



# PowerCool-LFP-LV series Operation Manual



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This document is intended only for the SolarEast PowerCool-LFP-LV battery system, excluding the hybrid inverter or any other equipment. Please keep the Manual properly and operate in strict accordance with all safety and operating instructions in this Manual. Please do not operate the product before reading through the Manual.

All brands and product names are trademarks or registered trademarks of their respective holders.

This Manual introduces PowerCool-LFP-LV manufactured by SolarEast. Please read this manual before you install the product and follow the instructions carefully during the installation process. Should you have any confusion, please contact SolarEast for advice and clarification.

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## 1 . Introduction

### 1.1 Content and Structure of this Document

This document is valid for PowerCool-LFP-LV battery system.

This document describes the product information, and guidance for installation, as well as APP configuration and commissioning.

Observe all documentation that accompanies the product, keep them in a convenient place and available at all times.

Illustrations in this document are reduced to the essential information and may deviate from the real product.

### 1.2 Target Group

Only qualified persons are allowed to perform the operations marked with a warning symbol in this document. Qualified persons must have:

- Knowledge of working principle of Li-ion battery.
- Knowledge of how to deal with the dangers and risks associated with installing and using electrical devices, batteries and systems.
- Knowledge of the installation and commissioning of electrical devices and systems.
- Knowledge of the applicable standards and directives.
- Understood and complied with this document, including all safety precautions.
- Understood and complied with the documents of the inverter manufacturer, all safety precautions included.

### 1.3 Levels of Warning Messages



#### **DANGER**

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.



#### **WARNING**

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



#### **CAUTION**

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



## NOTICE

NOTICE indicates a situation which, if not avoided, can result in property damage.



Warning electric shock.



Warning Fire.



Do not reverse connect the positive and negative.



Do not place near open flame.



Do not place at the children or pet touchable area.

### 1.4 Definition of Abbreviations and Nouns

Abbreviation	Noun
AC	alternating current
APP	application
BAT	battery
BMS	battery management system
DC	direct current
INV	inverter
PV	photovoltaic
SOC	state of charge
SOH	state of health

## 2 . Safety

### 2.1 Safety Instruction

This product is designed and tested in accordance with international safety requirements IEC 62619, IEC 63056, and IEC 62040, but as with all electrical and electronic equipment, certain precautions must be observed when installing and operating the product. To reduce the risk of personal injury and ensure the safe installation and operation of the product, more attention should be paid on following all instructions, cautions and warnings in this Manual.

### 2.2 Battery precautions



#### WARNING

It is important and necessary to read the user manual carefully 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, potentially rendering it inoperable.

- If the battery is stored for long time, it is required to charge it every six months, and the recommended SOC should be 50%~55%. The battery shall not be stored for more than 12 months if the storage temperature is -10 ~ 25°C, not more than 6 months if the storage temperature is 25 ~ 35°C and not more than 3 months if the storage temperature is 35 ~ 50°C
- Battery needs to be recharged within 12 hours after being fully discharged.
- Do not have the product installed in any environment that falls outside the range of temperature or humidity set out in the Manual.
- Do not expose cable outside.
- Do not connect power terminal reversely.
- All the power terminals must be disconnected for maintenance.
- Please contact the supplier within 24 hours in case of anything abnormal.
- Do not use cleaning solvents to clean battery.
- Do not expose battery to flammable or harsh chemicals or vapors.
- Do not paint any part of battery, include any internal or external components.
- Do not connect battery with PV solar wiring directly.
- Any foreign object is prohibited to insert into any part of battery.
- The warranty claims are excluded for direct or indirect damage due to above reasons.

### 2.3 Emergency situation



#### DANGER

This product is designed with multiple safety strategies to prevent hazards resulting from failure. However, hazards and dangers could emerge in few uncertain situations.

#### 2.3.1 Fire

The battery pack may catch fire when heated over 150°C.

Ensure an ABC or carbon dioxide extinguisher nearby the battery, and do not use water to extinguish the fire.

If a fire breaks out where the battery is installed, perform the following actions:

- Extinguish the fire before the battery catches fire.
- If the battery has caught fire, do not try to extinguish the fire. The fired battery will produce poisonous gases, please evacuate people immediately.

#### 2.3.2 Leaking

If the battery pack leaks, avoid contact with the leaking liquid or gas.

Electrolyte is corrosive and contact may cause skin irritation and chemical burns. If one is exposed to the leaked substance, perform the following actions:

Inhalation: Evacuate the contaminated area and seek medical attention immediately.

Eyes contact: Rinse eyes with flowing water for 15 minutes and seek medical attention immediately.

Skin contact: Wash the affected area thoroughly with soap and water and seek medical attention immediately.

Ingestion: Induce vomiting as soon as possible and seek medical attention immediately.

### 2.3.3 Wet battery

If the battery is wet or submerged in water, do not try to access it. Contact customer service for technical assistance.

### 2.3.4 Damaged battery

Damaged battery may emit toxic gas or/and flammable gas, which could cause hazards to lives or property. If the battery is damaged, please keep away from the battery and contact customer service for help as soon as possible.

## 3. System Introduction

### 3.1 Specifications

#### 3.1.1 Parameters of system

Battery Cell Technology	Li-iron (LFP)						
Number of Pack (pcs)	1	2	3	4	5	6	7
Total energy (kWh)	5.22	10.44	15.66	20.88	26.11	31.33	36.55
Usable Energy*(kWh)	4.9	9.8	14.7	19.6	24.5	29.4	34.3
Voltage Range(Vd.c)	44.8 ~ 58.4						
Nominal Voltage(V)	51.2						
Max. Charge Voltage(V)	58.4 (BMS third-level protection value)						
Protective Classe	I						
DC Overvoltage Category	OCV II						
Max. continuous charging current(A)	50	100	150	160	160	160	160
Max. continuous discharge current(A)	50	100	150	160	160	160	160
DOD(%)	95						
Communication	CAN/RS485						
Dimension(L*W*H),mm	(720±2) * (420±2) * (466±2)	(720±2) * (420±2) * (616±5)	(720±2) * (420±2) * (766±5)	(720±2) * (420±2) * (916±5)	(720±2) * (420±2) * (1066±5)	(720±2) * (420±2) * (1216±5)	(720±2) * (420±2) * (1366±5)
Net Weight(kg)	(69.2±2)	(116.7±5)	(164.2±5)	(211.7±7)	(259.2±9)	(306.7±11)	(354.2±13)
Operating Condition	Indoor or outdoor						
Operating Temperature	Charging	0~57 °C					
	Discharging	-3~57 °C					
Humidity	<60%RH (No Condensation)						
Cooling type	Natural						
WIFI Frequency Range	2412MHz~2472MHz						
WIFI Maximum Transmission Powe	20dBm						
IP rating of enclosure	IP55						
Installation method	Stacked installation						
Supply connection	Fixed power cord						

