battery, including battery voltage, current, temperature, status and battery production information, etc., and the default baud rate is 9600bps.
Operation instructions:
11.1 Accessories
11.2 Accessories introduced
11.3 Fitting installation steps
11.4 BMS software installation steps
11.5 Introduction to the functions of the host computer
11.6 Debugging steps of the host computer
11.7 Other settings

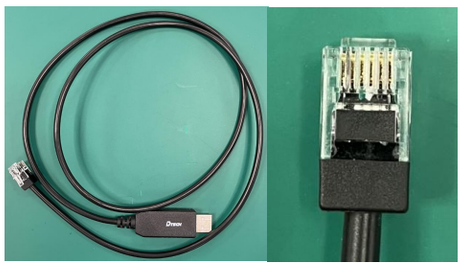
SHENZHEN PKNERGY ENERGY CO.,LTD
address: 9th Floor,Block B,Hongrongyuan North Station Center No. 32, Mintar ing Road, Longhua District,Shenzhen China.
Tel：+86-755-86670672 Fax：+86-755-86670609 E-mail：sales@pknergy.com Website：http://www.pknergy.com

11.1 Accessories

USB to RJ12 crystal head

Computer (upper computer)

11.2 Accessories introduced



RJ12 The order of the lines:

RS232（RJ12 6P6C）	
RJ12	
1、5、6	NC
2	GND
3	RX
4	TX

Where to buy：Brand：DTECH

（https://item.m.jd.com/product/100056943642.html?utm_source=iosapp&utm_medium=appshare&utm_campaign=t_335139774&utm_term=CopyURL&ad_od=share&gx=RnAonS8DazLah8lR5Q&gxd=RnAoy29eOzbfn8pDqYRzDLdkRBFs44NA603gijT5SyWCqjx-no1rDykVnXRAWV8）

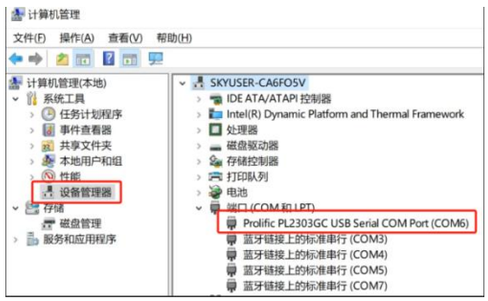
SHENZHEN PKNERGY ENERGY CO.,LTD
address: 9th Floor,Block B,Hongrongyuan North Station Center No. 32, Mintar ing Road, Longhua District,Shenzhen China.
Tel：+86-755-86670672 Fax：+86-755-86670609 E-mail：sales@pknergy.com Website：http://www.pknergy.com

11.3 Fitting installation steps

* The USB to RJ12 crystal head cable is integrated, and you only need to communicate with the seller about the RJ12 wiring sequence.
* After the USB is connected to the computer, the program will be installed automatically, and it will be displayed in My Computer - Device Manager-Ports:Prolific PL2303GC USB Serial COM Port（COM**）.
* COM**:It will be automatically sorted according to the number of USB installations on my computer.

Plug in the USB port of your computer

RJ12 is connected to the battery RS232



Automatic installer

Battery DIP setting：1：NO，2：OFF，3：OFF，4：OFF

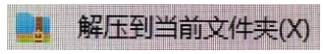
11.4 BMS software installation steps

沛城RS232上位机程序.zip

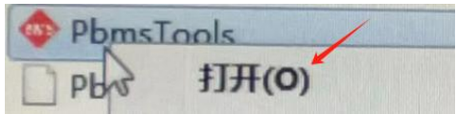
SHENZHEN PKNERGY ENERGY CO.,LTD
address: 9th Floor,Block B,Hongrongyuan North Station Center No. 32, Mintar ing Road, Longhua District,Shenzhen China.
Tel：+86-755-86670672 Fax：+86-755-86670609 E-mail：sales@pknergy.com Website：http://www.pknergy.com

Host computer program software

Installation Steps：

①unpack 

②Double-click the application



③Start the program（No login required）：

11.5 Introduction to the functions of the host computer

① Realtime Monitoring

② Mu1ti Monitoring

③ Memory Info.

