5.2 Switch On/Off

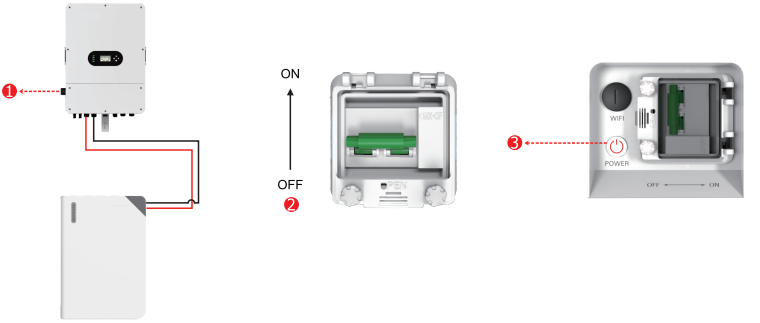
Power on steps:

Step 1: Turn on the inverter❶;

Step 2: Turn on the battery breaker❷("OFF" to the "ON");

Step 3: Press the battery switch button❸.

If the batteries are connected in parallel, turning on any one of them will turn on all the others.



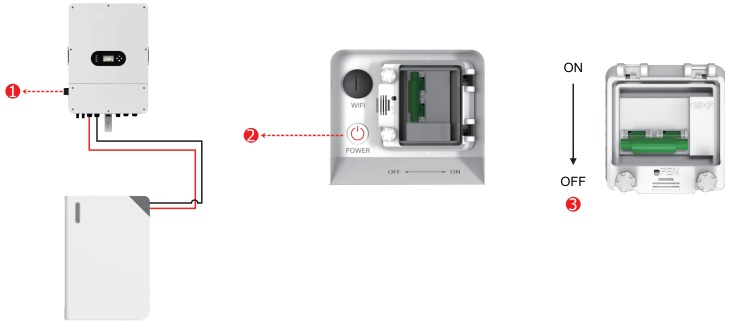
Power down steps:

Step 1: Turn off the inverter❶;

Step 2: Press and hold the battery switch button for 3 seconds❷;

Step 3: Disconnect the breaker of the battery❸ ("ON" to "OFF").

If the batteries are connected in parallel, turning off any one of them will turn off all the others.



6. Manage Devices Via Network

***If the entire system uses Felicitysolar products, the battery information can be monitored through the inverter. If paired with inverters from other brands, please follow the steps below:**

6.1 Configure Network

6.1.1 Download APP

Scan the QR Code on the right side and download the APP.

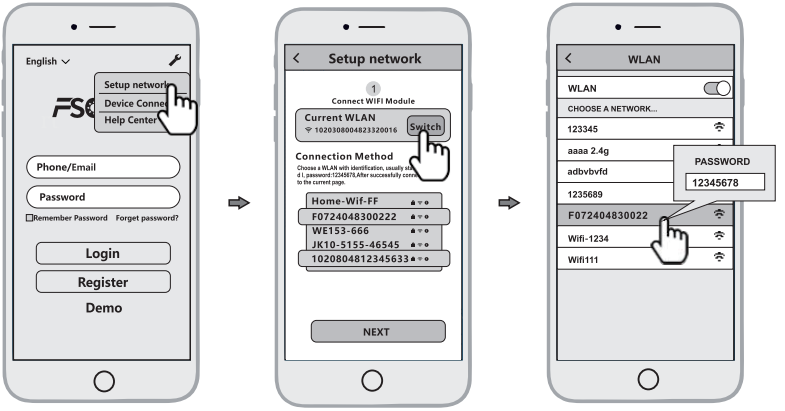
Fsolar APP

6.1.2 Connect to Built-in WIFI wireless network

Configure the mobile phone WLAN to connect to the wireless network of the Built-in WIFI

1) Run the APP, enter the login page, click the [Setup network] button to enter the network configuration page.

2) On the network configuration page, click the [Switch] button to enter the mobile phone WLAN page.



Configure the mobile phone WLAN to connect to the wireless network of the Built-in WIFI.

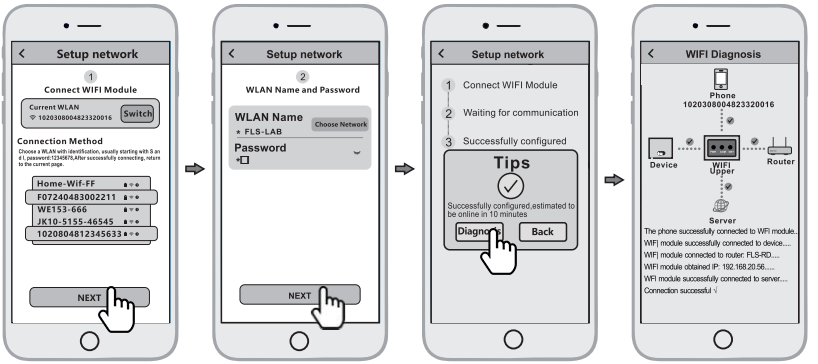
1) Run the APP, enter the login page, click the [Setup network] button to enter the network configuration page.

2) On the network configuration page, click the [Switch] button to enter the mobile phone WLAN page.

3) On the WLAN page of the mobile phone, find the corresponding wireless network name (SSID) of the Smart WiFi module, starting with F(e.g. Fxxxxxxxxxxxxxxxxx,the xxxxxxxx xxxxxxxxx is the same as the device serial number). enter the module wireless network password (default password: 12345678), and connect to the wireless network of the Built-in WIFI.

6.1.3 Configure the network

1)After the mobile WLAN is connected to the wireless network of the Built-in WIFI,return to the network configuration page ofthe APP and click the [NEXT] buttonto enter the WiFi network page.
2) On the WiFi network page, select the router wireless network to which the Built-in WIFI needs to connect, or directly enter the route name,enter the router wireless network password and click the [NEXT] button.
3)And then wait for the Built-in WIFI to connect to the router's wireless network, which will takesome time.
Then you can use the diagnostic function of the APP or according to the fault appendix to troubleshoot the problem.



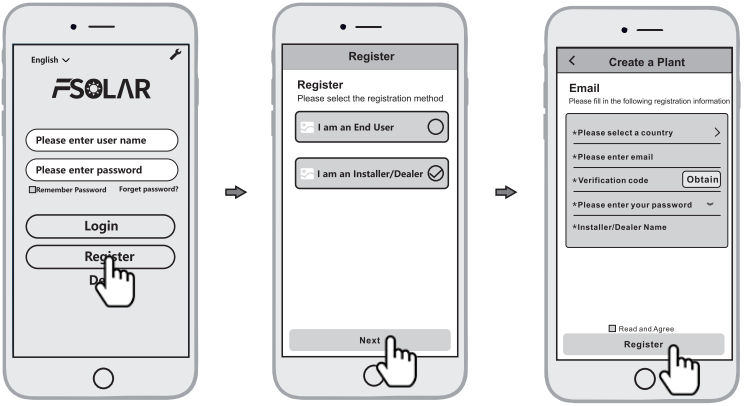
6.2 Create the Plant

After the Built-in WIFI is connected to the server, it will transmit the data of the device to the server. And after the plant is created, users can view and manage the device via the APP or web browser.

6.2.1 Manage devices via APP

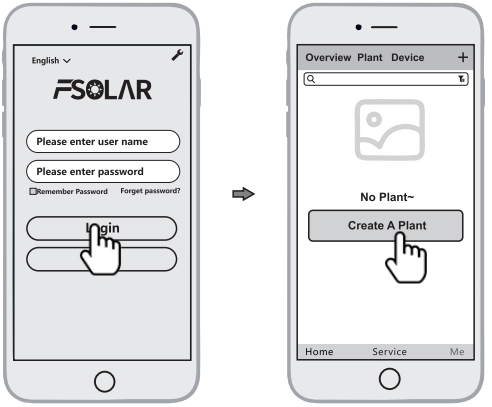
1)Register an account

Run the app, enter the login page, click the [Register] button, select the role you want to register, enter and fill in the relevant information (optional email) to register.