Warranty	10 years (5 free warranty + 5 paid warranty)
Authentication Level	IEC62619:2022, including IEC60730-1,EN IEC 61000-6-1:2019,EN IEC 61000-6-3:2021,EN IEC 61000-3-2:2019/A1:2021, EN 61000-3-3:2013/A2:2021,EN 301 489-1 V2.2.3,Draft EN 301 489-1 V3.2.5,EN 300 328 V2.2.2,EN 50663:2017,IEC62040 EN 62311:2008,IEC60529,IEC60068-2-52:2017,UN38.3/MSDS

\* Testing conditions based on temperature 25°C at the beginning of life. Total Energy/Usable Energy are measured with a standard test method: 0.2C Charge and Discharge. As per the characteristics of lithium batteries, such parameters as the charge/ discharge current and efficiency listed above are subject to change. The final right of interpretation is reserved by Jiangsu SolarEast Energy Storage Technology Co., Ltd.

### 3.1.2 Pack



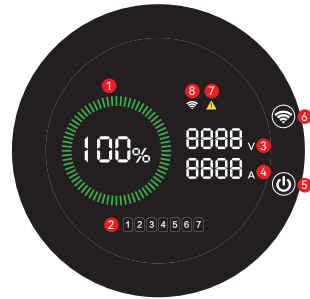
Battery Module Type	PowerCool-LFP-HV	
Total energy	5.22 kWh	
Usable Energy*	4.9 kWh	
Voltage Range	44.8~58.4 Vd.c	
Nominal Voltage	51.2 V	
Max. Charge Voltage	58.4 V (BMS third-level protection value)	
Max.continuous charging current	50 A	
Max.continuous discharge current	50 A	
DOD	95%	
Dimension(L*W*H)	(720±2)*(420±2)*(150±2)mm (Height of single pack)	
Net Weight	(47±2)kg	
Operating Condition	Indoor or outdoor	
Operating Temperature	Charging	0~57 °C
	Discharging	-3~57 °C
Humidity	<60%RH (No Condensation)	
Configuration	(8S)2S	
Warranty	10 years (5 free warranty + 5 paid warranty)	

### 3.1.3 Battery Control Box



## 1) Battery Control Box Display Panel

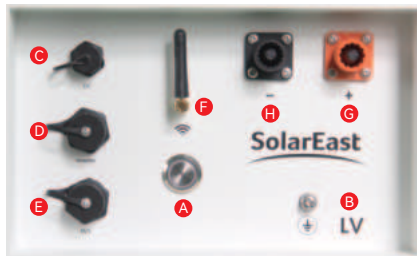
Object	Name	Description
1	System SOC	--
2	No. of Packs	--
3	System Voltage	--
4	System Current	--
5	Monitor Button	Click to activate/deactivate the monitor screen When the breaker is connected, press this button and hold for at least 10s to enter the force charging mode. At this time, the system main circuit is connected by force. Force charging mode can only be exited by disconnecting the breaker
6	WIFI Reset	If WiFi is to be reconnected, press the button and hold for 5s till the WIFI icon on the screen flashes, and then proceed with WIFI connection on App by following the procedures set out in Section 5.3 below.
7	Warning	This icon pops out on the screen in case of system fault. Review and check the cause(s) of the fault on APP
8	WIFI	--



\* Force charging mode: suitable to batteries that are under charge and unable to start up. Under this mode, the main circuit will be connected by force to charge up the battery. Please do not activate force charging when the battery SOC is within normal range, or it may cause overcharge, abnormal battery temperature and other contingencies to the detriment of battery safety.

## 2) Battery Control Box Interface Panel

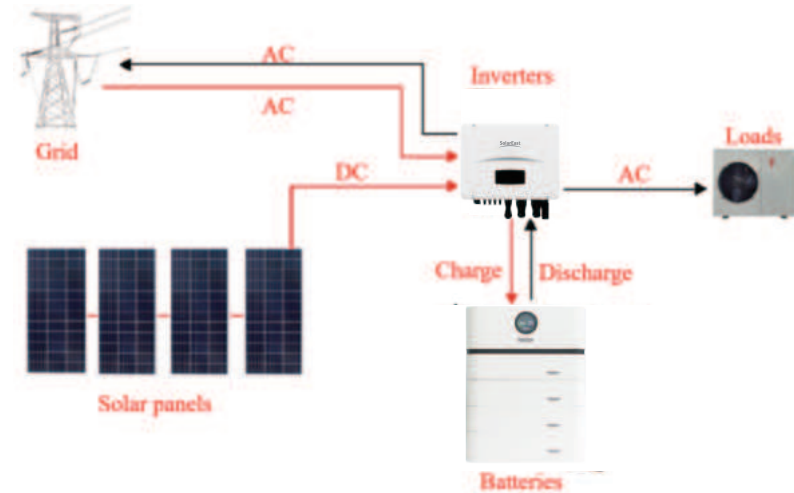
All ports are shown in the figure, and detailed information is shown in the table below



Object	Name	Description
A	ON/OFF	Battery system switch with indicators. Short press ON/OFF button for 1s to start up the battery system and long press it for 3s to shut down the battery system
B	GND	Grounding protection
C	DC	Power supply for the main controller, for commissioning by specialized personnel only
D	Inverter	Communication port to inverter
E	M/S	Communication ports to parallel batteries
F	WIFI Antenna	--
G	BAT+	Battery anode
H	BAT-	Battery cathode

1: In case of fault, e.g., overcharge, over-discharge, overcurrent, and over-temperature, the red light will keep on  
2: When battery system is under normal running, the green light will keep on

## 3.2 Application scenario



## 3.3 Features

- The battery is non-toxic, pollution-free and environmental-friendly.
- Anode material is made from LiFePO<sub>4</sub> with safety performance and long cycle life.
- Support upgrade BMS software via APP.
- BMS has protection functions including over-discharge, over-charge, over-current and high/low temperature.
- Flexible configuration, multiple battery modules can be connected in parallel to increase storage energy.
- The product is stackable up to 7 packs and supports capacity expansion via the Energy Port by connecting up to 3 stacks in parallel for a maximum capacity of 109.62kWh.