④ Parameter Setting

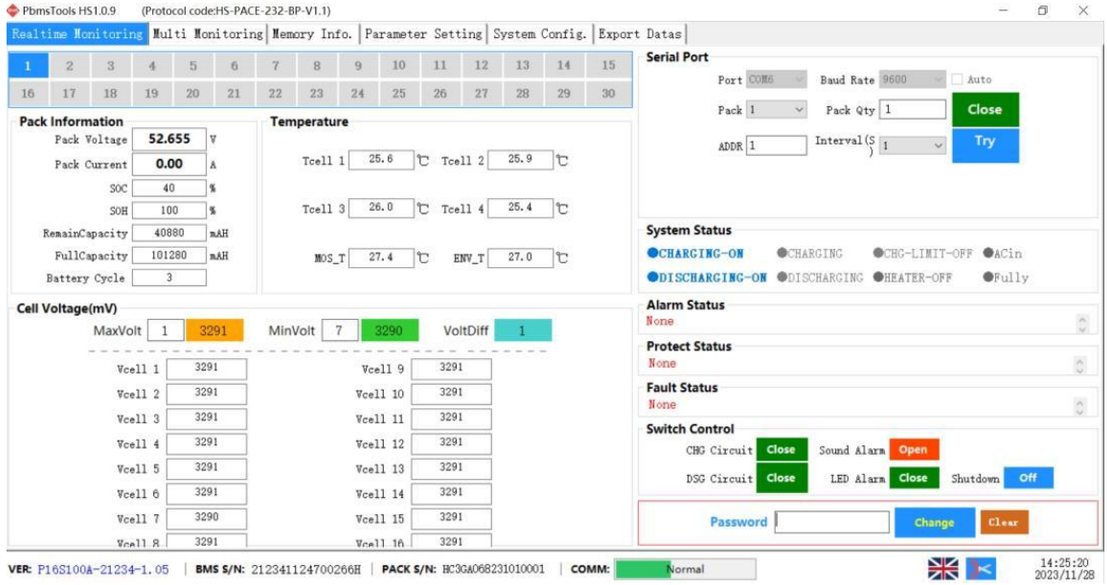
⑤ System Config

⑥ Export Datas

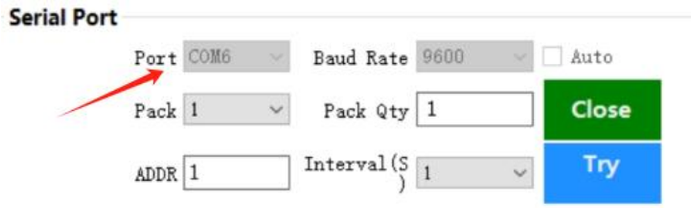
11.6 Debugging steps of the host computer

① Modify the language

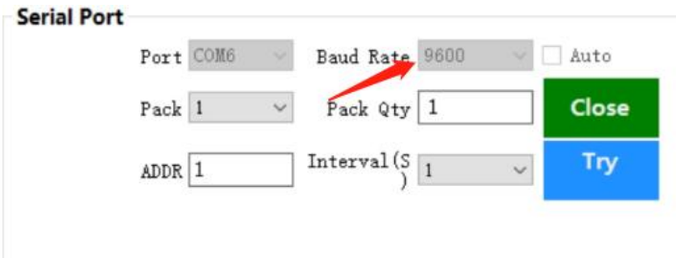
SHENZHEN PKNERGY ENERGY CO.,LTD
address: 9th Floor,Block B,Hongrongyuan North Station Center No. 32, Mintar ing Road, Longhua District,Shenzhen China.
Tel：+86-755-86670672 Fax：+86-755-86670609 E-mail：sales@pknergy.com Website：http://www.pknergy.com



② Set up Port（Click Try to automatically query COM**）



③ Set up Baud Rate（Set 9600）



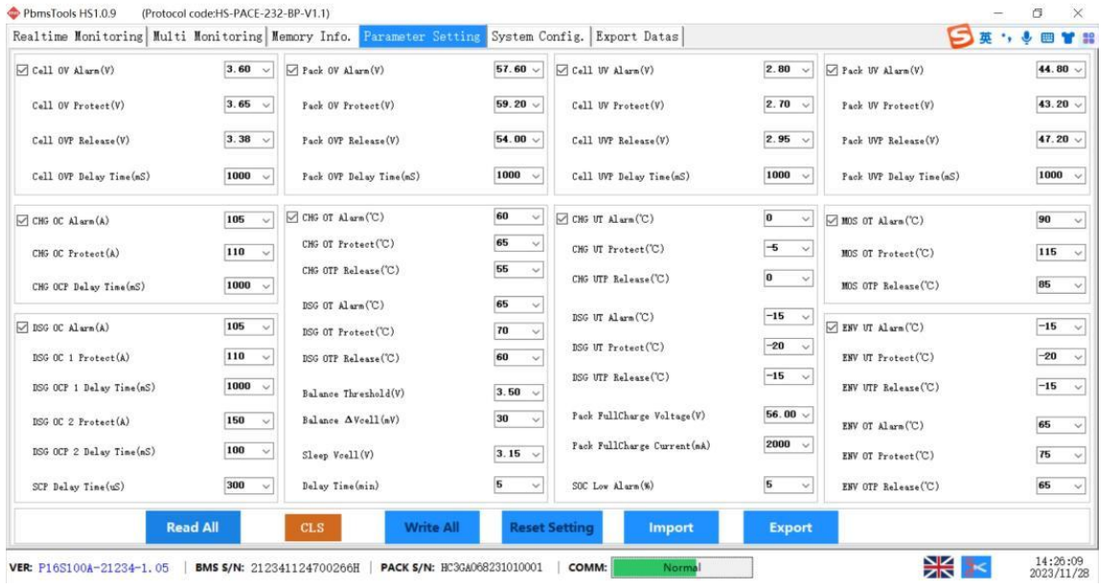
④ Set up Try（Nothing else is required）

⑤ The state after the communication（At the very bottom）

SHENZHEN PKNERGY ENERGY CO.,LTD
address: 9th Floor,Block B,Hongrongyuan North Station Center No. 32, Mintar ing Road, Longhua District,Shenzhen China.
Tel：+86-755-86670672 Fax：+86-755-86670609 E-mail：sales@pknergy.com Website：http://www.pknergy.com

⑥ Click Parameter Setting

⑦ Click Read All



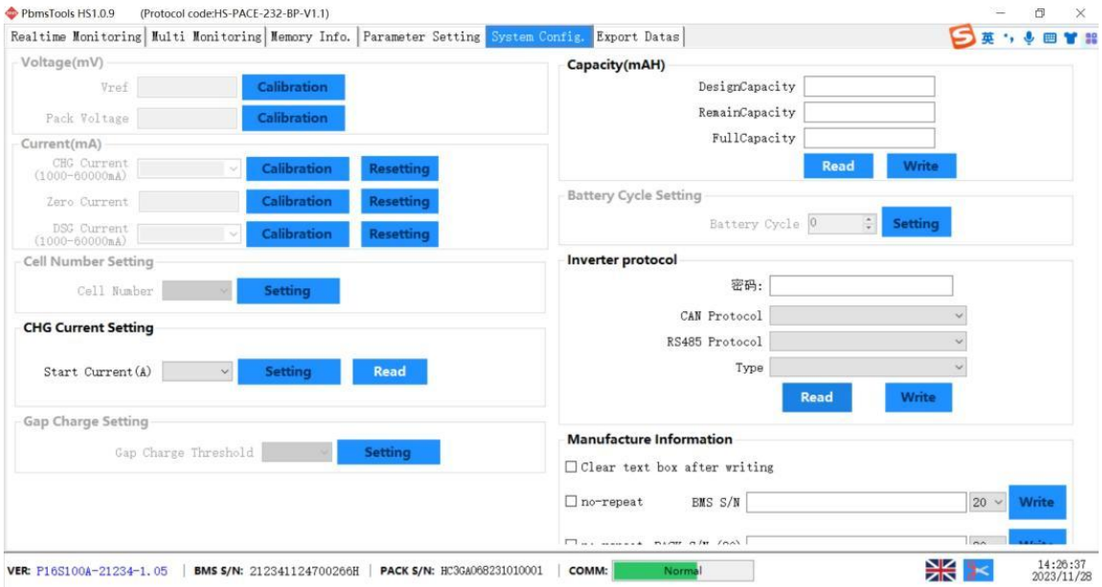
SHENZHEN PKNERGY ENERGY CO.,LTD
address: 9th Floor,Block B,Hongrongyuan North Station Center No. 32, Mintar ing Road, Longhua District,Shenzhen China.
Tel：+86-755-86670672 Fax：+86-755-86670609 E-mail：sales@pknergy.com Website：http://www.pknergy.com

⑧ Click What needs to be modified

⑨ Click Write All

⑩ Complete the setup

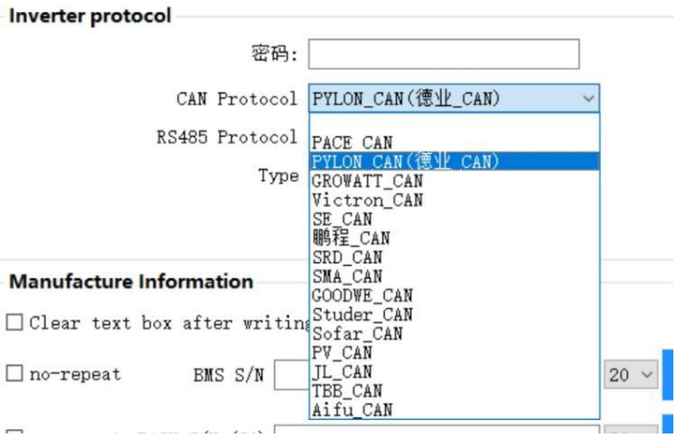
11.7 Other settings
System Config:



SHENZHEN PKNERGY ENERGY CO.,LTD
address: 9th Floor,Block B,Hongrongyuan North Station Center No. 32, Mintar ing Road, Longhua District,Shenzhen China.
Tel：+86-755-86670672 Fax：+86-755-86670609 E-mail：sales@pknergy.com Website：http://www.pknergy.com

① Inverter protocol:

② Inverter protocol selection:



③ Click Read The setup is complete.

12. Dip switch

Switch setting

In the multi-machine parallel communication operation, you need to configure the DIP address of each PACK first. The DIP code adopts the BCD code format, the address of 0 

is defined as (black dot is OFF state, blank is ON state,thesa me below) ,

address 1 

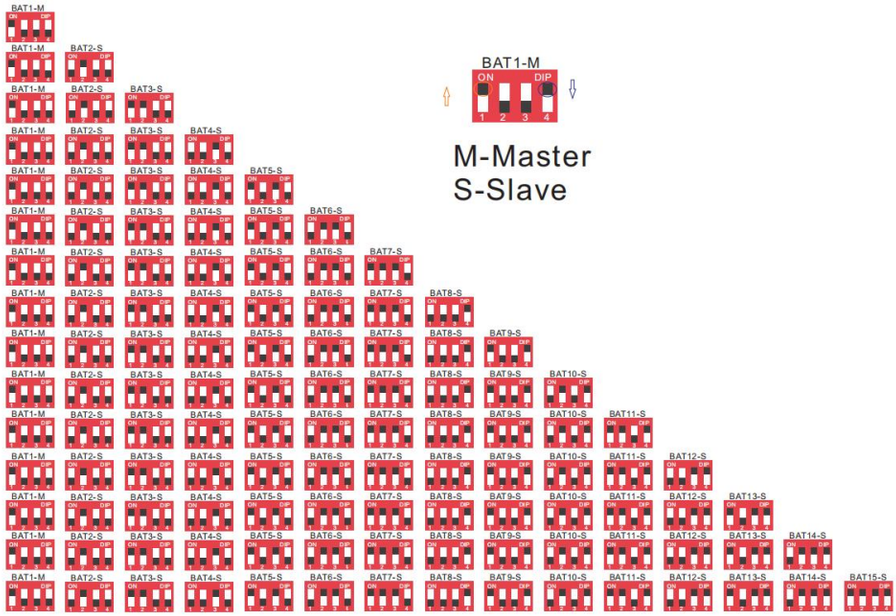
, address 2 

, andsoon.

SHENZHEN PKNERGY ENERGY CO.,LTD
address: 9th Floor,Block B,Hongrongyuan North Station Center No. 32, Mintar ing Road, Longhua District,Shenzhen China.
Tel：+86-755-86670672 Fax：+86-755-86670609 E-mail：sales@pknergy.com Website：http://www.pknergy.com

Slave Setting (Tablel)

Addr	DIP switch position				Description
	#1	#2	#3	#4	
0	OFF	OFF	OFF	OFF	PackO
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



13. Host computer communicationa ddress code setting

Communication Input the current master or slave code system to be communicated in the system parameters of the host computer, and the communication can be detected and communicated.
The BMS is configured in stand-alone working mode, and the DIP address can be any address;
The BMS is configured in cascading working mode, and the DIP address is selected from 0 to 15 for different addresses.

SHENZHEN PKNERGY ENERGY CO.,LTD
address: 9th Floor,Block B,Hongrongyuan North Station Center No. 32, Mintar ing Road, Longhua District,Shenzhen China.
Tel：+86-755-86670672 Fax：+86-755-86670609 E-mail：sales@pknergy.com Website：http://www.pknergy.com

PKNERGY®

Energy Storage System

SHENZHEN PKNERGY ENERGY CO.,LTD
Address: 9th Floor,Block B,Hongrongyuan North Station Center
No. 32, Mintar ing Road, Longhua District,Shenzhen China.
E-mail：sales@pknergy.com Website：http://www.pknergy.com