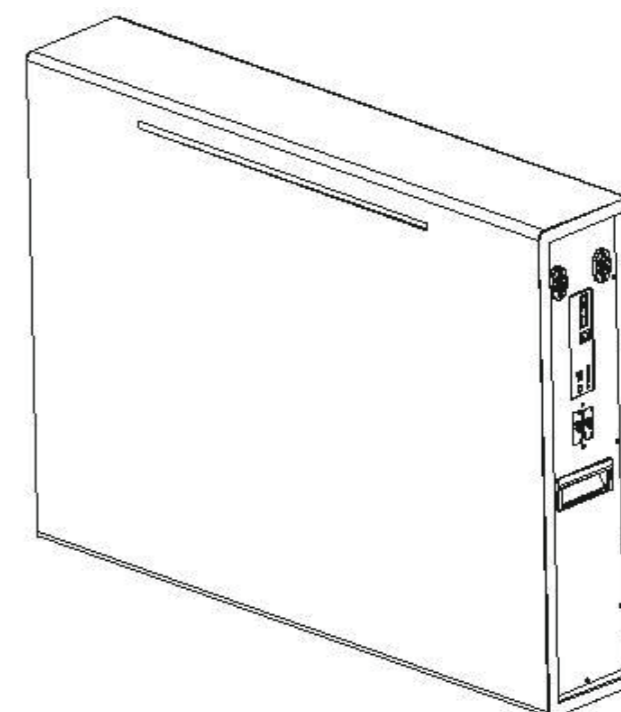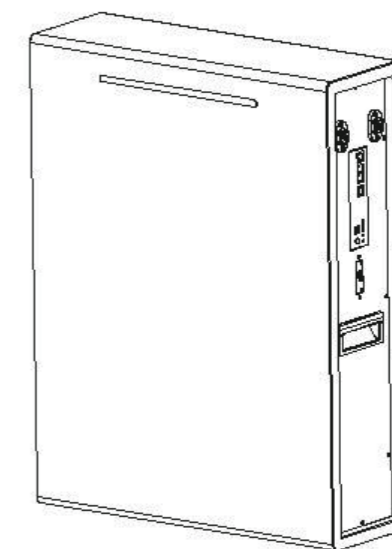# Lithium Battery Power Bank

Product Manual

This manual introduces 24/48VDC series energy storage battery,Please read this manual before you to install the battery and follow the instruction carefully during the installation .Any confusion ,please contact manufacturer immediately for advice and clarification .

Contents

b) Current: If current is greater than 150A, battery protection will turn on .
Solution: Check whether current is too large or not, if it is, to change the setting on power supply side.

c) High Voltage: If charging voltage above 29.2Vdc(24V system) or 58.4Vdc(48V system), battery protection will turn on.
Solution: Check whether voltage is too high or not, if it is, to change the setting on power supply side.

d) Low Voltage: When the battery discharges to 22.4Vdc(24V system) 44.8Vdc(48V system) or less, battery protection will turn on.
Solution: Charge the battery for some time, the LED light turn off.

5.3 The battery cannot be charged or discharged
  1) Cannot be charged:
  Disconnect the power cables, measure voltage on power side, if the voltage is
    25.6~27.0Vdc(24V system) or 51.2~54.0Vdc(48V system) ,restart the battery,
  connect the power cable and try again, if still not work, turn off battery and contact distributor.

  2) Unable to discharge:
  Disconnect the power cables and measure voltage on battery side, if it is under 22.3 V or
  44.5V, please charge the battery. If voltage is above 24V or 48V and still cannot discharge,
    turn off battery and contact distributor.

6. Emergency Situations
  1) Leaking Battery
  If the battery pack leaks electrolyte, avoid contact with the leaking liquid or gas.If one is
  exposed to the leaked substance, immediately perform the actions described below .
  Inhalation: Evacuate the contaminated area, and seek medical attention.
  Contact with eyes: Rinse eyes with flowing water for 15 minutes, and seek medical attention.
  Contact with skin: Wash the affected area thoroughly with soap and water, and seek medical
  attention.
  Ingestion: Induce vomiting, and seek medical attention.

  2) Fire
    NO WATER! Only dry powder fire extinguisher can be used; if possible, move the battery pack
    to a safe area before it catches fire.

  3) Wet battery
  If the battery pack is wet or submerged in water, do not let people access it,and then contact
 an authorized dealer for technical support.

