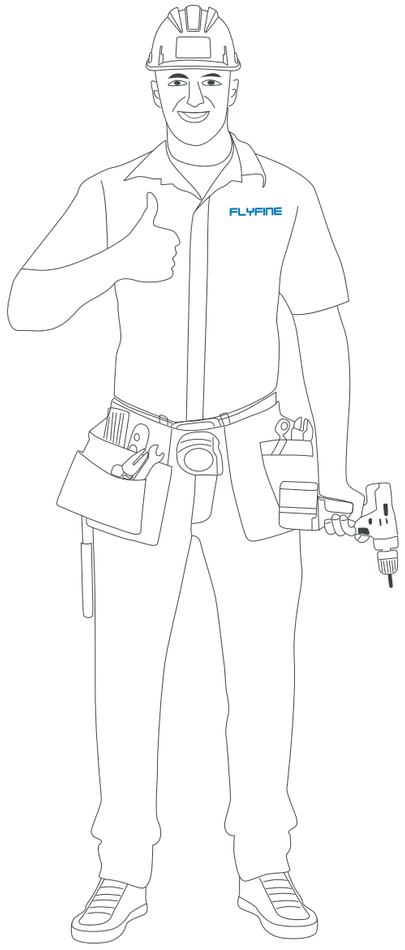
User Manual

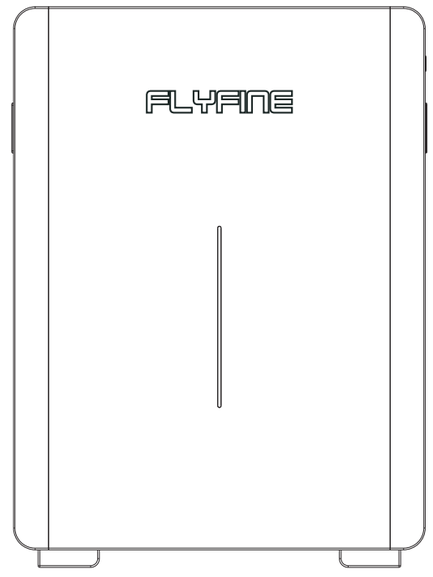
Wall Mounted Battery

FW5120

FLYFINE
Innovative Reliable Energy Pioneer

FLYFINE DIGITAL ENERGY CO.LTD





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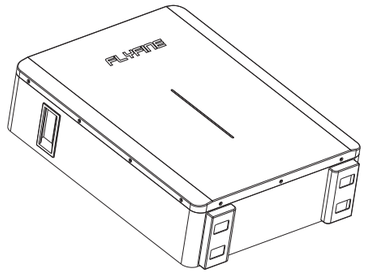
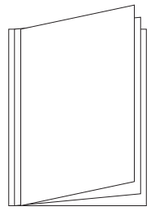
If you still have questions, please visit our official website **www.flyfinebattery.com** to get the latest product information.

