SS-BATT-SX-16.07kWh-LV-IP65

USER MANUAL

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v.1 (15/01/26)

PLEASE RETAIN FOR FUTURE REFERENCE

About this Document

This manual provides instructions for safe installation, operation, and maintenance of the Sunsynk X 16.07kWh Lithium Iron phosphate ($LiFePO_4$ or LFP) battery. Please read it carefully before installation and follow all steps during the process. If anything is unclear, contact Sunsynk for guidance and clarification. Contents may be periodically updated or revised due to product development. The information in this manual is subject to change without notice.

All Rights Reserved

Intended Audience

This document is intended for use by:

- Qualified Personnel / Installers
- End-users

Intended Use

The battery is designed for energy storage applications in residential and commercial solar PV systems, backup power systems, and hybrid systems.

Disclaimer

Sunsynk is not responsible for any damage or consequences resulting from:

- Damage occurring during transportation by the customer.
- Storage conditions that do not meet the requirements outlined in this manual.
- Improper storage, installation, or use of the battery.
- Installation or operation by unqualified personnel.
- Failure to follow the operation instructions and safety precautions in this manual.
- Use in extreme environments not covered in this manual.
- Operation beyond the specified voltage, current, temperature, or other limits.
- Unauthorized modifications to the product, software, or removal of components.
- Damage caused by force majeure events (e.g., earthquake, fire, storm).
- Expired warranty or failure to extend warranty coverage.
- Installation or use in environments not compliant with relevant international standard.

Manufacturer & Global Support Contact Information

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INTRODUCTION

Thank you for choosing the Sunsynk X 16.07kWh Lithium Iron Phosphate ($LiFePO_4$ or LFP) battery. This energy storage system is designed for high-power applications, efficient use in limited installation spaces, and offers an exceptionally long cycle life. It provides safe and reliable power for residential, commercial, and industrial energy systems.

Each module delivers a 16.07 kWh capacity and can be connected in parallel with multiple units to expand the total system capacity and output power. This modular design makes the X 16.07kWh highly flexible, allowing system sizes to be scaled according to the energy requirements of the user.

The battery is equipped with a built-in Battery Management System (BMS) that:

- Monitors real-time voltage, current, and temperature.
- Ensures over-charge, over-discharge, over-current, and short-circuit protection.
- Provides cell balancing to maximize performance and extend service life.
- Communicates seamlessly with Sunsynk inverters and other approved compatible systems via CAN/RS485 protocols.

Applications

- Solar PV energy storage.
- Backup power for residential and commercial loads.
- Peak-shaving and load-shifting in commercial and industrial facilities.
- Microgrid and distributed energy storage systems.

Key Advantages

- High safety: Uses $LiFePO_4$ chemistry with excellent thermal stability.
- Long cycle life: ≥ 6,000 cycles at 90% depth of discharge (DOD).
- Scalable: Parallel connection supports large-capacity energy storage.
- High efficiency: Fast charging and discharging capability with low energy loss.
- Smart monitoring: Integrated BMS with communication interface for inverter and system integration.
- Compact design: Space-saving with flexible installation options.

Compliance and Standards

The Sunsynk X 16.07kWh battery meets international safety and performance standards, ensuring reliable operation and global compatibility. For detailed information, refer to the Technical Specification section of this manual or contact Sunsynk for further assistance.

User Guidance

This manual provides:

- General and electrical safety precautions.
- Installation requirements and wiring instructions.
- Battery operation, communication, and monitoring guidance.
- Maintenance and troubleshooting information.

NOTICE

Please read this manual carefully before installation and operation. Keep it for future reference and ensure that all installers and users are familiar with the safety precautions and instructions provided.

SAFETY INFORMATION

Sunsynk products are engineered with safety as a top priority. However, like all electrical devices, they can pose risks if used incorrectly, including fire or electric shock, which may result in serious injury or death. To ensure your safety, please read and follow all safety precautions carefully before use.

Safety Symbols and Definitions

The following symbols are used in this document and their meanings are provided below.

DANGER

Indicates an immediate hazard that, if not avoided, will result in serious injury or death. This is the highest level of risk.

WARNING

Indicates a potential hazard that could result in serious injury or death if not avoided. It is slightly less severe than "DANGER".

CAUTION

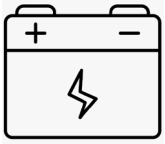
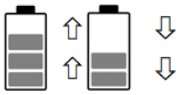
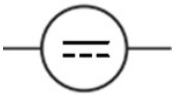
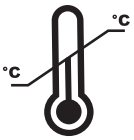
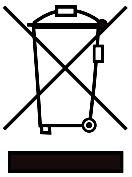
Highlights a potential hazard that could cause minor injuries or property damage if not avoided.

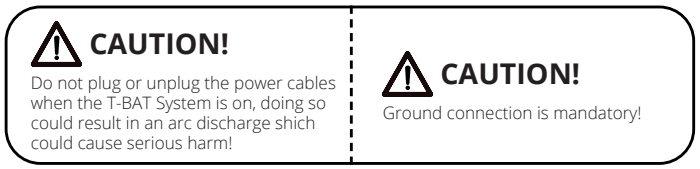
NOTICE

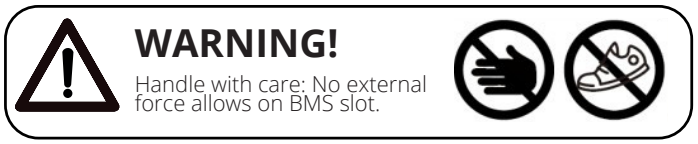
Provides helpful information that does not indicate any hazard.

The following safety symbols are used in this document and may also appear on product specification labels and packaging. Their meanings are explained below.

Symbol	Description	Symbol	Description
	This symbol indicates information that if ignored, could result in personal injury, physical damage or even death due to incorrect handling.		This product's batteries contain an explosive, self-reactive material that could blow up when heated.
	Electrical Hazard.		Read the manual.
	Danger.		Indicates that this product is recyclable.
	The Battery is heavy and can cause injury if not handled safely.		Do not place near open fire or incinerate. Do not use near heaters or hot temperature sources.
	Do not submerge the battery in water or expose it to moisture or liquid.		Do not disassemble or alter the battery in any way. Do not strike or puncture the battery.
	Do not drop, deform, or impact the battery.		Do not step or put any objects onto the battery.

Symbol	Description	Symbol	Description
	Keep out of reach of children, animals, and insects.		Li-ion Battery.
	Rechargeable.		Charging and Discharging.
	Direct Current.		Product exposure.
	Recommended Charge Instructions		
	Follow the indicated temperatures.		**BATTERY INPUT** Battery Discharge Voltage, Battery Discharge Current, Input Voltage Type, Battery Discharge Power.
	Contact the supplier within 24 hours if there is anything wrong. In case of leakage contact with eyes or skin, immediately clean with water and seek help from a doctor.		Do not dispose the device, accessories, and packaging with regular waste. Follow local ordinances or contact the manufacturer for disposal guidance.
	The UKCA marking is used for products placed on the market in Great Britain (England, Scotland and Wales). The UKCA marking applies to most products for which the CE marking could be used.		CE mark is attached to the solar inverter to verify that the unit follows the provisions of the European Low Voltage and EMC Directives.





Qualified Personnel

The Sunsynk X 16.07kWh Lithium Iron Phosphate ($LiFePO_4$ or LFP) battery must only be installed, commissioned, operated, and maintained by qualified personnel.

Qualified personnel are individuals who:

- Have received formal training in electrical systems and photovoltaic (PV) installations.
- Are familiar with local and national electrical codes, regulations, and safety standards.
- Understand the risks involved when working with both low- and high-voltage equipment.
- Possess the skills to correctly use the required tools, personal protective equipment (PPE), and test instruments.

For safe and reliable installation, Sunsynk strongly recommends using a Sunsynk-approved installer. These installers are trained specifically on Sunsynk products and are equipped with the knowledge to ensure correct installation, commissioning, and long-term operation.

NOTICE

- Installation or operation by unqualified personnel may cause personal injury, electric shock, fire hazards, or property damage.
- Any damage or failure resulting from improper installation, unauthorized modifications, or neglect of instructions will void the product warranty.
- Always follow all safety warnings, handling instructions, and manufacturer recommendations when working with the battery.

General Safety

- Use the battery only as instructed in this manual.
- Do not use the battery if it appears broken, damaged, or compromised in any way.
- The battery is non-user-serviceable, do not attempt to open or repair it.
- Handle the battery with care during installation, transportation, or relocation.
- Do not connect the Sunsynk X 16.07kWh battery with batteries of a different type or model unless otherwise specified the battery may be paired only with a compatible battery.
- Do not operate the battery with faulty or incompatible inverters.
- Always contact the supplier within 24 hours if any abnormal condition occurs.
- After unpacking, carefully check the product and packing list. If any parts are missing or damaged, contact your retailer immediately.
- Recharge within 48 hours after full discharge.
- Charge the battery at least every 6 months; keep State of Charge (SOC) ≥50% during long-term storage.
- Warranty does not cover damage caused by misuse or violation of the above precautions.

Electrical Safety

- Before installation, disconnect the grid power supply and ensure the battery is switched off.
- Verify correct wiring: do not reverse positive (+) and negative (–) cables, and ensure no short circuit with external devices.
- Never connect the battery directly to PV solar panel wiring.
- Do not connect the battery directly to AC power.
- Ensure the battery system is properly grounded with a resistance of less than 1Ω.
- Confirm that the electrical parameters of the battery system match the connected equipment.
- Disconnect all terminals before maintenance.
- Always cut off the power supply and fully shut down the battery before moving or performing any repairs.

Environmental Safety

To ensure safe operation and long service life, the Sunsynk X 16.07kWh Lithium Iron Phosphate ($LiFePO_4$ or LFP) battery must be installed in an environment that meets the following conditions:

LOCATION AND PROTECTION

- Install indoors or in a sheltered enclosure, protected from direct sunlight, rain, dust, and condensation.
- Keep away from flammable materials, corrosive substances, or explosive gases.
- Ensure adequate physical protection against accidental impact or mechanical damage.

VENTILATION AND CLEARANCE

- Provide sufficient airflow around the battery to prevent heat build-up.
- Maintain at least 30 cm clearance around all sides for cooling and maintenance access.
- Do not block air vents or enclose the battery in an airtight cabinet.

PROHIBITED AREAS

- Do not install outdoors without appropriate weatherproof enclosures.
- Do not install in bedrooms, living spaces, or occupied areas where noise or heat may cause discomfort.
- Avoid areas exposed to salt spray, chemicals, or corrosive vapors (e.g., near swimming pools or industrial sites).

Safety Handling

To ensure safe operation and longevity of the Sunsynk X 16.07kWh Lithium Iron Phosphate ($LiFePO_4$ or LFP) battery, the following precautions must be observed:

- Cables: Keep all cables protected from damage. Do not bend, crush, or expose them to heat or moisture.
- Foreign Objects: Never insert objects into the battery or its connectors.
- Cleaning: Do not use solvents, chemicals, or cleaners on the battery. If cleaning is required, use a dry, soft cloth only.
- Flammable Materials: Do not expose the battery to fire, heat sources, or flammable/harsh chemicals.
- Painting/Modifications: Do not paint, disassemble, modify, or tamper with the battery.
- Servicing: Only Sunsynk staff or authorized service personnel may open, repair, or service the battery. Unauthorized handling or repair will void the warranty and may result in hazards.
- Fire Safety: In case of fire, use a dry powder fire extinguisher only. Do not use water or liquid extinguishers.
- Environment: Keep the battery away from water, excessive dust, vibration, and direct sunlight. Do not expose to freezing temperatures or high humidity.
- Handling: Always lift the battery with proper equipment or sufficient manpower. Avoid dropping or subjecting it to impact.
- Storage/Transport: Store and transport the battery in an upright position, in a clean, dry, and ventilated environment.

WARNING

Improper handling may cause injury, fire, electric shock, or permanent damage to the battery.

Prohibited Uses

To prevent hazards, never:

- Short-circuit the battery terminals or connect them directly with metal objects.
- Immerse the battery in water or allow it to get wet.
- Connect incompatible chargers, inverters, or third-party devices not approved by Sunsynk.
- Operate the battery outside its rated voltage, current, or temperature limits.
- Install the battery in a sealed or poorly ventilated area.
- Place heavy objects on top of the battery.
- Use the battery if it is physically damaged, leaking, or emits unusual odors or sounds.

WARNING

Improper handling or prohibited use may lead to electric shock, fire, property damage, or personal injury, and will void the product warranty.

Emergency Procedures

In case of accidental exposure to battery materials, take immediate action as outlined below. Always seek medical assistance after providing first aid.

- Do not use a damaged battery.
- Return it to Sunsynk or dispose it properly at a certified recycling facility.
- Leaking electrolytes can cause skin irritation, chemical burns, or other serious injuries.
- Avoid all direct contact with leaking material.

Hazard	Action
Eyes	Flush eyes with plenty of clean water for at least 15 minutes, lifting eyelids occasionally. Seek immediate medical attention.
Skin	Remove contaminated clothing. Rinse skin thoroughly with water or shower for at least 15 minutes. Seek medical attention.
Inhalation	Move the affected person to fresh air immediately. If breathing is difficult, provide oxygen if available. Seek medical assistance.
Ingestion	Do not induce vomiting. Do not give anything by mouth if the person is unconscious. If conscious, rinse mouth with water and give small sips of water or milk. Call a physician or poison control center immediately.

WARNING

Failure to follow the safety instructions in this manual may result in serious injury, electric shock, fire, or damage to the battery and will void the warranty.

NOTICE

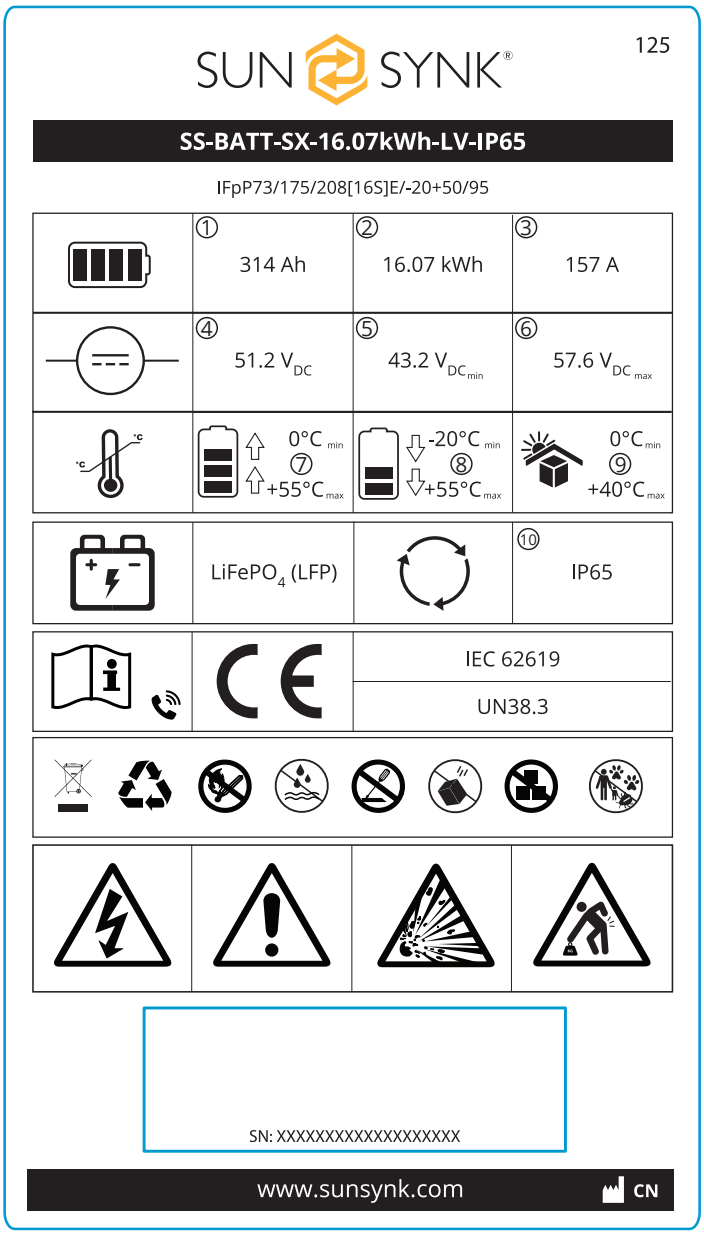
Always use the battery as instructed in this manual. Safe handling and proper maintenance will ensure reliable performance and extend the service life of your battery.