  4) Damaged Battery
  Damaged battery are dangerous and must be handled with the utmost care. They are not fit
  for use and may pose a danger to people or property. If the battery pack seems to be damaged
  pack it in its original container, and then return it to an authorized dealer.

4.3 Installation Location
Make sure that the installation location meets the following conditions.

◆The area is completely water proof.

◆The floor is flat and level.

◆There are no flammable or explosive materials.

◆The ambient temperature is within the range from 0℃ to 50℃.

◆The temperature and humidity is maintained at a constant level.

◆There is minimal dust and dirt in the area.

◆Use fitting screws to fix the box on the wall.
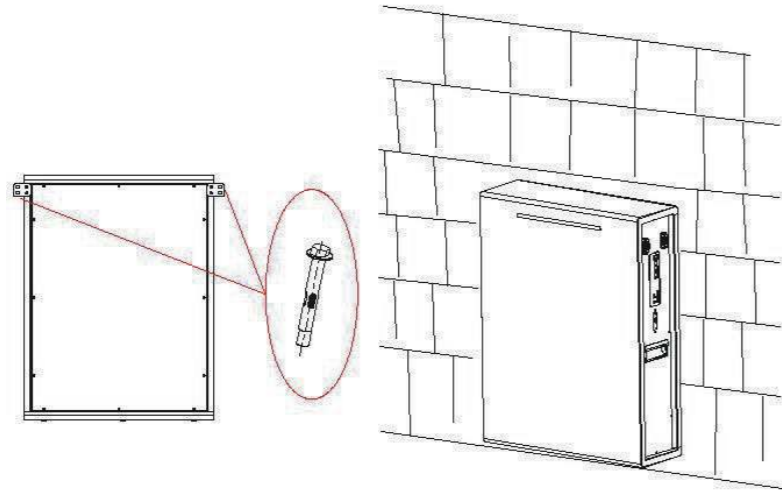
⚠ **CAUTION**

If the ambient temperature is outside the operation range, the battery pack stops operation to protect itself. The optimal temperature range for the battery pack to operate is 0℃ to 50℃ .

Frequent exposure to harsh temperature may deteriorate the performance and life of the battery pack .

5. Trouble Shooting Steps
5.1 Problem determination based on:
1) Whether the battery can be turned on or not.

2) If battery is turned on, check the LED light is off, flashing or lighting.

3) If the LED light is off, check whether the battery can be charge/discharge or not.

5.2 Preliminary determination steps:
1) Battery cannot turn on, switch on the lights are all no lighting or flashing.
   If the battery external switch is on, the LED light is flashing, and the external power supply voltage is 48V or more, the battery still unable to turn on, please contact distributor.

2) The battery can be turned on, but red light is lighting, and cannot charge or discharge. If the red light is lighting, that means system is abnormal, please check values as following:
   a) Temperature: Above 50℃ or under -10℃, the battery could not work.

   Solution: to move battery to the normal operation temperature range between -10℃ and 50℃.

1. Safety Precautions

⚠ Reminding

1) It is very important and necessary to read the user manual carefully (in the accessories) before installing or using battery .Failure to do so or to follow any of the instructions or warnings in this document can result in electrical shock ,serious injury ,or death,or can damage battery ,potential rendering it inoperable .
2) If the battery is stored for long time ,it is required to charge them every six months ,and the soc should be no less than 90% .
3) Battery needs to be recharged within 12 hours ,after fully discharged .
4) Do not expose cable outside .
5) All the battery terminals must be disconnected for maintenance .
6) Please contact the supplier within 24 hours if there is something abnormal .
7) Do not use cleaning solvents to clean battery .
8) Do not expose battery to flammable or harsh chemicals or vapors .
9) Do not paint any part of battery ,include any internal or external components .
10) Do not connect battery with PV solar wiring directly .
11) The warranty claims are excluded for direct or indirect damage due to items above .
12) Any foreign object is prohibited to insert into any part of battery .

⚠ Warning
1.1 Before Connecting
1) After unpacking ,please check product and packing list first ,if products is damaged or lack of parts ,please contact with the local retailer .
2) Before installation ,be sure to cut off the grid power and make sure the battery is in the turned-off mode .
3) Wiring must be correct ,do not mistake the positive and negative cables ,and ensure no short circuit with the external device .
4) It is prohibited to connect the battery and AC power directly .
5) The embedded BMS in the battery .The wall mounted case are not allowed to be used in series ,in the communication state, a maximum of 16 parallel connections are allowed .
6) Battery system must be well grounded and the resistance must be less than 1Ω .
7) Please ensured the electrical parameters of battery system are compatible to related equipment .
8) Keep the battery away from water and fire .