Contents

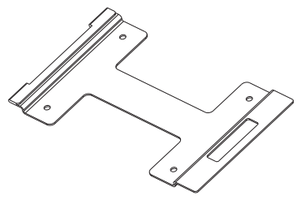
1. Packing List



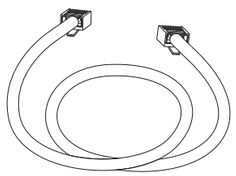
Machine



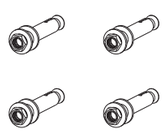
User manual



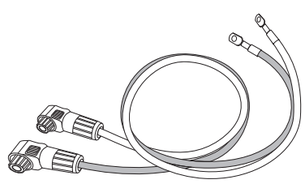
Wall mounting bracket



Communication cable



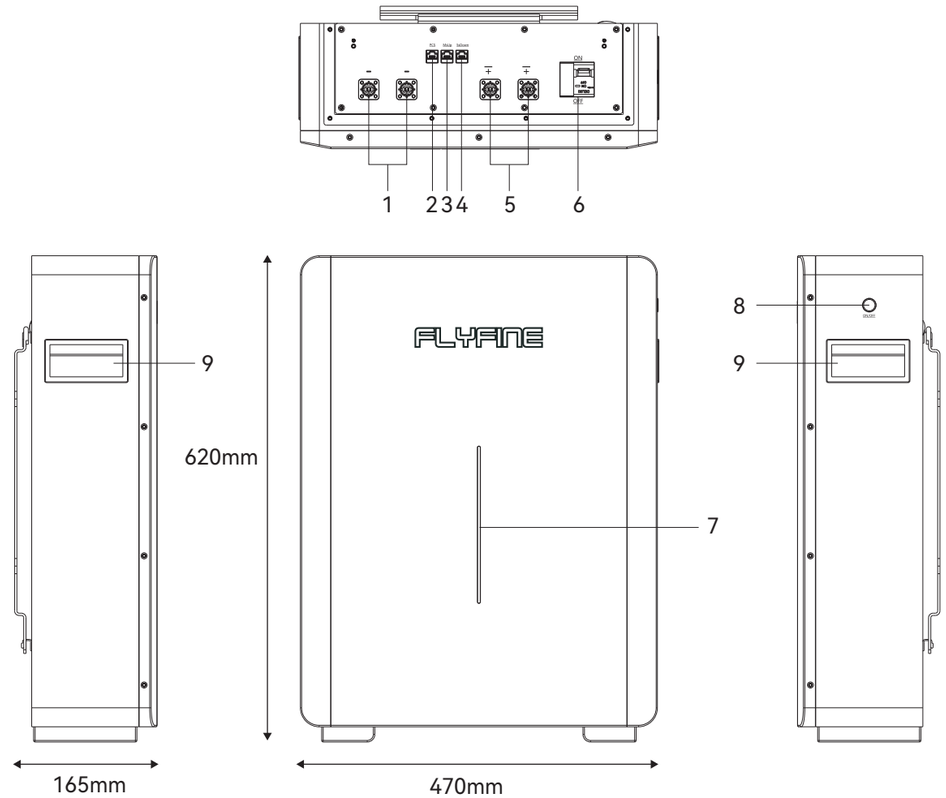
Expansion bolt *4



Power cable (optional)

2. Overview

2.1 Product overview



No.	Description	Remark
1	Battery negative terminal "-"	Charge discharge negative electrode
2	Inverter connection port	CANbus、RS485 2-in-1
3	Uplink port for battery	CAN communication port
4	Downlink port for battery communication	CAN communication port
5	Battery positive "+" interface	Charge discharge positive electrode "+" interface
6	Air switch+shunt release	Secondary protection for battery
7	LED indicator light	SOC power, alarm warning
8	Power Switch	Short press the switch and long press to restart
9	Handle	/

2.2 “+” ”-” output terminals

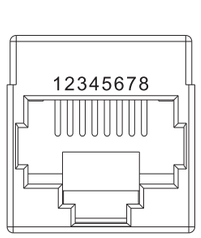
Positive and negative terminals are terminals, located on the left and right sides of the panel, rated current 100A, connected to the external transmission line (inverter) for charging and discharging.

2.3 PCS communication interface

The battery supports interaction with PCS CAN communication to view the information of the PACK, PCS-CAN, as the host interface of the battery pack, can automatically summarizes the data of all the slave batteries and actively reports to PCS.

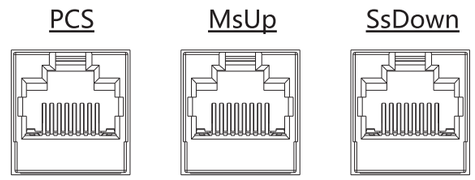
PCS-RS485 communication:
The battery supports RS485 communication with PCS to view the information of the PACK. PCS-RS485, as the host interface of the battery pack, can automatically summarizes the data of all slave batteries and actively reports to PCS.

Internal CAN communication:
The battery can communicate with the host computer through the internal CAN interface, so as to monitor all kinds of information of the battery on the host computer, including battery voltage, current, temperature, status, SOC, SOH, and battery production information, etc.



Pin No.	Name	Function Description
1	CAN2_H	Internal CAN2H, connection to BMS host computer
2	CAN2_L	Internal CAN2L, connection to BMS host computer
3	E12-	External signaling -
4	CAN1_H	PCS CAN1H, connector PCS CAN communication
5	CAN1_L	PCS CAN1L, connector PCS CAN communication
6	EXIT 12V+	External signal +,MAX20V
7	RS485_B	PCS RS485 B, connector PCS RS485 communication
8	RS485_A	PCS RS485 A, connector PCS RS485 communication

2.4 Parallel uplink/downlink interface



parallel interface

Note: The parallel harness can be plugged in with a standard CAT5 cable.