PRODUCT OVERVIEW

The Product Overview provides key information about the Sunsynk X 16.07kWh battery system, helping users understand its components, specifications, and applications.

Product Identification Labels

The battery is equipped with identification and rating labels that display critical information, including model number, serial number, voltage, capacity, safety certifications, and manufacturer details. These labels should be referenced during installation, maintenance, and troubleshooting to ensure proper use and maintain warranty coverage. The Rating Label below is affixed to the side of the battery module.



Item	Requirement	SS-BATT-SX-16.07kWh-LV-IP65
1	Rated Capacity	314 Ah
2	Battery Usable Energy	16.07 kWh
3	Max. Charge & Discharge Current	157 A
4	Rated Voltage	51.2 Vdc
5	Min. Operating Voltage	43.2 Vdc
6	Max. Operating Voltage	57.6 Vdc
7	Min./Max. Charge Temperature	0 °C / 55 °C
8	Min./Max. Discharge Temperature	-20 °C / 55 °C
9	Min./Max. Storage Temperature	0 °C / 40 °C
10	Ingress Protection Rating	IP65

Technical Specifications

The technical data below summarizes the electrical, mechanical, and operational parameters of the battery, providing installers and system designers with the information needed to integrate the battery safely and efficiently into energy systems.

Model	SS-BATT-SX-16.07kWh-LV-IP65
Parameters	
Battery Chemistry	LFP 1P16S
Total Energy [1]	16.07kWh
Nominal Voltage	51.2V
Operating Voltage Range	43.2~57.6V
Charging Voltage	55.2V
Max. Charge/Discharge Current [2]	157A
Communication	RS485, CAN
Storage Temperature	0°C~40°C (Recommended)
Storage Humidity	≤85% (RH)
Operating Temperature	Charging: 0°C~55°C Discharging: -20°C~55°C
Working Humidity	≤95% RH (Non-Condensing)
Working Altitude	≤2000m
Protection Level	IP65
Protection Class	I
Weight	112kg ± 2kg
Dimensions (WxDxH)	425x233x790mm (H Without Base)
Warranty	See website for Warranty details
Cycle Life	>6000 (25°C, 0.5C/0.5C, 90% DOD, 80% Remaining)
Scalability	Recommended ≤8
Certification	Approvals and certifications are subject to change without prior notice. Please confirm the current status with Sunsynk before placing an order.

[1] Test conditions: fresh battery, cell voltage 2.5~3.65V, 25 ± 2°C, 0.5C charge and 0.5C discharge.

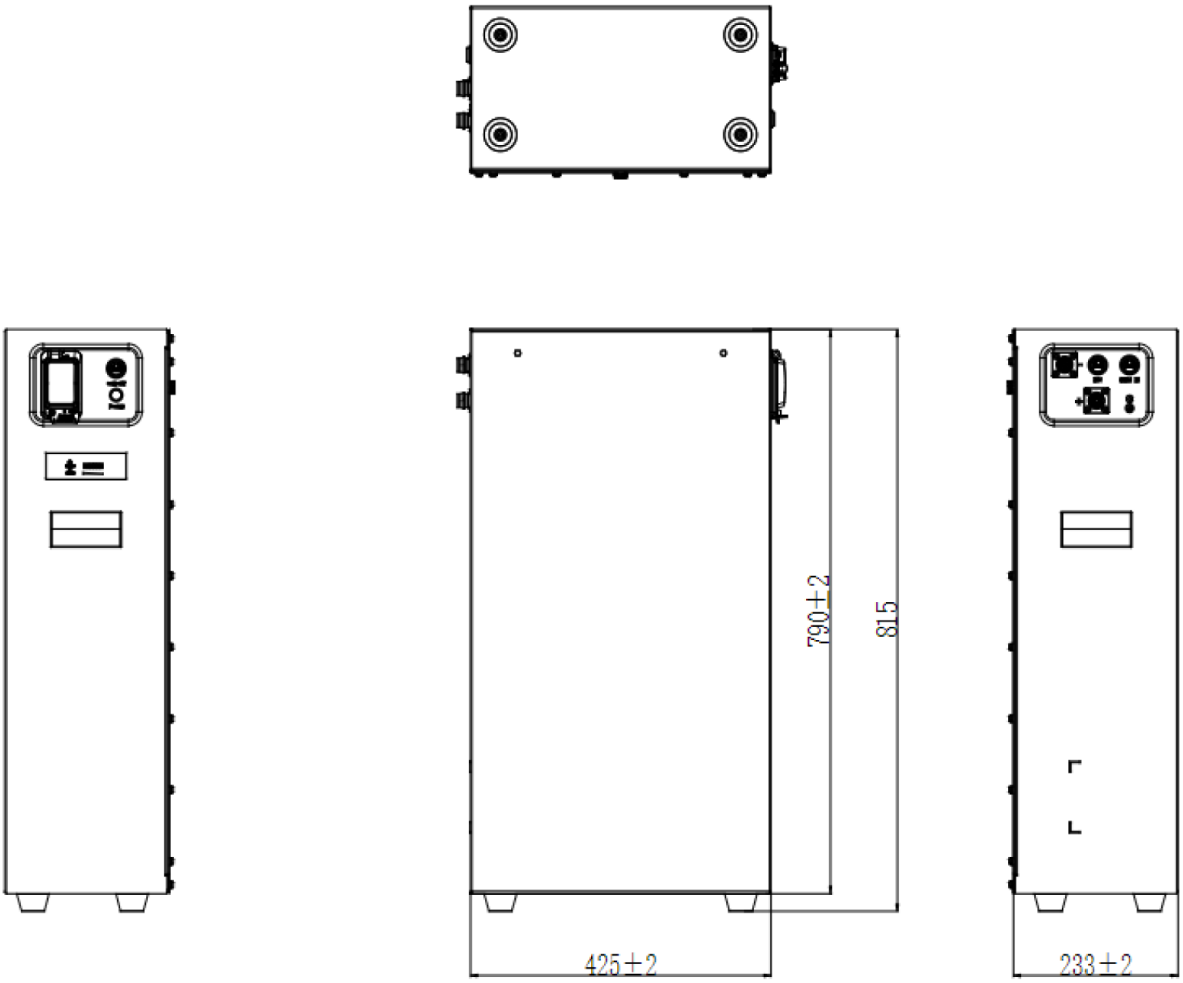
[2] Dependent on the temperature and SOC of battery.

Battery Module (Dimensions, Weight & Interface)

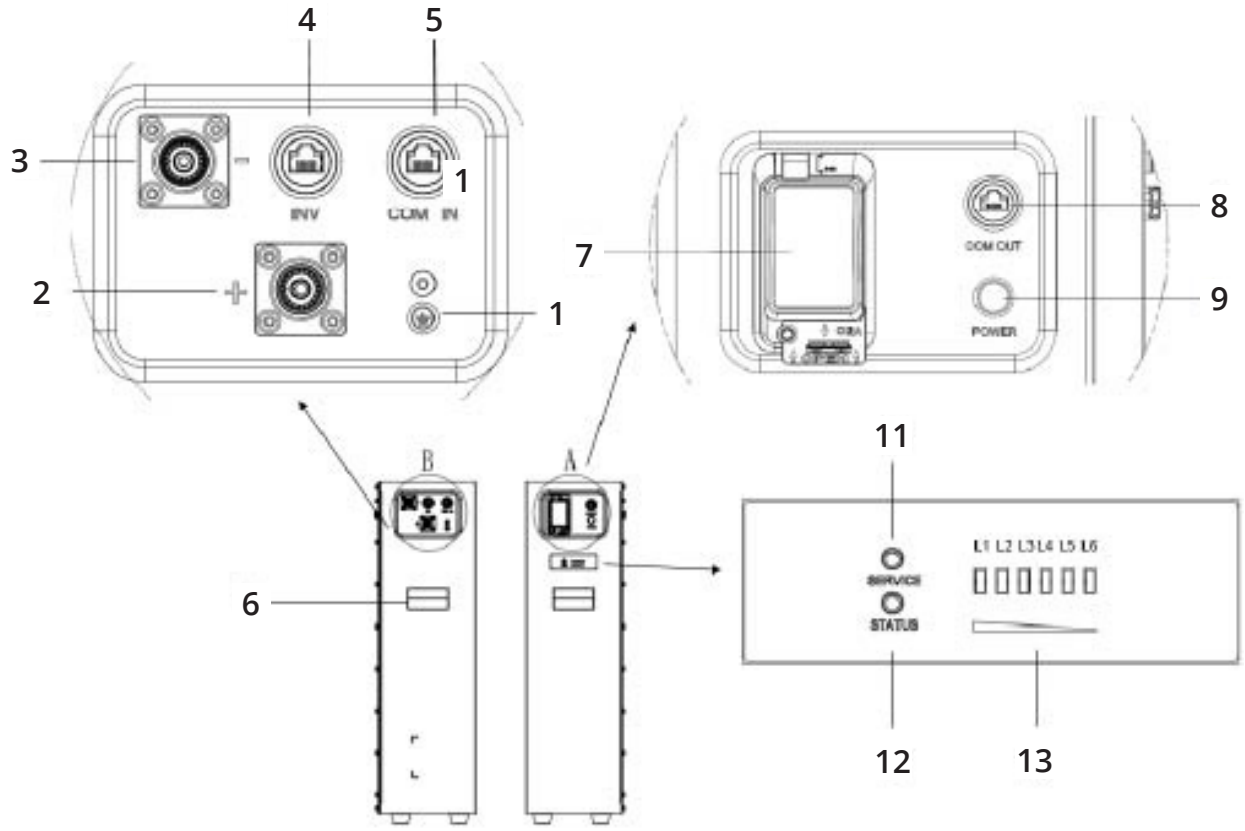
This section details and displays the module's size, weight, mounting options, and design features for safe, space-efficient installation. It also outlines the available connections and ports, including terminals and communication interfaces, for proper integration with other system components.

- The Sunsynk X 16.07kWh battery module Dimensions and Weight are presented below:

SS-BATT-SX-16.07kWh-LV-IP65	
Depth	233mm
Width	425mm
Height	790mm
Weight	112kg



- The Sunsynk X 16.07kWh battery module is equipped with a user-friendly interface that provides all necessary electrical and communication connections for safe integration into energy systems.



Items	Function	Note
1. PE	Battery module grounding hole	
2. +	Battery output positive connector	
3. -	Battery output negative connector	
4. INV	Communication interface with Inverter	RS485 or CAN
5. COM IN	Parallel communication input interface	
6. Handle	Handle	
7. Circuit Breaker	Control the battery module power Circuit Breaker	With a waterproof cover
8. COM OUT	Parallel communication output interface	
9. POWER	Power On/Off Button	Latching Button
10. Mounting Foot	The battery module has four mounting feet to ensure stability	
11. Run	Battery module running LED light	
12. Alarm	Battery module fault LED light	
13. SOC	Battery module SOC indicator LED light	

Interface	Description and Instructions
Battery Switch	Battery Switch to turn ON/OFF the whole battery BMS standby, no power output.
RUN	RUN LED: 1 green LED lighting to show the battery running status.
Alarm	Alarm LED: 1 red LED flashing to show the battery has an alarm, lighting to show the battery is under protection. See LED indicator table for details. Inform the manufacturer or professional engineer for commissioning or maintenance.
SOC	SOC LED: 6 green LEDs to show the battery's current capacity.
PCS	The battery communicates with the inverter through CAN protocol or RS485 protocol, with default baud rates 500 kbps and 9600 bps. The recommended communication method is the CAN protocol. See PCS Port Definition table.
Power Terminal	Power cable terminals: There are two pairs of terminals with the same function, which are respectively connected to the inverter and battery module. For power cables uses water-proofed connectors. Must keep pressing this Lock Button while pulling out the power plug 
Parallel IN/OUT	The RS485 protocol is recommended for communication between multiple parallel batteries. See IN/OUT Port Definition table.. The output port of Parallel RS485 OUT is connected to the Parallel RS485 IN of the next battery, and so on. Up to 8 batteries can be connected in parallel. The module communicating with the inverter is the host. After the high-voltage line and communication line of the parallel machine are connected, turn on the master battery. The system starts up and carries out automatic coding, and If the coding fails, the red light will flash.
Debug	Dry contact 1: On - closed at low capacity. (NO1 COM1) Dry contact 2: On - closed under protection status. (NO2 COM2) RS 232: Software upgrade and debugging port. See Debug Port Definition table.
Grounding Bolt	Used for the battery connecting to the PE.

The following table presents the LED indicatior definition:

Indicator Light Description:

The indicator light is off.

The indicator light is on.

The indicator is flashing.

Flashing Type	Duration of Indicator On	Duration of Indicator Off
1 1	0.25s	3.75s
2 2	0.5s	0.5s
3 3	0.5s	1.5s

Status	Mode	RUN	ALM	Capacity Indicator LED						Description
				SOC1	SOC 2	SOC 3	SOC 4	SOC 5	SOC 6	
Power off	Sleep	○	○	○	○	○	○	○	○	All OFF
Standby	Normal	◐1	○	Display according to actual SOC						Standby
CH	Normal	●	○	Display according to actual SOC The highest LED in the battery indicator blinks						Corresponding led light flashes to indicate charging progress.
	FC	●	○	●	●	●	●	●	●	
	OCH Protection	●	○	●	●	●	●	●	●	Stop Charging
	T Protection	●	○	◐2	◐2	◐2	○	○	○	Stop Charging
	Charging overcurrent protection	●					◐2	◐2		
DCH	Normal	◐3	○	Display according to actual power						
	UV Protection	◐3	○	○	○	○	○	○	○	Stop Discharging
	T Protection	●	○	○	○	○	◐2	◐2	◐2	
	Discharging overcurrent protection	●	○	○	◐2	◐2	○	○	○	
	SC/RC protection	●	◐2	Display according to actual SOC						Buzzer Sounding
Protection against large temperature differences, high voltage differences, and failure [1]		●	●	○	○	○	○	○	○	Stop Charging and Discharging Buzzer Sounding
Environmental high-temperature and low-temperature protection		●	○	○	○	○	◐2	○	○	
MOSFET high-temperature protection		●	○	○	○	○	◐2	○	○	
Failure		●	○	◐1	◐1	◐1	◐1	◐1	◐1	

[1] Failure refers to abnormal charging/discharging MOSFET drive voltage, abnormal power supply voltage, charging/discharging MOSFET failure, AFE failure, NTC sensor failure, cell failure, current sensor failure, precharge failure, and current limiting failure.

Abbreviation Description:

Abbreviation	Full Name	Abbreviation	Full Name
CH	Charge	T	Temperature
DCH	Discharge	C	Current
RUN	Work normally	SC	Short-circuit
ALM	Alarm	RC	Reverse connection
UV	Under-voltage	F	Failure
OCH	Overcharge	FC	Fully charged

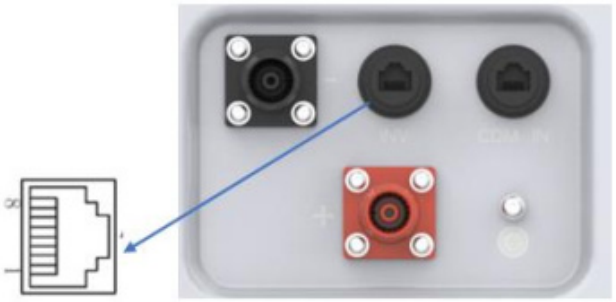
Battery Level Indicators Instructions:

State		Charge						Discharge					
Capacity Indicator LED		L1	L2	L3	L4	L5	L6	L1	L2	L3	L4	L5	L6
Power	0~8%	2	○	○	○	○	○	●	○	○	○	○	○
	9~26%	●	2	○	○	○	○	●	●	○	○	○	○
	27~50%	●	●	2	○	○	○	●	●	●	○	○	○
	51~74%	●	●	●	2	○	○	●	●	●	●	○	○
	75~92%	●	●	●	●	2	○	●	●	●	●	●	○
	93~100%	●	●	●	●	●	2	●	●	●	●	●	●
Indicator Light				●						3			

INV Port

The battery communicates with the inverter through CAN protocol or RS485 protocol, with default baud rates 500 kbps and 9600 bps. The recommended communication method is the CAN protocol.