1.2 In Using
1) If the battery system needs to be moved or repaired ,the power must be cut off and the battery is completely shutdown .
2) It is prohibited to connect the battery with different type of battery .
3) It is prohibited to put the battery working with faulty or incompatible inverter .
4) It is prohibited to disassemble the battery (QC tab removed or damaged) .
5) In case of fire ,only dry powder fire extinguisher can be used ,liquid fire extinguishers are prohibited .
6) Please do not open ,repair or disassemble the battery except staffs from manufacturer .We do not undertake any consequences or related responsibility which because of violation of safety operation or violating of design ,production and equipment safety standards .

2. Introduction

24/48VDC series Lithium battery power bank is one of new energy storage products developed ,it can be used to support reliable power for various types of equipment and systems .Is especially suitable for application scene of high power ,limited installation space ,restricted load-bearing and long cycle life .

24/48VDC series has built-in BMS battery management system ,which can manage and monitor cells information including voltage ,current and temperature .What's more ,BMS can balance cells charging and discharging to extend cycle life .

Multiple batteries can connected in parallel to expand capacity and power in parallel for larger capacity and longer power supporting duration requirements .

The capacity of Lithium battery should be higher than the Solar Inverter which you will connect with .

2.1 features:

 ◆ The whole module is non-toxic ,non-polluting and environmentally friendly .

 ◆ Cathode material is made from LiFePO4 with safety performance and long cycle life .

 ◆ Battery management system (BMS) has protection functions including over-discharge ,over-charge ,over-current and high/low temperature .

 ◆ The system can automatically manage charge and discharge state and balance current and voltage of each cell .

 ◆ Flexible configuration ,multiple battery modules can be in parallel for expanding capacity and Power .

 ◆ Adopted self-cooling mode rapidly reduced system entire noise.
  The module has less self-discharge ,up to 6 months without charging it on shelf ,no memory effect ,excellent performance of shallow charge and discharge .

 ◆ Working temperature range is from -10℃ to 50℃ ,(charge 0℃~ 50℃ ,discharge -10℃~ 50℃) with excellent discharge performance and cycle life .

2.2 Specifications:

Basic parameters	200Ah	250Ah	300Ah	200Ah	250Ah	300Ah
Nominal capacity	5120Wh	6400Wh	7680Wh	10240Wh	12800Wh	15360Wh
Fast charge voltage	28.8Vdc			57.6Vdc		
Float charge voltage	28.0Vdc			56.0Vdc		
Low DC cut-off voltage	23.4Vdc			46.8Vdc		
Max. CHG. current	100A			100A		
Max. DISC. current	100A			100A		
Peak DISC. current	200A(30 sec.)					
Display	RGB , WiFi					
communication	RS485 , RS232					
Working temperature	charge 0℃ ~ +50℃ ,discharge -10℃ ~ +50℃					
Shelf temperature	-10℃ ~ 50℃					
certification	UN38.3 , MSDS					

4. Installation
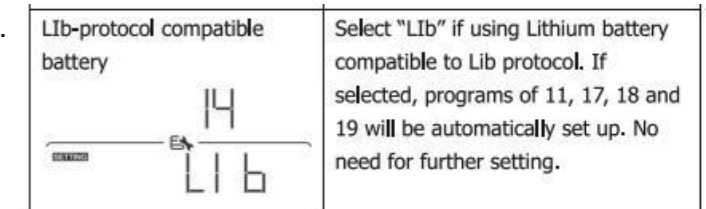### 4.1 One set Lithium battery product connects to Inverter
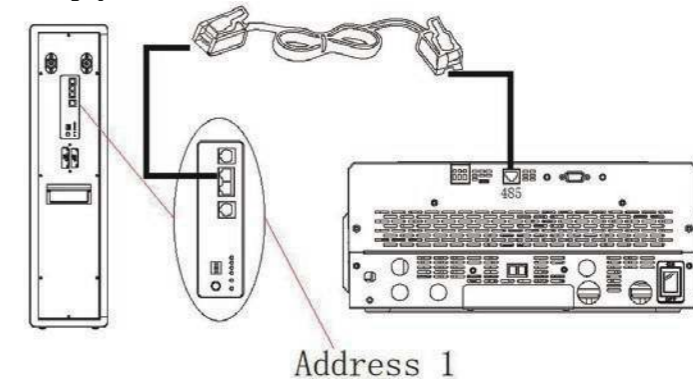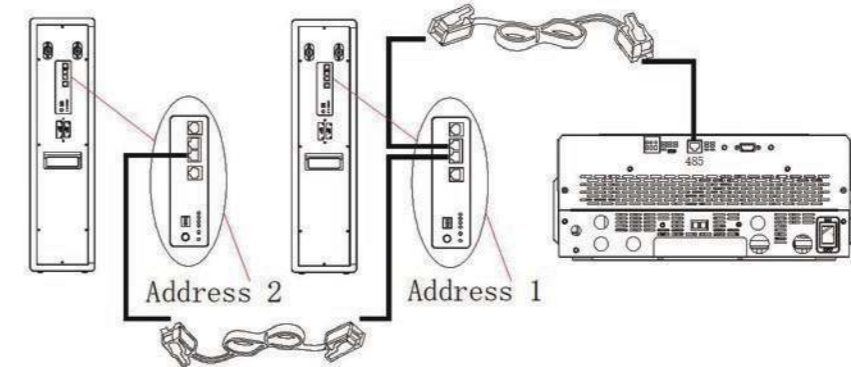

