SK12V314PH

Rechargeable Lithium Battery

Installation and Operation manual

Version: V-1.2

If you have any Suggestion or require assistance, please send us an email: sales@sokbattery.com .Please note, if no reply in 24 hours, it maybe went to your spam folder or please resend again. Or give us a call at: 725 765 2879 Monday-Friday 9AM - 4PM (PST).

About This Document

Purpose

This document describes the SK12V314PH Rechargeable Lithium battery in terms of its features, performance, working principles, appearance as well as instructions for installation and operation.

Intended Audience

This document is intended for:

- Sales engineers
- Technical support engineers
- System engineers
- Hardware installation engineers
- Commissioning engineers
- Maintenance engineers
- Knowledge of how an energy storage system (including PV/ lithium iron phosphate batteries /hybrid inverter, MPPT, Meter etc.) works and is operated.

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
DANGER	Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
WARNING	Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.
NOTE	Supplements the important information in the main text. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

REVISION LOG

Version Num.	Date	Purpose of Revision
V-1.0	2024/5/13	This issue is the first official release.
V-1.1	2024/12/27	Added Bluetooth APP description
V-1.2	2025/05/18	Added series and parallel connection descriptions, added the NMEA2000 protocol, and supplemented some parameter descriptions

Contents

1 Information

1.1 Applicability

This document applies to the: SK12V314PH Rechargeable Lithium battery. When transporting, storing, installing, operating and maintaining the equipment, please read this manual first and strictly follow all safety precautions marked on the equipment and in the manual.

1.2 Safety

Statement

Before installing, operating, and maintaining the equipment, read this document and observe all the safety instructions on the equipment and in this document.

The "NOTICE", "WARNING", and "DANGER" statements in this document do not cover all the safety instructions. They are only supplements to the safety instructions. SOK will not be liable for any consequence caused by the violation of general safety requirements or design, production, and usage safety standards.

Ensure that the equipment is used in environments that meet the listed specifications. Otherwise, the equipment may become faulty, and the resulting equipment malfunction, component damage, personal injuries, or property damage are not covered under the warranty.

Follow local laws and regulations when installing, operating, or maintaining the equipment. The safety instructions in this document are only supplements to local laws and regulations.

SOK will not be liable for any consequences of the following circumstances:

- Damage caused during shipping or mishandling of the Product.
- Damage due to improper installation: loose terminal connections, under-sized cabling, incorrect series (cannot be used in series) or parallel connections, reverse polarity connections.
- Environmental damage such as inappropriate storage conditions as defined by the Manufacturer, exposure to extreme hot or cold temperatures, fire or freezing, or water damage,

impact, or collision.

- Damage due to improper operation or maintenance such as under- or over-charging the Product, cold temperature charging, lack of cleaning resulting in corroded terminal connections or build-up of dirt, debris, organic matter, fossil fuels, or chemicals on the Product casing.
- Product that has been opened, modified, Tampered or removed of manufacture date codes.
- Product that was used for applications other than which it was designed and intended for by the Manufacturer.

Emergency treatment measure

If a battery leaks, protect the skin or eyes from the leaking liquid. If the skin or eyes come in contact with the leaking liquid, wash it immediately with clean water and go to the hospital for medical treatment.

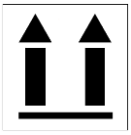
- **Gas Inhalation**: Evacuate the people in the contaminated area and immediately seek medical attention.
- **Eye Contact**: Flush your eye with clean and flowing water for 15 min, and immediately seek medical attention.
- **Skin Contact**: Thoroughly rinse the exposed area with soap and water to be sure no chemical or soap is left on them, and immediately seek medical attention.
- **Ingestion**: Induce vomiting, and immediately seek medical attention.

Support

If you have technical questions about the Product, please contact the place of purchase or SOK Battery directly at techsupport sales@sokbattery.com.

1.3 Symbol Description

Symbols on products label

Label	Definition
	Do not expose the battery to direct sunlight, rain and snow
	Maintain upward storage/transportation
	Handle with care
	A maximum of 5 layers are stacked
	Pay attention to the positive and negative battery terminals
	Grounding point
UN38.3	The certificate label for UN38.3
	Beware of electrical shock

1.4 Abbreviation Description

Abbreviation	Definition
Battery	Single SK12V314PH rechargeable lithium iron phosphate battery pack including cells, BMS and enclosure etc.
BMS	Full name: Battery Management System Unit to ensure lithium cells' safety and display information or control the battery work mode.
SOC	Full name: State of Charge SOC is defined as the ratio of the remaining capacity to the battery capacity.
SOH	Full name: State of Health The ratio of the current battery capacity to the new battery capacity reflects the remaining life and performance of the battery.