MsUp - 8P8C vertical RJ45 socket is used **MsUp**		SsDown - 8P8C vertical RJ45 socket is used **SsDown**	
Pin No.	Name	Pin No.	Electric Specification
1	CAN2_H	1	CAN2_H inside
2	CAN2_L	2	CAN2_L inside
3	GND_ISO	3	GND_ISO
4	GND_ISO	4	sS
5	MS	5	ISO_GND
6	GND_ISO	6	GND_ISO
7	E_OT	7	E_IN
8	SOUT	8	SOUT

2.5 LED Indicator light Status Description

PACK Status	PACK Information	Display Logic					Remark	Duration
		LED 1	LED 2	LED 3	LED 4	Bi-colour LED5 (BLUE /RED)		
Remote		/	/	/	/	/	LED5 depending same as the normal status	/
Bootload		★	★	★	★	★	2HZ	1S~2S
Starting	master-slave definition	★	★	★	★	●	Master	3S~30S
		/	/	/	★	●	Slave 1	
		/	/	★	/	●	Slave 2	
		/	/	★	★	●	Slave 3	
		/	★	/	/	●	Slave 4	
		/	★	/	★	●	Slave 5	
		/	★	★	/	●	Slave 6	
		/	★	★	★	●	Slave 7	
Application Mode checking	Parallel or single application mode checking success	Display according to actual SOC				★	Blink 5 times	2S
	Wait for the power loop to dynamically incorporate PACK	Display according to actual SOC				★	1Hz	/
charge	0%-25.0% SOC	■	/	/	/	●	Flash LED (Water light) 1HZ	/
	25%-50.0% SOC	■	■	/	/	●	/	/
	50%-75.0% SOC	■	■	■	/	●	/	/
	75%-99.9% SOC	■	■	■	■	●	/	/
	100% SOC	●	●	●	●	●	/	/
Discharge & Standby	100%-75%	●	●	●	●	●	/	/
	75.0%-50%	●	●	●	/	●		
	50.0%-25%	●	●	/	/	●		
	25.0%-0%	●	/	/	/	●		
Fault	Three -Level Cell Over Voltage	/	/	/	●	○	/	/
	Three -Level Cell Under Voltage	/	/	●	/	○		
	Three -Level Over Temperature	/	/	●	●	○		
	Three -Level Under Temperature	/	●	/	/	○		
	Three -Level Over Current (charge or discharge)	/	●	/	●	○		

Fault	Three -Level Under SOH	/	●	●	/	○	/	/
	Internal communication	/	●	●	●	○		
	External communication	●	/	/	/	○		
	Parallel ID addressing failure	●	/	/	●	○		
	FUSE Fault	●	/	●	/	○		
	reserved	●	/	●	●	○		
	reserved	●	●	/	/	○		
	reserved	●	●	/	●	○		
	other All	●	●	●	/	○		
	BMS fault (Classification of internal faults such as relay adhesion)	●	●	●	●	○		
Shutdown	/	★	★	★	★	★ or ☆ or ○	LED5 depending on the previous status, blink 2 times, then shutdown	/
Click	Display PACK ID	Display PACK ID				off	Return after 10s	/

Remark:
★: Blue LED Blink ●: Blue LED On ■: Blue LED flash display
☆: Red LED Blink ○: Red LED On
* The LEDS switch can be controlled by soft key

2.6 Power button description

When BMS is in sleep state, press the key (2~5S) and release it, the protection board is activated, the LED indicator starts from “RUN”, and lights up the LED according to 2.5 status logic.

When BMS is active, press the key (2~5S) and release it, the protection board will be dormant and the LED indicator will turn off according to 2.5 Status Logic.

When the BMS is active, press the key (>25S) and release it, the protection board is reset.

After the BMS is reset, it still retains the parameters and functions set by the host computer. If it is necessary to restore the initial parameters, it can be realized through the “Restore Default Value” of the host computer, but the related operation records and stored data remain unchanged (such as power, cycle times, protection records, etc.).

3. Installation instructions

3.1 Installation precautions

(1) When installing and operating the product, the user should comply with local regulations and norms.

(2) Personnel requirements: personnel responsible for installation and maintenance must first undergo rigorous training to master the correct operating methods and safety precautions before going on duty for installation, operation and maintenance.

(3) Personal safety
① Insulated tools and gloves should be used during installation, and it is strictly prohibited for all conductors containing metal materials to contact the battery pack;
② Avoid falling and collision of the battery pack during installation; c. It is strictly prohibited to remove the battery parts privately. Battery maintenance must be carried out by professionally trained maintenance engineers.

(4) Scene and environment
① Clean: the battery pack needs to be kept clean and neat around.
② fire prevention: the room is strictly prohibited to store flammable, explosive and other dangerous items, and should be equipped with effective fire fighting equipment.
③ Ventilation and heat dissipation: In order to facilitate the operation, maintenance and heat dissipation of the product, the equipment should be at least around the (30 ~ 50) cm of space.
④ Installation requirements: the battery pack should be placed flat on the ground, avoid tilting or placing it on the uneven ground, and avoid exposing to sunlight, rain, or humid places.
⑤ Environmental requirements: Ambient temperature: -20 ~ 60℃. Relative humidity: 0%RH ~ 95%RH, no condensation; ground verticality: no vibration and vertical, tilt angle not more than 5°.

(5) Before checking the installation of the switching power supply, please make sure that the load capacity of the incoming power grid can meet the requirements of the new equipment, whether the switching power supply complies with the voltage and frequency on the nameplate of the equipment, and whether the current-carrying capacity decreases due to the aging of the wires. If in doubt, please consult with the local power supply department to solve the problem.

3.2 Preparation for installation

(1) Unpacking and checking the product and its accessories are packed in cartons. When unpacking, you must carefully disassemble, check the packing list, and promptly check whether the equipment and accessories are complete and whether there is any damage during transportation. Before removing packing materials, make sure that all accessories have been found. If the equipment or accessories are damaged during transportation, or the equipment and accessories are not in conformity with the ordering contract, it should be recorded in time and contact with ADAYO POWER after-sale service or office immediately. Clean up the Scene, review again, determine the acceptance information and prepare for acceptance.

(2) Preparation of installation tools

No.	Name	Specification	Remark
1	Electric screwdriver	/	With M6/M8 socket
2	Wrench	Torque Wrench	Inspection
3	Wrench	M10	Positive and negative wires, terminal block
4	Socket	M6	Positive and negative wires, terminal block
5	Phillips screwdriver	/	Lock box cover
6	Diagonal Nose Pliers	/	Cutting Ties
7	Electrician's knife	/	/
8	Clamp meter	UT204	Inspection
9	Insulated gloves	/	Electrical insulation
10	RS485 communication cable	/	Communication commissioning
11	Notebook	/	Commissioning of equipment, reading of parameters
12	Impact Drill	M10 drill	Punching

(3) Installation and Wiring
① Adopt wall mounting type installation, fix the battery on the wall mounting bracket, as shown in Figure 3-2.
② Connect the battery output terminals P+ and P- on the chassis of the product to the DC output terminals “+” and “-” of the DC power module with red and black cables of 25m² or more gauge. For multi-level connection, For multi-stage connection, connect the battery packs in parallel and then connect them, as shown in Figure 3-1.
③ Connect the communication interface of the battery pack to the communication interface of the dynamic ring with a standard network port communication cable.

3.3 Product Installation

Battery packs can be operated singly or in parallel, with a maximum of 16 groups in parallel. The following figure takes 2 groups in parallel as an example, as shown in Figure 3-1.

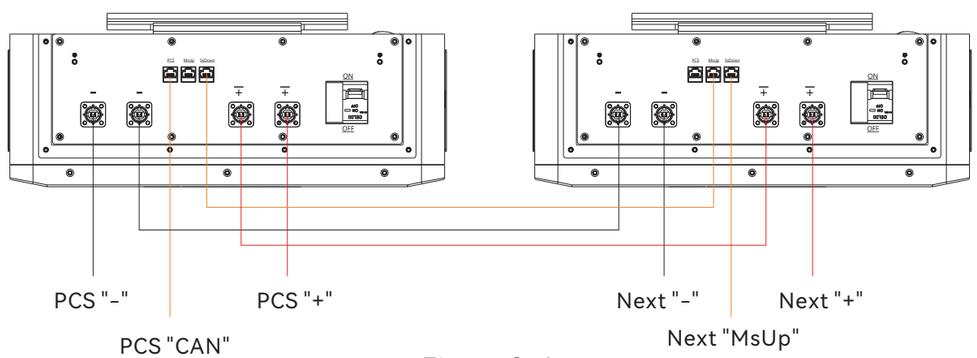


Figure 3-1

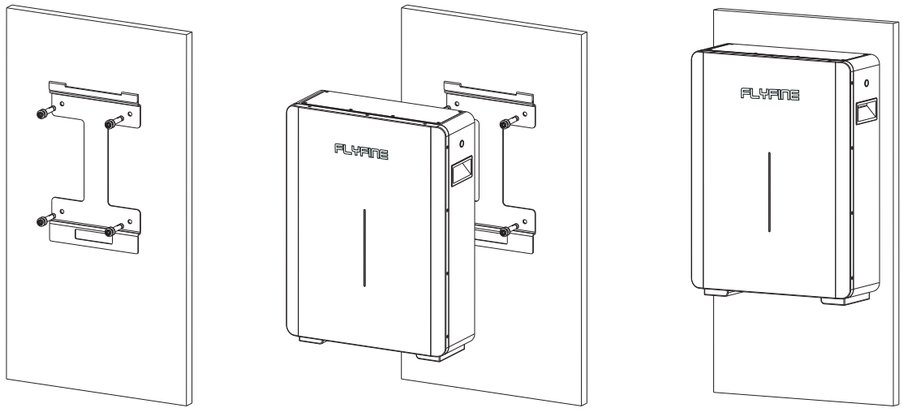


Figure 3-2

① Prepare the bracket, expansion bolts, wall-mounted batteries, impact drills; put the bracket against the wall, mark the holes, and drill the holes.

② Install the M6 expansion bolts into the four mounting holes.

③ Two people lift the battery, use the battery backplane hook to hang the bracket.

Note: It should be installed on the hard lime or cement surface wall, and is strictly prohibited to be installed on the hollow board or the wall with foam!

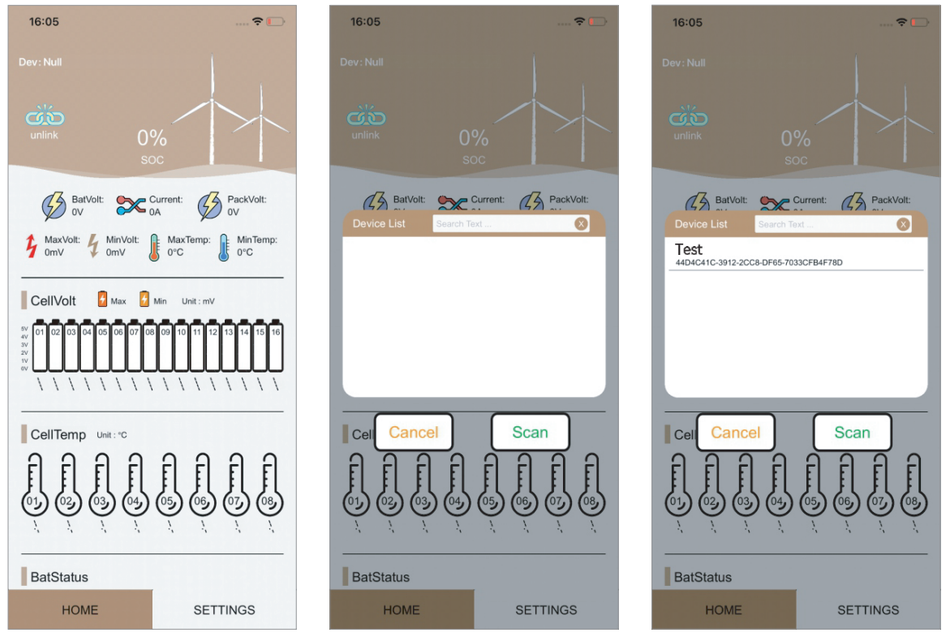
4. Instructions for use

4.1 Use of APP

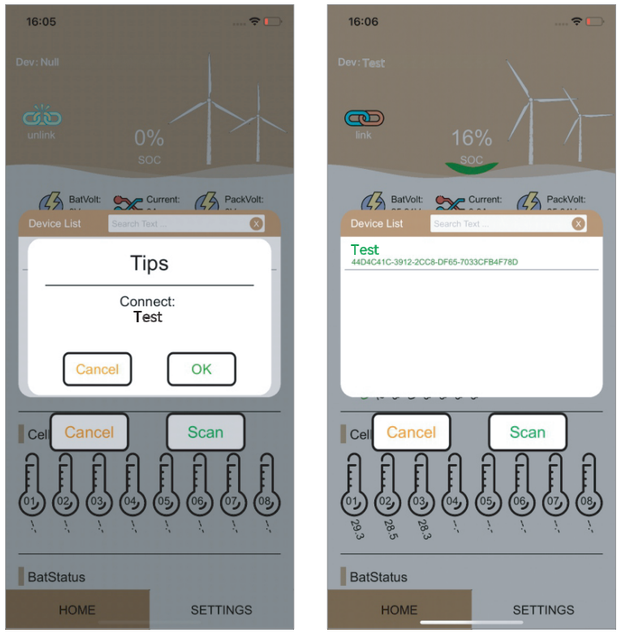
(1) Scan and download the APP.