## 4 . Installation

### 4.1 Tools and safety gear

The displayed tools are recommended and could be used in the installation of battery or batteries. And the safety gear should be worn correctly during installation.

 Screwdriver	 Wire cutter	 Crimping modular plier
 Voltmeter	 Pocket knife	 Insulating tape
 Insulated gloves	 Safety goggles	 Safety shoes

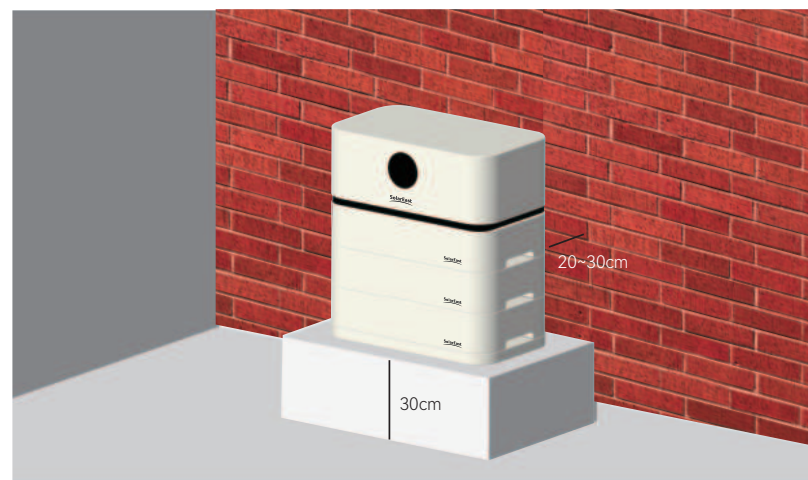
#### 4.2 Package items

Battery Control Box		
Item	Description	Set
1	Battery Control Box	1
2	Pedestal	1
3	2.5m power cable (1AWG) to inverter BAT+ port	1
4	2.5m power cable (1AWG) to inverter BAT- port	1
5	2.5m ground wire (4AWG)	1
6	M6*12 Pack connection screws	4
7	2.5m communication cable to inverter communication port	1
8	Operation Manual and Warranty Card	1
PACK		
1	PACK	1
2	M6*12 Pack connection screws	4

#### 4.3 Installation location

Make sure that the installation location meets the following conditions:

- The floor is flat and level;
- There are no flammable or explosive materials nearby;
- The ambient temperature is within the range from 0°C to 50°C;
- The temperature and humidity (<60%RH) are maintained at a constant level;
- There is minimal dust and dirt in the area.;
- The distance from heat source is more than 2 meters;
- The distance from air outlet of inverter is more than 0.5 meters;
- The installation areas shall avoid of direct sunlight;
- There are no mandatory ventilation requirements for battery module, but please avoid of installation in confined area. The aeration shall avoid of high salinity, humidity or temperature.
- According to the on-site situation, the equipment should be fixed to the wall during installation against the wall.
- The battery system should be used in PD2 environment.
- Please install the battery system on a foundation about 30cm above the ground. Make sure a distance of 20~30cm will be kept between the battery and the wall. The foundation shall bear a load of 400kg.





**CAUTION**

If the ambient temperature is out of the operating range, the battery stops operating to protect itself. The optimal temperature for the battery pack ranges from 10°C to 40°C. Frequent exposures to harsh temperatures may deteriorate the performance and life of the battery.

**4.4 Module Installation**

1) Place the pedestal in the right place (the details about installation position described in chapter 4.3)



2) Place battery pack in the right place of the pedestal. CAUTION: align the battery pack and pedestal before putting it on, make sure the couplings are on the same line to avoid any structural damage.



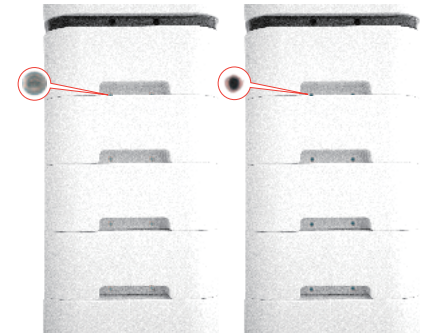
**CAUTION**

Before placing battery pack or Battery Control Box on the pedestal, please align it with the pedestal and make sure the couplings are on the same line to avoid any structural damage or render installation impossible. Since each pack is as heavy as 47kg, if mechanical tools are not available, it is recommended to have at least 2 workers working on battery installation.

3) Stack battery packs (7 at most) on the pedestal before placing the Battery Control Box on top of the last battery pack.



4) Tighten M6\*12 screws into the threaded holes on both sides of Battery Control Box and each pack. Threaded holes on one side are coated with conductive paint to ensure the equipotential bonding of the whole battery case after being tightened with screws.

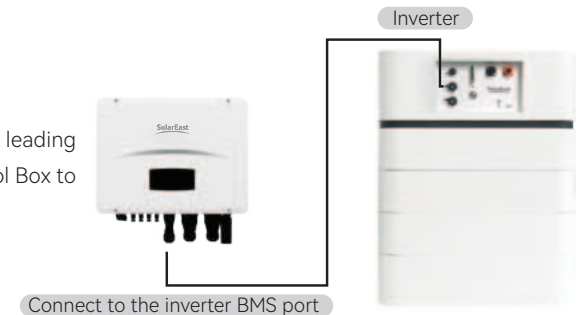


**4.5 Cables Connection**

1) Connect the ground cable to the grounding point of the Battery Control Box. Ground cable is 5 AWG. The cable shall be copper with yellow-green color.