2 Product introduction

2.1 Features Description

The SK12V314PH battery is designed for PV/Marine systems. It is composed of 4 314AH prismatic LiFePO4 battery cells connected in series. It has an advanced and reliable BMS management system and user-friendly Bluetooth user interface. Has the following features:

- Gas Aerosol Fireproof: Equipped with a gas aerosol fire suppression system for enhanced safety, quickly containing potential fire hazards.
- CAN Communication with Victron GX products: Supports CAN protocol, ensuring seamless communication and integration with Victron inverters, and Cerbo communication center (GX devices).
- Self-Heating: Built-in self-heating functionality allows for reliable operation in low-temperat

ure environment, perfect for installations in colder climates.

- IP67 Waterproof & Dustproof: Designed with IP67 protection, offering excellent water and dust resistance for extended durability in outdoor and harsh environments.
- 8000+ Cycle Life: Delivers a long lifespan with over 8000 charge cycles, ensuring sustained performance over time.
- Bluetooth for iOS and Android Apps: Allows real-me monitoring and control via Bluetooth on both iOS and Android devices .
- ON/OFF Switch: Features an easy-to-use switch for quick power control.
- 800A/10s Peak Discharge Current: Supports a peak discharge of 800A for 10 seconds.
- Support the NMEA2000 protocol.
- Supports series or parallel switching and communicates with Victron inverters.

2.2 Specifications

Items	SK12V314PH
Nominal voltage	12.8V
Nominal capacity	314Ah
Nominal energy	4kWh
Max. voltage range	10~15V
Voltage deviation	≤0.5%
Charging voltage	14V（The Charging MOS may go OFF）
Float charging voltage	13.8V（The DVCC of the inverter can be set to the voltage）
Standard charge current	≤200A（The DVCC of the inverter can be set to the current）
Max. charge current	250A@3S
Standard discharge current	≤200A
Max. discharge current	260A@60S/800A@10s

Short-circuit current	2000A	
Current deviation	≤2%@ I > 2A	
Standard charge Temperature	32 ~ 122°F /0~50°C	
Max. charge Temperature	23~149°F/-5~65°C (Turn on heating when the temperature drops below -5℃.)	
Standard discharge Temperature	-4 ~ 140°F /-20~60°C	
Max. discharge Temperature	-4~158°F/-20~70°C	
Storage Environment	Recommend environment	59 ~ 95°F/15~35°C 5～75%RH
	≤3 months	14 ~ 113°F/-10 ~ 45°C 5～85%RH
	≤6 months	23 ~ 104°F/-5 ~ 40°C 5～80%RH
Communication	RS485 /CAN	
Max series/parallel number	10P or 4S	
Dimension	17.1*9.4*10.9 inch	
Weight	About 30 KG	

⚠ WARNING

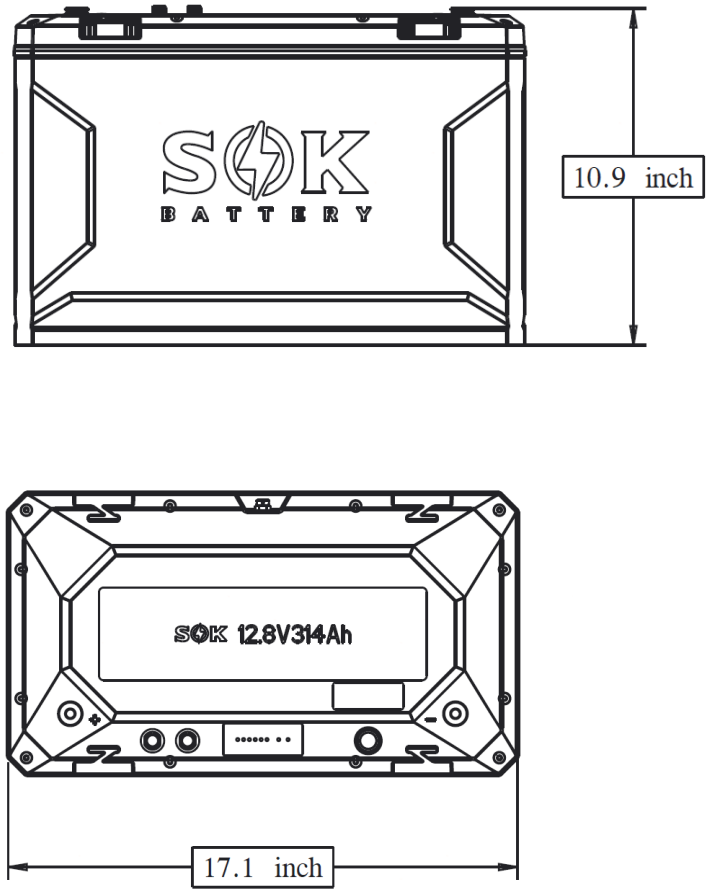
There is a risk of safe if use outside the Max current, Max voltage, Max temperature range.

Do not immerse in water.

⚠ CAUTION

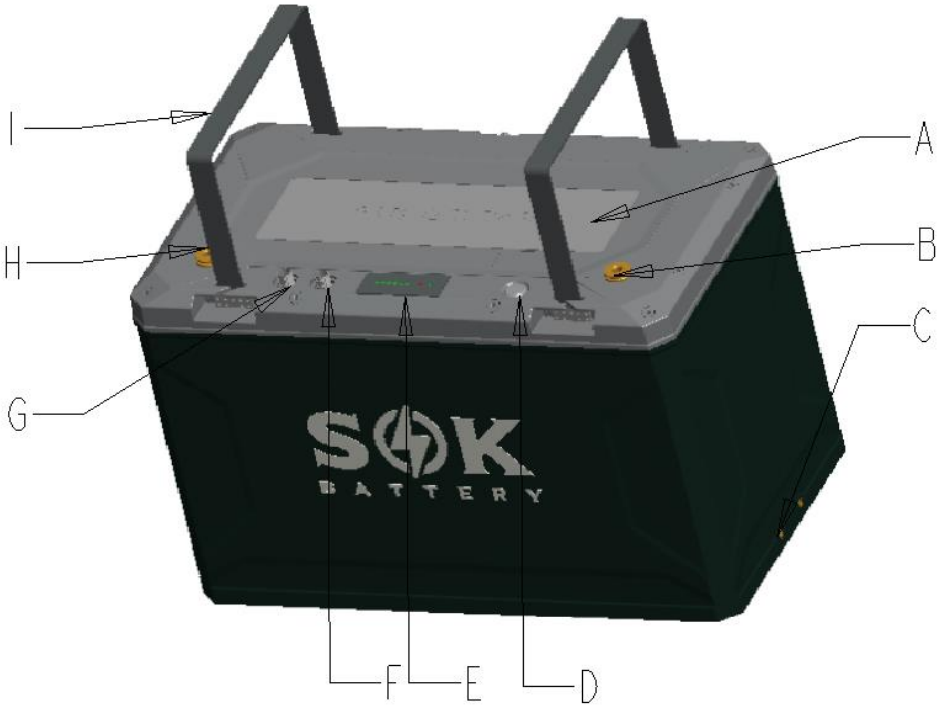
The device supports a maximum of four batteries in series or 10 batteries in parallel. Batteries cannot be connected in series or parallel at the same time.

2.3 Dimensions



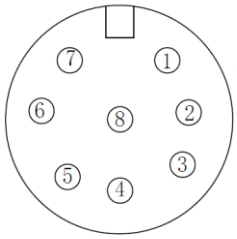
Dimension (L x W x H):
17.1*9.4*10.9 inch
435*240*276 mm

2.4 Controls and indicators



No.	Items	Usage description
A	Cooling aluminum sheet	For BMS heat dissipation
B	Negative terminal	Used to connect the inverter/charger
C	Mounting hole	For holding batteries
D	Power switch	Used to Power on/off battery
E	SOC light	Used to show battery real-time SOC
F	Link OUT	For internal and external communication
G	Link IN	For internal and external communication
H	Positive terminal	Used to connect the inverter/charger
I	Lifting rope	For handling batteries

2.4.1 Link IN / Link OUT



Port	Pin No.	Definition	Remarks
Link IN	1	CAN-H	Connected inverter device or NMEA2000 network
	2	CAN-L	
	3	RS485-A	For internal communication
	4	RS485-B	
	5	RS485-A1	For internal communication
	6	RS485-B1	
	7	GND	/
	8	DI-IN	For BMS identification address
Link OUT	1	CAN-H	/
	2	CAN-L	
	3	RS485-A	For internal communication
	4	RS485-B	
	5	RS485-A1	For internal communication
	6	RS485-B1	
	7	GND	/
	8	DI-OUT	For BMS identification address

⚠ CAUTION

When multiple batteries are used, the Link-OUT of the first battery must be connected to the Link-IN of the next battery.

2.4.2 Battery LED indicators

Mode	Normal/Alarm/Protection	RUN	ALM	LED indicator						description
		🟢	🔴	🟢	🟢	🟢	🟢	🟢	🟢	
Shut down	Dormancy	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ALL OFF
Standby	Normal	FLASH1	OFF	According to battery state of charge						Standby
	Warning	FLASH1	FLASH3							Low voltage
Charge	Normal	ON	OFF	According to battery state of charge (highest SOC LED: FLASH2)						All alarm except the over charge
	Warning	ON	FLASH3							
	over charge	ON	OFF	ON	ON	ON	ON	ON	ON	
	Other protection	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop charging
Discharge	Normal	FLASH3	OFF	According to battery state of discharge						
	Warning	FLASH3	FLASH3							
	over discharge	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Stop discharging
	Other protection	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop discharging
Internal malfunction		OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop charging/discharging

FLASH Type	ON	OFF
FLASH1	0.25S	3.75S
FLASH2	0.5S	0.5S
FLASH3	0.5S	1.5S

3 Installation

Please strictly follow the local safety regulations along with product technical specifications. and installation requirements.

3.1 Installation environment

The operating environment shall meet the following requirements:

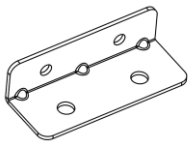
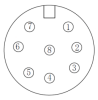
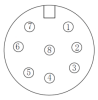
Type	Description
Temperature	-20℃-60℃(maximum operating range)
Humidity	5%RH～90%RH
Altitude	0～4000m（In the 3000m to 4000m environment, derating is required）
Safety requirement	• Do not expose the battery to direct sunlight, rain and snow. • Do not place the battery in reach of children or pets. • Do not place the battery near heat source and flammable material. • Do not place the battery in a closed place where ventilation is not available. • Do not drop, deform, impact, cut, drill or modify the battery enclosure. • Do not store anything on top of the battery. • Do not disassemble the battery without Manufacturer's permission. • If the battery does not function, contact your dealer or SOK Support.

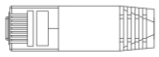
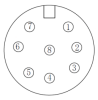
3.2 Installation Inspection

3.2.1 Unpacking

- Step 1. Check if the packing boxes are intact. If the packing case is damaged or wet, note the damage prior to accepting delivery and notify your dealer.
- Step 2. Open the box.
- Step 3. Check the number of parts on the packing list. If the quantity is different from that on the packing list, please notify your dealer.

3.2.2 Checking components

<table>
<tr><th>Type</th><th>Description</th><th>quantity</th></tr>
<tr><td>Battery</td><td>  </td><td>1PCS</td></tr>
<tr><td>Mounting fittings</td><td>Used to secure the left and right sides of the battery
  </td><td>6PCS</td></tr>
<tr><td>Screw</td><td>M6 Screw（Use with mounting fittings）</td><td>24PCS</td></tr>
<tr><td>Line of Parallel</td><td>Battery to battery communication cable(500mm)
 
<table>
<tr><td colspan="2">  </td><td colspan="2">  </td></tr>
<tr><td>Pin 1</td><td>GND</td><td>GND</td><td>Pin 1</td></tr>
<tr><td>Pin 2</td><td>RS485 B</td><td>RS485 B</td><td>Pin 2</td></tr>
<tr><td>Pin 3</td><td>RS485 A</td><td>RS485 A</td><td>Pin 3</td></tr>
</table></td><td>1PCS</td></tr>
</table>

<table>
<tr><td></td><td><table>
<tr><td>Pin 4</td><td>RS485 B1</td><td>RS485 B1</td><td>Pin 4</td></tr>
<tr><td>Pin 5</td><td>RS485 A1</td><td>RS485 A1</td><td>Pin 5</td></tr>
<tr><td>Pin 6</td><td>/</td><td>/</td><td>Pin 6</td></tr>
<tr><td>Pin 7</td><td>/</td><td>/</td><td>Pin 7</td></tr>
<tr><td>Pin 8</td><td>OUT/IN</td><td>OUT/IN</td><td>Pin 8</td></tr>
</table></td><td></td></tr>
<tr><td>GX devices to attery BMS communicati on cable</td><td>Battery to inverter(Victron) communication cable(2000mm)
  <table>
<tr><td>  </td><td colspan="3">  </td></tr>
<tr><td>Pin 1</td><td>/</td><td>/</td><td>Pin 1</td></tr>
<tr><td>Pin 2</td><td>/</td><td>/</td><td>Pin 2</td></tr>
<tr><td>Pin 3</td><td>/</td><td>/</td><td>Pin 3</td></tr>
<tr><td>Pin 4</td><td>RS485 B1</td><td>RS485 B1</td><td>Pin 4</td></tr>
<tr><td>Pin 5</td><td>RS485 A1</td><td>RS485 A1</td><td>Pin 5</td></tr>
<tr><td>Pin 6</td><td>/</td><td>CANOL</td><td>Pin 6</td></tr>
<tr><td>Pin 7</td><td>CANOH</td><td>CANOH</td><td>Pin 7</td></tr>
<tr><td>Pin 8</td><td>CANOL</td><td>/</td><td>Pin 8</td></tr>
</table></td><td>1PCS</td></tr>
<tr><td>Warrnty Card</td><td>/</td><td>1PCS</td></tr>
<tr><td>Specification</td><td>/</td><td>1PCS</td></tr>
<tr><td>factory quality assurance test report</td><td>/</td><td>1PCS</td></tr>
</table>

⚠ CAUTION

Please check whether the accessories are complete, if there is any problem, please contact your dealer.

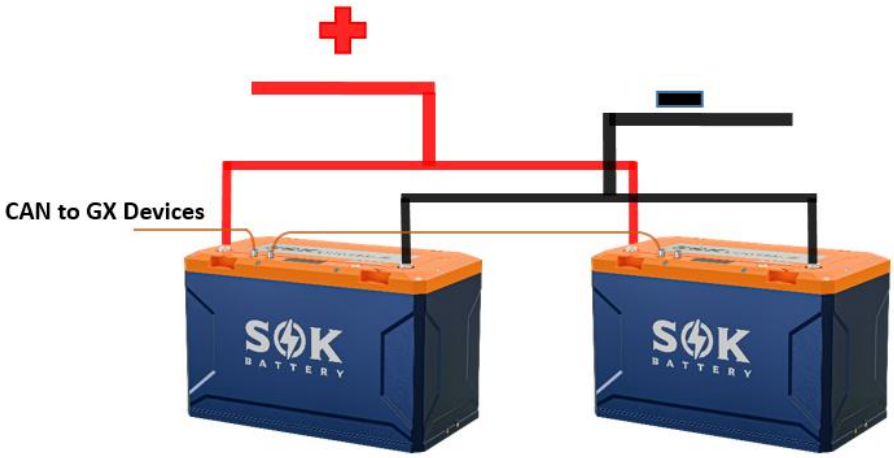
3.3 Wiring

In systems where one or more batteries are connected in series or parallel, it is recommended to add a FUSE at the positive electrode to enhance the electrical protection of the entire system. The specification of FUSE is: the number of batteries connected in series in the system N x 300A.

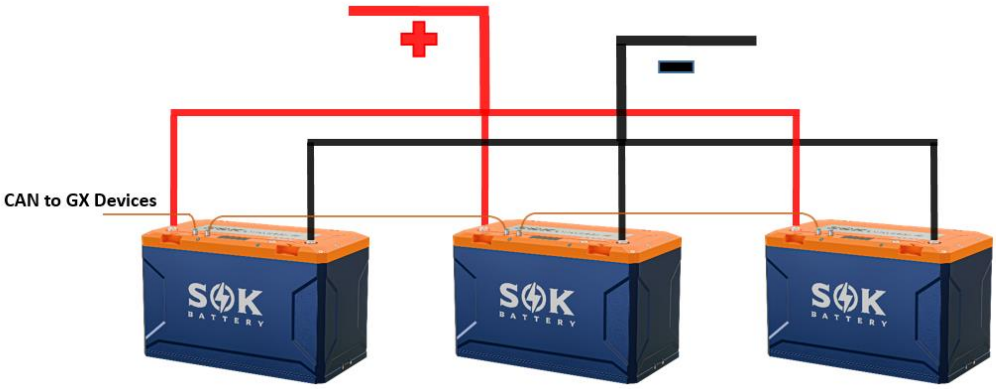
Each battery must be secured to avoid any lateral or vertical movement if installed in a vehicle or vessel. It is recommended to secure the battery with the provided brackets into a solid material with 4 screws able to support at least 30 kg (66 lb.) per fastener withdrawal force. Some severe conditions may require a more robust installation.

3.3.1 Parallel installation（Communication with GX Devices）

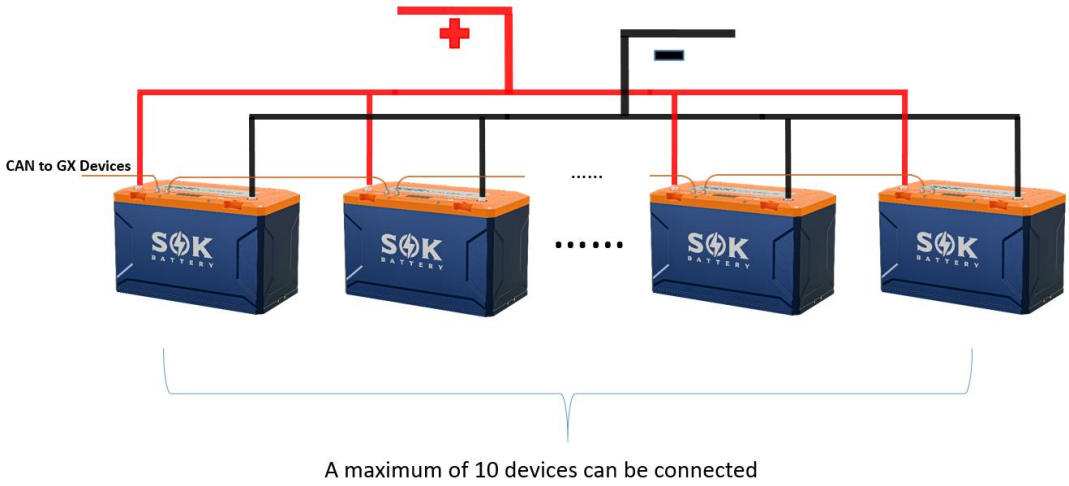
A: Connect 2 batteries (12V 628AH)



B: Connect 3 batteries (12V 942AH)



C: Connect 4 or more batteries (12V 314 * N (N≤10))



3.3.2 Series installation （Communication with GX Devices）

A: Connect 2 batteries (24V 314AH)

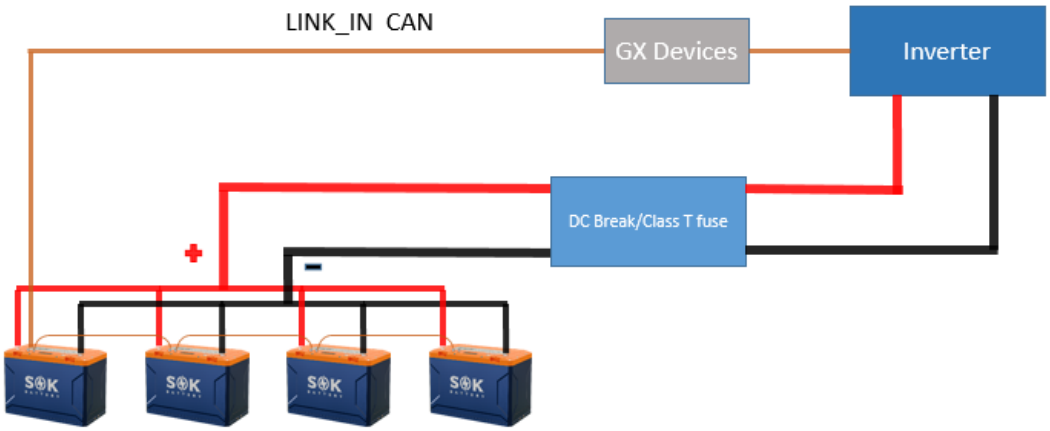
B: Connect 3 batteries (36V 314AH)

C: Connect 4 batteries (48V 314AH) Max 4

⚠ WARNING

Only the above three series mode are supported (The number of batteries in series cannot exceed 4). All other operations are illegal and have serious risks (It cannot be used in series and parallel).

3.4 Connecting with inverter



⚠ WARNING

This connection in this diagram is only for illustration, please follow the Manual suggestions of related devices and operate in accordance with locally applicable connection requirements, standards, and directives.

Due to the high discharge current potential of lithium batteries, a fuse with an Ampere Interrupting Capacity of 2000 Amps or higher is recommended within 18 inches of the positi ve battery terminal. Refer to applicable electrical codes or standards.

- The maximum communication cable length is required to be less than 15m between inverter/charge and battery.
- The maximum power cable length is suggested to be less than 10m between inverter/charge and battery (Screw fixing torque value range 9-11 N.M).
- When multiple batteries are wired in parallel, use a bus bar to connect the battery to the inverter.
- Connecting Master battery Link IN port with inverter CAN communication port communication cable.
- Connecting battery OUTPUT (+) with inverter battery INPUT (+), battery OUTPUT (-) with inverter battery INPUT (-), choose the corresponding power cable pair and wiring them correctly.
- Confirm inverter AC input and PV input is disconnected before wiring connection, and the DC/ signal switch of inverter/charger is in off status.
- The maximum permissible current of each power cable and terminal is 200A.
- Please use corresponding number of power cable pairs according to the field configuration and local connection requirements, standards, and directives.

3.5 Commissioning

3.5.1 Power on

Step 1： Make sure the harness is connected correctly.

Step 2： Hold down the switch button of the battery for 3s to start the battery.

Step 3： Then turn on the inverter/charger isolator and other charging sources.7/9/2025

Step 4： Program the inverter/charger and any other charging sources as listed in the battery specifications. On inverter/charger or any other control devices, if everything is correct, you are ready to use.