(2) Firstly, turn on the location and Bluetooth function of your cell phone.

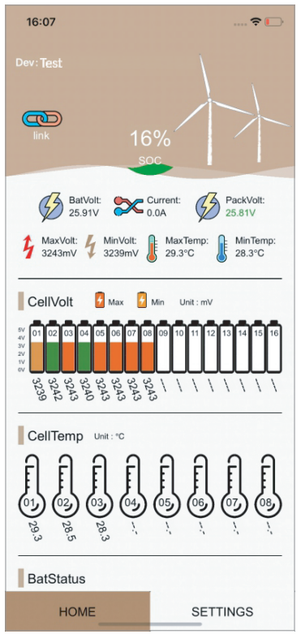
(3) Open “APP”, then click “unlink”→“Scan”, you can search for Bluetooth.



(4) Click on the name of the Bluetooth device you want to connect, click OK to confirm, the device name will turn into green font to indicate a successful connection.

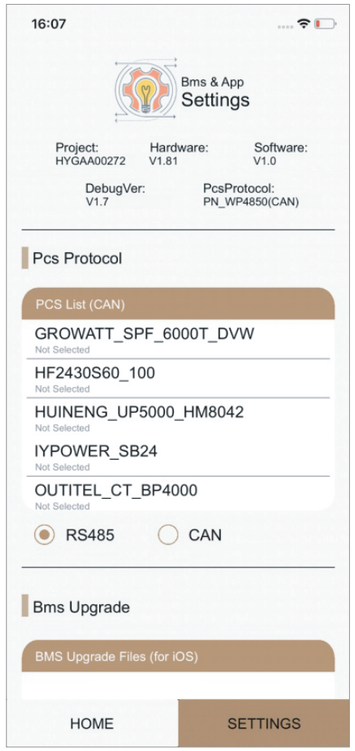


(5) If the Bluetooth connection is successful, you can check the battery data in the main page.



4.2 Protocol Matching

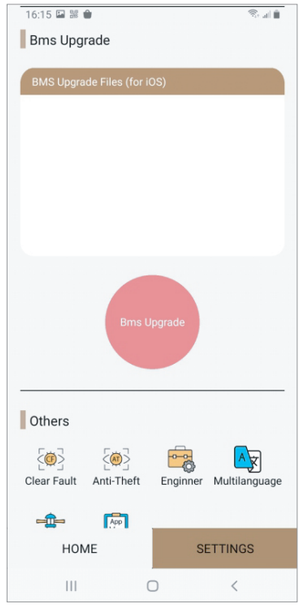
Click “SETTINGS”, switch RS485 or CAN, select different inverter protocols, directly click to select the inverter protocol and transmission method.

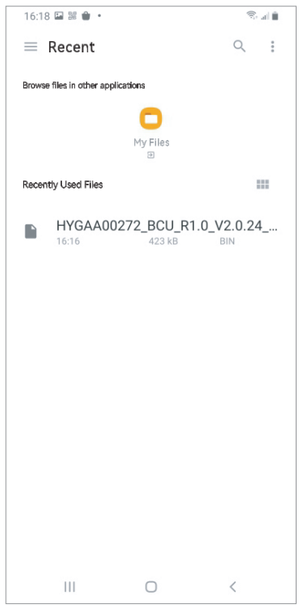


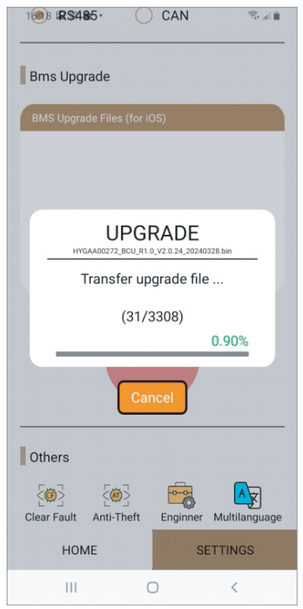
4.3 Bluetooth local upgrade

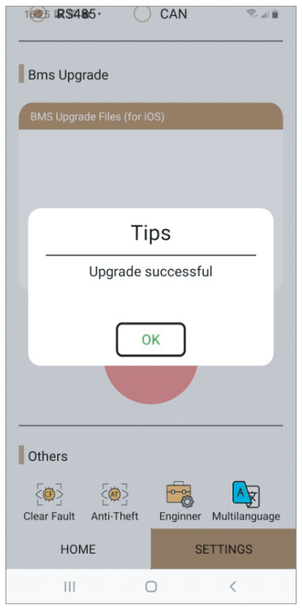
(1) Transfer the upgrade file to your cell phone.