Address 1

Operation instructions:
1.Use the RJ45 communication cable of the accessory, connect the 485 communication port of the inverter to the 485 communication port of the lithium battery .
2.Set the communication device address of the lithium battery pack to 1 .

3.Set the inverter's battery type to LIB mode .

LIb-protocol compatible battery	Select "LIb" if using Lithium battery compatible to Lib protocol. If selected, programs of 11, 17, 18 and 19 will be automatically set up. No need for further setting.
14 LI b	

4.2 Multiple sets of Lithium battery product connects to Inverter
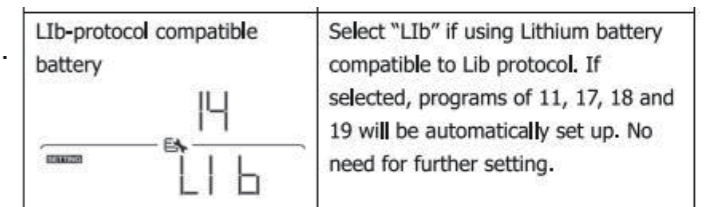

Address 2   Address 1

Operation instructions:
1.Use the RJ45 communication cable of the accessory, connect the 485 communication port of the inverter to the 485 communication port of the first lithium battery .
2.Then use the RJ45 communication cable of the accessory, connect the 485 communication port of the 1st lithium battery to the 485 communication port of the 2nd lithium battery .
3.Set the communication device address of the 1st lithium battery pack to 1 .

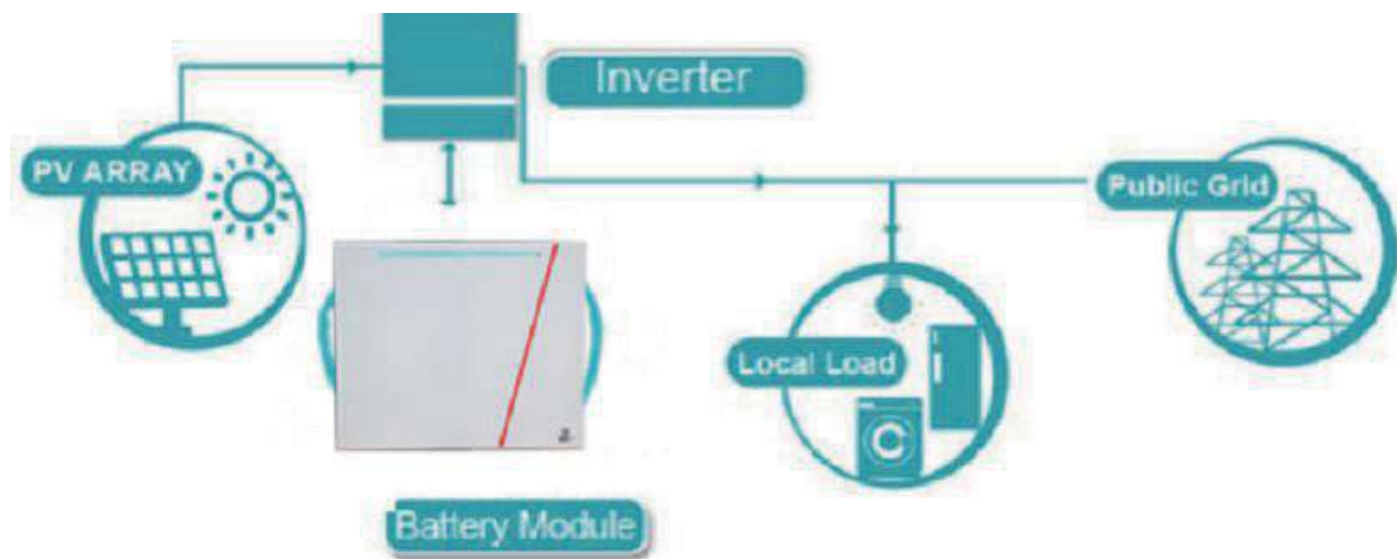4.Set the communication device address of the 2nd lithium battery pack to 2 .