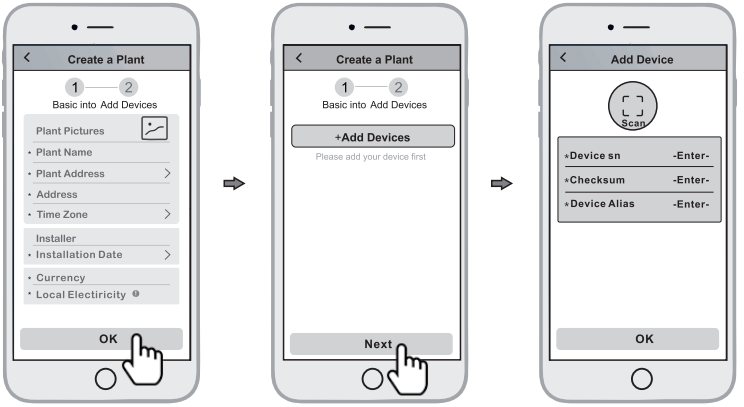
2)New plant construction

- Log in with the newly registered account, enter the homepage, and click on [Create A Plant]



• Fill in the corresponding information and click [OK]

• Click [Add device], click the above icon [scan, align the bar code/two-dimensional code on the side of the inverter or battery pack to scan, or fill in the SN and activation code on the label.



- Manage the device via a web browser, please refer to: https://shine.felicitysolar.com

7. Maintenance and Troubleshooting

7.1 Storage

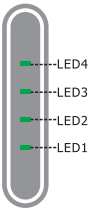
- Do not expose battery to open flame.
- Do not place the product under direct sunlight.
- Do not place the product near flammable materials. It may lead to fire or explosion in case of accident.
- Store in a cool and dry place with ample ventilation.
- Store the product on a flat surface.
- Store the product out of reach of children and animals.
- Do not damage the unit by dropping, deforming, impacting, cutting or penetrating with a sharp object.
- It may cause leakage of electrolyte or fire.
- Do not touch any liquid spilled from the product. There is a risk of electric shock or damage to skin.
- Always handle the battery wearing the insulated gloves.
- Do not step on the product or place any foreign objects on it. This can result in damage
- Do not charge or discharge damaged battery.

7.2 Maintenance Troubleshooting

7.2.1 Analysis and Treatment of Common Faults

Item	Fault phenomenon	Reason analysis	Solution
1	Unable to communicate with the inverter	The wrong communication cable was used	Use the correct communication cable to connect the battery and the inverter.
2	Battery does not fully charge	The charging voltage set on the inverter is too low	Set the charging voltage on the inverter according to the recommended value in the battery manual
3	Inaccurate SOC display	The battery's SOC has not been calibrated	The SOC will automatically calibrate after one full charge cycle. First, discharge the battery to 0%, then charge it to 100%.
4	High current charging & discharging causes output cutoff	The charging & discharging current set on the inverter is too high	Set the charging & discharging current on the inverter according to the recommended values in the battery manual
5	Battery output is interrupted due to high current during charging and discharging	The charging and discharging current settings on the inverter are too high	Set the charging and discharging current on the inverter according to the recommendations in the battery manual
6	When multiple batteries are connected in parallel, battery data on the inverter is missing or incorrect.	The parallel connection of the batteries is not set up correctly	Check the communication cables between the batteries
7	The battery indicates it is charging, but the SOC does not change.	The ambient temperature is too low, preventing the battery from charging.	Charge the battery in an indoor environment that meets the operating temperature range specified in the manual