(2) Click “BMS Upgrade”, select the file to be upgraded and start upgrading, until the interface shows “Upgrade successful”, then click OK, the upgrade is successful.









5. Daily Maintenance

(1) Battery packs should be guarded by professional personnel during charging operations. During the charging process, make sure that the plug and socket are in good contact, the charging equipment is working properly, and the connection points of the battery pack are in good contact. If any abnormality occurs, immediately disconnect the power, only after repair can be charged;

(2) Before charging and discharging operation of the battery pack, you can use the BMS upper computer to read the battery voltage, temperature, differential pressure and other states, to ensure that all values are in the normal range;

(3) If there is a lot of dust, metal shavings or other debris on the top cover and poles of the battery pack, use compressed air to clean it in time, and do not use water or water-soaked objects to clean them;

(4) Prohibit the splashing of water or other conductive objects on the battery cover and poles during charging and discharging operations, such as exposing the battery pack to heavy rain;

(5) Estimate the charging time and discharging time of the battery pack according to the actual usage condition of the battery pack, and observe whether there is any abnormality of the battery pack, such as the voltage difference of the battery is relatively large, at the end of the charging period and the end of the discharging period through the top computer of the BMS.

NO.	Maintenance content	Operation method	Precautions
1	Check the positive and negative terminal screws to determine if there is any looseness.	Wear insulating gloves, hold the insulating rubber sleeve of positive and negative terminal wires and shake it gently.	Please wear insulated gloves when checking the positive and negative battery screws to prevent electric shock and don't push too hard.
2	Check whether there is a fault alarm	Whether there is any abnormality in the LED display of switching power supply and battery pack panel.	Stop battery system work when there is a fault.
3	Check whether the total voltage is normal	Check the switching power supply or measure with a multimeter.	/
4	Battery pack information troubleshooting	Enter the battery management interface from the display of the dynamic loop monitoring system or the BMS host computer, to check whether the battery voltage, temperature, current, SOC information is normal and record it.	You must take timely action if you find any battery faults such as voltage, temperature, current, SOC, etc.

6. Troubleshooting

Battery packs can be used in the process of failure in accordance with the following table troubleshooting, troubleshooting personnel need to have the appropriate professional knowledge and skills, there should be no fewer than two people to work together, and the venue needs to have the appropriate firefighting capabilities. After the implementation of the above troubleshooting process if you can not solve the problem, please consult the after-sales service.

Failure phenomenon	Troubleshooting contents and sequence
Unable to start	Press and hold the reset key to restart.
Unable to communicate	① Check whether the BMS has been turned on; check whether the communication cable and crystal head are physically connected; check whether the BMS has been turned on. ② Check whether the physical connection of communication cable and crystal head is stable. ③ Check whether the pin pins of the crystal head are crimped correctly. ④ Check whether the dip switches are set to the right position.
Unable to charge	① Check whether the BMS has been turned on; ② Check whether the BMS alarm indicator is lit; ③ Check that the BMS is set to allow charging. ④ Check whether the charging cable is connected accurately and completely. ⑤ Check if the battery pack is in full state.
Cannot discharge	① Check that the BMS is turned on. ② Check that the BMS alarm indicator is lit. ③ Check whether the BMS has been set to allow discharging; ④ Check whether the charging cable is connected accurately and completely. ⑤ Check if the battery pack is already in a deficit state.
Alarm indicator is always on	① Check that the +/- and its cables are not short-circuited. ② Check that the battery pack is not physically damaged. ③ Check if the temperature of the battery pack triggers the protection. ④ Check if the charging and discharging current of the battery pack triggers the protection.