3.5.2 Switch off battery

Step 1： Turn off the inverter.

Step 2： Hold down the switch button on the battery for 3s to turn off the battery.

3.6 Mobile device APP

The user can review relevant battery data with the dedicated Bluetooth APP. The APP can be downloaded in the following two ways.

Method 1: Download directly by scanning the QR code.

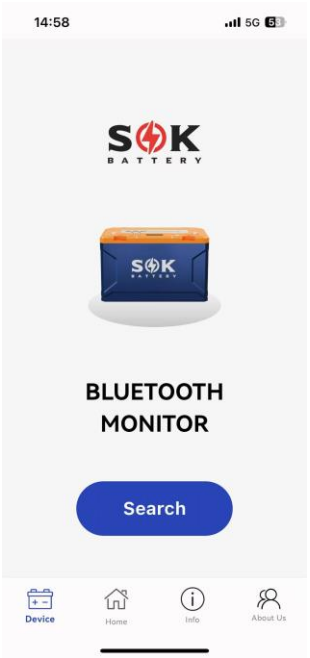
iOS system

Android system

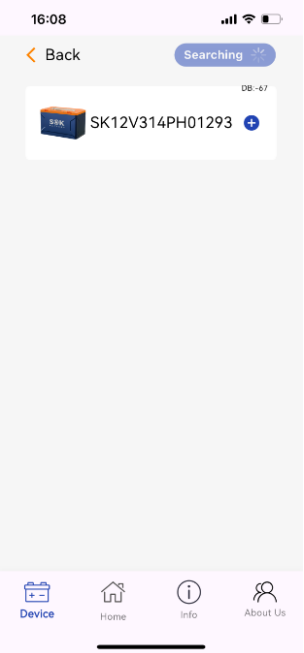
Method 2: Apple users can search for "**SOK Battery**" directly in the App Store. Android users search for "**SOK Battery**" directly in the Google Play (If the search is incorrect, you can search for "**APP: SOK Battery**").

3.6.1 Adding batteries to the app

Step 1：Open the installed APP, and the page is displayed as follows:



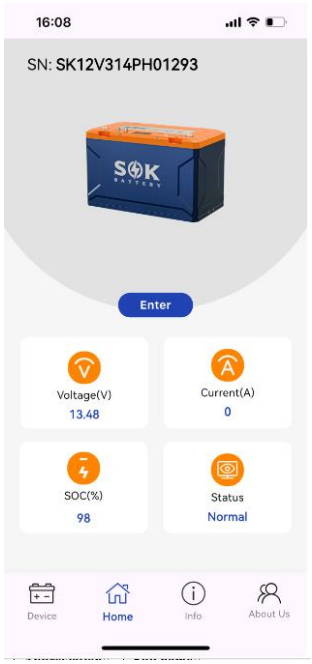
Step 2： Click the "Search" button on the main page. If the device is not detected, please check whether the Bluetooth of the mobile phone is turned on or whether the battery is power-on state, and it is within the Bluetooth search range. After the battery is found, the following page is displayed:



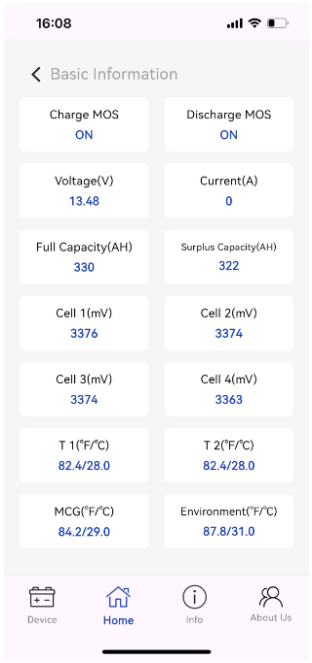
Step 3： Click the "+" button to the right of the battery information. The battery is connected successfully.

3.6.2 Battery information display

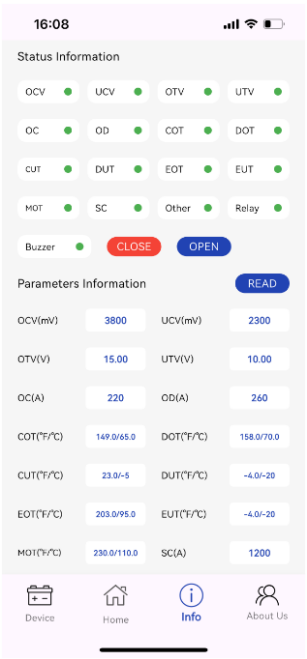
After the battery is successfully connected, the home page is displayed. The home page displays the following information: Battery voltage information, Battery current information (the negative number is discharge current and the positive number is charge current), Battery SOC information, Battery status information (including normal, heating, Balance , Discharge complete , Charge complete and fault status). The page is displayed as follows:



After clicking the "Enter" button in the home page, you can view more detailed battery data, including detailed cell voltage, temperature information and MOS state. The page is displayed as follows:



The "info" page displays **Status Information、Parameter information and Parameters Settings**.