7.2.2 Fault Code

LED Definition	LED Status				Fault Info
	LED1	LED2	LED3	LED4	
	ON	OFF	OFF	OFF	Bttery Voltage High
	OFF	ON	OFF	OFF	Battery Voltage Low
	ON	ON	OFF	OFF	Cell Voltage High
	OFF	OFF	ON	OFF	Cell Voltage Low
	ON	OFF	ON	OFF	Charging Current High
	OFF	ON	ON	OFF	Discharging Current High
	ON	ON	ON	OFF	BMS Temperture High
	OFF	OFF	OFF	ON	BMS Temperature Low
	ON	OFF	OFF	ON	Cell Temperture High
	OFF	ON	OFF	ON	Cell Temperature Low
	ON	ON	OFF	ON	Current Sensor Abnomal

8. Battery recovery

Aluminum, copper, lithium, iron, and other metal materials are extracted from discarded LiFePO4 batteries using an advanced hydrometallurgical process, achieving a comprehensive recovery efficiency of up to 80%. The detailed process steps are outlined as follows.

8.1 Recovery process and steps of cathode materials

The aluminum foil used as collector is an amphoteric metal. Initially, it is dissolved in a NaOH alkaline solution, allowing aluminum to enter the solution as $NaAlO_2$. After filtration, the filtrate is neutralized with a sulfuric acid solution, resulting in the precipitation of $Al(OH)_3$. When the pH exceeds 9.0, the majority of the aluminum precipitates, and the resulting $Al(OH)_3$ can achieve chemical-grade purity upon analysis.

The filter residue is treated with sulfuric acid and hydrogen peroxide, allowing lithium iron phosphate to dissolve into the solution as $Fe_2(SO_4)_3$ and Li_2SO_4, while separating it from carbon black and the carbon coating on lithium iron phosphate. After filtration, the pH of the filtrate is adjusted using NaOH and ammonia solution. Iron is first precipitated as $Fe(OH)_3$, followed by the precipitation of the remaining solution using a saturated Na_2CO_3 solution at 90°C.

8.2 Recovery of anode materials

The recovery process for anode materials is relatively straightforward. After separating the anode plates, the copper purity exceeds 99%, making it suitable for further refining into electrolytic copper.

8.3 Recovery of diaphragm

Automatic dismantling machine, pulverizes, wet gold pool, etc.

8.4 List of recycling equipment

The diaphragm material is primarily non-hazardous and holds no recycling value.

Appendix I

Model	FLB48230WG1-H
Battery Type	LiFePO4
Nominal Energy	11.7kWh
Nominal Capacity	230Ah
Nominal Voltage	51.2V
Operating Voltage	44.8~57.6V
Recommend Charge/Discharge Current	100A
Max.continuous charge/Discharge current[1]	150A
Peak Charge/Discharge Current(15s)	200A
Scalability	Up to 32 units in parallel(374.4kWh)
Depth of Discharge(DOD)	≥ 95%
Display type	LED
Protection Level	IP65
Working Temperature Range	Charge: -20°C~+55°C
	Discharge:-20°C~+55 °C
Storge Temperature Range	0°C~+35°C
Humidity	5%~95%
Altitude	≤ 2000m
Communication	RS485 / CAN
Cycle Life	≥ 6000 Cycles(25℃ ±2℃,0.5C/0.5C,90%DOD,70%EOL)
Installation	Wall-Mounted / Floor-Mounted
Protection	Built-in smart BMS, Breaker, Fuse
Warranty Period[2]	10 Years
Product Weight Approximate	91kg
Package Weight Approximate	111kg
Product Dimension	683x450x258mm
Package Dimension	778x548x438mm
[1] Max.continuous charge/Discharge current is affected by temperature and SOC.	
[2] Conditions apply, refer to Felicitysolar Warranty policy.	

*In the absence of communication, please follow the recommended settings in the table below.

Setting	FLB48230WG1-H
Max. Charging Voltage	57.6V
Floating Charging Voltage	57.6V
Max. Charging Current	150A*N
Cut-off Voltage	44.8V

Notes:

1. "N" means the number of battery packs connected in parallel.
2. Charge at constant current 50A until the voltage reaches 57.6V, then charge at 57.6V til charge current is 5A.