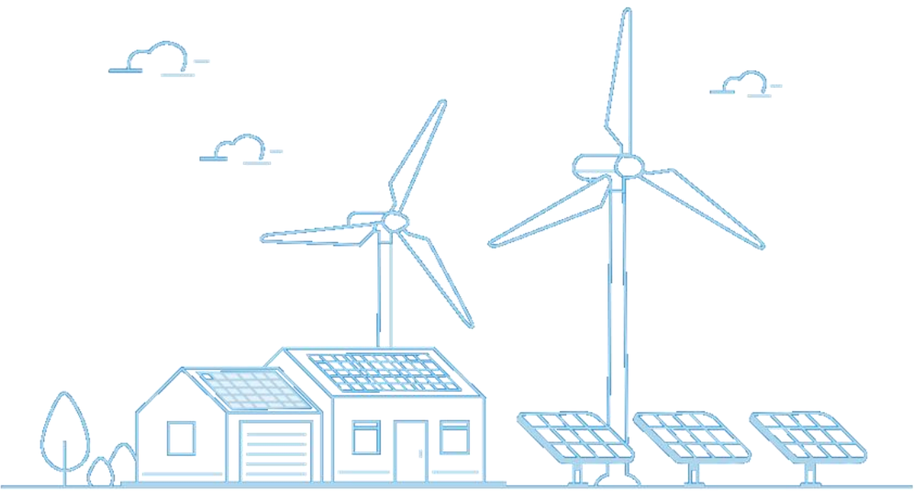
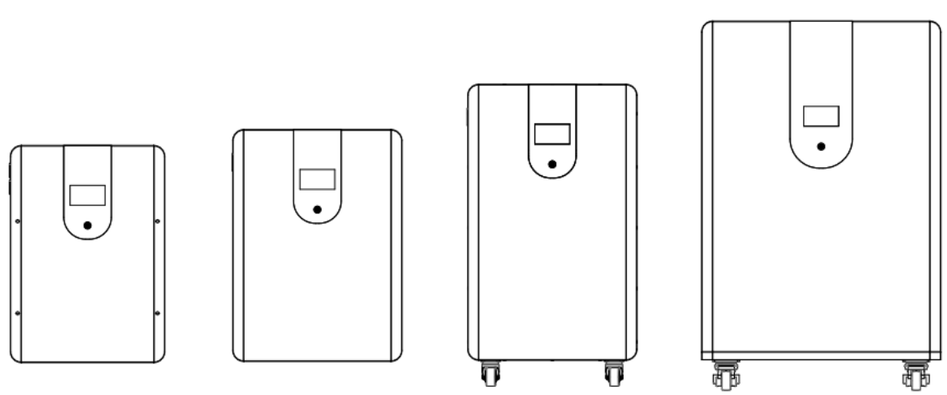
User Manual

Suitable for all low-voltage battery packs from DUBAK



Empowering Your Clean Energy,Together!



Contents

Note: ***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.***

Warning

Read instruction before use.

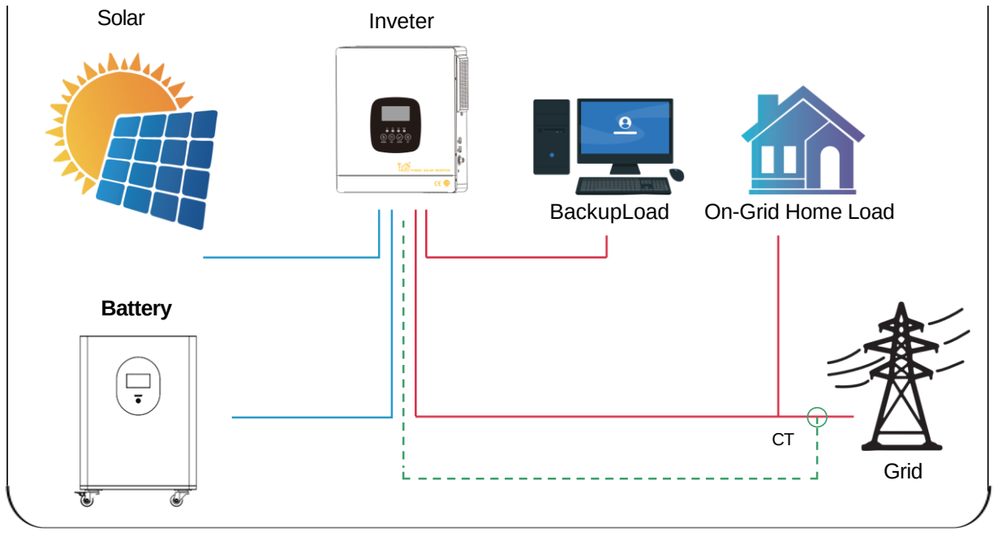
Recyclable.

Do not dispose battery in household trash.

1. Instructions

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-consumptionand ultimately achieve the goal of energy independence.

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



Energy storage System Overview

It is very important and necessary to read the user manual carefully before instaling 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 90%,after fully discharging,The battery needs to be recharged within 12hours.
- Do not expose cable outside;Do not use cleaning solvents to clean the battery.
- All battery terminals must be disconnected before maintenance.

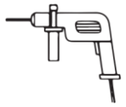
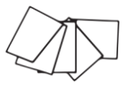
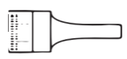
2.Important Safety Warning

- 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.
- Our company will not bear any warranty claims for direct or indirect damage caused by violation of the above items.

2.1 Before connecting

- 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 circuitwith the external device;
- It is prohibited to connect the battery with AC power directly;
- The BMS in the battery is designed for 12VDC/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.

Necessary installation Tools.

 Clamp meter	 Multi-meter	 Label paper	 Phillips screwdriver
 COAX crimping tool	 Diagonal pllers	 Wire stripper	 Claw hammer
 Hammer drill	 Insulation tape	 Cotton cloth	 Brush
 Heat shrink tubing	 Heat gun	Electriclan's knife	 Protective gloves

Personal protective equipment

 Insulated gloves	 Safety goggles	 Safety shoes	 Helmet

Necessary installation environment

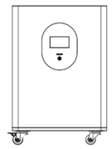
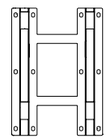
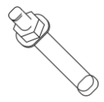
2.2 During operation

- If the battery system needs to be moved or repaired, the power must be cut off first and the battery iscompletely shutdown;
- It is prohibited to connect the battery with different type of battery;
- It is prohibited to put the batteries working with faulty or incompatible inverter;
- In case of fire,only dry powder fire extinguisher can be used, liquid fire extinguishers are prohibited;
- Please do not open, repair or disassemble the battery. We do not undertake any consequences orrelated responsibility due to violation of safety operation or violating of design, production andequipment safety standards.

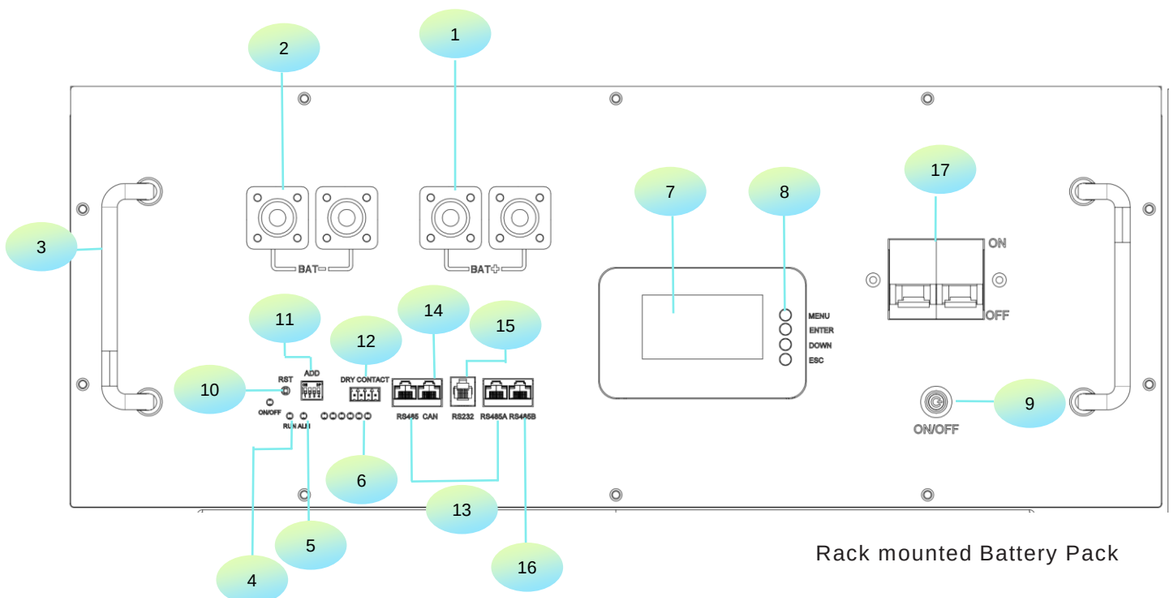
3.Unpacking & Overview

3.1 Packing List

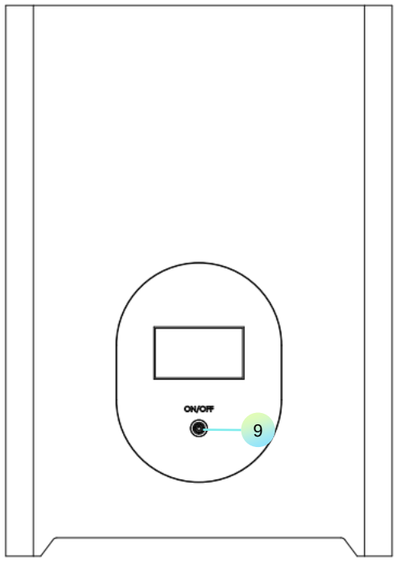
You will receive the following parts(Not a full set), sample as follow picture.For customized requirements, please place an order with the manufacturer.

Battery Pack	Power out Negative cable	Power out Positive cable
 Parallel common cable	 Desiccant	 Mounting brackets (optional)
 Mounting frame screw (optional)	 Manual(optional)	 Warrty Card(optional)
		

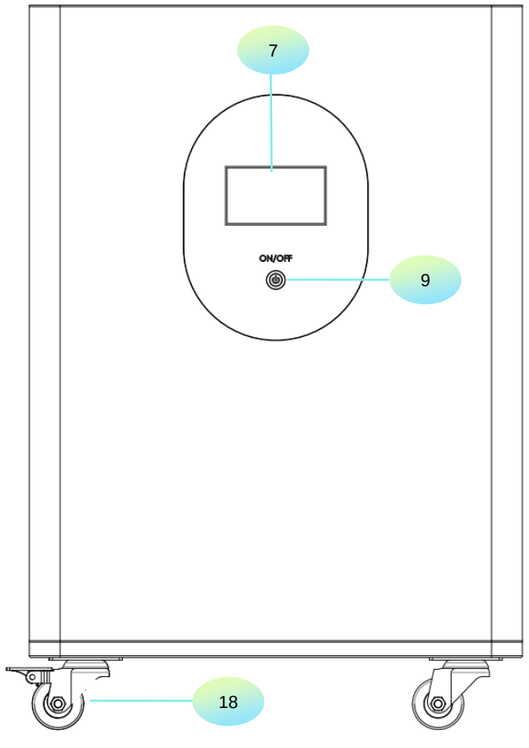
3.2 Product Overview



Rack mounted Battery Pack



Wall Mounted Battery pack



Floor Mounted Battery pack

	Description	Silk-screen	Remark
1	Output terminal	+ +	Output terminal
2	Output terminal	- -	Output terminal
3	Handle		
4	LED indicate	RUN	Operation indicator
5	LED indicate	ALM	Alarm indicator
6	LED indicate	CAPACITY	Capacity indicator
7	LCD		Touch screen or non touch screen
8	LCD Key	MENU/Enter/UP/ESC	
9	Power Switch	ON/OFF	
10	Reset button	RST	For reset the batter
11	Dial switch	ADS	Set the address
12	Dry port	DRY CONTACT	
13	RS485A Port	RS485A	RS485A and inverter connection port
14	CAN bus Port	CAN	CAN bus and inverter connection port
15	RS232 Port	RS232	RS232 and computer connection port
16	RS485B Port	RS485B	battery and battery connection port
17	E-Switch	ON/OFF	
18	Wheel		

4.Installation

4.1 Selecting Mounting Location (Apply to Wall mounted product)

Consider the following points to install the energy storage Pack:

- Do not mount the Pack on flammable construction materials. Mount on a solid surface.
- Install this Pack module at eye level in order to allow the readability of LCD display at all times.
- For proper air circulation to dissipate heat, please leave a gap of about >0.3 meter from the ground,30 cmfrom the side of the device.
- The ambient temperature should be between 0'c and 40'c and relative humidity should be between 25%and 85% to ensure optimal operation.
- The recommended installation is flat wise adherence.
- Install the battery module in a dry, protected area with no excessive dust and sufficient air circulation. Do notoperate in locations where the temperature and humidity are outside the specified range.

4.2 Mounting The PACK (Apply to Wall mounted product)

WARNING!! Remember that this Pack is heavy so please be careful when removing it from the package,or install it

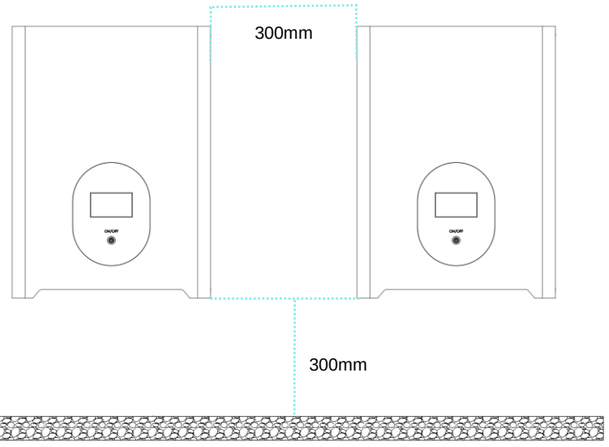
When installing the Pack bracket, use appropriate screws to fix it. After that, the equipment should befirmly bolted.The pack can be run indoors or outdoors, However, only professional personnel can enterthis area for installation or maintenance.

Step 1:

- When receiving the product, first check whether all parts are complete, if not, please report to the Dealer.

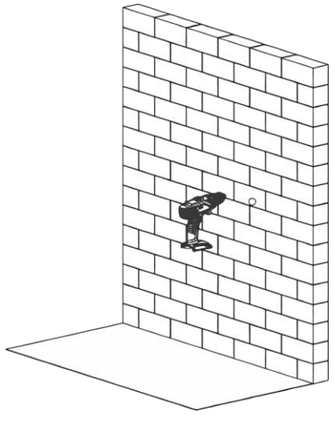
Step 2:

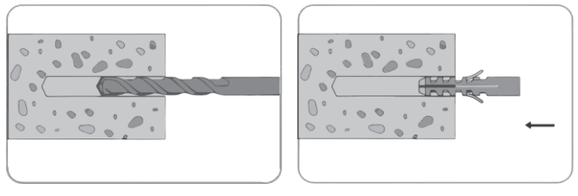
- Ensure that the Pack is installed on the wall surface.Choose a suitable installation location and require the battery pack to be placed at a safe diatance greater than 30cm from the ground,and the safety distance between battery packs is also greater than 30cm too.We recommend an installation distance is 50cm.



Step 3:

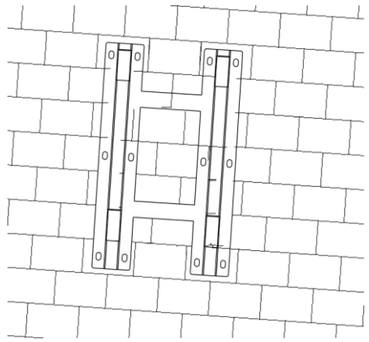
- Use the mounting bracket to mark the location of the positioning screw hole on the wall,and use an electric drill to drilling the hole. Need to be drilled with a drill of appropriate diameter.

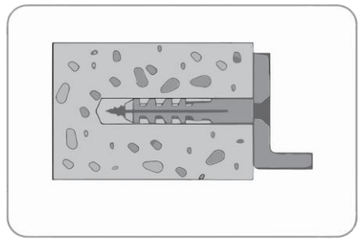




Step 4:

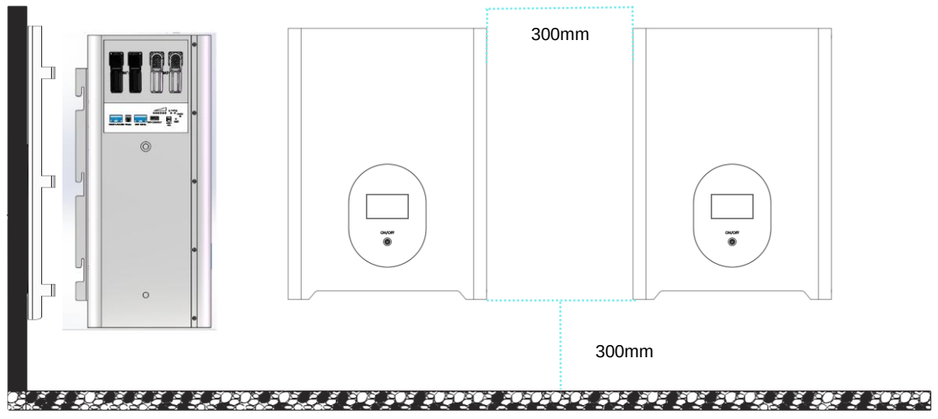
- Insert frame screws,then place the bracket,and use screws lock it.





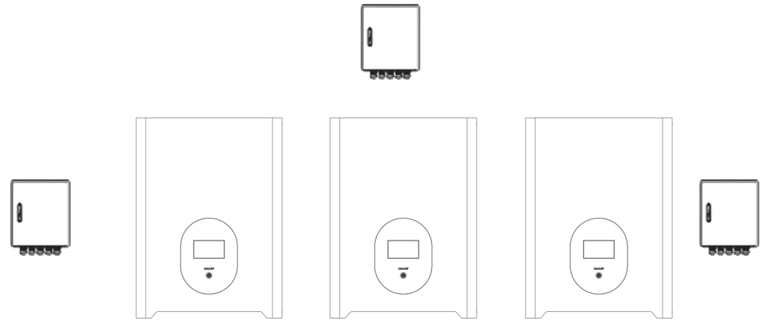
Step 5:

- As shown in the below,install the battery pack.The pack is too heavy,Please use a special lifting device to life the pack for operation and safety protection.Lift the pack and put it into the slot of the fixing bracket from the front.You can install more packs as shown.



Tips:

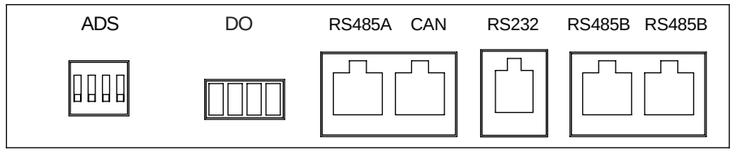
- When more than 3 PCS packs are connected in parallel,then we recommend you install combiner box.3 locations we recommend you install the combiner box.First select location is Top and Botttom, show as below.



4.3 Connection and Communication

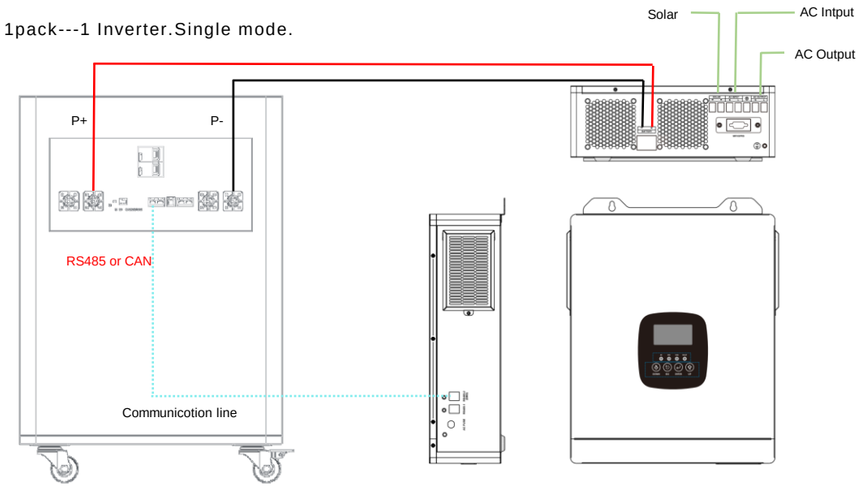
Step 1 :

Connect the wiring of the Pack as shown below.See figure 11.If inverter need CAN BUS port/RS485B only be used for battery packs parallel mode.



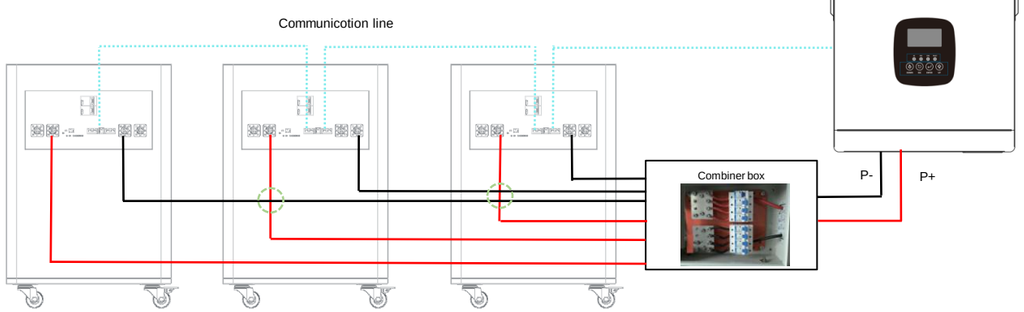
CAN And RS485A---Communicate with external devices,sample as inverter ,EPS
RS232---Communication with host computer
RS485B---Communication with host computer or parallel communication with battery pack

1pack---1 Inverter.Single mode.



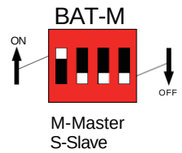
More pack are parallel,one pack is master,other are slave.

If your need a “3-phase inverter output380VAC”.
One inverter is master,other are slave.
Please refer to the operation manual of the inverter for the parallel connection method of the invierter,there is only an example.

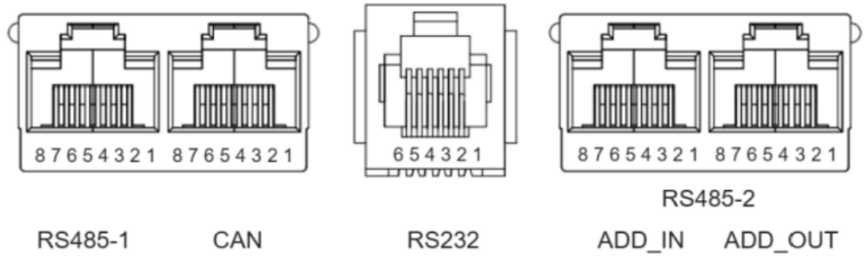


Step 2:

Set the address of packs. This a important step. Please set as the picture show below.
PACK 1 set as Master, and address "0" is only used for single mode.
It support 15 PCS pack(max) in parallel.



拨码地址位	说 明 (Explain)				
	4	3	2	1	
0000(0)	OFF	OFF	OFF	OFF	单机使用single mode
0001(1)	OFF	OFF	OFF	ON	设置 PACK1(主机MASTER)
0010(2)	OFF	OFF	ON	OFF	设置 PACK2
0011(3)	OFF	OFF	ON	ON	设置 PACK3
0100(4)	OFF	ON	OFF	OFF	设置 PACK4
0101(5)	OFF	ON	OFF	ON	设置 PACK5
0110(6)	OFF	ON	ON	OFF	设置 PACK6
0111(7)	OFF	ON	ON	ON	设置 PACK7
1000(8)	ON	OFF	OFF	OFF	设置 PACK8
1001(9)	ON	OFF	OFF	ON	设置 PACK9
1010(10)	ON	OFF	ON	OFF	设置 PACK10
1011(11)	ON	OFF	ON	ON	设置 PACK11
1100(12)	ON	ON	OFF	OFF	设置 PACK12
1101(13)	ON	ON	OFF	ON	设置 PACK13
1110(14)	ON	ON	ON	OFF	设置 PACK14
1111(15)	ON	ON	ON	ON	设置 PACK15



接 口 Connector	RS485-1		CAN1		RS323		RS485-2 * 2	
功能描述 Function	连接上位机或逆变器 (Connected PC or PCS)		连接上位机或逆变器 (Connected PC or PCS)		连接上位机 (Connected PC)		并机通信 (Parallel communication) * 2	
引脚说明 Pin specification	PIN	Description	PIN	Description	PIN	Description	PIN	Description
	1、8	RS485-B1	1、8	NC	1、2、6	NC	1、8	RS485-B2
	2、7	RS485-A1	2、7	NC	3	TX	2、7	RS485-A2
	4	NC	4	CANH1	4	RX	4、5	NC
	5	NC	5	CANL1	5	GND	3	IN(L)/OUT(R)
	3、6	GND	3、6	GND			6	GND

- **NOTE:** Rs232 port used for host software and update the firmware.
- **NOTE:** The all-in-one products will not need to connect power cables and communication cables
- **NOTE:** The output connected to the communication cable with a waterproof plug is listed according to theorder requirements, which are customized products, and are not listed here.

Step 3: Power on and set protocol

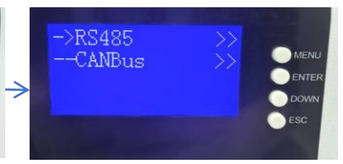
Confirm that the operation is correct, and the battery function can be turned on after the wiring is correct.
Running the device, set the external charger or inverter parameters, please set according to the product spec.
Can not exceed the rated parameter requirements.

Touch screen version

a.Login to account here, Password:666888

b.Select the Protocol here.
Sincere suggest purchasing inverters together from our factory.
We will set up the protocol before leaving the factory to reduce your installation trouble.

Keypad version



Operate as shown in the above picture.
Sincere suggest purchasing inverters together from our factory.
We will set up the protocol before leaving the factory to reduce your installation trouble.

When it is necessary to stop the charging and discharging of the battery or troubleshooting, please stop the external equipment first, cut off the input and output circuits, and then press the power switch off each battery pack.

Battery Pack support communication with inverter:
(More communication protocols need to be proposed separately)

逆变器品牌 Brand of inveter		协议名称 Protocol	通讯方式 Communication method	是否配对过
派能	PYLONTECH	RS485-protocol-pylon-low-voltage	RS 485-9600	OK
		CAN-Bus-protocol-PYLON	CANBUS-500K	OK
固德威	固德威 GOODWE	固德威通讯协议	CANBUS-500K	OK
古瑞瓦特	Growatt	SPF BMS RS485协议	RS485-9600	OK
		Growatt BMS CAN-Bus-protocol-low-voltage(SPF)	CAN	OK
SMA	SMA	FSS-ConnectingBat-TI-en-20W	CANBUS-500K	OK
Victron	victron energy	can-bus_bms_protocol	CANBUS-500K	OK
TBB	TBB POWER	TBB 锂电池BMS平台CAN 通讯协议V1.02	CANBUS-500K	OK
MUST	MUST美世乐	1_PV1800F-CAN communication Protocol1.04.04	CANBUS-100K	OK
硕日	srne	PACE BMS Modbus Protocol for RS485	RS485-9600	OK
迈格瑞能	MEGAREVO	深圳迈格瑞能技术混合逆变器_5K_BMS协议V1.01	CANBUS-500K	OK
德业	Deye 德業	RS485-protocol-pylon-low-voltage-新增协议设计-德业12号9600	485	OK
		CAN-Bus-protocol-PYLON-v1.3	CANBUS-500K	OK
英威腾	invt 英威腾	XN Inverter and BMS 485 communication protocol 20200325	RS485-9600	OK
日月元	Voltronic Power	Voltronic Inverter and BMS 485 communication protocol	9600	OK
首航	SOFAR SOLAR 首航新能源	Sofar-首航-CAN-V1.00-211117-Rev6	CANBUS-500K	OK
北京汇能精电	EPEVER	BMS-Link通讯协议 V1.4	9600	OK
佛山春夏秋冬	SVCEnergy	Invert_Modbus通信协议_中文版V1_4	9600	OK
鹏程	LUXPOWER	Luxpowertek Battery CAN Protocol	CANBUS-500K	OK

Appendix 1

BMS parameters.

LED indicate,picture of 4bit coder.

Chart 1: Battery Status

●	●	●	●	●	●	●	●
SOC						ALARM	RUN

Chart 2: LED flash description

闪烁模式(Flash Mode)	亮(ON)	灭(OFF)
Flash1	0.25S	3.75S
Flash2	0.5S	0.5S
Flash3	0.5S	1.5S

Chart 3: SOC display description

状态(State)			充电(Charging)						放电(Discharging)					
LED		LED6 ●	LED5 ●	LED4 ●	LED3 ●	LED2 ●	LED1 ●	LED6 ●	LED5 ●	LED4 ●	LED3 ●	LED2 ●	LED1 ●
SOC(%)	0~16.6%	OFF	OFF	OFF	OFF	OFF	Flash2	OFF	OFF	OFF	OFF	OFF	ON
	16.6~33.2%	OFF	OFF	OFF	OFF	Flash2	ON	OFF	OFF	OFF	OFF	ON	ON
	33.2~49.8%	OFF	OFF	OFF	Flash2	ON	ON	OFF	OFF	OFF	ON	ON	ON
	49.8~66.4%	OFF	OFF	Flash2	ON	ON	ON	OFF	OFF	ON	ON	ON	ON
	66.4~83.0%	OFF	Flash2	ON	ON	ON	ON	OFF	ON	ON	ON	ON	ON
	83.0~100%	Flash2	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
RUN LED●		ON						Flash 3					

Chart 4: LED display description

系统状态 State of system	事件 Event	MOS (LED9) ●	Run (LED8) ●	Alarm (LED7) ●	SOC(LED6~1) LED6 ●	LED5 ●	LED4 ●	LED3 ●	LED2 ●	LED1 ●	说 明
关机(Power off)	休眠(Sleep)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	全灭(All LEDs turn off)
待机 static state	正常(Normal)	OFF	Flash1	OFF							/
	告警(Alarm)	OFF	Flash1	Flash3							/
充电 Charging	正常(Normal)	OFF	ON	OFF	参考表 4-11-2 Refer to table(4-11-2)						/
	告警(Alarm)	OFF	ON	Flash3							过充告警 ALM 不闪烁 The over-voltage alarm does not flash
	过压保护 (OV protect)	ON	ON	OFF	ON	ON	ON	ON	ON	ON	/
	温度、过流、失效保护 (Temperature, Over-current, fail-safe)	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	/
放电 Discharging	正常(Normal)	OFF	Flash 3	OFF	参考表 4-11-2 Refer to table(4-11-2)						
	告警(Alarm)	OFF	Flash 3	Flash 3							
	欠压保护 (UV protect)	ON	Flash2	OFF	OFF	OFF	OFF	OFF	OFF	OFF	/
	过流、短路、温度、失效保护 (Over-current,	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	/

Chart 5: Description of the self-locking switch

When the BMS is in hibernation state, after closing the self-lock, the protection board is powered on, and the LED indicator lights up successively from "LED1" for 0.5 seconds.

When the BMS is active, turn off the self-locking switch and wait for 1S~3S before the system enters the power-off state.

Chart 6: Reset key switch description

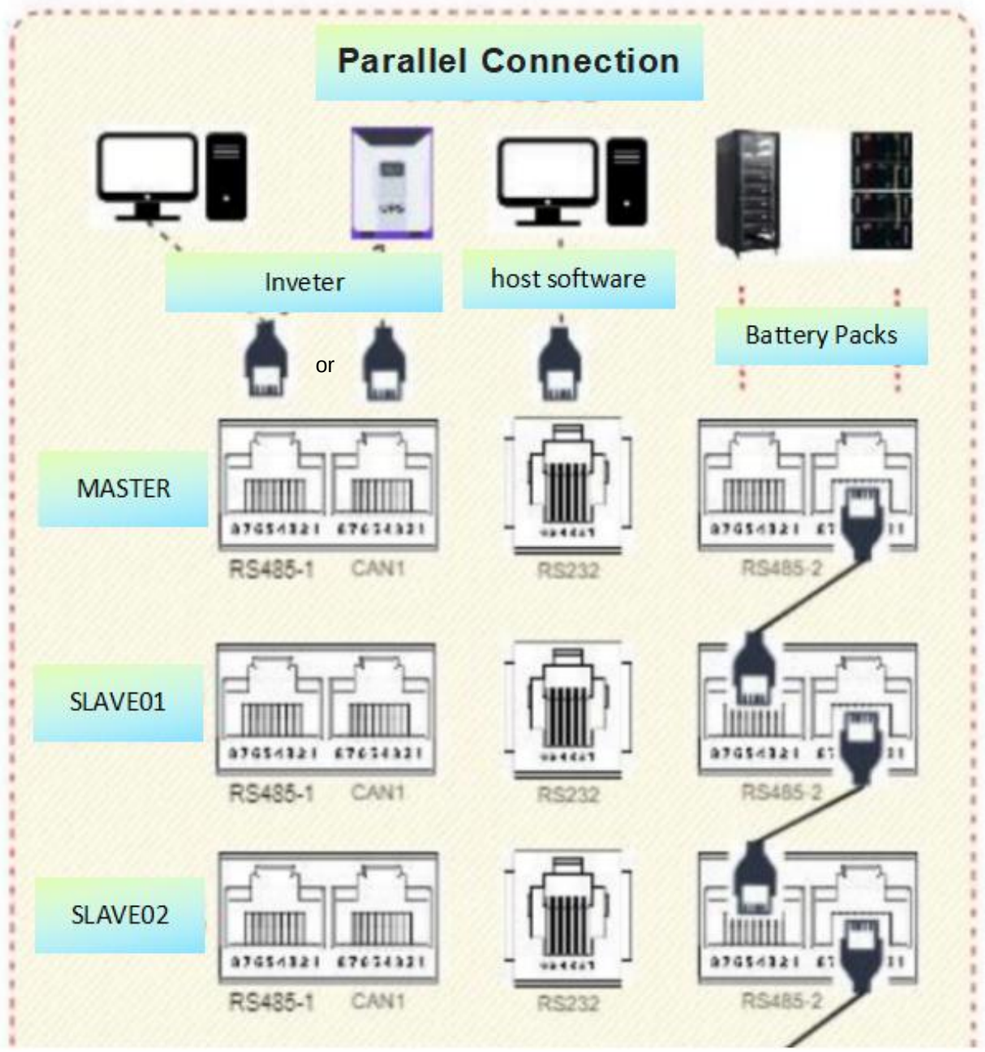
When the BMS is in hibernation state, press the key (1S) and release it, the protection board is activated, and the LED indicator lights up successively from "LED1" for 0.5 seconds.

When the BMS is active, press the button (3 to 6S), and the LED indicator will turn on for 0.5 seconds from the lowest power indicator. When released, the system will go to sleep.

When the BMS is in the active state, press the button (6-10s) and release it, the protection board is reset, and the LED indicator is displayed according to the current power.

Appendix 2

Parallel Connection

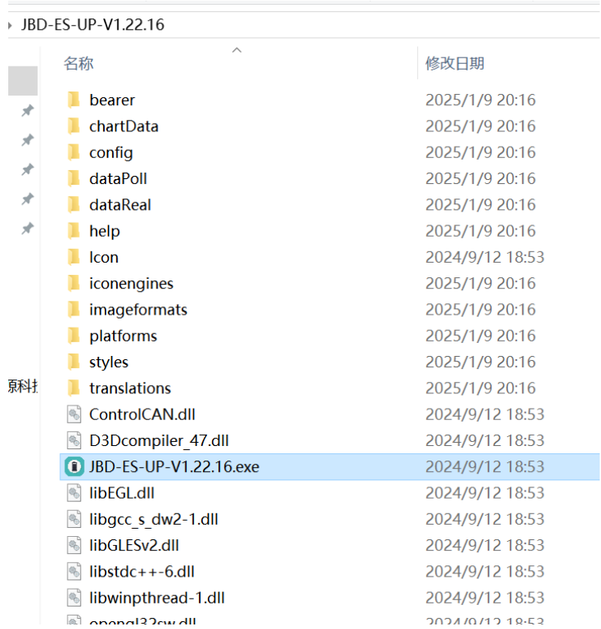


Appendix 3

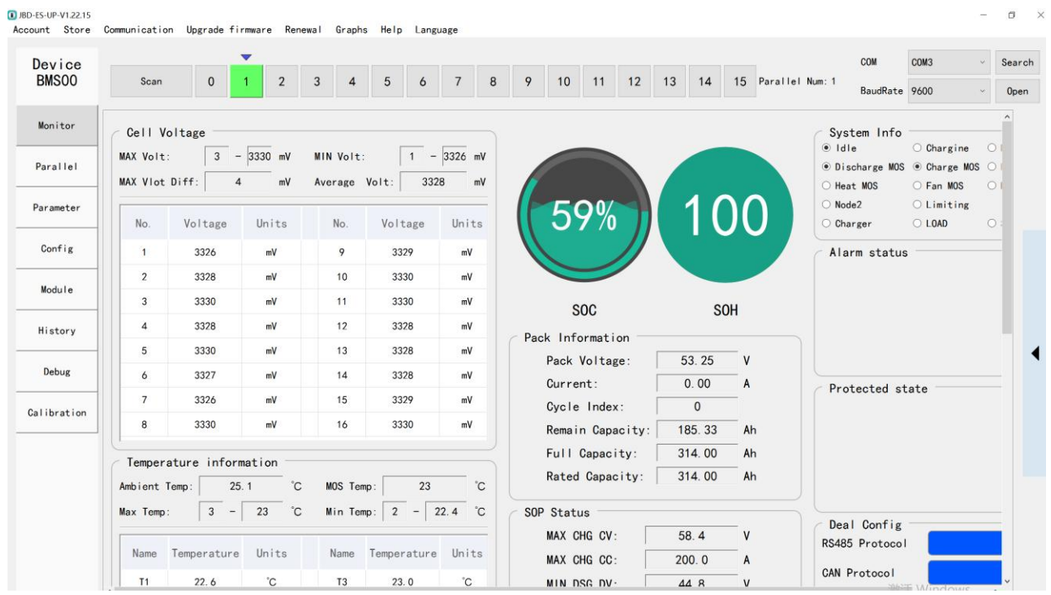
Host soft operation:

When the equipment manufacturer confirms that it is necessary,

It can authorize to provide the customer with the host software and operating instructions.



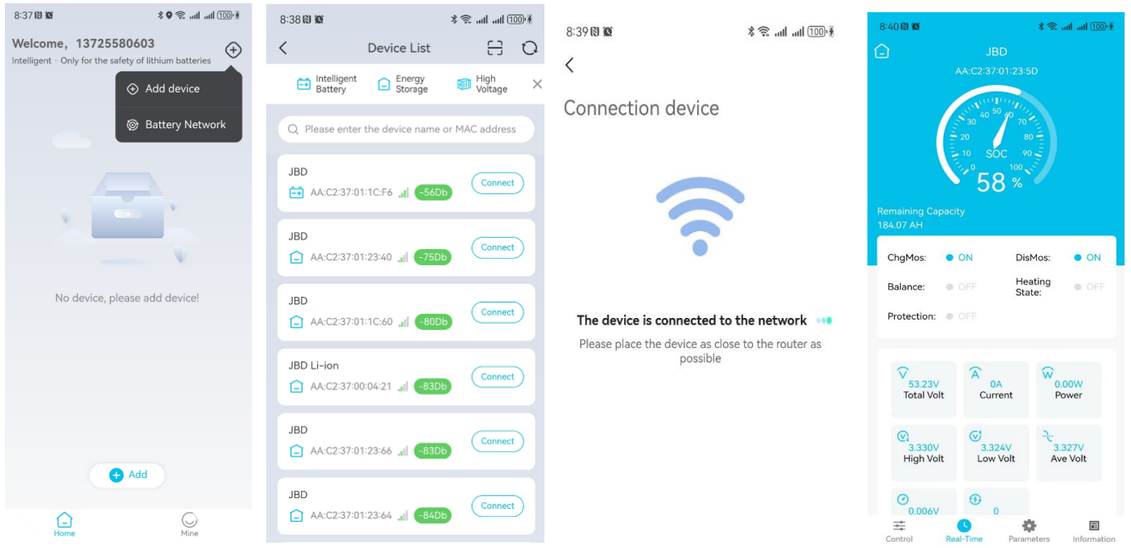
The connection method:
After installing the special driver for our communication box on the computer, insert the USB end of the communication box into the USB port of the computer, and connect the other end to the corresponding interface of the protection board that has been connected to the battery. Open the upper computer, click the communication port settings, select the COM port corresponding to the communication box, and do not change other options. After confirming, click Start to read the data from the BMS.



Appendix 4

Wifi&Bluttooth

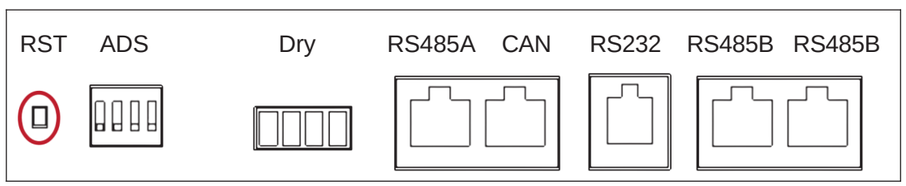
Download the APP from the website below：
https://cn.jiabaida.com/li-ion.html



Appendix 5

Trouble shooting

1. Battery pack stop work.
A: Turn on switch, be sure it is ON; If battery is low SOC, it need to charging in.
B: Battery pack low volt or enter sleep mode,there you will press down "RST" button3-6 second,or charging in.



2. No communication ,inverter can not received any DATA from BMS.
A: Check whether if communication cable is OK,check RJ45 PIN,
B: Replace the communication line.Please give feedback to the dealer and exchange it.
C: Check inverter or other device which connect to BMS,update it is firmware.
D: If the communication function needs to be upgraded, please consult the agent or manufacturer.
E: Confirm your inverter and battery protocol is correct,Different protocol or different connection will make a mistake.

3. Battery pack report SOC is mistake.
A: Inverter received Data from Master BMS, but it is SOC < total SOC, sample as: 9PCS packs has 1800Ah, but inverter read DATA is 1600Ah. So you may check any one is disconnected.check RS485B communication cable(blue), RS485 communication cable, replace the cable which is broken.RJ45 PIN:
CAN: PIN4:CANH,
PIN5:CANL;
RS485A: PIN2:485-A,
PIN1:485-B;
B: SOC DATA has Large tolerance.
Discharge empty the battery first, then charge it fully with a small current, and learn to discharge. Any pack ismistake, we advice you read the BMS Data(When we authorize the terminal to use) with host software.then we reset the BMS and calibration.
C: When multiple batteries are connected in parallel, the SOC is different.
We recommend that each pack has a small current discharged and it is emptied until the S0C alarm appears, and then recharged in parallel and fully charged.

4. How to turn on the Pack todischarge.
We recommend method is:
A: Reset the single pack's BMS, LED will flash and startwork
B: Turn on the power switch on the bottom/front panel;
C: Turn on power switch in the combiner box.

WARNING: The operating parameters of the equipment cannot exceed the rated working voltage and current ofthe Pack, exceed the rated volt and current,Can cause damage to the Pack or other failures.

5. Inverter or other external device can not connect the battery.
We recommend method is:
A: Check whether the working parameter's of the device and battery are appropriate, and improper parameters cannot be matched.
B: When the device is turned on, the current is too large, resulting in battery protection, At this time, you should beable to see the LED flashing from the battery panel.in this case, You can adjust your equipment parameters or contact the dealer to solve.
C: It is necessary to update BMS parameters and match the device,then Reset BMS and restart your device.

6. Replace bad Pack.
There is a bad battery pack, it is need to replace, please connect your supplier, need professional installers to operate it. We recommend replace all or make pack has same voltage and same specification batteries pack.
NOTE: When replacing the battery, the same module needs to be replaced at the same time, and the voltage should be the same.

7. Need to replace spare parts or emergency maintenance.
Some parts can be obtained from the sales or agency, and the excess parts need to be purchased separately.
Be careful, turn off the power switch before replacing parts.

8. Need to place some safety device for keep a safe environment.
You'd keep a safe case for Pack and external device, Please place safety device, as: fire-fighting sand, fire-fighting blankets, fire-fighting water pipes, Install Monitor sound, light, electricity, smoke and other equipment.

WARNING:

Emergency process:

1. The external device catches fre and explodes:
A: Under the condition of ensuring safety, non-operating personnel immediately move to a safe location.
B: Under the condition of ensuring safety, the operator immediately cut off the external power supply of the equipment and the internal power supply.
C: Use fire-fighting equipment for fire-fighting treatment
(the use of fire-fighting sand, fire-fighting blankets, fire- fighting water pipes)
D: If you cannot completely extinguish the fire, please call the local fre department for help.
E: Keep the accident site data so that the source of the accident can be traced.

2. The Pack catches fre and explodes:
A: Under the condition of ensuring safety, non-operating personnel immediately move to a safe location.
B: Under the condition of ensuring safety, the operator immediately cut off the external power supply of the equipment and the internal power supply.
C: Use fire-fighting equipment for fire-fighting treatment
(the use of fire-fighting sand, fire-fighting blankets, fire- fighting water pipes)
D: If you cannot completely extinguish the fire, please call the local fre department for help.
E: Keep the accident site data so that the source of the accident can be traced.