5.Set the inverter's battery type to LIB mode .

LIb-protocol compatible battery	Select "LIb" if using Lithium battery compatible to Lib protocol. If selected, programs of 11, 17, 18 and 19 will be automatically set up. No need for further setting.
14 LI b	

3. Safe handing of lithium battery guide
3.1 Schematic Diagram of solution

3.2 Tools
The following tools are required to install the battery pack

Wire cutter   Crimping Modular Plier   Screw Driver

NOTE

Use properly insulated tools to prevent accidental electric shock or short circuits.
If insulated tools are not available,cover the entire exposed metal surfaces of the available tools, except their tips, with electrical tape.

3.3 Safety Gear
It is recommended to wear the following safety gear when dealing with the battery back.
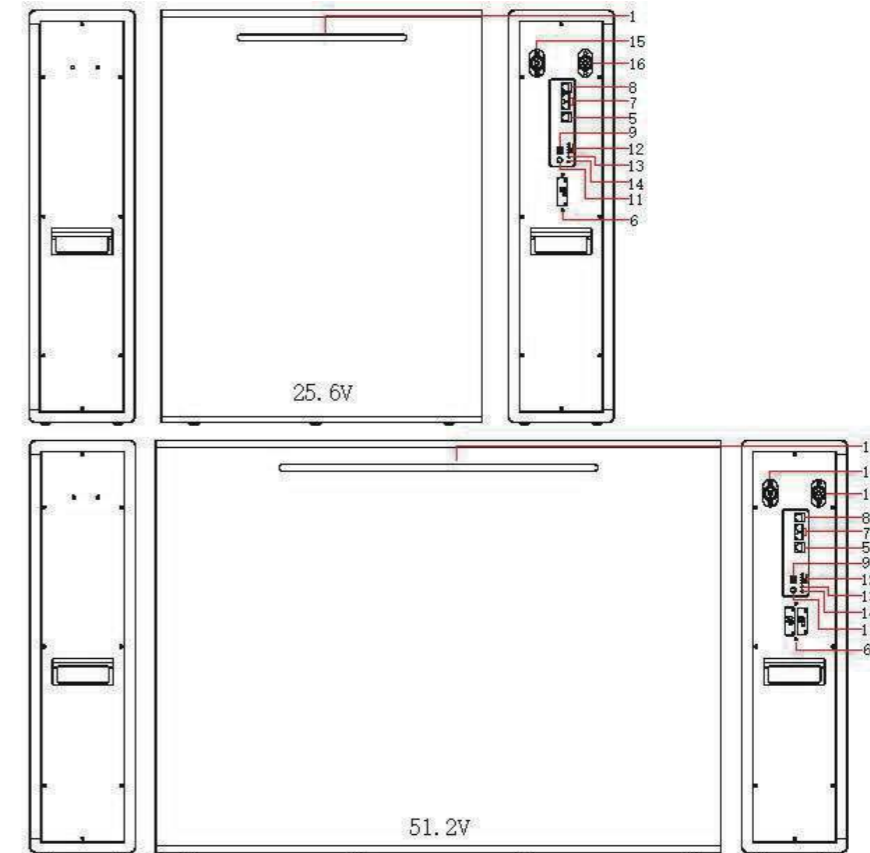

Insulated gloves   Safety goggles   Safety shoes

2.3 Equipment Interface Instruction

25. 6V

51. 2V

1. RGB light indicates
The SOC. remaining capacity through different colors .

5. RS485 interfaces(Reserve other communication protocols)
Reserve 485 communication ports for inverters of other brands .

6. Active balancing external interfaces
Connect the external equalizer .

7. Double RS485 interfaces(Compatible with SAKO communication protocol)
Follow RS485 protocol, for communication between multiple parallel battery .