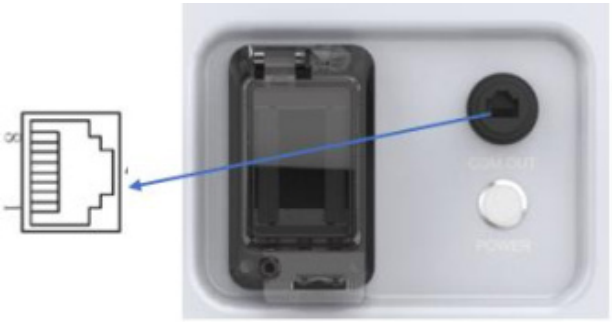
PIN	Definition
1	RS485B
2	RS485A
3	GND
4	CANH
5	CANL
6	NC
7	NC
8	NC



COM OUT Port

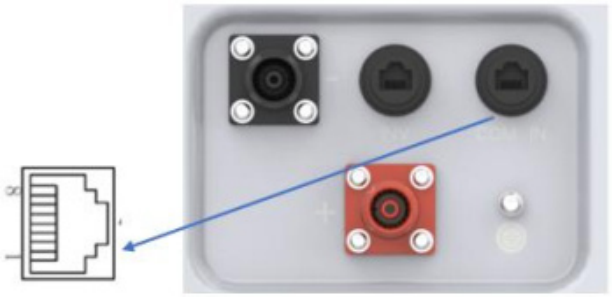
RS485 Communication Terminal (RJ45 port), connect to inverter, follow RS485 protocol.

PIN	Definition
1	OUT-R485B
2	OUT-R485A
3	GND
4	CANL
5	CANH
6	GND
7	RS485A
8	RS485B



COM IN Port

PIN	Definition
1	IN-RS485B
2	IN-RS485A
3	GND
4	CANL
5	CANH
6	GND
7	RS485A
8	RS485B



It is used for communication between multiple parallel battery modules. The output port of Parallel RS485 COM OUT is connected to the Parallel RS485 COM IN of the next battery, and so on. Up to 8 batteries can be connected in parallel. The module communicating with the inverter is the host. After the power cable and cable of the parallel battery modules are connected, turn on all the battery modules. The system starts up and carries out automatic coding, and if the coding fails, the red light will flash.

System Components

System components introduces the main hardware elements, including the battery module, BMS, connectors, and interfaces, to give a clear understanding of the system structure.

Check if you received all the items listed below. Ensure that nothing is damaged in the package.

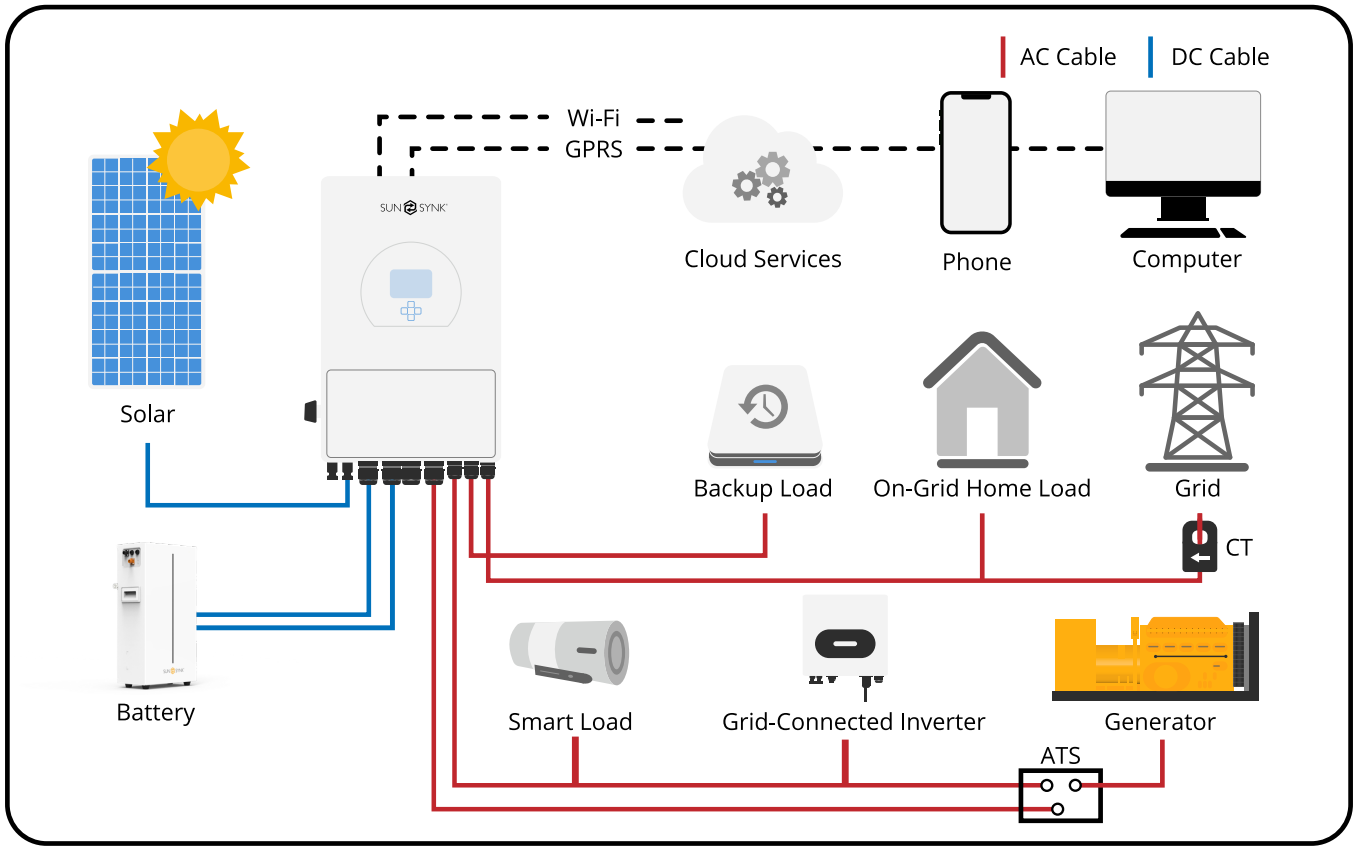
No	Pictures	Description	Quantity
1		Battery Module	1pcs
2		1500mm 10 AWG Grounding Cable (Grounding Bolt M5)	1pcs
3		1500mm RJ45 Communication Cable (RS485 Communication to Inverter)	1pcs
4		1500mm RJ45 Communication Cable (CAN Communication to Inverter)	1pcs
5		1500mm Negative Power Cables	1pcs
6		1500mm Positive Power Cables	1pcs
7		User Pamphlet	1pcs

NOTICE

Power and communication cables connect to inverter belongs to an External Cable Kit. They are placed in the EPE pearl cotton groove above the battery module.

Application Scenario

The illustration below shows typical applications of this battery, including residential solar storage, backup power, and hybrid energy systems. These examples highlight the battery's flexibility and scalability. For other system designs, please consult your system integrator to ensure the best solution for your requirements.



INSTALLATION GUIDELINES

Pre-Installation Inspection

Packaging

Before installing the battery, carry out the following checks:

- Inspect the battery and packaging for any signs of shipping damage.
- Verify that all parts and accessories are present.
- Check the battery enclosure for swelling, deformation, or abnormalities.

NOTICE

Do not install or use the battery if any issues are found. Contact your supplier or installer immediately.

Site Requirements

- The Sunsynk X 16.07kWh Lithium Iron Phosphate battery is rated IP65, this ensures complete protection against dust and solid particles. It is resistant to low-pressure water jets from any direction, with no harmful effects.
- **Note:** IP65 does not make the battery waterproof, therefore it must be installed in locations where it is not continuously exposed to rain or water.
- Select a dry, clean, and well-ventilated location, away from direct sunlight, rain, snow, heat sources, cold air outlets, and flammable materials.
- Maintain at least 30 cm clearance on all sides for airflow and heat dissipation.
- Do not install in environments with excessive oil, smoke, steam, dust, moisture, or at altitudes above 2000 m.
- Near coastal areas, provide salt-air filtration to prevent corrosion.
- Avoid areas with explosive atmospheres or humidity above 95%.
- Ensure the installation surface is stable, level, non-conductive, and free from contaminants.
- Provide adequate ventilation (natural or forced) to prevent gas buildup in enclosed spaces.
- Inspect the battery and site for damage or obstructions before installation.
- Use only the supplied cables and connectors. Secure the battery to prevent movement or vibration.
- Perform regular maintenance checks for overheating, corrosion, or damage. Disconnect immediately if abnormal conditions occur.

Handling and Mounting Instructions

- **Handle with care:** Always use appropriate lifting equipment or two people when moving the battery. Do not drop, drag, or roll the battery.
- Keep the battery upright during transport and installation. Tilting or inverting may cause damage.
- Do not lift or carry the battery by its cables or connectors.
- Avoid impact, vibration, or rough handling.
- Place on a flat, stable, level, and non-conductive surface that can support the full weight of the battery.
- Maintain at least 30 cm clearance on all sides for ventilation and heat dissipation.
- If installed in a cabinet or enclosure, provide adequate ventilation or forced airflow.
- Secure the battery firmly to prevent shifting or vibration during operation.

Tools and Safety Gears Necessary

The following tools are required to install the battery:

Wire Cutter

Modular Crimping Plier

Screwdriver

Electric Drill

WARNING

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

We recommend wearing the following safety gear when dealing with the battery pack installation or maintenance.

Insulated Gloves

Safety Goggles

Safety Shoes

Installation Method

To ensure optimal cooling and the structural integrity of the internal cells, the battery must be installed exclusively in an upright, vertical position.

WARNING

Prohibited Orientations.

Failure to follow the orientation guidelines below will result in permanent damage and pose significant safety risks:

- Prohibited upside down installation.
- Prohibited sidelong/flat installation.

The following placements are recommended:

- Method: Ground Mounted.
- Ensure that the angle of the battery pack is less than 5°.
- The ground is smooth and there is no water.
- The recommended distance between battery packs is 200mm to 400mm.

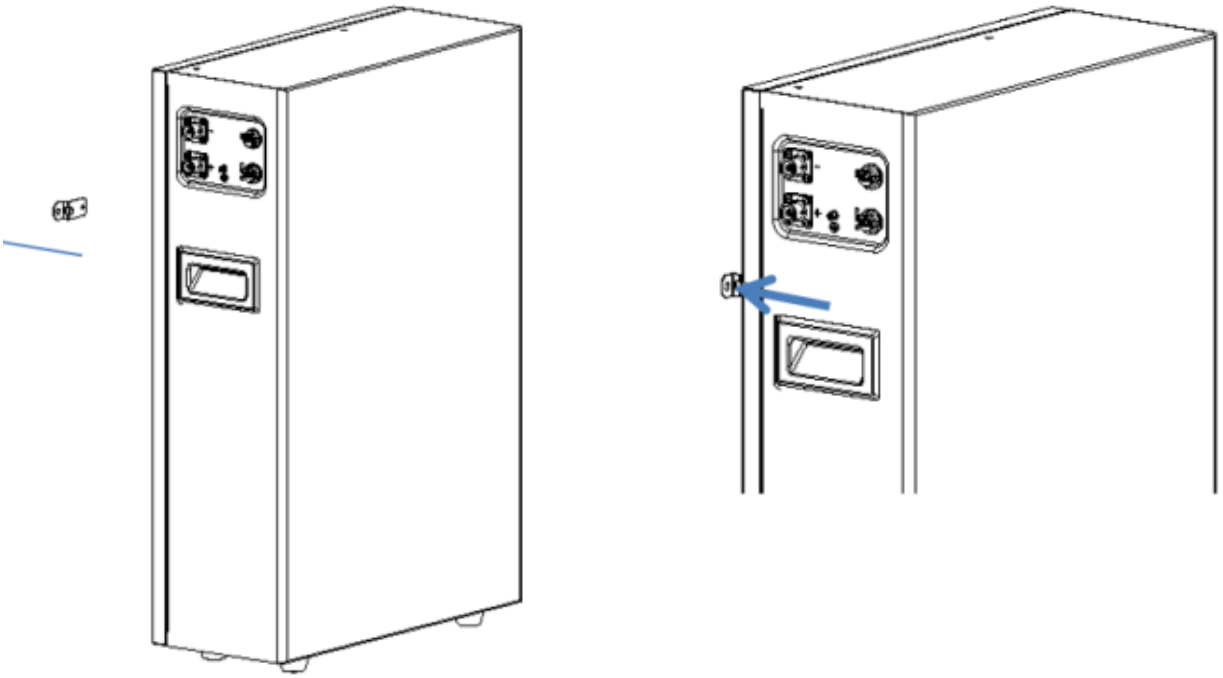
Installation Steps

WARNING

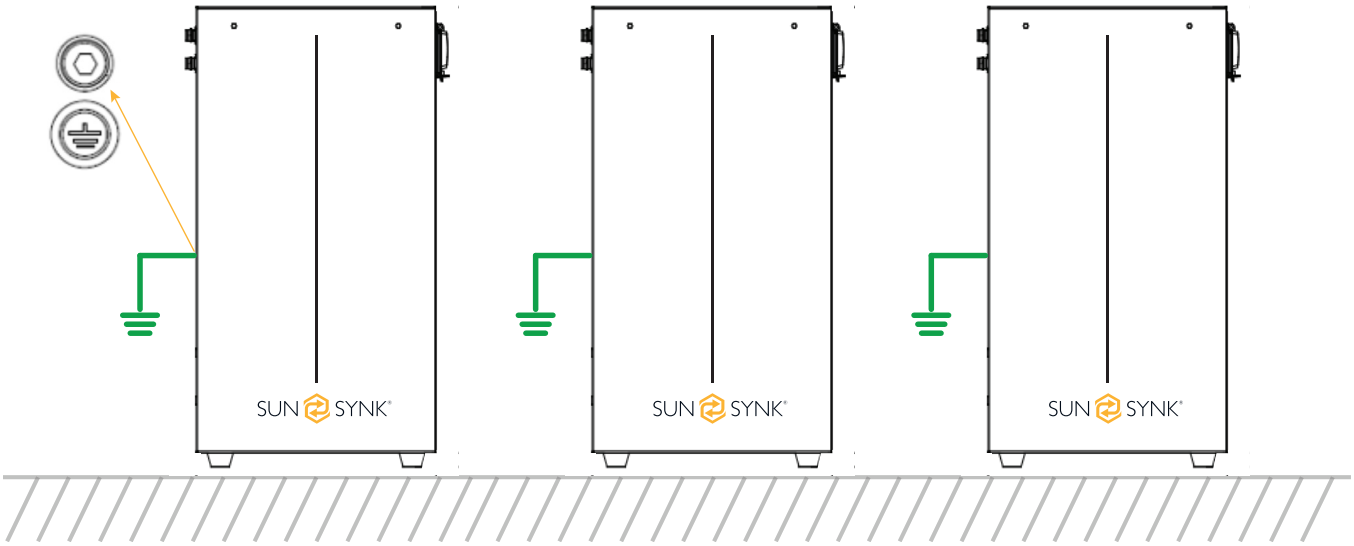
- Follow local electric safety and installation policy; a suitable breaker is required between the battery system and the inverter.
- All installations and operations must comply with the local electrical standards and requirements.
- When battery modules are paralleled, the system should be powered off before installation.

Ground Mounted:

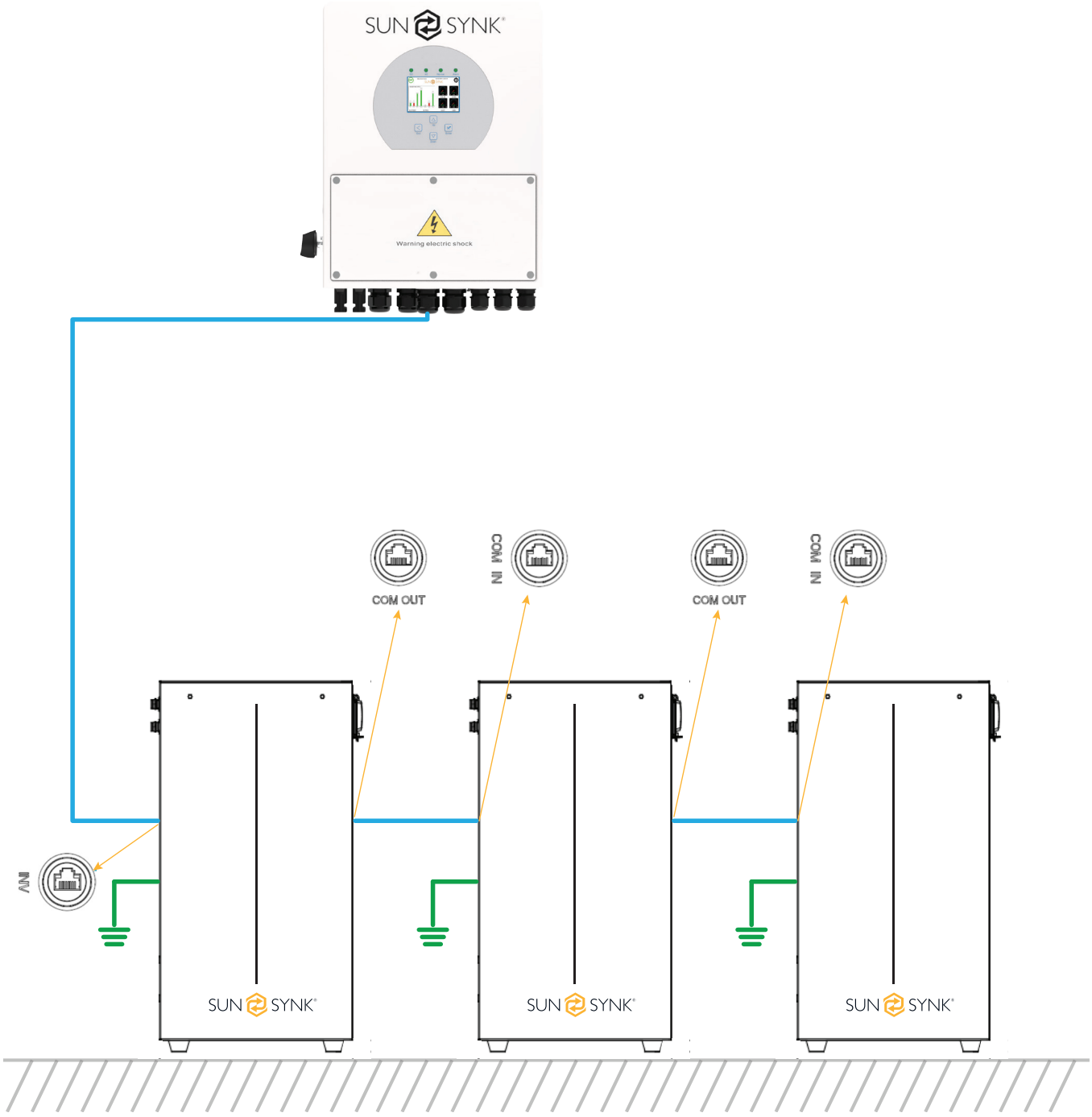
1. Use two M5*10 screws to install the bracket to the back of the battery pack.
2. Use two ST6.3*50 hexagon flange self-tapping screws and two 10*50 plastic expansion tubes to install the battery pack to the wall.



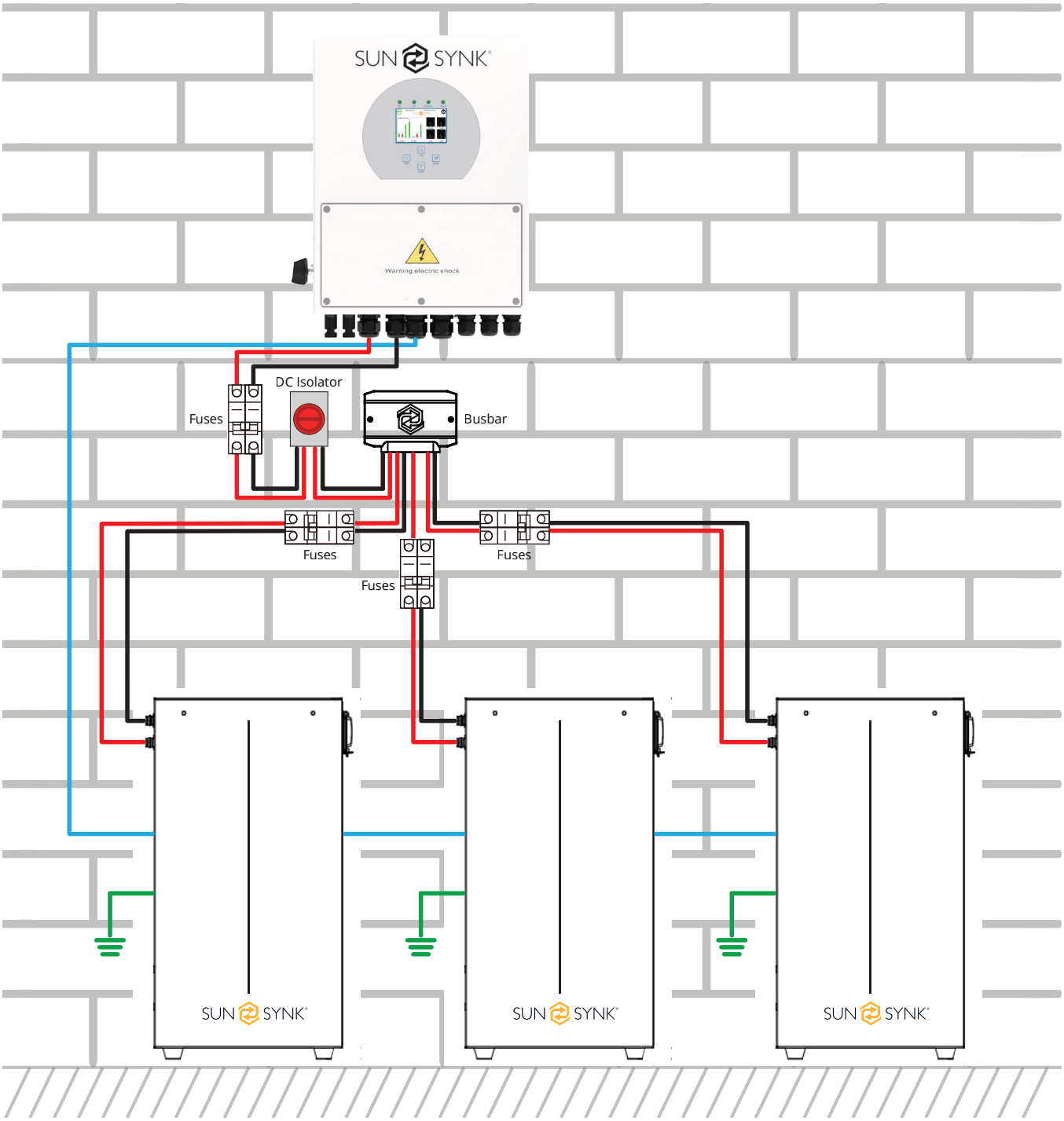
3. Ground cable connection of each module.



4. Connect the communication cables.
   - First connect the parallel communication cable between the battery modules. The COM OUT of battery 1 is connected to the COM IN of battery 2, and the COM OUT of battery 2 is connected to the COM IN of battery 3, and so on.
   - Then based on the inverter's communication method, select either the RS485 communication cable or the CAN communication cable to connect one of the battery modules to the inverter.
   - Please keep the inverter and the battery modules turned off for the above operations.



5. Connect the power cables to the inverter.



6. Latch the POWER button of all the battery modules to start up, and if the system fails, the Alarm light will be on.

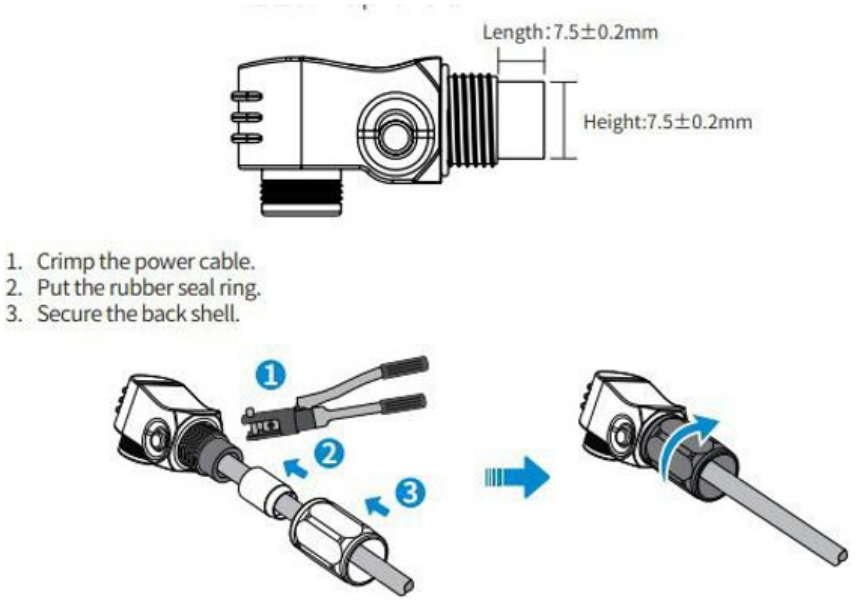
Battery DC Connections

NOTICE

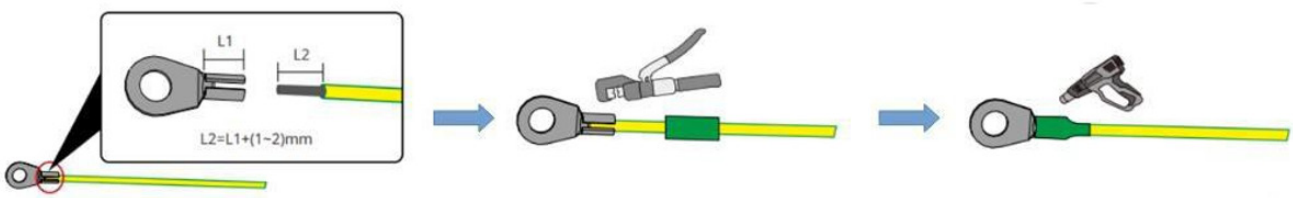
This battery must be used in conjunction with compatible hybrid inverter models. It needs to establish communication with the inverter to activate the lithium battery mode, ensuring optimal performance.

Cable Requirements

1. Power Cable:
   - Connect the orange power cable to the orange harness and the black power cable to the black harness.
   - Crimping specifications:
     - Cross-sectional area: 35 mm²
     - Withstand voltage: DC 1500V
     - Operating temperature range: -40°C to 115°C
     - Stripped conductor length: 23 ± 1 mm
   - Secure the back shell and ensure there are no gaps or loose connections.
   - Use a manual hydraulic tong with a 35 mm² die.
   - Ensure a minimum tensile force of ≥ 2200N after crimping.
   - If the battery is not connected, cover the port with a protective cover to prevent dust, moisture, or accidental contact.



2. PE Cable:
   - Disconnect the power supply before disassembling the equipment.
   - Use a PE cable for grounding.
   - After crimping, ensure the traction force of the cable is at least 400N.
   - At least one of the two grounding cables must be connected to the ground.
   - Keep all other grounding cables intact.
   - Cable gauge: 10 AWG.
   - Must be suitable for outdoor use and meet relevant safety requirements.



WARNING

- Follow all instructions carefully to protect the battery BMS and avoid damage.
- Ensure both the battery and inverter are completely turned off before connecting cables to prevent fire, electric shock or equipment damage.
- Use only the supplied DC cables when connecting the battery.
- Voltage caution: Maximum battery voltage is 60V, higher than the safe touch voltage of 36V. Avoid direct contact with exposed terminals during installation.
- Polarity is critical: Terminals and wires must only connect to the intended points. Positive (+) and Negative (-) polarity are clearly marked on each module. Prevent wires or terminals of opposite polarity from contacting each other.
- Wire and tool safety: Use insulated tools and ensure wires are properly stripped and securely connected. Avoid loose connections.
- Check connections: After connecting, double check polarity, tightness, and cable routing to prevent short circuits or overheating.

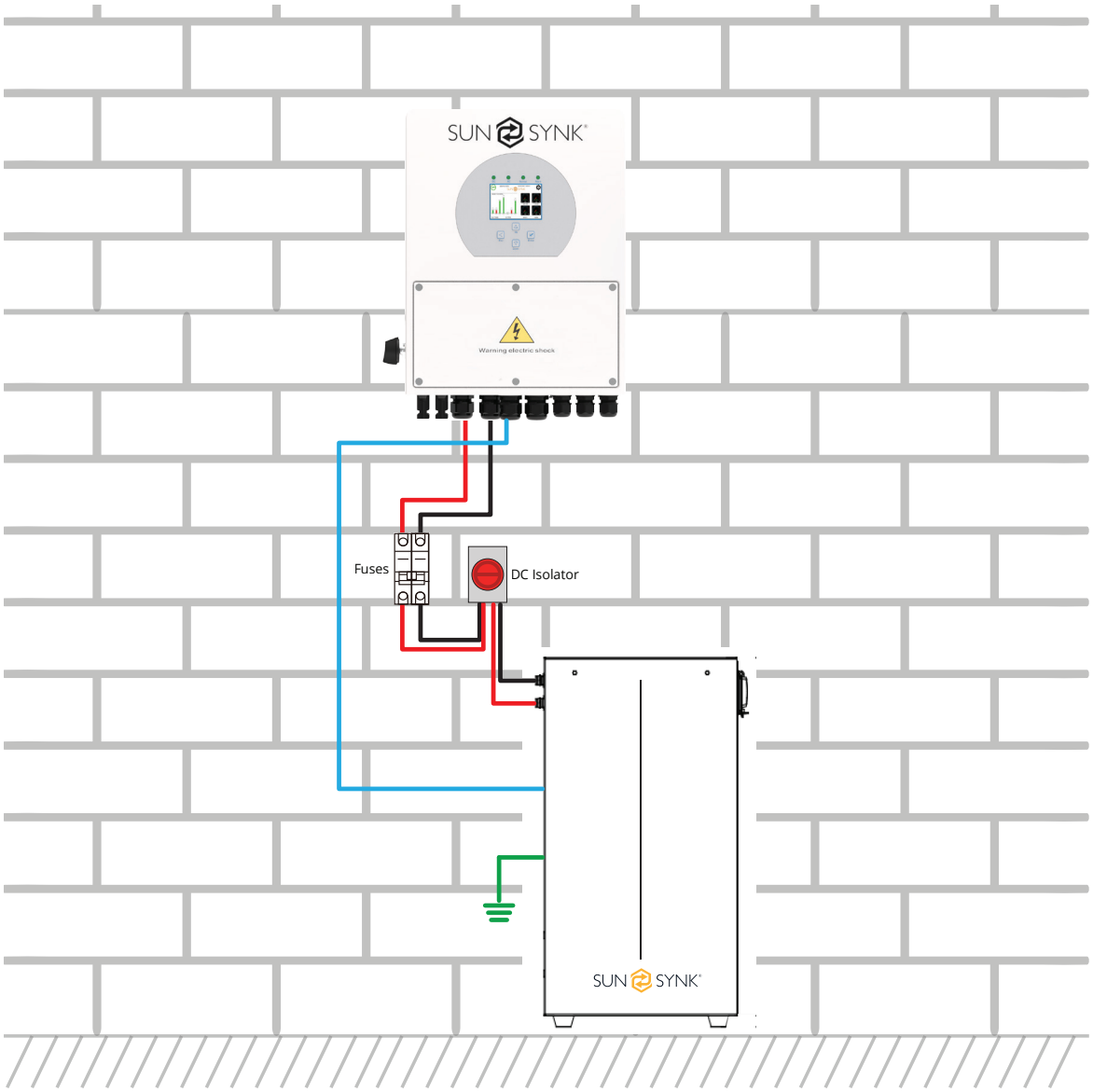
Ground Wire Cabling

- Purpose: Grounding ensures user safety, protects equipment from faults, and prevents potential overvoltage damage.
- Connection: Use only the supplied grounding cable. Connect the battery's grounding terminal directly to the system or building ground. Ensure all connections are tight.
- Routing: Route the ground cable along a safe, unobstructed path. Avoid running parallel DC or AC cables to reduce electromagnetic interference.
- Verification: Measure resistance between the battery ground and system ground; it should meet the local electrical standards (typically < 1Ω). Inspect periodically for loosened connections or damage.

NOTICE

Never operate the battery without a proper ground connection. Grounding must always comply with local electrical codes and the battery manufacturer's instructions.

Single Battery Connection



NOTICE

DC Breaker Requirement and Sizing

A 2-pole DC breaker must be installed between the battery and inverter, as shown in the wiring diagrams. This ensures both the positive and negative conductors are isolated during maintenance or in the event of a fault.

When selecting the DC breaker, consider the following parameters:

- Battery operating voltage range: 43.2 V – 57.6 V
- Maximum charge/discharge current: 157 A

Inverter DC Input Rating and Protection Requirements

It is recommended to use a 200 A, 2-pole DC breaker rated for at least 80 V DC.

This ensures safe and reliable operation under all charging and discharging conditions, and provides adequate protection against overcurrent events.

Step-by-Step Connection

Step 1 - Grounding:

1. Connect the battery ground cable securely.

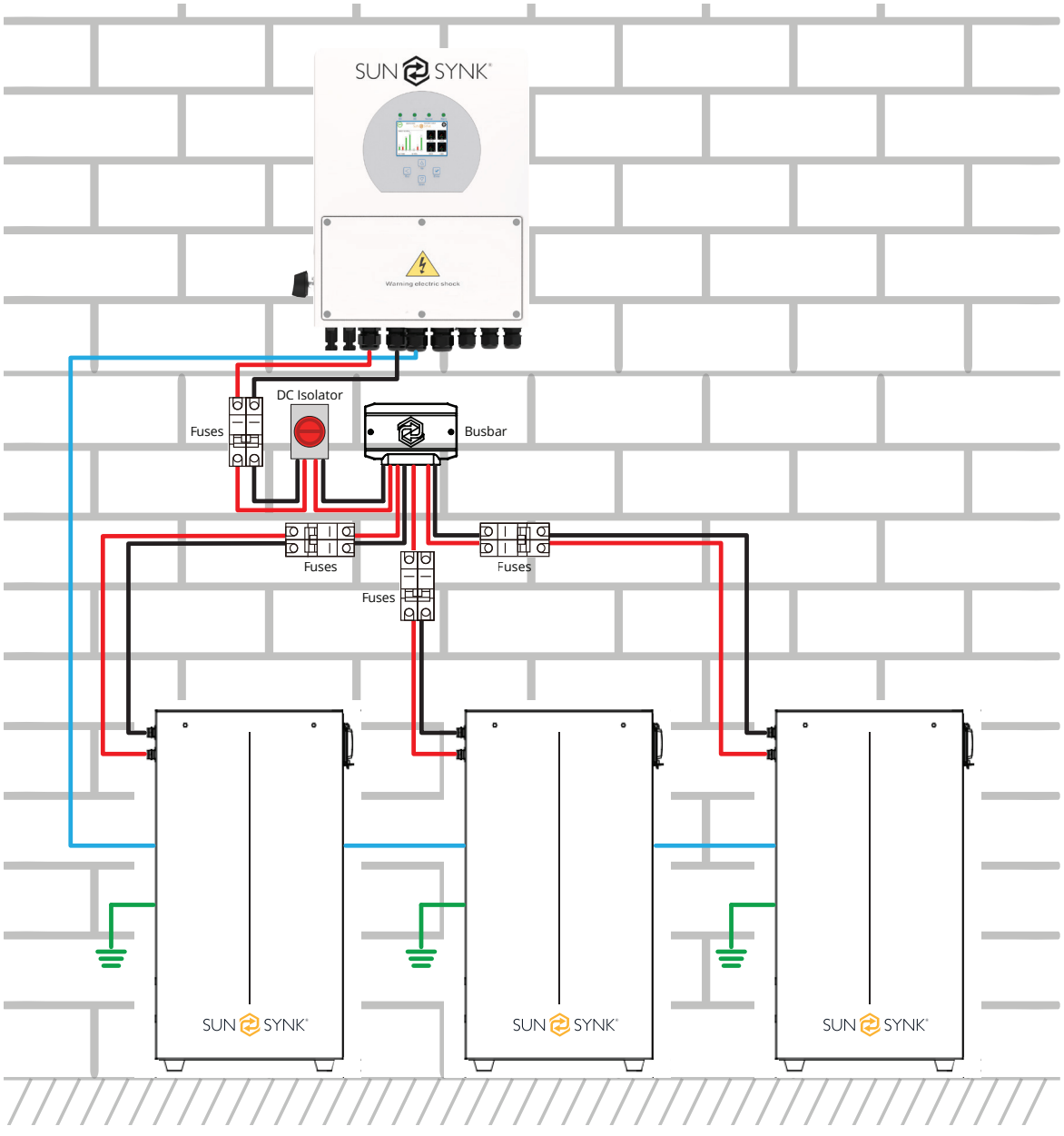
Step 2 - Connect Power Cables and DC Fuse Breaker:

1. Remove protective covers from battery terminals.
2. Connect negative (-) cable
3. Connect positive (+) cable
4. Connect a correctly rated DC Fuse Breaker and Isolator between battery and inverter.

Step 3 - Inverter Connection:

1. Confirm DC Fuse Breaker and Isolator are installed.
2. Remove inverter terminal covers.
3. Connect positive (+) battery cable to inverter positive terminal.
4. Connect negative (-) battery cable to inverter negative terminal.
5. Route cables neatly; secure with cables ties.

Multiple Battery Connection Procedure



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WARNING

- Use cables of the same diameter and length for each battery to ensure current balance.
- A Sunsynk Bus-Bar must be used for parallel connections.
- Install DC fuse breakers and Isolator for each battery: between the battery and Bus-Bar, and between the Bus-Bar and the inverter.
- This arrangement ensures battery protection, safe isolation, and reliable operation.

Step-by-Step Connection:

Step 1: Prepare Batteries

- Wear protective gloves.
- Inspect all batteries and cables for damage.

Step 2: Connect Battery Terminals

- Following the single-battery connection procedure, connect negative (–) and positive (+) cables to each battery terminal.

Step 3: Install Individual DC Fuse Breakers and Isolators

- Route each battery's positive and negative cables through its respective DC fuse breaker / Isolator.

Step 4: Connect to Bus-Bar (Follow the Bus-Bar installation instructions provided in its user manual)

- Connect all battery cables from the individual DC Fuse Breakers / Isolators to the Sunsynk BusBar.

Step 5: Install Bus-Bar DC Fuse Breaker / Isolator to Inverter

- Install a DC Fuse breaker / Isolator between the Bus-Bar and the inverter to protect the system.

Step 6: Connect Inverter

- Connect the Bus-Bar positive and negative outputs to the inverter terminals following the standard inverter connection procedure.

Step 7: Cable Management

- Route and secure all cables neatly. Use cable ties and avoid tight bends.

Step 8: Verify Connections

- Double-check polarity, fuse ratings, and grounding.
- Ensure all connections are tight and secure before powering on the system.

Battery Communication Connection

- **Single Battery Communication Setup**
  - Connect a BMS Cable from the inverter's CAN port directly to the PCS port of the battery.
  - This allows proper communication between the inverter and the single battery for control and monitoring.
- **Multiple Battery Communication Setup**
  - Connect the inverter's CAN port to the PCS IN port of the master battery.
  - Daisy-chain from the master battery's PCS OUT port to the PCS IN port of the second battery (Slave 2).
  - Continue by connecting from Slave 2's PCS OUT port to the PCS IN port of the third battery (Slave 3).
  - Repeat this sequence for additional batteries as required.

NOTICE

This communication connection enables reliable battery-to-inverter communication. In systems with multiple batteries connected in parallel, the communication is routed through the master battery, ensuring synchronized and stable communication across all connected units.

Important: For adding new batteries to an existing system, refer to **Section: Battery Expansion and Use**.

COMMISSIONING

The battery must be installed by qualified personnel, following the relevant national wiring and installation regulations. Prior to powering ON, the qualified personnel must complete the following checks:

- Ensure that the entire system is completely OFF.
- All cables are securely connected (power, ground, and communication).
- Polarity is correct (positive-to-positive, negative-to-negative).
- Communication cable is properly linked between the inverter and battery (CAN → PCS).
- DC fuse breakers and isolators are installed and in the OFF position.
- Cables are neatly routed and secured with no sharp bends or mechanical stress.
- Battery and inverter terminals are tightened, and covers are re-installed.
- Grounding connection is verified.

NOTICE

Ensure that the battery is connected only to a compatible low-voltage inverter. This is a critical requirement for safe and reliable operation.

OPERATION AND SETTINGS

After successful commissioning, proceed to test system operation by switching it ON. Verify that all communication responses are functioning correctly, recheck cable connections if any abnormal behavior is observed, and confirm that the battery settings are properly configured.

Power ON/OFF

Power ON Sequence

- Check installation: Ensure cables, grounding, and inverter are OFF.
- Verify system status: Battery breaker OFF, LEDs inactive.
- Turn ON battery: Switch breaker ON and press Power button.
- Wait for initialization: Allow 1-2 minutes for BMS self-check, verify LEDs indicate normal status.
- Power up inverter: Confirm communication: Inverter should display BMS SOC and BMS Voltage ON Li-BMS battery settings menu.

Normal Operation and LED Indicators

During normal operation, the battery functions under the control of its Battery Management System (BMS) and communicates with the inverter to manage charging and discharging. Check the battery charge and discharge is within the C rating of the battery. Too high will damage the battery.

- Checklist for Normal Operation
  - Green LEDs indicate RUNNING/CHARGING/DISCHARGING.
  - No Red or Orange LED indicators.
  - Communication with inverter is stable.
  - Battery SOC changes gradually as charging/discharging progresses.

Check LED Indicator Status Table for more details.

- **Final Confirmation:** Monitor for at least 15minutes, battery charging/discharging current flows correctly, and no alarms or warnings are displayed.

Power OFF Sequence

- Switch OFF inverter: Button OFF → AC breaker OFF.
- Turn OFF battery: Press Power button OFF, then switch breaker OFF / disconnect isolator.
- Verify system is safe: Ensure all lights OFF, wait 5 minutes before handling cables.

WARNING

Never connect or disconnect battery cables while the system is powered ON.

- Always follow the correct order: Start-Up (Battery → Inverter), Shut-Down (Inverter → Battery).
- Wait at least 5 minutes after shut-down before touching cables or components.
- Refer to section **Model Interface Description and Instructions** for LED indicators and BMS warnings.

Communication Faults and Protection Mode

If battery–inverter communication fails during startup or after installation, the Red (ALM) or Orange LEDs will indicate an error. The RUN LED (Green) may switch off or stop blinking, and the battery will enter protection mode, suspending charge/discharge.

To resolve:

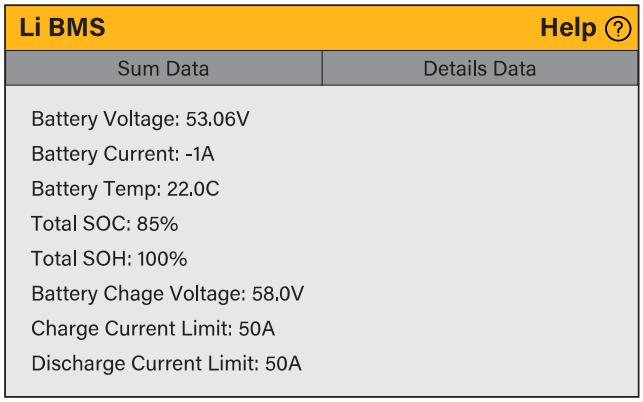
- Check inverter fault codes for error details.
- Verify communication cable is correctly connected (CAN on inverter – PCS on battery) and that the correct cable type is used.
- Inspect and secure all connections.
- Confirm inverter Battery type is set to Lithium.
- For non-Sunsynk inverter, verify compatibility in the with the Sunsynk X 16.07kWh battery and confirm with the inverter manufacturer.
- Restart and reconfigure the system once resolved.

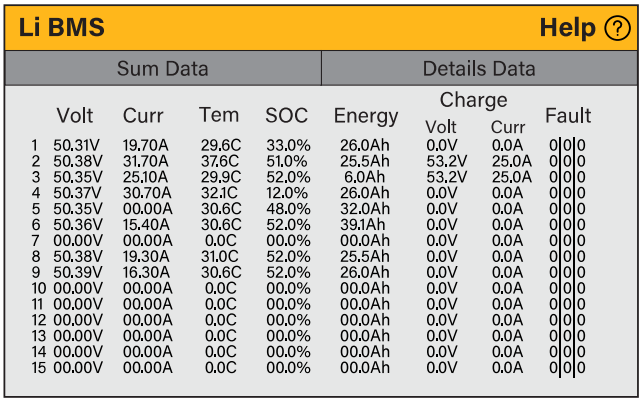
NOTICE

Do not continue operation if Red or Orange LEDs remain active. Contact Sunsynk Technical Support for Assistance.

Battery Settings

After switching ON the battery, check the communications page by clicking on the 'Li BMS' icon to see if the BMS information is visible. Suppose some information is not displayed correctly (it should look like the diagram below to the right), then there will be a communication error, and it can be resolved by reading section Communication Faults and Protection Mode.

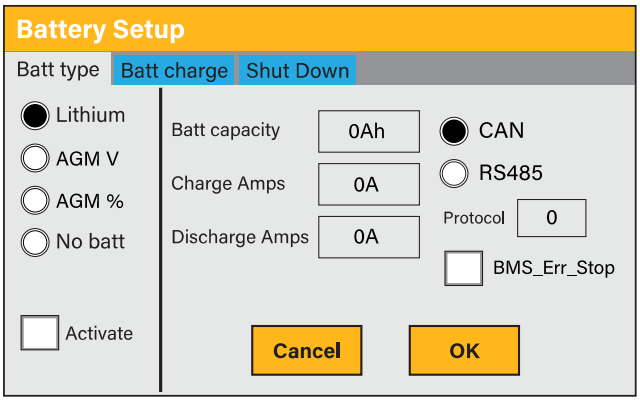


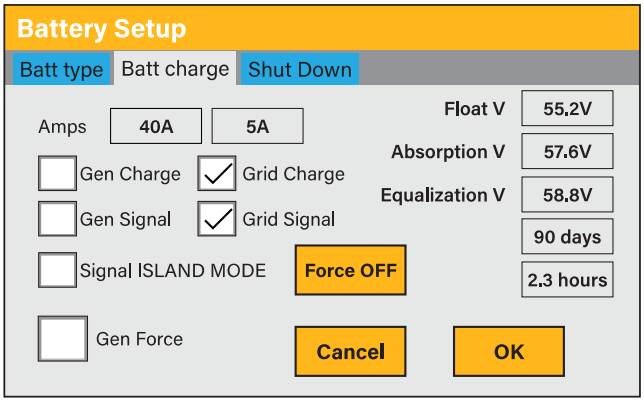


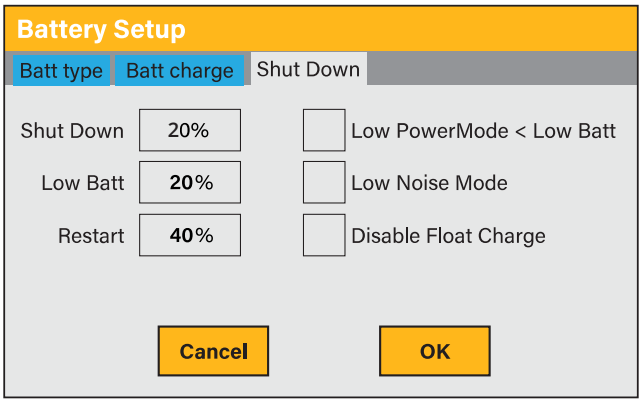
When the 'Li BMS' indicator appears, it confirms communication between the inverter and battery.

Setting Up Lithium Battery

- Click the 'BATTERY' icon and go to the 'Batt Type' column.
  - Select 'Lithium', set the battery 'capacity', and configure 'charge/discharge' currents according to the battery's technical specifications.
- Choose CAN for BMS communication and enable Activate. This allows recovery of a fully discharged battery by slowly charging from the solar array until normal charging resumes.
- Proceed by setting 'Batt Charge' and 'Shut Down', entering desired operating parameters.







NOTICE

Additional settings can be applied based on system requirements.

For full details, refer to the Low-Voltage Inverter User Manual → Battery Settings.

TROUBLESHOOTING

To assess the battery system's status, users need to utilize additional battery status monitoring software to check the protection mode. Please refer to the installation manual for instructions on using the monitoring software. Once the user identifies the protection mode, consult the following table for solutions and further information.

Fault Type	Possible Causes	Troubleshooting
POWER button no response	Damaged POWER button.	Please contact the supplier to repair or replace the battery.
Short discharge time	Battery SOC is low.	Keep the battery charged continuously and keep the energy storage battery system fully charged.
	Low ambient temperature.	Guarantee the battery to work within the recommended suitable temperature range.
	Product overload.	Check load status and remove non-essential loads.
	Batteries age and capacity decreases.	To replace the battery, please contact the supplier for the battery and its components.
Unable to charge and discharge	Internal failure.	Refer to the LED indicator table for more details and contact the supplier.
	Battery indicates charging or discharging protection failure.	Refer to the LED indicator table for more details and contact the supplier.
	After reaching the SOC protection level, the battery must charge for a while before discharging again.	The battery is charged to the SOC value configured for discharging again.
	Battery over temperature.	Let the battery rest at room temperature for over 3 hours.
After the system is powered on, the LED cannot be lit	LED failure.	Please contact the supplier to repair or replace the battery.
The LED indicator light turned off during operation	1. The battery has entered sleep mode. 2. If the LED still does not light up after restarting, the LED is faulty.	1. Unlatch the POWER button and then relatch it to exit the sleep mode. 2. Please contact the supplier to repair or replace the battery.
Abnormal battery communication	Communication disconnection.	Check whether the battery stack is installed reliably.
The inverter is powered on for the first time through the battery, and the battery reports short-circuit protection	The parallel capacitor value of the input terminal on the battery side of the inverter is large.	Battery protection can be automatically restored.
Inverter failed to start	The battery voltage is too low or the SOC is below the shutdown protection level.	Charge the battery after starting the inverter from the grid.
Battery and inverter communication failed	1. Communication cable error. 2. Communication protocol mismatch.	1. Check if the signal definitions of the communication interfaces between the battery and inverterare consistent. 2. Contact the supplier to configure the correct communication protocol.

After reviewing the provided data, please forward it to our customer service team. They will assess your issue and provide you with the most suitable solution.

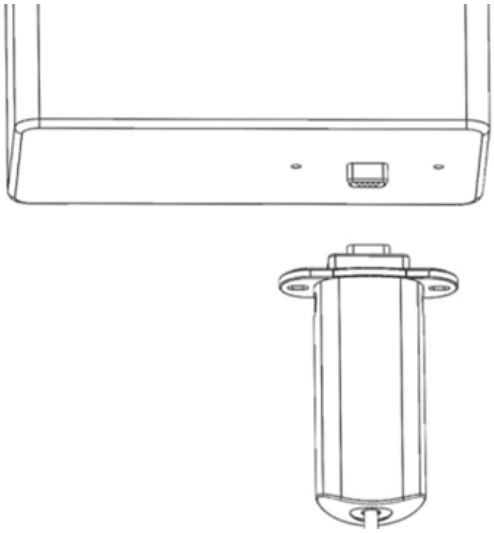
MONITORING

Sunsynk battery monitoring is easily accessible via the Sunsynk Connect and Sunsynk Connect Pro Cloud apps. Sunsynk inverter systems use the CANBUS protocol to maintain continuous communication with connected batteries. To enable monitoring of battery functionality and performance, a data logger must be properly connected to the inverter and to WIFI, and a site plant must be created via the Sunsynk Connect or Sunsynk Pro Cloud apps. For detailed instructions on the Sunsynk Connect or Sunsynk Connect Pro Cloud App and setting up system monitoring, refer to the Sunsynk Connect or Sunsynk Connect Pro User Manual on sunsynk.org

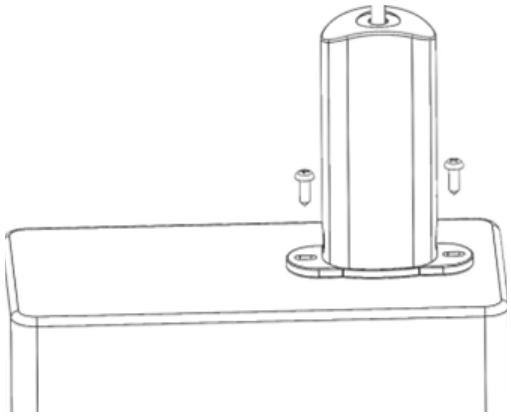
The following illustrations show how to register, create a plant for a site and monitor a battery online with ease.

Data Logger Installation

1 Insert the Data Logger into the DB9 interface of the inverter, as shown in the following figure.

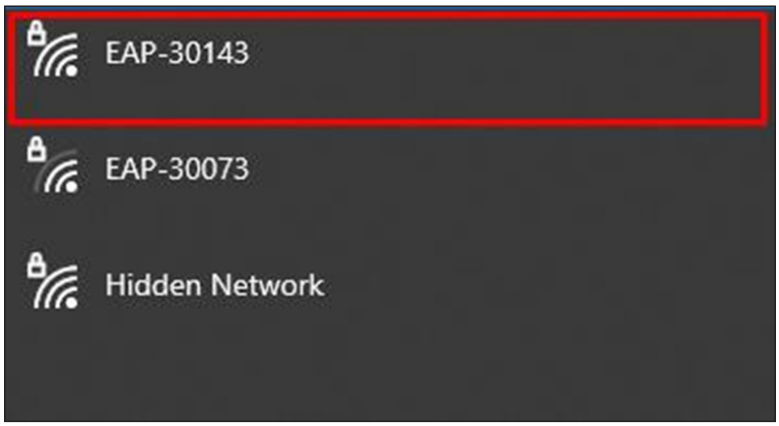


2 Insert the two screws that come with the Data Logger trough the holes, and then tighten them with a Phillips screwdriver, as shown in the figure below.

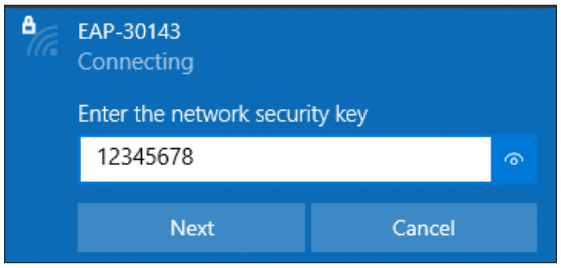


Connecting to Wi-Fi

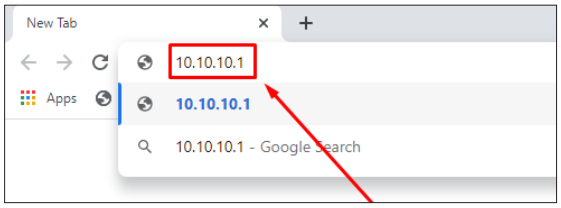
To connect the data logger to the Wi-Fi you need to go to the Wi-Fi setting on your device and search for it. You will see an available connection with the SSID 'EAP-*****' ('*****' are the last 5 digits of the serial number on the data logger).



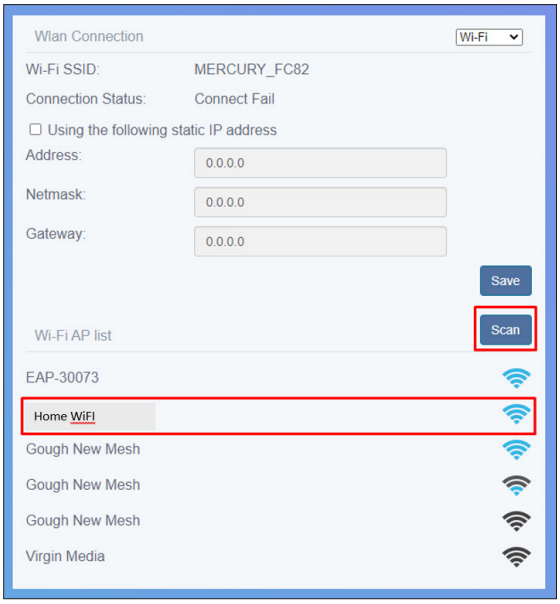
1 Select the correct connection and then enter the password 12345678.



2 Once you have connected to the EAP connection, you need to connect it to your own Wi-Fi. To do this, open the Internet browser and search the IP address 10.10.10.1.



3 Once connected, click 'Scan' to search the Wi-Fi List and you should then see your Wi-Fi connection.

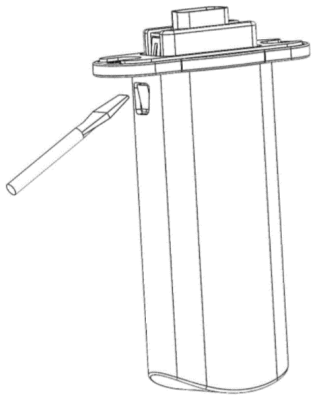


4 Select your Internet / Wi-Fi connection, enter your password, and click 'Connect'.

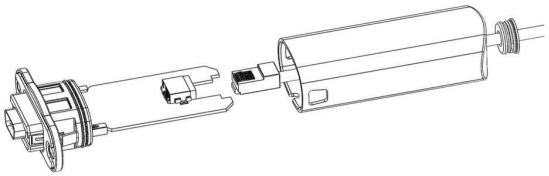
5 Once your data logger is connected to your Wi-Fi, you can then disconnect from the data loggers EAP connection and connect back to your usual Wi-Fi connection.

Network Cable

1 Use a flat-blade screwdriver to press the buckles on the left and right sides of the shell, as shown in the following figure. Then extract the DB9 interface part manually.

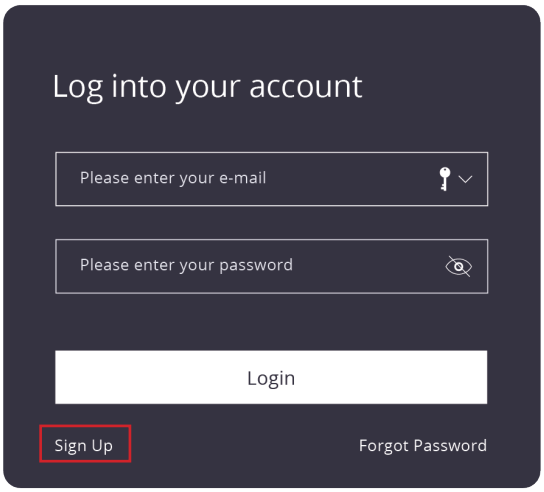


2 Pass the network cable through its specific hole at the bottom of the shell. Then, insert the RJ45 plug into the RJ45 socket, and place the sealing plug with the hole on the network cable, as shown in the figure below.

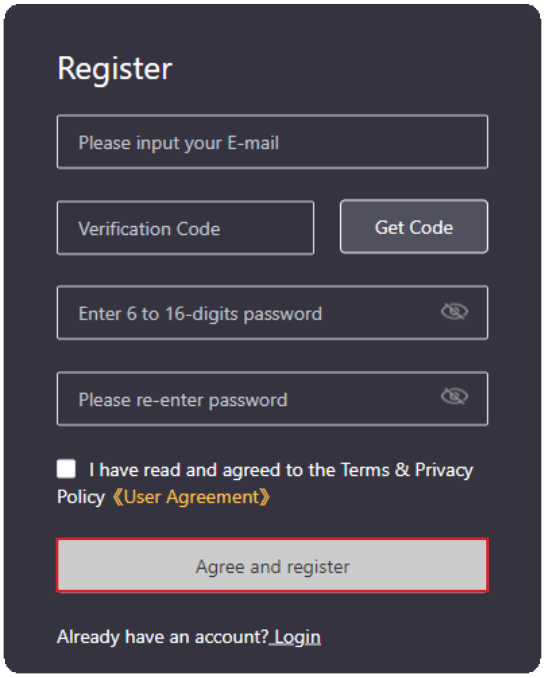


Registration

1 Visit https://sunsynk.net in your browser to access the web version of the management tool. Click on 'Sign Up' on the Login page to proceed to the Registration page.



2 Enter a valid email address to receive a verification code. Complete the registration form by setting a password, checking the user agreement box to confirm agreement, and then click 'Agree and Register'.



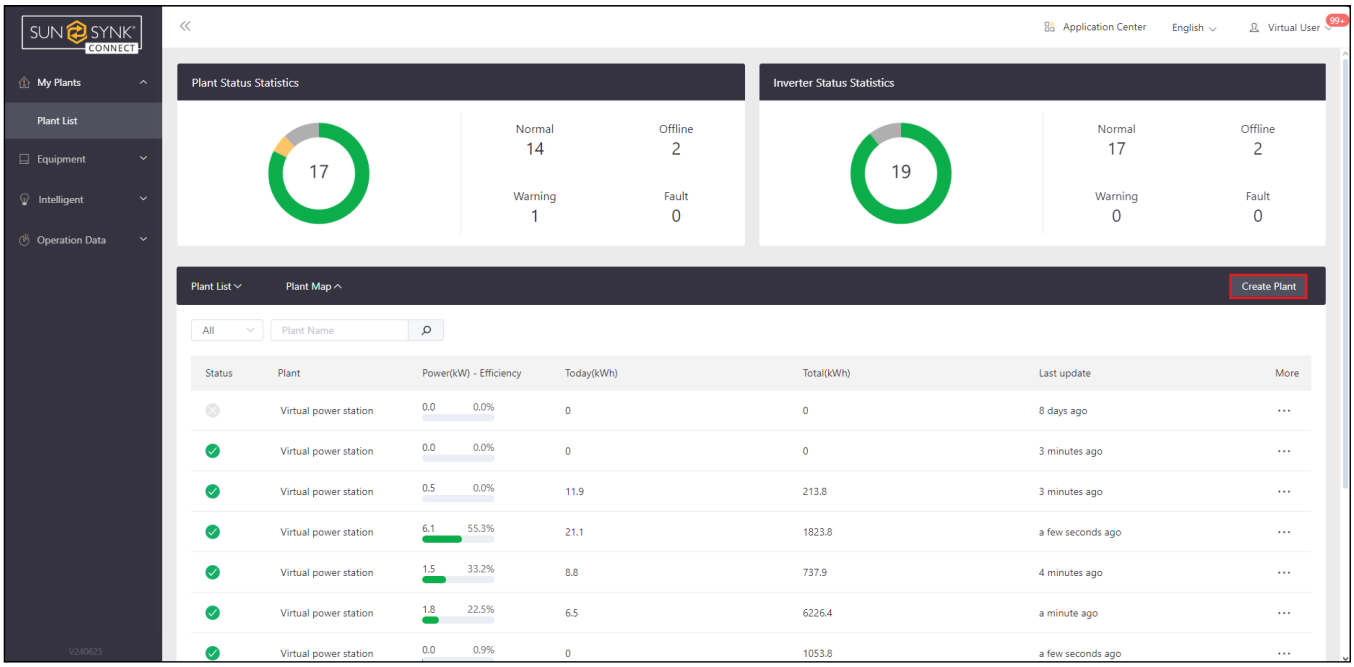
Requesting User Level Access Change

If you are an installer who has registered on the Sunsynk Connect platform, you may initially have a basic user account with limited permissions. To request elevated user access for parameter changes, remote inverter upgrades, and other functions, please visit https://www.sunsynk.org/remote-monitoring and complete the form provided.

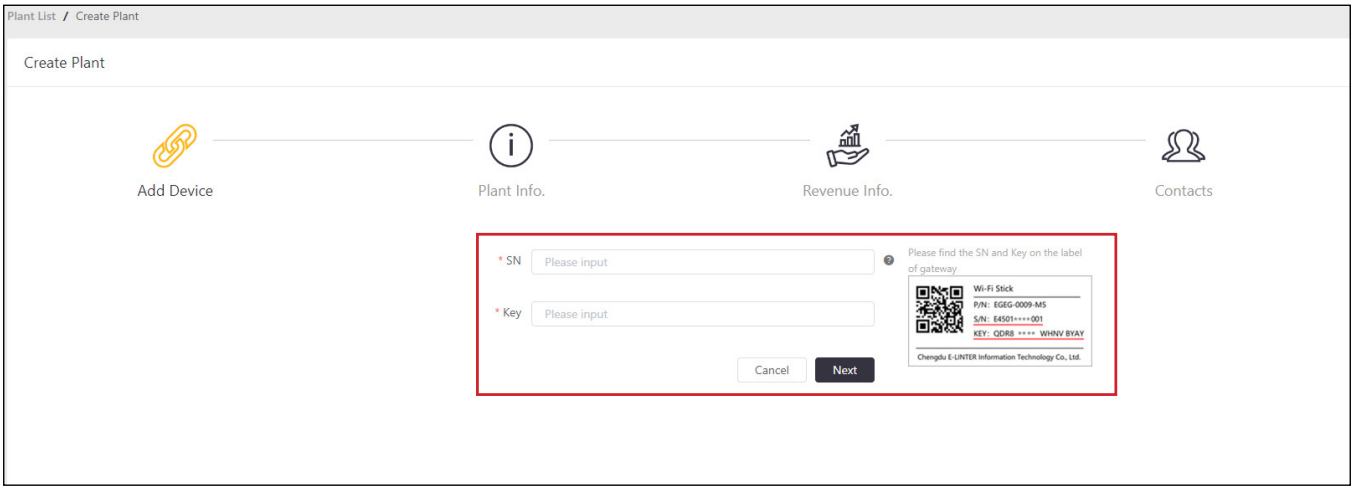
Creating a Plant

1 Navigate to the menu and click on 'My Plant', then select 'Plant List'.

2 To initiate a new plant setup, click on 'Create a Plant' located in the right of the page.



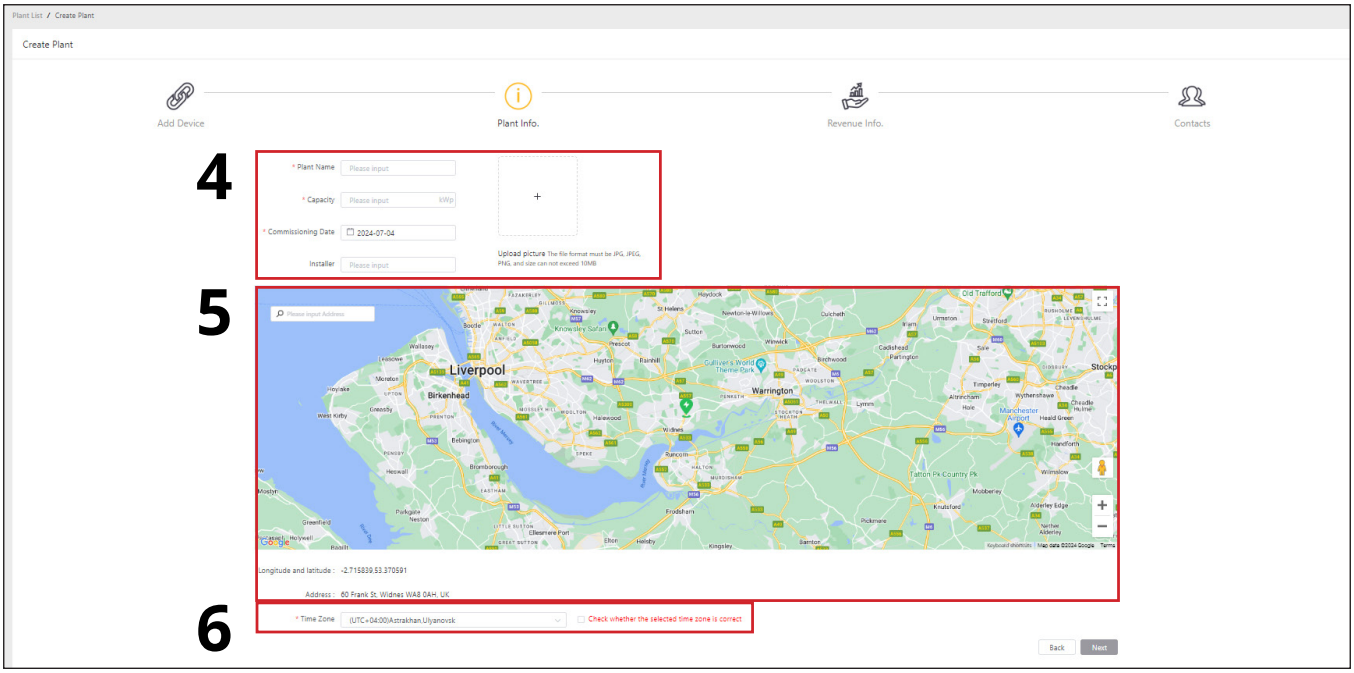
3 Enter the Serial Number (SN) and KEY from the Data Logger label, then click 'Next'.



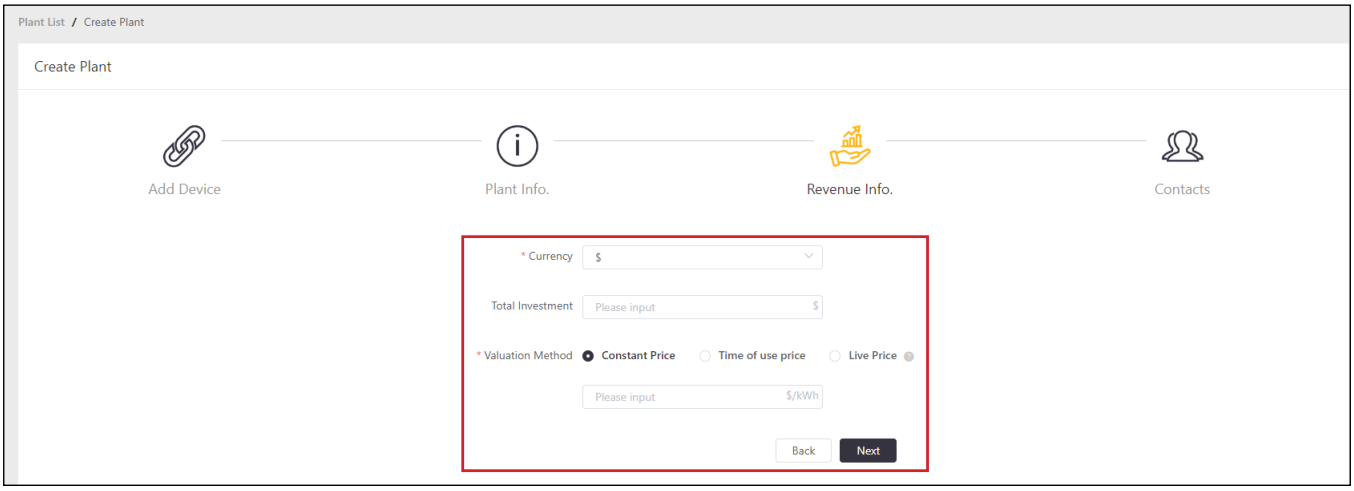
4 Specify the total capacity in the 'Capacity' field and choose the appropriate 'Plant Type'. Note that different types of plants will display different information on the page. To ensure accurate plant statistics, complete all required fields accurately.

5 Enter the installation address of the plant in the address input box on the map to pinpoint the exact location, or use the map to select the correct installation site.

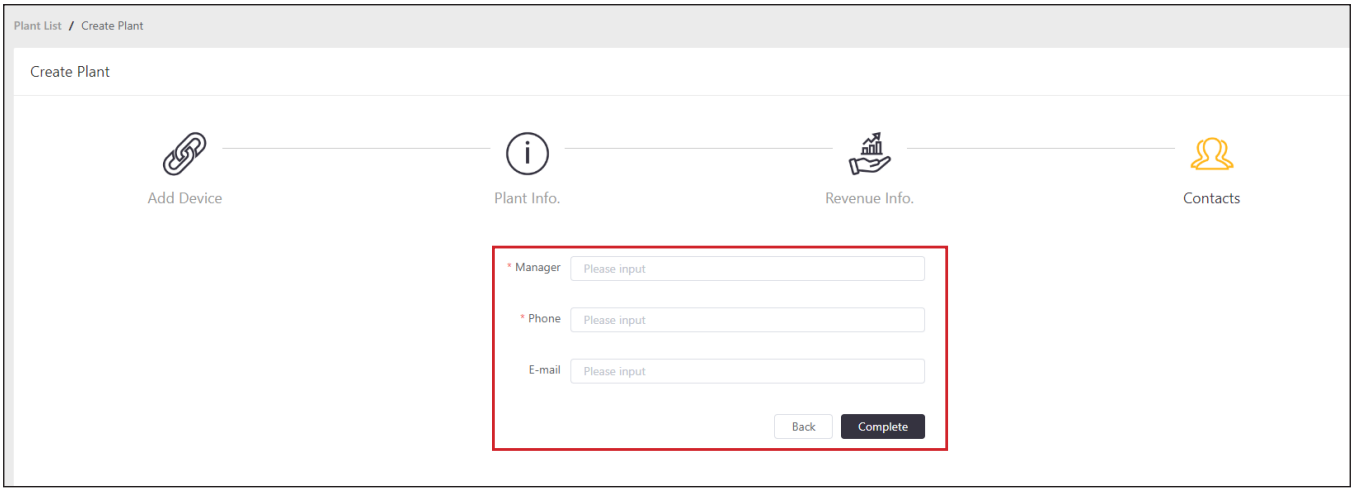
6 Verify and adjust the plant's time zone if necessary. Click 'Next' to proceed.



7 Select your currency, specify the total investment, and choose your preferred Valuation Method.
Note: The Live Price option is currently available only for UK customers.



8 Provide the name, phone number, and email address of the user responsible for managing the system.

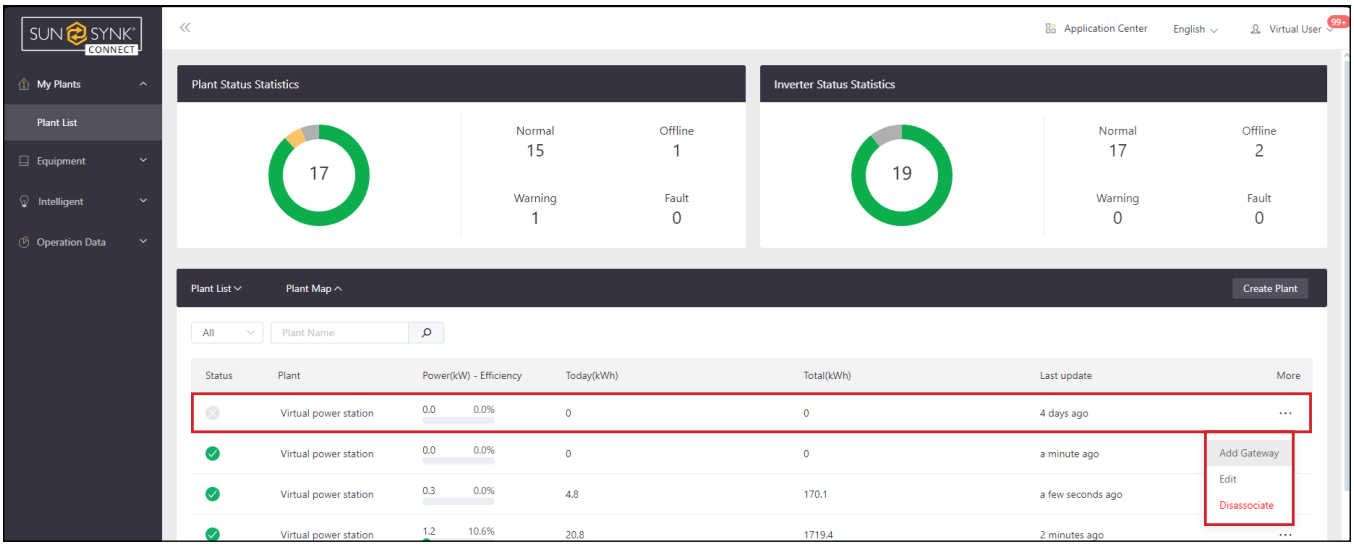


Adding a Device

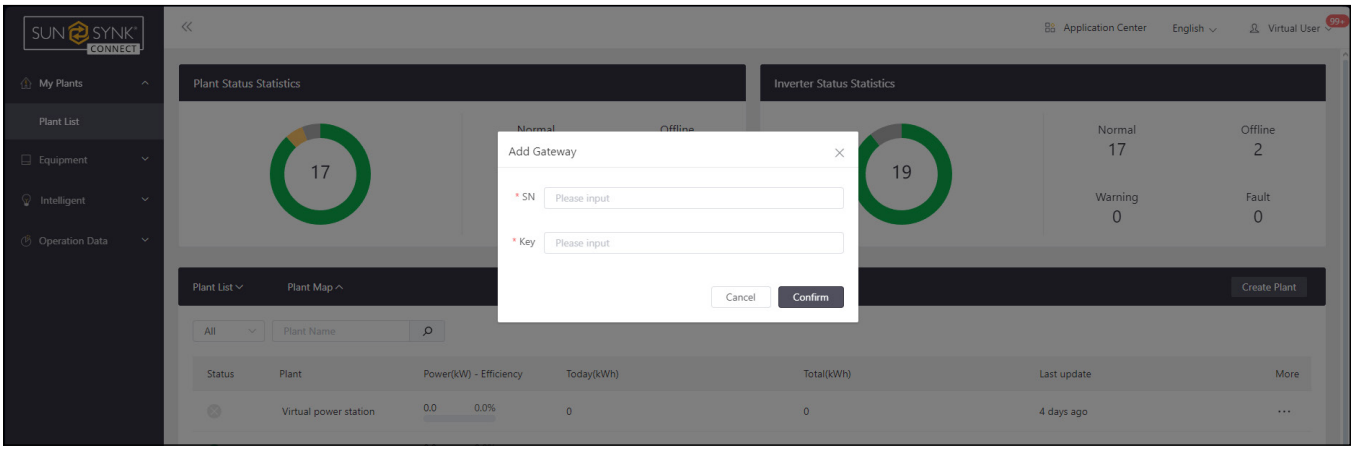
1 In the menu, first click 'My Plant', then 'Plant List'.