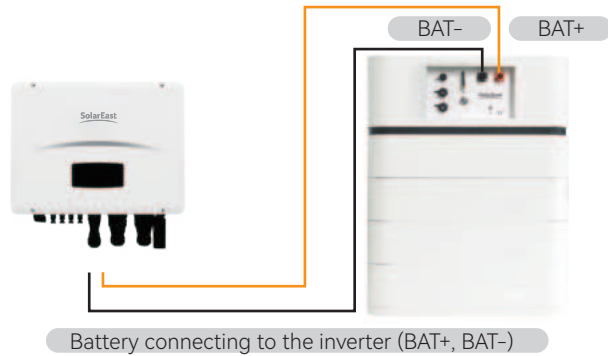


2) Connect the communication cable by leading it from the inverter port of Battery Control Box to the inverter BMS port.





3) Connect BAT+ and BAT- power cables by leading them from Battery Control Box to corresponding ports of inverter.



#### NOTICE

The PowerCool-LFP-LV battery system is designed to support both CAN and RS485 communication with the inverter.



#### CAUTION

I. For Australian market, an overcurrent and disconnection device that isolates all live conductors (positive and negative) is required between the battery system and the inverter.

II. In Australia installations should be conducted in accordance with AS/NZS 3000 and AS/NZS 5139.

#### 4.6 Power on

Check all the power cables and communication cables between Battery Control Box and inverter. Check and make sure grounding is connected.

- 2) Turn on the Breaker on the Battery Control Box.
- 3) Switch ON the disconnection device between Battery Control Box and inverter if available.
- 4) Short press for 2 sec the ON/OFF button, and then the ON/OFF button's LED light (green) will be on.

#### 4.7 Power off

Press the ON/OFF button on the Battery Control Box and hold for 3 sec., and the ON/OFF button's LED light will be gradually off. Then disconnect the breaker.

### 5 . APP configuration and commissioning

#### 5.1 Download our APP:

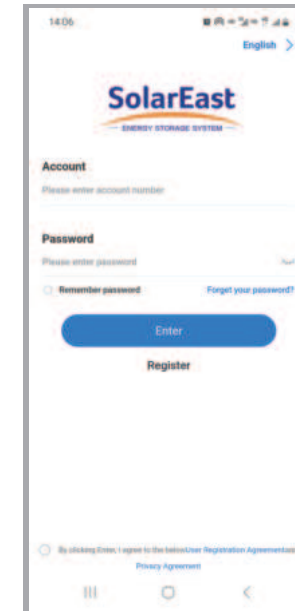
APP for iOS: Open up the APP Store, type in 'SolarEast PowerCool' in the Search tab to search and download.

APP for Android: Open up the Google Play, type in 'SolarEast PowerCool' in the Search tab to search and download.

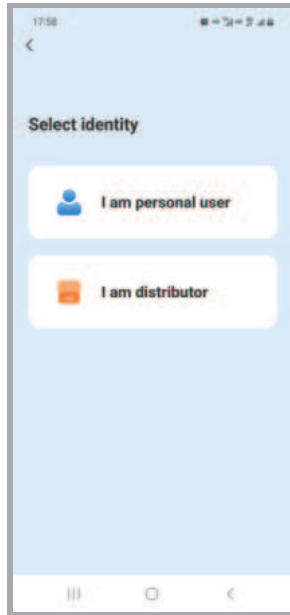
You can also download our APP on our official website: <https://www.solareastess.com>.

#### 5.2 Register and login

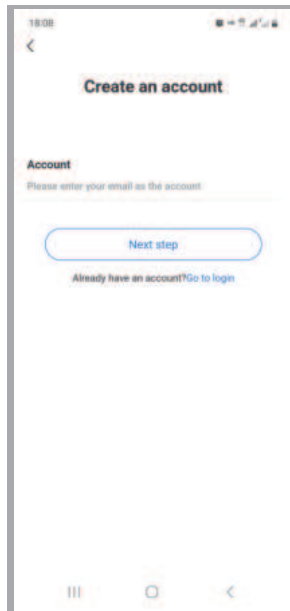
5.2.1. The main functions of this pages include language switching, password retrieval, registration, login, viewing service agreement and privacy agreement.



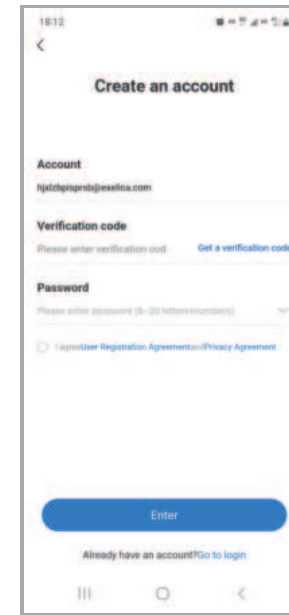
5.2.2. Click 'Register' and go to this page to select identity



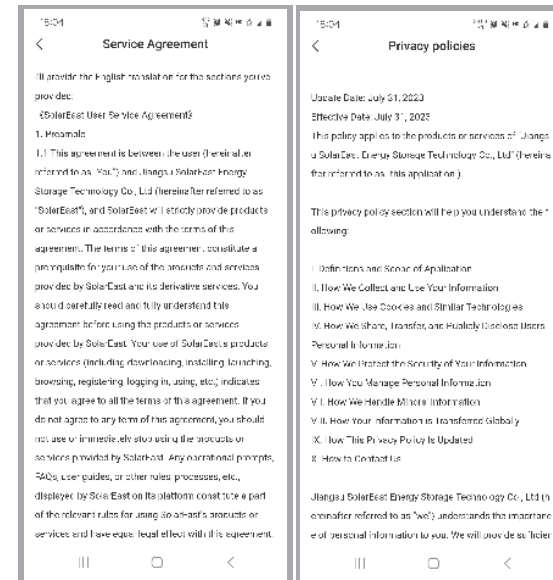
5.2.3. Go to this page after selecting identity, insert the email address to be signed in and click 'Next step'.