8. RS232 interfaces
Follow RS232 protocol, for output battery information .

9. Device address
Used to set the address of each BMS protection board .

11. Power switch
ON ~ Long button one time ,the battery is turn on and the battery has output voltage .
OFF ~ Keep flash pressing the button ten times ,the battery is turn off and the battery has no output voltage .
RESET ~ Keep long pressing the button more than 5 seconds ,the BMS software reset to start output voltage .

12. SOC status indicator
Green LEDS to show the battery's current capacity 25% 50% 75% 100% .

13. Alarm status indicator
Red LED flashing to show the battery has alarm .

14. Run status indicator
Yellow LED lighting to show the battery is charging ,and fast flashing to show the battery is discharging ,and slow flashing to show the battery is standby status .
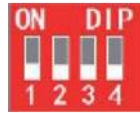
15. +Battery terminal
There are one pair of terminals, Red is battery positive pole .

16. -Battery terminal
There are one pair of terminals, Black is battery negative pole .

BMS Modbus-485 communication device address

Dial code switch position				Address	Instruction
1	2	3	4		
1	0	0	0	1	Set to Pack1
0	1	0	0	2	Set to Pack2
1	1	0	0	3	Set to Pack3
0	0	1	0	4	Set to Pack4
1	0	1	0	5	Set to Pack5
0	1	1	0	6	Set to Pack6
1	1	1	0	7	Set to Pack7
0	0	0	1	8	Set to Pack8
…	…	…	…	…	…
1	1	1	1	15	Set to Pack15
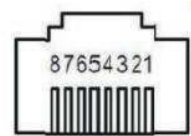
RS485 interfaces		Double RS485 interfaces		RS232 interfaces	
RJ45 pin	define	RJ45 pin	define	RJ45 pin	define
1	RS485-B	3	RS485-B1/B2	1	TXD
2	RS485-A	5	RS485-A1/A2	2	RXD
3,6,7,8	null	1,2,6,7	null	3,5,6,7	null
4	CANH	4	+12V(External DC+12V power supply input)	4	+12V(External DC+12V power supply input)
5	CANL	8	GND	8	GND

2.4 RGB light indicates Instruction

SOC. capacity	Charging statue	Discharging statue	Standby statue
0%	Yellow LED light is flash	Red LED light is flash	Yellow LED light is flash
1%~20%	Blue→Green→Cyan→White is flash	Blue LED light is flash	Blue LED light is flash
21%~50%	Blue→Green→Cyan→White is flash	Blue LED light is on	Blue LED light is on
51%~75%	Green→Cyan→White is flash	Green LED light is on	Green LED light is on
76%~90%	Cyan→White is flash	Cyan LED light is on	Cyan LED light is on
91~100%	White LED light is flash	White LED light is on	White LED light is on
100%	White LED light is on	White LED light is on	White LED light is on

2.5 WiFi function instruction

2.5.1 Select the APP(Android phones only)

2.5.2 WiFi Device Selection
1)Click on the "Connected Devices" , then select the available WIFI device to connect to.
2)Go back to the page and click on the "Refresh List" .
3)To facilitate identification and management, the WIFI module can be renamed .
4)Click on to access the WIFI device with the assigned IP address.


2.5.3 Battery pack working status data
1)The green circle in the upper right corner is flash, that WIFI data is being received .
2)Temp: The cell temperature .
RC: Remaining capacity .
Total voltage: The battery pack voltage .
Cycles: Complete charge and discharge times .
Power: Charge and discharge power .
H-Cell: The cell with the highest voltage .
L-Cell: The cell with the lowest voltage .
Charging: Charging MOS status .
Discharge: Discharge MOS status .
BAT status: Battery pack working status .
COMM: Mobile phone and battery pack communication status .

2.5.4 Configure default parameter query or change
1)System info
2)Charge&Discharge parameters
3)AFE parameters
4)Calibrator parameters
5)Reset to defaults
6)Communication parameters
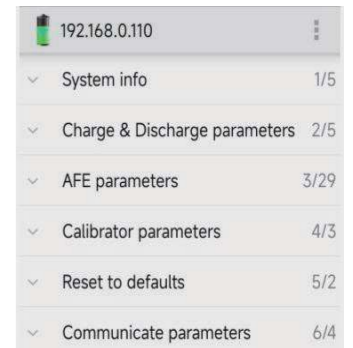
2.5.5 Connect to LAN WIFI devices
1)Check current connect: Check the current WIFI channel
2)Refresh WiFi list: