

PowerCool-LFP5000 series Operation Manual

Version No.: V1.0



Jiangsu SolarEast Energy Storage Technology Co., Ltd



Disclaimer

Copyright © SolarEast Energy Storage Technology Co., Ltd. 2023. All rights reserved.

No part of this document may be reproduced or transmitted in any form or by any means without prior written consent of SolarEast Energy Storage Technology Co., Ltd.

The material furnished in this document is believed to be accurate and reliable. The information and recommendations in this document do not constitute commitments or warranties in the form of assignments. The information in this document is subject to change without notice. You may refer to the official website (http://www.solareastess.com) for the most updated version.

This document is intended only for the SolarEast Powercool-LFP5000 battery, 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-LFP5000 from 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.



CONTENTS

1.	Introduction					
	1.1	Content and Structure of this Document	1			
	1.2	Target Group	1			
	1.3	Levels of Warning Messages	1			
	1.4	Definition of Abbreviations and Nouns				
2.	Safe	ety	3			
	2.1	Safety Instruction	3			
	2.2	Battery precautions				
	2.3	Emergency situation				
3.	Proc	duct Introduction				
	3.1	Technical Data	5			
	3.2	Product Appearance				
	3.3	Battery Interface Instruction				
	3.4	Application scenario				
	3.5	Features	8			
4.	Insta	Installation				
	4.1	Tools and safety gear	9			
	4.2	Package items				
	4.3	Installation location	11			
	4.4	Installation direction	12			
	4.5	Bracket installation	12			
	4.6	Parallel connection	14			
	4.7	Connect to inverter	17			
	4.8	Power on	18			
	4.9	Power off	19			
5.	APF	configuration and commissioning	19			
6.	Maintenance					
	6.1	Capacity calibration	51			
	6.2	6.2 Annual inspection				



1. Introduction

1.1 Content and Structure of this Document

This document is valid for Powercool-LFP5000 battery.

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

This document is intended for qualified persons and end users. Only qualified persons are allowed to perform the operations marked with a warning symbol in this document. Tasks that do not require any specific qualifications will not be marked and can be performed by the end user. 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 $50\%\sim55\%$. The battery shall not be stored for more than 12 months if the storage temperature is $-10\sim25$ °C, not more than 6 months if the storage temperature is $25\sim35$ °C and not more than 3 months if the storage temperature is $35\sim50$ °C
- **>** Battery needs to be recharged within 12 hours after being fully discharged.
- ➤ Do not install the product in outdoor environment, or an environment out of the operation temperature or humidity range listed 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. Product Introduction

3.1 Technical Data

Model		PowerCool-LFP5000	
Total energy		5.22 kWh	
Usable Energy*		4.9 kWh	
Voltage Range		44.8~57.6 Vd.c	
Nominal Voltage		51.2 V	
Max. Charge Voltage		57.6 V	
Max. continuous charg	ing current	50 A	
Max. continuous discha	arge current	80 A	
DOD		95%	
Communication		CAN/RS485	
Max. Number of Paralle	el	10	
Dimension(L*W*H)		(560±2)*(390±2)*(138±2)mm	
Net Weight		(45±1)kg	
Operating Condition		Indoor	
Operating	Charging	0~50 ℃	
Temperature	Discharging	-10~50 °C	
Humidity		<60%RH (No Condensation)	
Cooling type		Natural	
WIFI Frequency Range)	2412MHz~2472MHz	
WIFI Maximum Transm	nission Power	20dBm	
IP rating of enclosure		IP20	
Configuration		(8S)2S	
Installation method		Rack mount	
Supply connection		Fixed power cord	
Warranty		10 years (5 free warranty + 5 paid warranty)	
Authentication Level		IEC62619/IEC63056/IEC62040 /ICE61000-6-1/3/ ICE61000-3-2/3 /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.

3.2 Product Appearance



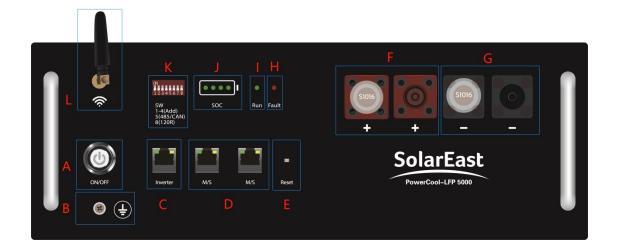






3.3 Battery Interface Instruction

All the ports and indicators are shown in the picture below and detailed in the following table.



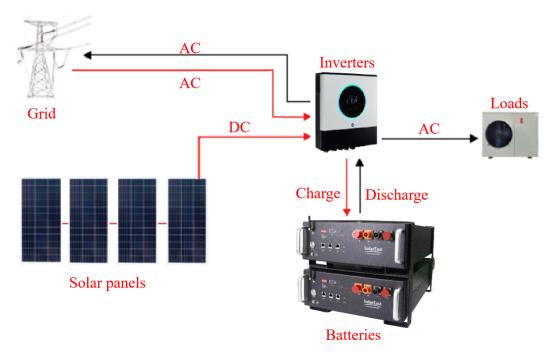
Object	Name	Description	
Α	Power switch	The switch of the battery	
В	GND	Grounding protection	
С	Inverter	Communication port to inverter	
D	M/S	Communication ports to parallel batteries	
E	Reset	Reset the WIFI configuration	
F	BAT+	The left side is the input terminal; the right side is the output terminal	
G	BAT-	The right side is the input terminal; the left side is the output terminal	
Н	Fault ¹	Fault indicator; Red light	
I	Run ²	Operating indicator; Green light	
J	SOC	SOC indicator light	
K	SW ³	DIP switch	
L	WIFI Antenna		

¹: The red light keeps flashing when fault occurs, such as overcharge, over-discharge, overcurrent, as well as over high/low temperature, etc.

²: The green light flashes slowly when the battery runs normally. The green light flashes quickly when turning on or off.



3.4 Application scenario



3.5 Features

- The battery is non-toxic, pollution-free and environmental-friendly.
- ➤ Anode material is made from LiFePO₄ 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 for capacity expansion.



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.



4.2 Package items

Multiple products can be connected in parallel to expand capacity, and the pack connected to the inverter is the master while the others are slaves.

a. Battery pack*1





b. Parallel connection power cables*2 (Only for slaves, 4AWG)



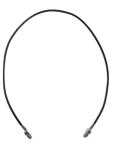
c. RJ45 communication cable for parallel configuration*1 (Only for slaves)



d. Power cables to inverter*2 (Only for master)



e. RJ45 communication cable to inverter*1 (Only for master)



f. Ground wire (6AWG)





g. Bracket*2



h. User Manual & Warranty card *1



4.3 Installation location

Make sure that the installation location meets the following conditions:

- The area is completely waterproof;
- > The floor is flat and level;
- There are no flammable or explosive materials nearby;
- \triangleright 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.



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 Installation direction

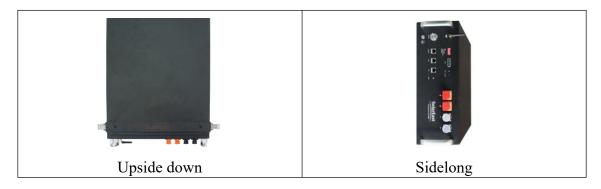
Recommended:





Do not stack modules together directly.

Not allowed:



4.5 Bracket installation

1) Put the battery into 2 pcs of bracket.





2) Use 4 location holes, stack the batteries together.



3) And connect the 4 lockers together.



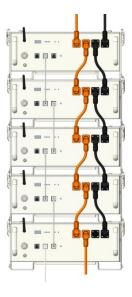
4) Maximum 5 in stack.



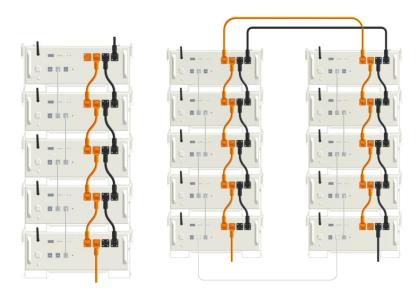


4.6 Parallel connection

- 1) Please check the voltage of each battery and make sure the voltage difference is less than 1V.
- 2) Connect communication cables to M/S communication terminal interface between batteries.

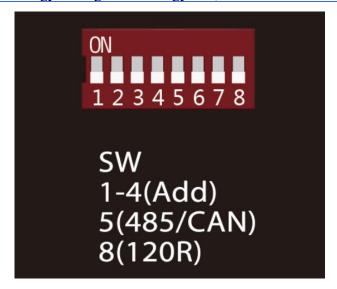


- 3) Connect the orange parallel connection power cables to the BAT+ terminals of adjacent batteries.
- **4)** Connect the black parallel connection power cables to the BAT- terminals of adjacent batteries.



5) Select the batteries' addresses by setting the DIP 1~4 on each battery, as shown in the following Fig.





BAT number	Group	DIP 1	DIP 2	DIP 3	DIP 4
1	-	OFF	OFF	OFF	OFF
2	Master	ON	OFF	OFF	OFF
2	Slave	OFF	ON	OFF	OFF
	Master	ON	OFF	OFF	OFF
3	Slave 1	OFF	ON	OFF	OFF
	Slave 2	ON	ON	OFF	OFF
	Master	ON	OFF	OFF	OFF
4	Slave 1	OFF	ON	OFF	OFF
4	Slave 2	ON	ON	OFF	OFF
	Slave 3	OFF	OFF	ON	OFF
	Master	ON	OFF	OFF	OFF
	Slave 1	OFF	ON	OFF	OFF
5	Slave 2	ON	ON	OFF	OFF
	Slave 3	OFF	OFF	ON	OFF
	Slave 4	ON	OFF	ON	OFF
	Master	ON	OFF	OFF	OFF
	Slave 1	OFF	ON	OFF	OFF
6	Slave 2	ON	ON	OFF	OFF
0	Slave 3	OFF	OFF	ON	OFF
	Slave 4	ON	OFF	ON	OFF
	Slave 5	OFF	ON	ON	OFF
	Master	ON	OFF	OFF	OFF
	Slave 1	OFF	ON	OFF	OFF
7	Slave 2	ON	ON	OFF	OFF
	Slave 3	OFF	OFF	ON	OFF
	Slave 4	ON	OFF	ON	OFF



	Ol	٥٦٦	ON	ON	OFF
	Slave 5	OFF	ON	ON	OFF
	Slave 6	ON	ON	ON	OFF
	Master	ON	OFF	OFF	OFF
	Slave 1	OFF	ON	OFF	OFF
	Slave 2	ON	ON	OFF	OFF
8	Slave 3	OFF	OFF	ON	OFF
0	Slave 4	ON	OFF	ON	OFF
	Slave 5	OFF	ON	ON	OFF
	Slave 6	ON	ON	ON	OFF
	Slave 7	OFF	OFF	OFF	ON
	Master	ON	OFF	OFF	OFF
	Slave 1	OFF	ON	OFF	OFF
	Slave 2	ON	ON	OFF	OFF
	Slave 3	OFF	OFF	ON	OFF
9	Slave 4	ON	OFF	ON	OFF
	Slave 5	OFF	ON	ON	OFF
	Slave 6	ON	ON	ON	OFF
	Slave 7	OFF	OFF	OFF	ON
	Slave 8	ON	OFF	OFF	ON
	Master	ON	OFF	OFF	OFF
	Slave 1	OFF	ON	OFF	OFF
	Slave 2	ON	ON	OFF	OFF
	Slave 3	OFF	OFF	ON	OFF
40	Slave 4	ON	OFF	ON	OFF
10	Slave 5	OFF	ON	ON	OFF
	Slave 6	ON	ON	ON	OFF
	Slave 7	OFF	OFF	OFF	ON
	Slave 8	ON	OFF	OFF	ON
	Slave 9	OFF	ON	OFF	ON

6) Definitions of DIP switch $5 \sim 8$

DIP5: Inverter communication switch selection: 0 represents CAN, while 1 represents RS485; the default communication mode is CAN, while the final communication mode is subject to the communication protocol of inverter used;

DIP6: Forced charging switch: 0 represents OFF, while 1 represents ON. It is OFF by default under normal operating mode, and can only be turned ON by professional personnel or following instructions from professional personnel.

DIP7: Master communication switch: 0 represents OFF, while 1 represents ON. It is OFF by default and can only be turned ON during fault check and commissioning by

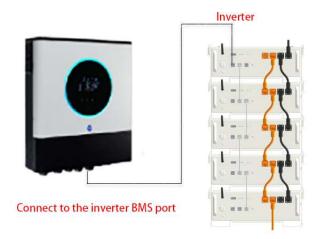


professional personnel;

DIP8: CAN communication 120 resistance switch: 0 represents OFF, while 1 represents ON. Keep in ON when there is no parallel connection. Under the circumstance of parallel connection, turn DIP8 of first and last batteries ON and keep all others in-between OFF.

4.7 Connect to inverter

1) Connect the communication cable from the inverter port on the master battery to the corresponding port of the inverter.



2) Select the communication mode by turning "ON" or "OFF" the DIP 5. The "OFF" represents CAN while "ON" is RS485.



The Powercool-LFP5000 battery is designed to support both CAN and RS485 communication with the inverter. Please verify the communication mode of the inverter and select the corresponding mode of the battery.

Definition of RJ45 Port Pin

PIN Number	Definition	PIN Number	Definition
PIN1	-	PIN5	CAN L
PIN2	-	PIN6	GND
PIN3	-	PIN7	485A
PIN4	CAN H	PIN8	485B

3) Connect the power cables from BAT+ and BAT- on the master battery to the corresponding ports of the inverter.







- A rated 160A overcurrent and safety cut-off device has to be installed between the battery system and the inverter to isolate all charged conductors (positive and negative)
- II. In Australia installations should be conducted in accordance with AS/NZS 3000 and AS/NZS 5139.
- 4) Install a grounding cable to the grounding point of the batteries(6AWG).



4.8 Power on

- 1) Check all the power cable and communication cable between batteries, and between battery and inverter.
- 2) Check the DIP setting for each battery.
- 3) Switch ON the disconnection device between battery and inverter if available.
- 4) Short press for 1 sec the master power switch, and then all the battery LED light (green) will be on, and buzzers of both master and slave batteries will ring at the same time.



4.9 Power off

Press and hold for 4 secs the master battery power switch till the buzzer rings, and all the battery LED light will be off slowly.

5. APP configuration and commissioning

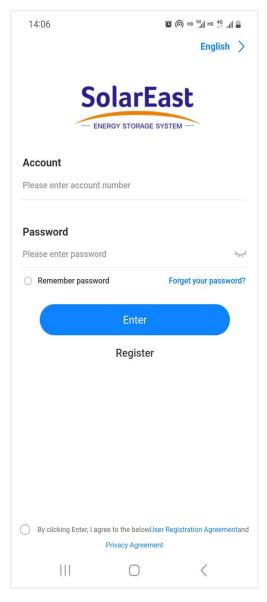
5.1 Download our APP:

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.

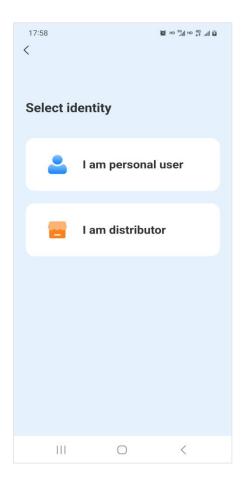
You can also download our APP on our official website: https://www.solareastess.com.

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



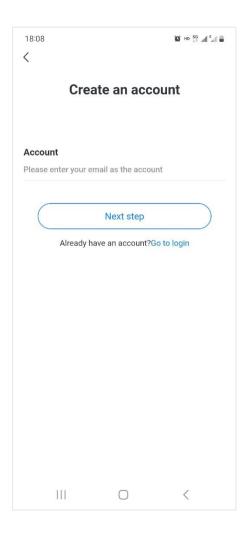


5.3 Click 'Register' and go to this page to select identity



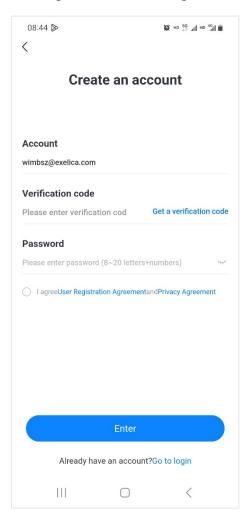


5.4 Go to this page after selecting identity, insert the email address to be signed in and click 'Next step'.





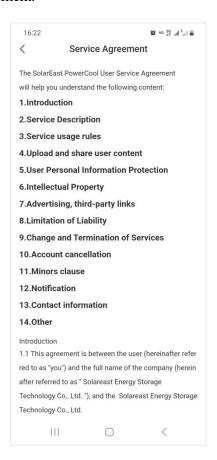
5.5 Click 'get a verification code' and retrieve it from the mailbox. Insert the verification code received on this page, set the password, check 'I agree' and click 'Enter'.





Jiangsu SolarEast Energy Storage Technology Co., Ltd

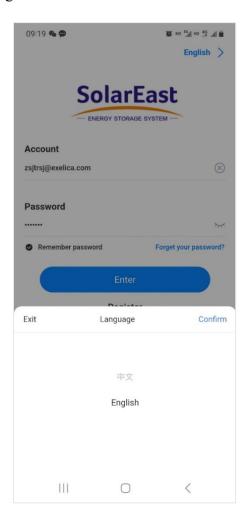
5.6 Click 'Service Agreement' or 'Privacy Agreement', you may view the details of such agreement.





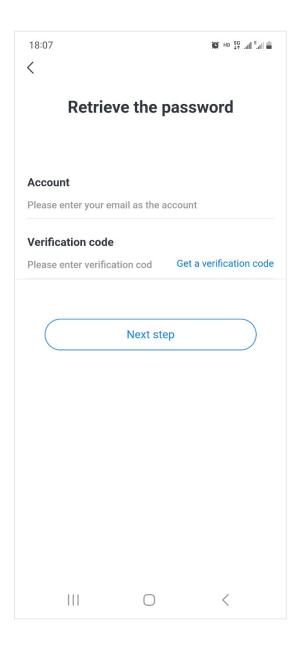


5.7 Click to switch language



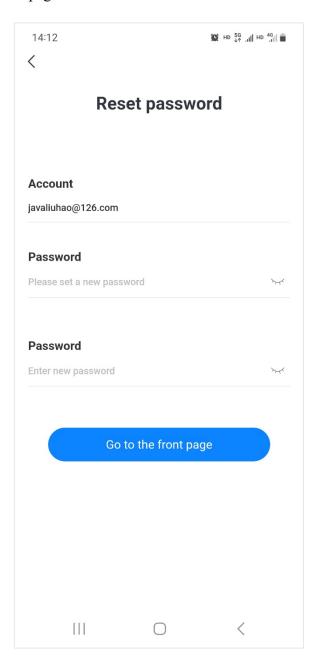


5.8 Click 'Retrieve the password' and go to this page, you may insert the account number, obtain a verification code via email, input the verification code and click 'Next step'.





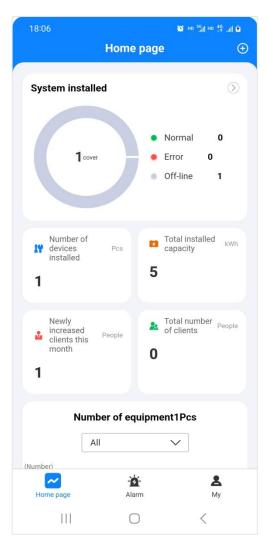
5.9 On this page, you can reset password by inserting the new password twice, and then click and go to the front page.





5.10 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.





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



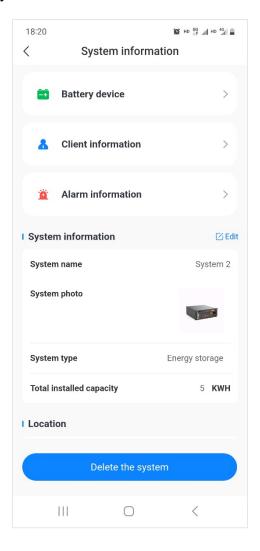


5.12 On the 'system list' page, you may add new systems by clicking '+' button. Then fill in information as instructed and save.



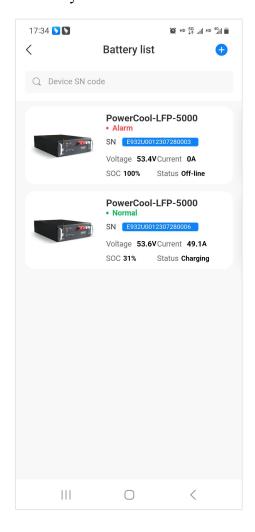


5.13 Click any item on the system list, you will go to the 'System information' page, where you may view and edit system information.





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





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



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



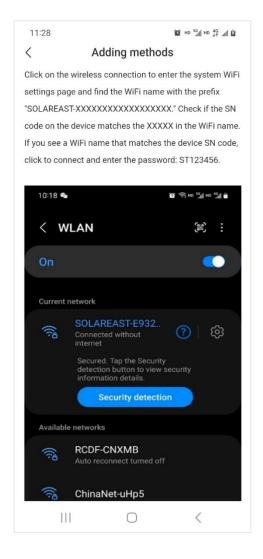


5.17 Scan tag code and go to 'Add device' page, and then click 'Wireless connection' for WIFI configuration.





5.18 Click on "How to Add a Device" to view the step-by-step instructions for adding a device.





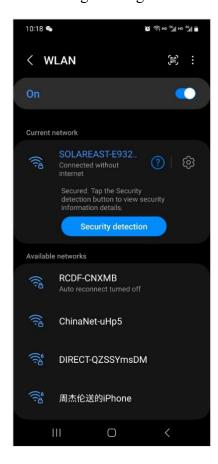
5.19 On the system WIFI page, you can find the device WIFI name based on its SN code.

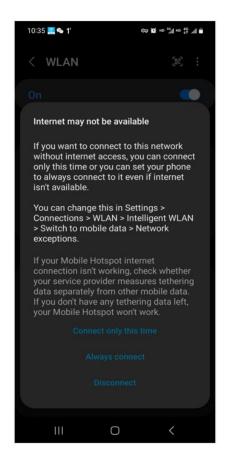
Device WIFI name: SOLAREAST-(device SN code)

Click 'connect' and then you are given the options of 'Connect only this time' and 'Always connect'.

PS: When device WIFI has no network available, a prompt will pop out when a cellphone is connected to a WIFI without network. Only after performing the procedures above will the cellphone be truly connected to the device WIFI.

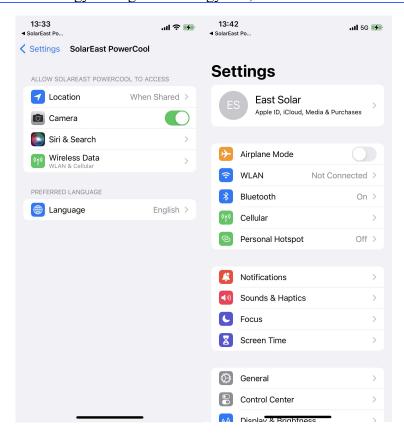
5.19.1 Android Page Configuration



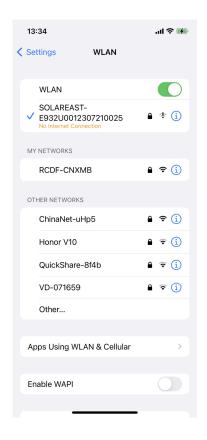


5.19.2 iOS Page Configuration

a) After entering the page, click on "Settings" to access the system settings page.



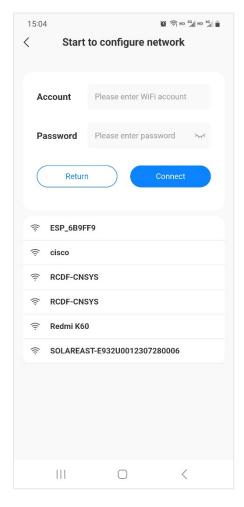
b) On this page, click on "Wireless LAN" to access the Wi-Fi configuration page and connect to the device's Wi-Fi.





5.20 When the cellphone is truly connected to device WIFI, click 'Return' on the system WIFI page of the APPP and it will jump to 'Start to configure network' page.

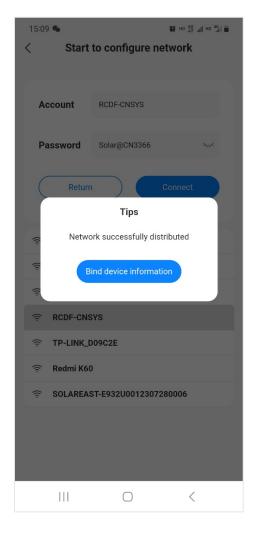
You may then select a WIFI on the list and input its password, and click 'Connect'.





5.21 When the network is successfully configured, a prompt will pop out.

Click 'Bind device information' button, and return to device list page when the binding is done.





5.22 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.



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





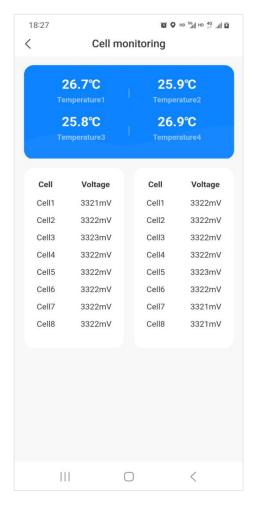


5.24 View alarm data





5.25 View cell running data

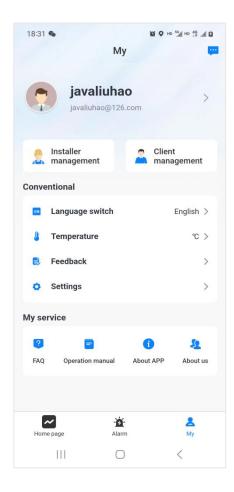




5.26 [Distributor account]

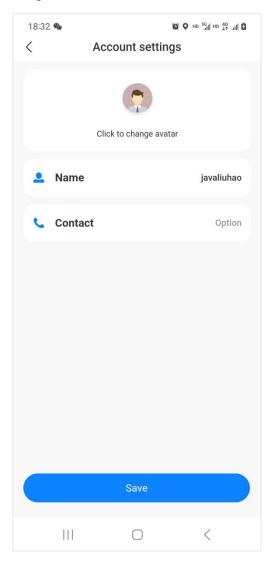
'My' page features the following functions: checking personal information, viewing messages, viewing installers, viewing clients, switching language, switching temperature unit, submitting feedback and setting the system.

'My service' mainly include viewing FAQ, operation manual, APP version information and supplier's information.



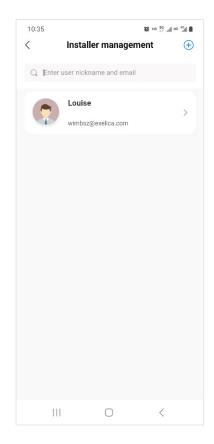


5.27 You are allowed to change avatar, name and contact on 'Account settings' page.





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

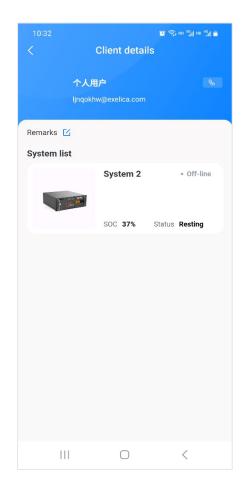






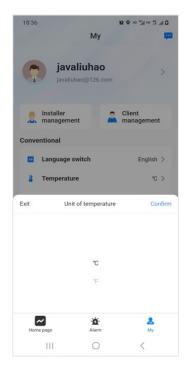
5.29 You may view client details by clicking 'Client management'. By clicking the system list, you may view the system information.

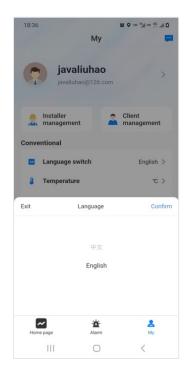




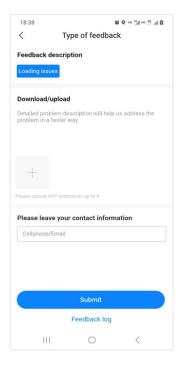


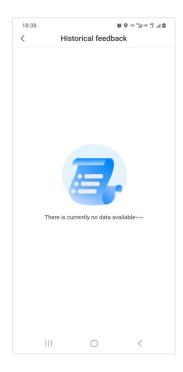
5.30 Language and temperature unit switching





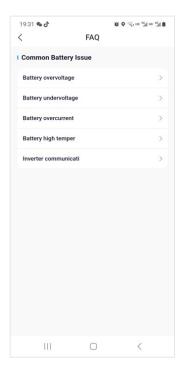
5.31 On this page you may report problems encountered and view historical feedback.

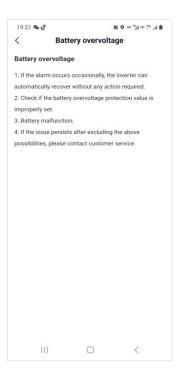






5.32 On 'FAQ' page you may view the list of common alarm problems. Click any item to view details.



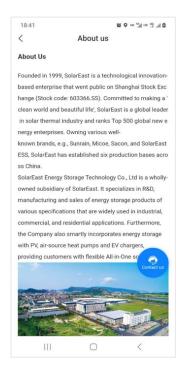


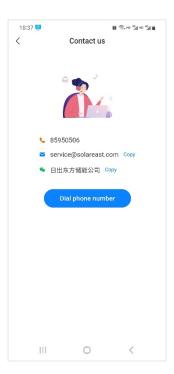
5.33 View APP version details.



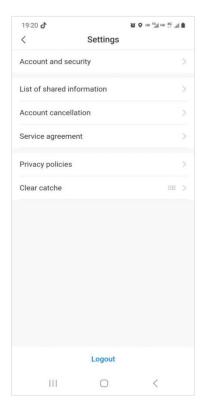


5.34 'About us' pages shows company profile and contact information of the supplier.



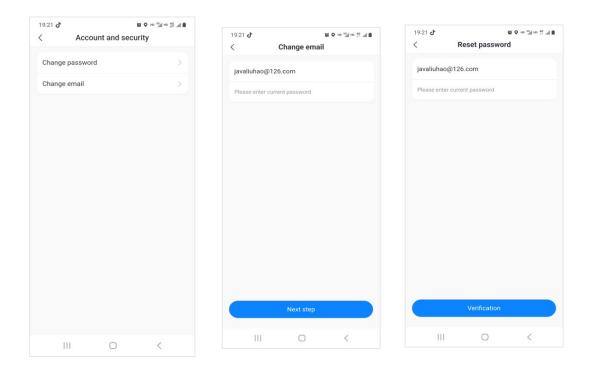


5.35 On this page, you may change password or email address. You may also view list of shared information, log off, view service agreement and privacy agreement, clear cache and cookies, and log out.

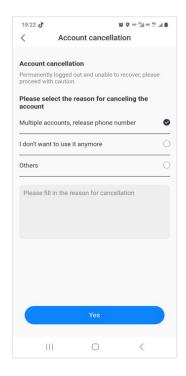




5.36 On 'Account and security' page, you may change password and email address.

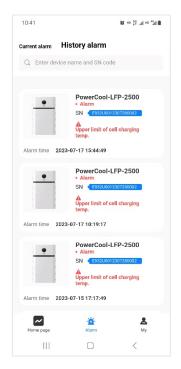


5.37 On account cancellation page, you are allowed to cancel your account.





5.38 View alarm list and alarm description.





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, e.g. grid.
- 2) Make sure the battery discharges through PCS at a maximum discharge current of 80A.
- 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 80 A.
- 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 IP20 battery system.