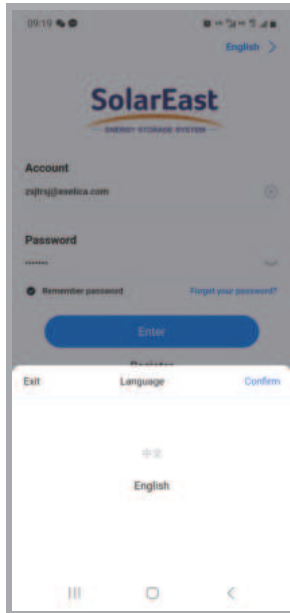
5.2.4. Click 'get a verification code' and retrieve it from the mailbox. Insert the verification code received on this page, set the password, check 'I agree' and click 'Enter'. Newly registered distributor account has to be approved by the Administrator before taking effect.



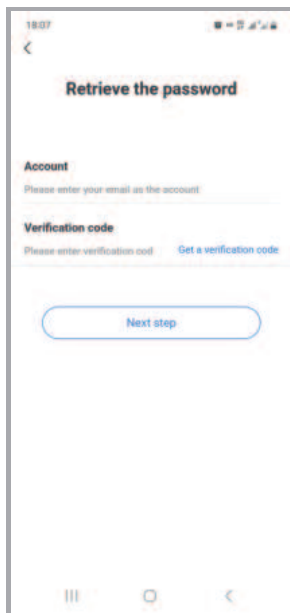
5.2.5. Click 'Service Agreement' or 'Privacy Agreement', you may view the details of such agreement.



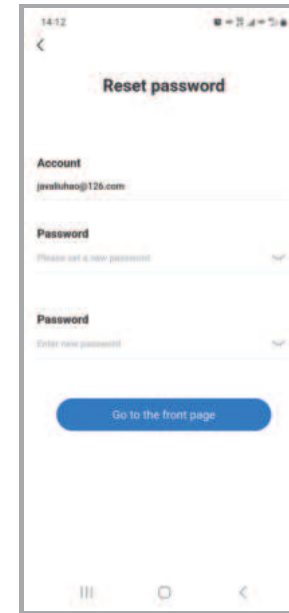
5.2.6. Click to switch language



5.2.7. Click 'Forget the password' and go to this page, you may insert the account number, obtain a verification code via email, input the verification code and click 'Next step'.



5.2.8. On this page, you can reset password by inserting the new password twice, and then click and go to the front page.



### 5.3 Viewing installed units and adding new units

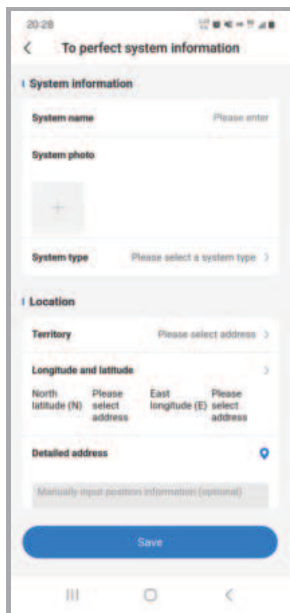
5.3.1. The picture demonstrates a distributor's account. It shows such figures as the number of devices installed, total installed capacity, newly increased clients this month and total number of clients.



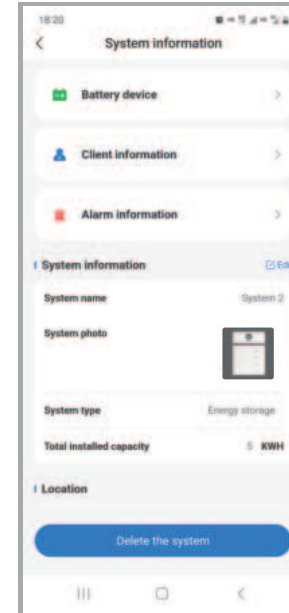
5.3.2. Click 'Installations' on the front page, you can view the systems you created. You may search by system name, email or address.



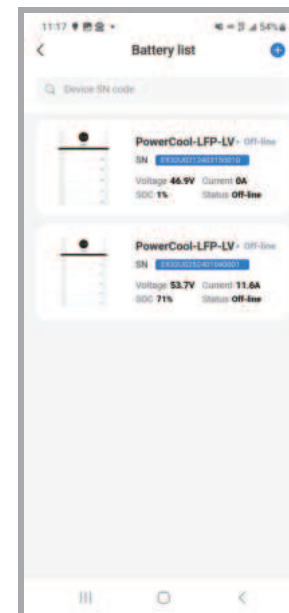
5.3.3. On the 'system list' page, you may add new systems by clicking '+' button. Then fill in information as instructed and save.



5.3.4. Click any item on the system list, you will go to the 'System information' page, where you may view and edit system information.



5.3.5. Click 'Battery device' on the 'System information' page and go to 'Battery list', where you may add device and view battery information.



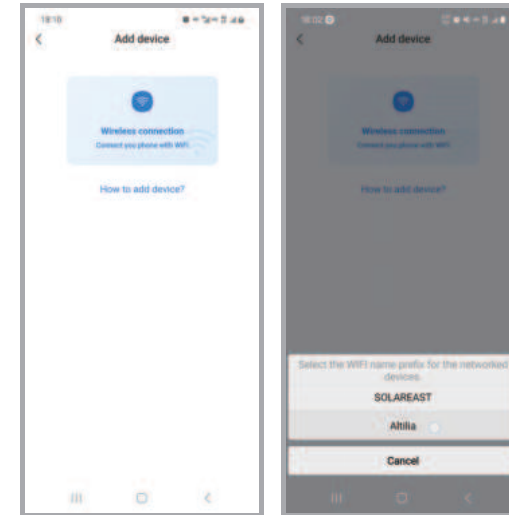
5.3.6. Click '+' on the 'Battery list' page and then you may add a new device by scanning its tag code.



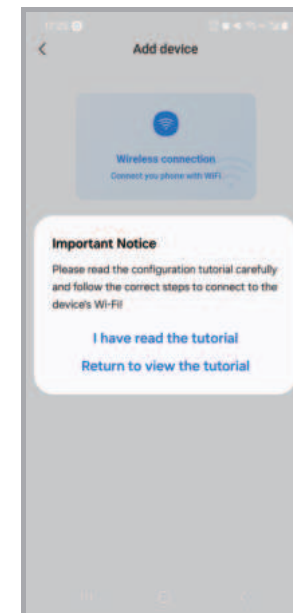
5.3.7. Find our label code on the side of the device and scan it.



5.3.8. Scan tag code and go to 'Add device' page, and then click 'Wireless connection' for WIFI configuration. And can click on "How to Add a Device" to view the step-by-step instructions for adding a device.



5.3.9. Select "I have read the tutorial" and go to next steps



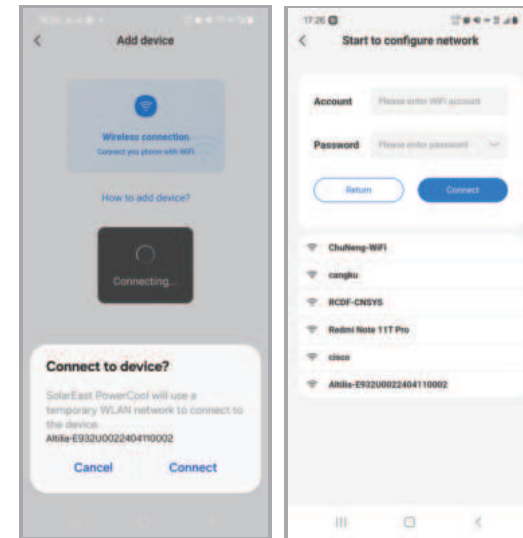
5.3.10. Pop-up window shows that phone WiFi is not turned on. Click "Yes".



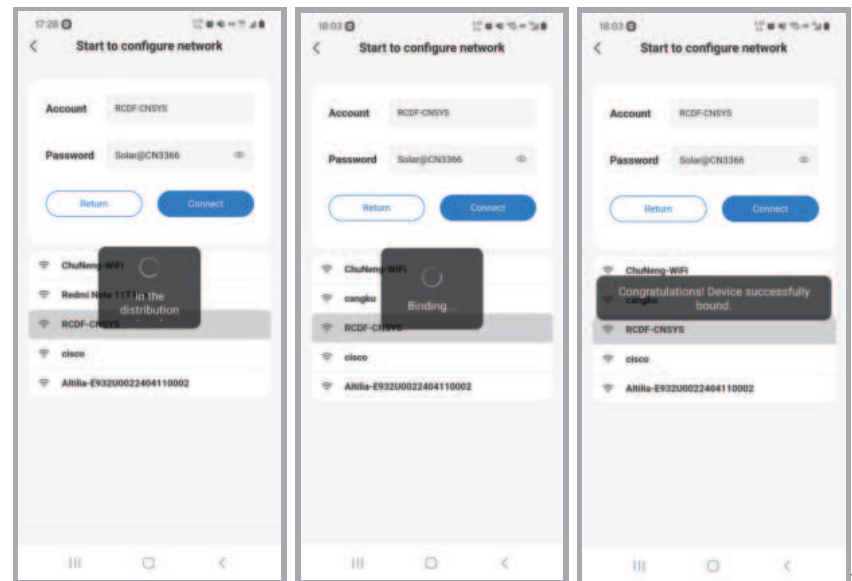
5.3.11. Turn on WLAN on the pop-up window and click "Done" right away.



5.3.12. Click to connect the device and wait for successful connection. After successful connection, it will go to the WiFi login page.



5.3.13. Insert account and password, click "Connect" for automatic configuration and binding.

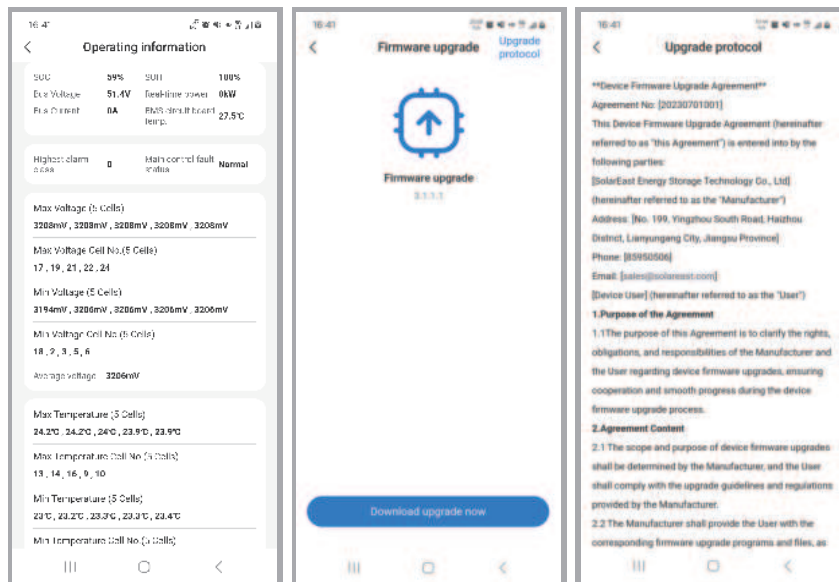


## 5.4 Viewing details of installed devices

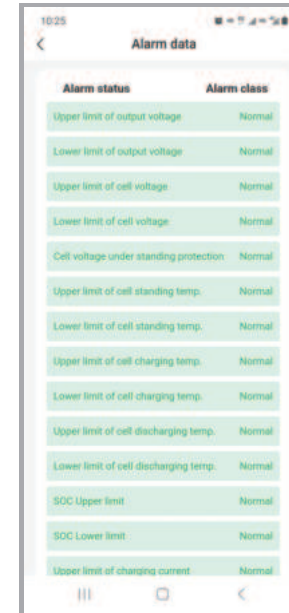
5.4.1. Click any item on the battery list you will go to the device details page, where you can view such data as battery SOC, battery temperature, voltage, power, current, operating information, cell monitoring, alarm data and statistics.



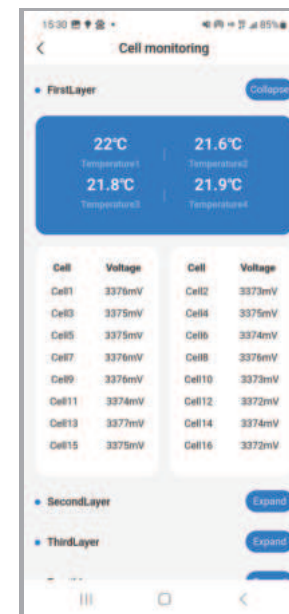
5.4.2. You may check the operating information of the device and view the upgrade protocol.