7. Specification

Item	Specification	Remark
Type	LiFePO4 Battery	
Pack Method	16S1P	
Nominal capacity	100Ah	Charge/Discharge: 0.5C Cut-off Voltage: 40V
Nominal voltage	51.2V	
Energy	5120Wh	
Charge method	CC/CV	
Charge cut-off voltage	58.4V	
Discharge cut-off voltage	40V	
Standard charge current	50A	
Max. continues charge current	100A	Warranty conditions: Discharge current ≤ 50A (0.5C) @ 77°F (25°C) 80% DoD
Standard discharge current	50A	
Max. continues discharge current	100A	Warranty conditions: Discharge current ≤ 50A (0.5C) @ 77°F (25°C) 80% DoD
Discharge depth	100%	
Operating efficiency	98%	
Cycle life	≥6,000 times	Temperature 25±2℃, charge/discharge current ≤100A
Internal impedance	≤50mΩ	
Dimension	L620 x W470 x H165mm	
Communication Mode	CAN, RS485	
Wireless monitoring and upgrading	Bluetooth as standard (4G optional)	Neutral APP (usage range: monitoring within 3 meters, upgrading within 1 meter)
overall upgrade	OTA overall upgrade	If FLYFINE inverter is selected, the inverter can be used to upgrade the overall OTA of the battery cluster.
Weight	Approx. 49KG	
IP level	IP21	
Maximum parallel quantity	16	
Working temperature range	Charge: 0℃~55℃ Discharge: -10℃~55℃	
Storage Temperature	-20℃~60℃	

8. Communication protocol code list

No.	Equipment Name	Manufacturer
1	MACQUARIE_R8KLNA	MEGAREVO
2	SOROTEC_REVO_11_5_5KW	SOROTEC
3	GROWATT_SPF5000	GROWATT
4	GROWATT_SPH6K	GROWATT
5	DEYE_8K_860KP_EU	Deye
6	VITVONN_48V5KW	Victron
7	SERMATEC_SET_5K _TL_UN	SERMATEC
8	LUXPOWER_LXP_5K_HYBRID_5KW	LUXPOWER
9	GSSTES_SOLARE_5KTL_5KW	GSSTES
10	SMA_SI6048_US_10	SMA
11	SMA_SB5_6_0_US_10	SMA
12	GOODWE_GW5048D_ES	GOODWE
13	GOODWE_GW5K_ET	GOODWE
14	HF2430S60_100	SRNE
15	HUINENG_UP5000_HM8042	HUINENG
16	IYPOWER_SB24	iYPOWER
17	REVO_DEVICE	MEGAREVO
18	AY19	SNMP Customize

9. Safety instructions

IMPORTANT !

Read all instructions before you use this product. Do not make any changes or settings that are not described in this manual. If personal injury, damage, etc. are caused by failure to follow the instructions, the responsibility is not in our company, and the warranty does not apply.

- Install and wire the product correctly, and use the product under specified conditions.
- Do not use the product in extreme environment. Excessive temperature may damage the product and cause danger. If the temperature is too low, the performance of the product will be seriously reduced or stop working.
- Do not use this product near a heat source, such as fire source or heating furnace.
- Please use this product in a dry, well-ventilated place with little dust.
- Do not expose the product to rain, snow or high humidity. Do not immerse it in water.
- Do not use it in strong static electricity or strong magnetic field environment. This may cause the product to work abnormally or the protection function to fail, which may lead to accidents.
- Working at extremely air pressure may cause damage to the product.
- Do not stack more than 60kg weight on the product; Do not stand on the product.
- Please store the product out of the reach of children and pets. Close supervision is necessary when the product is used near children.
- Do not put fingers or hands into the product. Do not insert foreign objects, especially electric conductor, into any port of the product to avoid the risk of electric shock or product damage.
- Do not clean the product with harmful chemicals or detergents.
- Do not operate the product with the damaged electric plug or cable. To reduce risk of damage to the plug and cable, pull the plug rather than the cord when disconnecting the product.
- Ensure that the product is not hit, dropped or violently vibrated. When transporting the product, please firmly fix the product to avoid damage. If the product suffers from severe external impact, please immediately turn off the power supply and stop using it.
- This product must be grounded to reduce the risk of electric shock.
- Do not disassemble the product or puncture it with sharp objects. Take it to a qualified service person when service or repair is required. Incorrect reassembly may result in a risk of fire or electric shock. To reduce the risk of electric shock, disconnect the product wiring before servicing.
- Do not use unofficial parts or accessories. It may result in a risk. If you need to replace it, please go to the sales channel designated by our company for the relevant information.
- Do not use the product and accessories that is damaged or modified. Damaged or modified batteries may exhibit unpredictable behavior resulting in fire, explosion or risk of injury.
- If the product is at risk of serious damage or has been seriously damaged, please immediately cut off the power supply connection to the product and turn off it. Place the product in an open, waterproof and safe place, away from people and flammable materials. Please take measures to prevent electric shock before touching the product. The product shall not be reused and shall be disposed of according to local laws and regulations.
- If the product catches fire accidentally, it is recommended to use fire extinguishing equipment in the following order: sand, fire blanket, dry powder and carbon dioxide fire extinguisher.