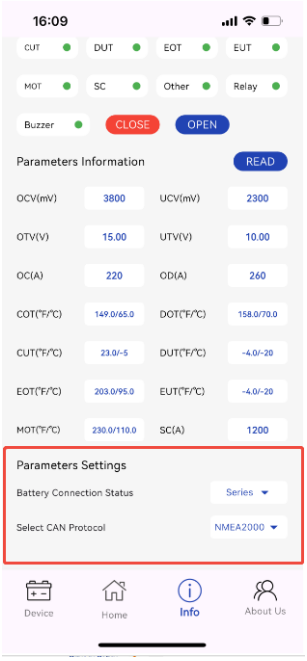
Status Information shows the alarm information of the battery, and the corresponding contents are as follows:

Abbreviation	**Full name**		**Abbreviation**	**Full name**
OCV	Over cell voltage		DOT	Discharging over temperature
UCV	Under cell voltage		CUT	Charging under temperature
OTV	Over total voltage		DUT	Discharging under temperature
UTV	Under total voltage		EOT	Environment over temperature
OC	Over Charge current		EUT	Environment under temperature
OD	Over Charge current		MOT	MOS over temperature
COT	Charging over temperature		SC	short-circuit
Relay	Relay Status(Reserve)		Buzzer	Buzzer Status (Reserve)

⚠ CAUTION

The CLOSE and OPEN switches of Buzzer have no application in this product and are reserved functions.

Parameter information displays the protection item parameters of the BMS after reading.



In the **Parameter settings** module, two modes are supported for selection and setting. They are respectively the series and parallel Settings of the battery and the selection Settings of the CAN protocol.

The following are the precautions for using these **Battery Connection Status** functions：

1：When multiple batteries are selected in series and parallel, each battery must be in the same state.（They are all in series or all in parallel）

2：When the series and parallel connection selection is incorrect, the main unit battery (the battery connected to the inverter serves as the main unit) will always light up a red light. And when communicating with the inverter for use, send a command to prohibit charging.

3：When the Settings are incorrect and the host lights up a red light. Check all batteries and ensure they are set to the same connection state (either in series or in parallel at the same time). Click on the series and parallel Settings of the host again and reset it to the correct state. The malfunction will disappear.

The "About Us" page contains the contact information of the manufacturer and the version information of the product, you can contact us if you have any questions.

4 Troubleshooting

Items	Solution
Unable to start	1：Press and hold the Start button and release it after 5 seconds. 2：Use a charger or inverter to provide 12~14V voltage.
Unable to charge	1: Check whether the battery has a charging fault, which can be observed through the Bluetooth APP. After the charging fault is eliminated, try charging again. 2：Check that the power lines and communication lines of the battery and the inverter/charger are correctly connected. 3：Check whether the inverter or charger is faulty.

Unable to discharge	1: Check whether the battery has a discharging fault, which can be observed through the Bluetooth APP. After the discharging fault is eliminated, try discharging again. 2：Check that the power lines and communication lines of the battery and the inverter/charger are correctly connected. 3：Check whether the inverter or charger is faulty.
High/Low temperature	1. Let the battery stand for a period of time and observe whether the temperature returns to normal. 2. Avoid continuous full charging and discharging. 3. Reduce battery power.
High current	1: Use more batteries for parallel use. 2: Set the correct inverter parameters.
Communication fail	1. Check the communication cable type is correct and is contacted well. 2. Check the inverter protocol related setting is correct. 3. Check both battery and inverter are working properly.
Long time charge	After the SOC is 100%, the battery can be charged for a long time (> 30min). This is normal because the product itself may have a capacity of > 314AH.
The inverter displays an incorrect number of batteries	Check whether the communication cable of the battery is connected properly, and the OUT of the previous battery is connected to the IN of the next battery.
When multiple batteries are in use, the main battery lights up red	Check the series and parallel Settings through the Bluetooth APP. After all batteries are set to the same state, make a confirmatory setting for the main unit battery and then restore it to normal.
After the above actions, the battery still cannot be used. Please contact the supplier	

5 Disposal of battery

Disposal of battery must comply with the local applicable disposal regulations for electronic waste and used batteries, please review your local Battery recycling or management regulations.