5.4.3. View 'alarm data'



5.4.4. View cell running data



5.4.5. Power usage tracking function. You may view the statistic data of charging/discharging capacity in the time span of Day/Month/Year.

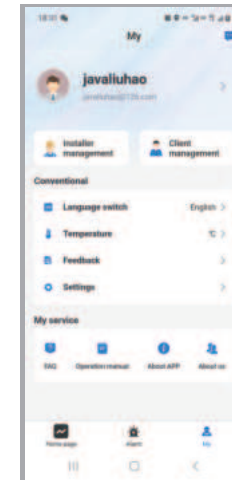


5.4.6. View alarm list and alarm description.

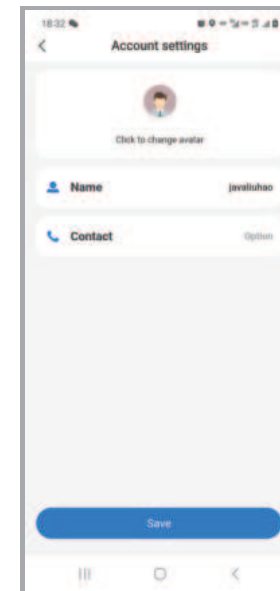


### 5.5 'My' page features

5.5.1. 'My' page features the following functions: checking personal information, viewing messages, viewing installers, viewing clients, switching language, switching temperature unit, submitting feedback and setting the system. 'My service' mainly include viewing FAQ, operation manual, APP version information and supplier's information.

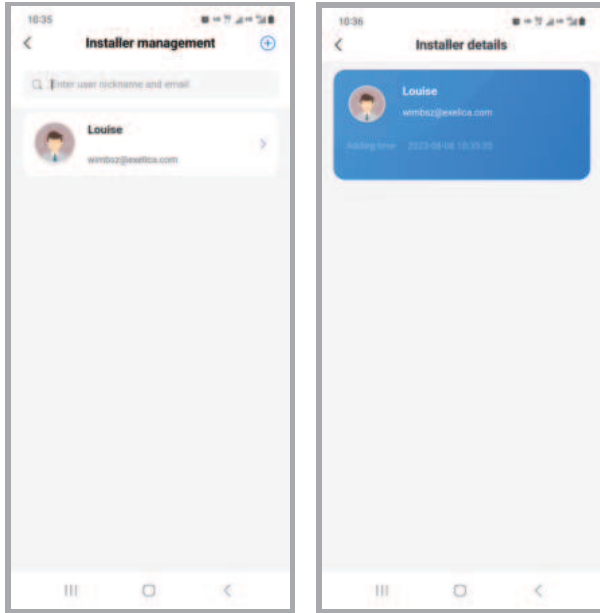


5.5.2. You are allowed to change avatar, name and contact on 'Account settings' page.

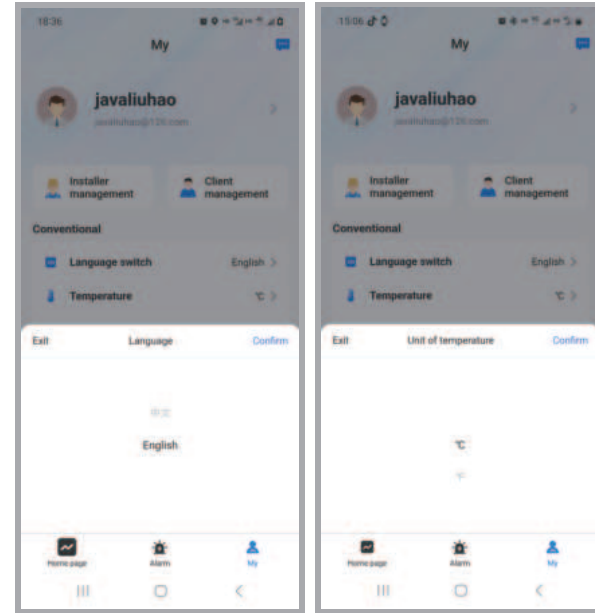




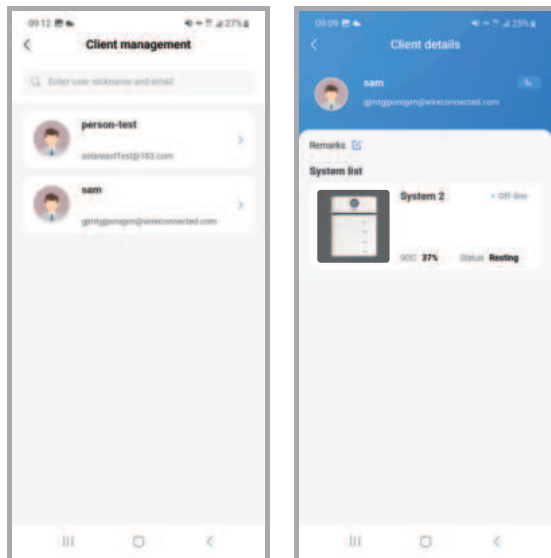
5.5.3. On 'Installer management' page, you may view installers under your name. Click each installer to view the details.



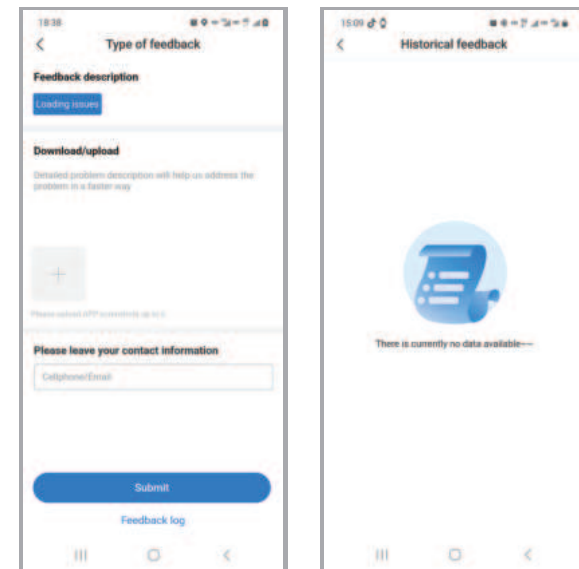
5.5.5. Language and temperature unit switching



5.5.4. You may view client details by clicking 'Client management'. By clicking the system list, you may view the system information.



5.5.6. On this page you may report problems encountered and view historical feedback.



5.5.7. On 'FAQ' page you may view the list of common alarm problems. Click any item to view details.



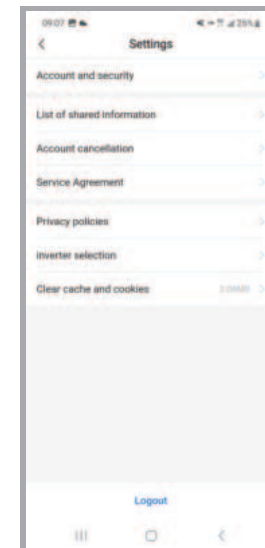
5.5.8. View APP version details.



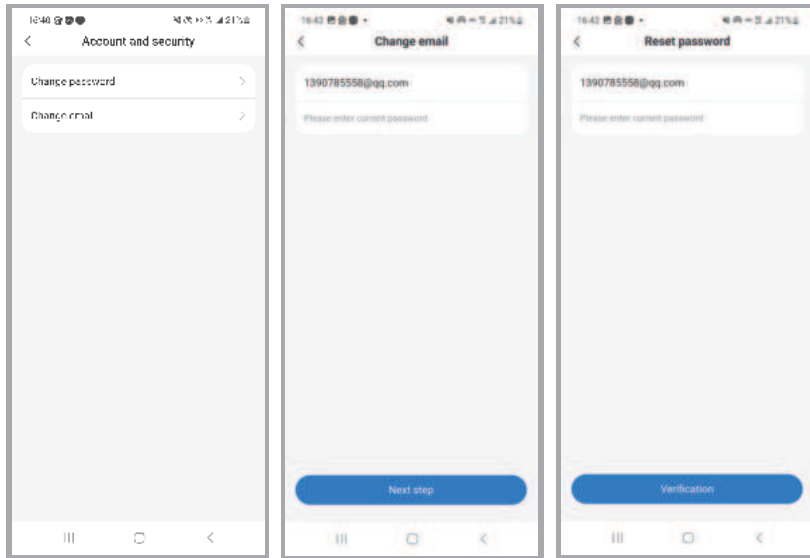
5.5.9. 'About us' pages shows company profile and contact information of the supplier.



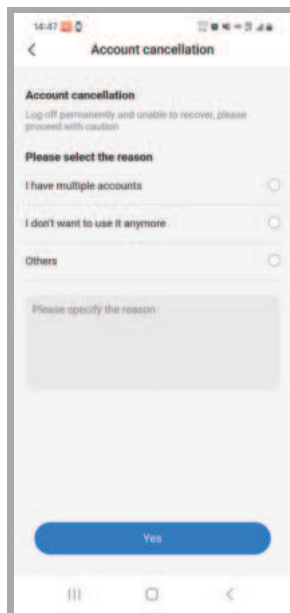
5.5.10. On this page, you may change password or email address. You may also view list of shared information, log off, view service agreement and privacy agreement, clear cache and cookies, and log out.



5.5.11. On 'Account and security' page, you may change password and email address.

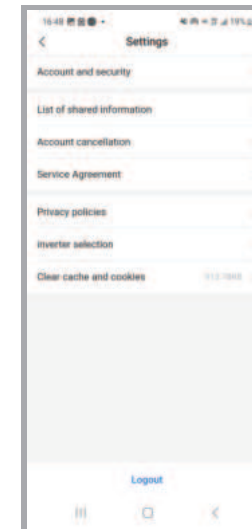


5.5.12. On account cancellation page, you are allowed to cancel your account.

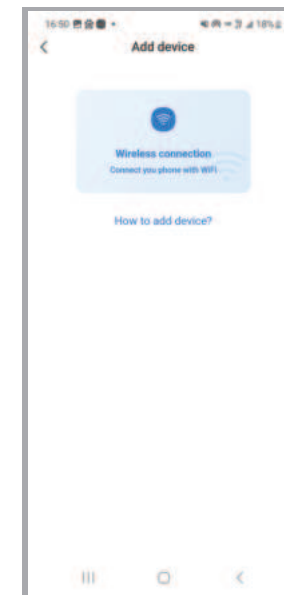


## 5.6 Inverter selection

5.6.1. Click "My", enter "Settings" page, click "Inverter selection", and then turn on camera to scan the bar code on the Control Box and enter the configuration page



5.6.2. Click "connect your phone with WiFi", confirm on the pop-up window that you've read the tutorial and then enter the WiFi configuration page, the following procedures are identical to Items 5.3.8~5.3.12.



5.6.3. Select the right model and click “Start configuring” for configuration. After a successful configuration, disconnect the device WiFi.



## 6. Maintenance

### 6.1 Capacity calibration

It is better to fully charge–discharge the battery for the capacity calibration at least once every six months (if available). Please conduct the calibration maintenance according to the following steps:

1. Make sure there is a relatively stable power supply source to charge the battery at a maximum charge current of 50A (Single PACK) , e.g. grid.
2. Make sure the battery discharges through PCS at a maximum discharge current of 50 A ( Single PACK) .
3. Set the inverter, and ensure that the DOD is 100% (if available), the maximum charge current is less than 50 A (20.4 A is better), while the maximum discharge current is 50 A (Single PACK) .
4. Adjust the inverter working mode and discharge the battery till power off, and keep it for at least 30min;
5. Adjust the inverter working mode and charge the battery to 100%, and keep it for at least 30min;
6. Adjust the inverter working mode and discharge the battery till power off, and the capacity calibration is finished;
7. Charge the battery to 30%~80%SOC, and then set the inverter as before the capacity calibration.

### 6.2 Annual inspection

Every year after installation. The connection of power connectors, grounding points, power cables and screws are to be checked. Make sure there is no loosening, fracture or corrosion at any connection point. Check the installation environment such as dust, water, insect etc. and make sure it is suitable for IP55 battery system.