2 Select the plant that need to add equipment from the 'Plant List'.

3 Click the 'More (...)' button and Select 'Add Gateway'.



4 Input the serial number SN and key of the Data Logger to be connected, then click 'Confirm'.

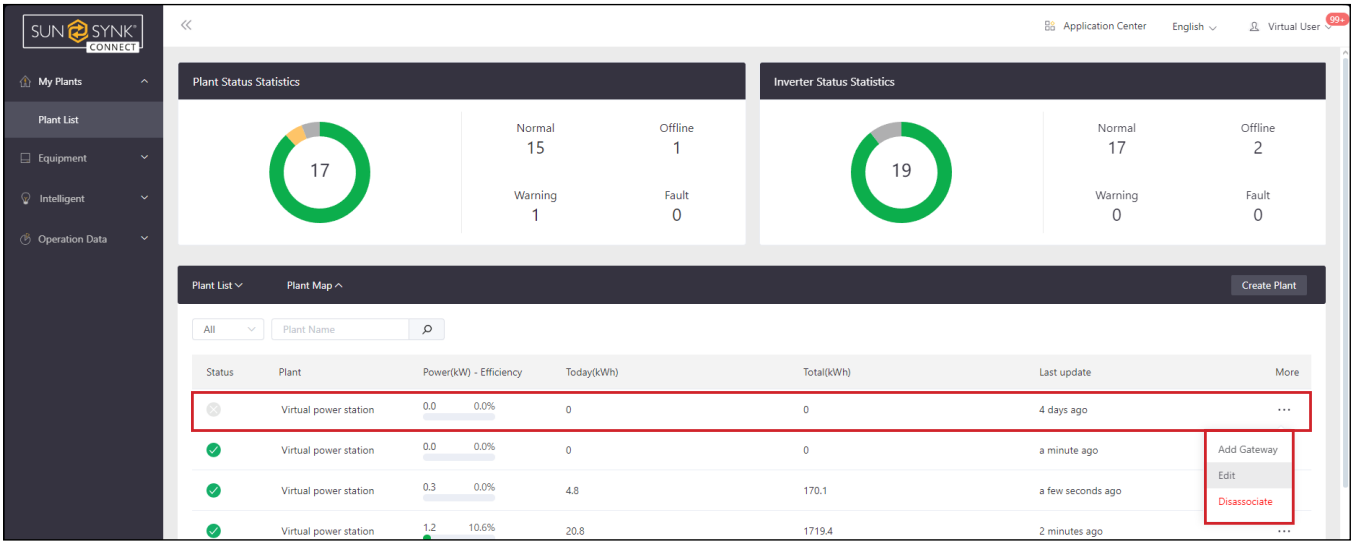


Editing a Plant

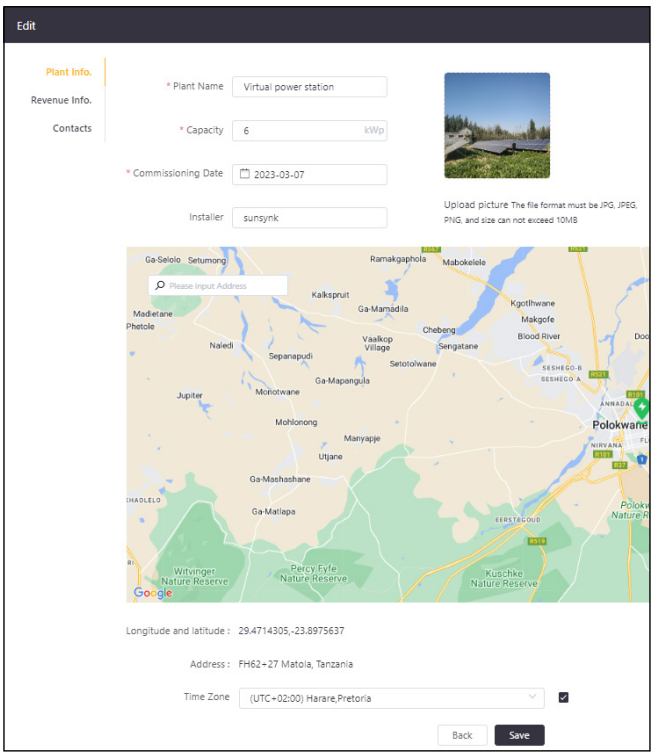
1 In the menu, first click 'My Plant', then 'Plant List'.

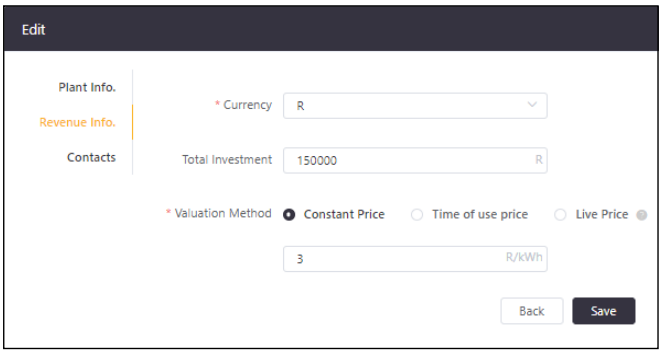
2 Select the plant that need to be edited from the 'Plant List'.

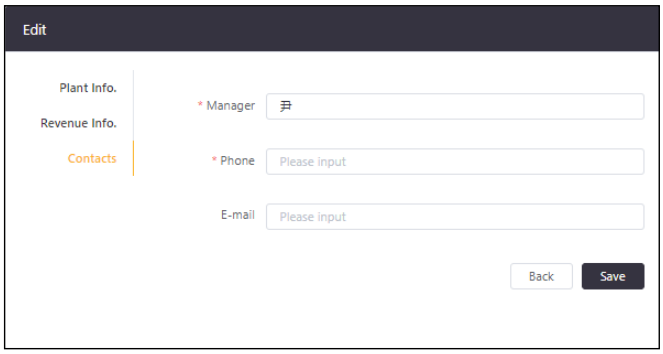
3 Click the 'More (...)' button and select 'Edit'.



4 Review and make edits to any previously entered information as needed.



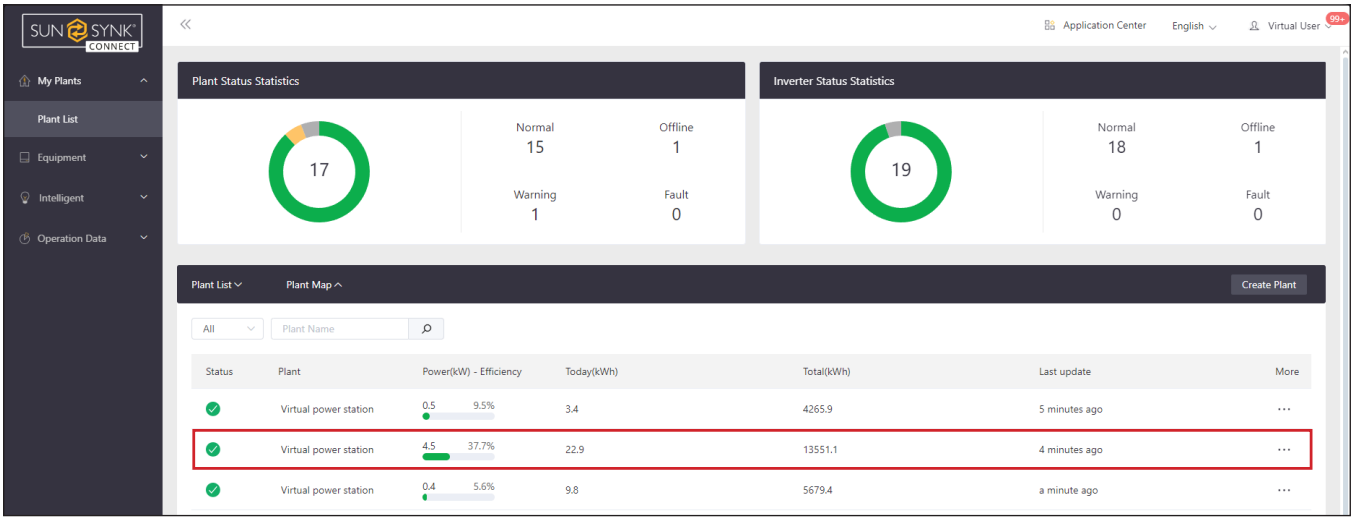




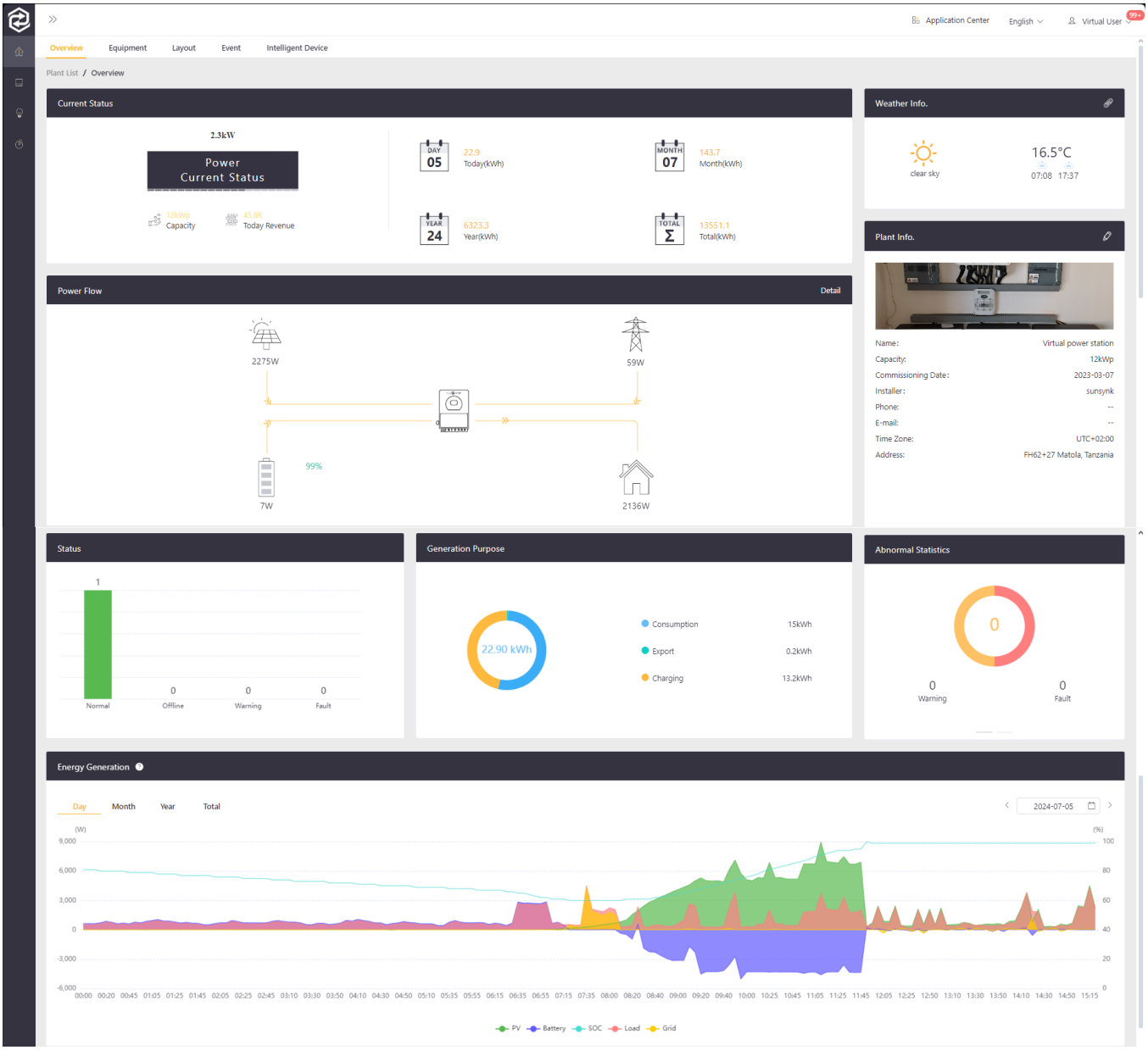
Plant Overview

1 In the menu, first click 'My Plant', then 'Plant List'.

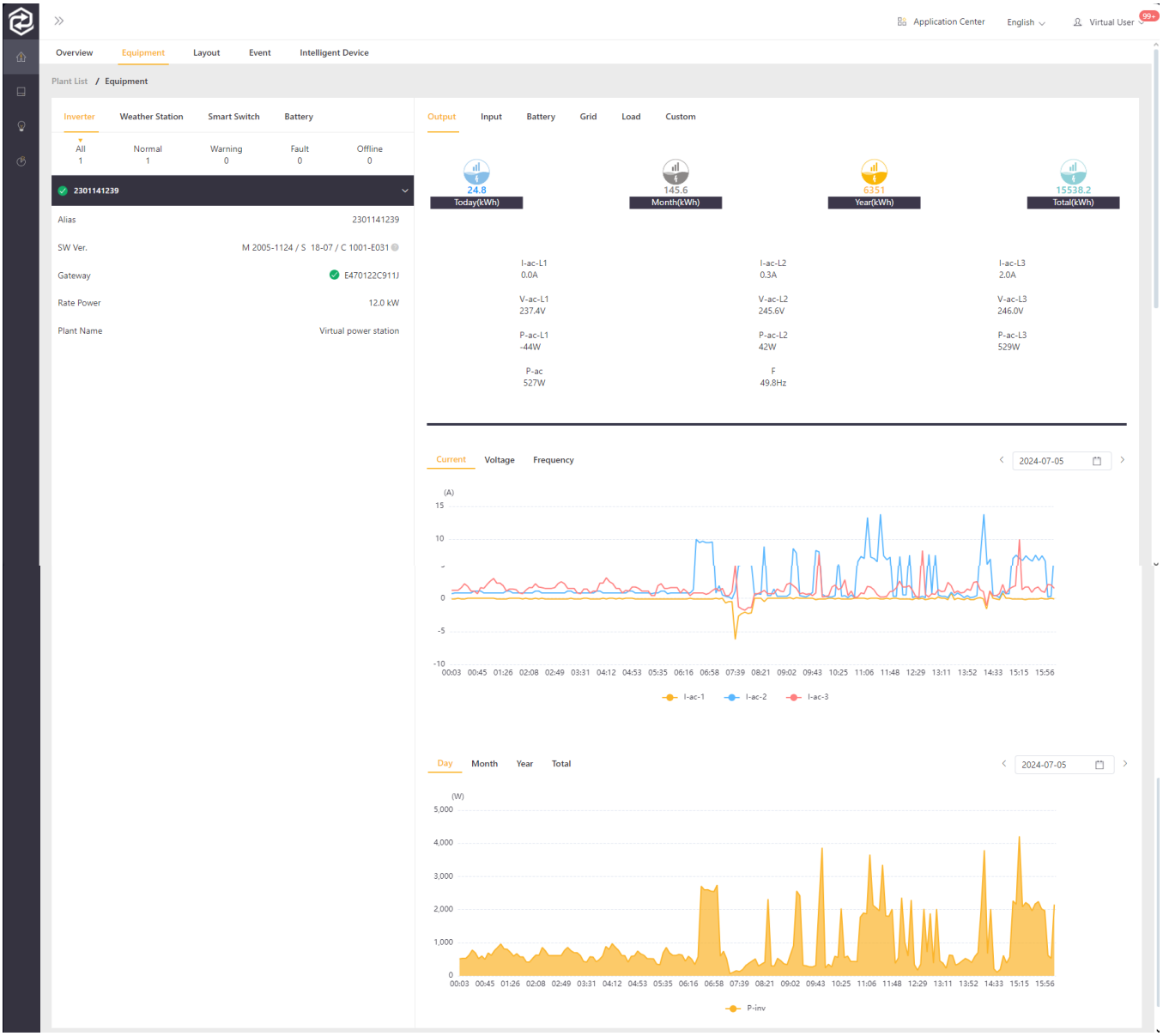
2 Select plant list 'Plant List' and click the corresponding plant name to enter the plant Overview page.



3 On the Plant Overview page, you can monitor the plant's status, weather conditions, energy flow diagram, inverter status, recent abnormalities, power generation charts, and other relevant information (as illustrated on the next page).

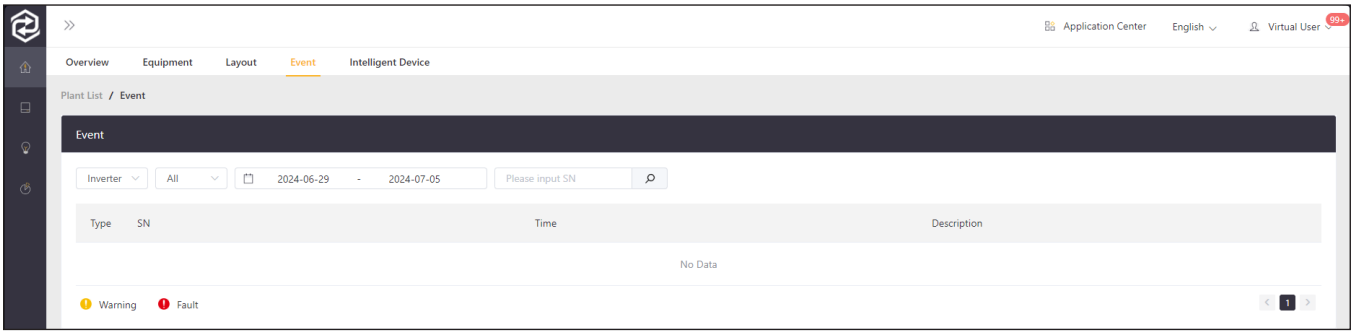


4 Click on 'Equipment' within the Overview page to access detailed information about all equipment installed in the plant. Here, you can view operational data charts, perform remote upgrades, adjust parameter settings, and manage other operations.

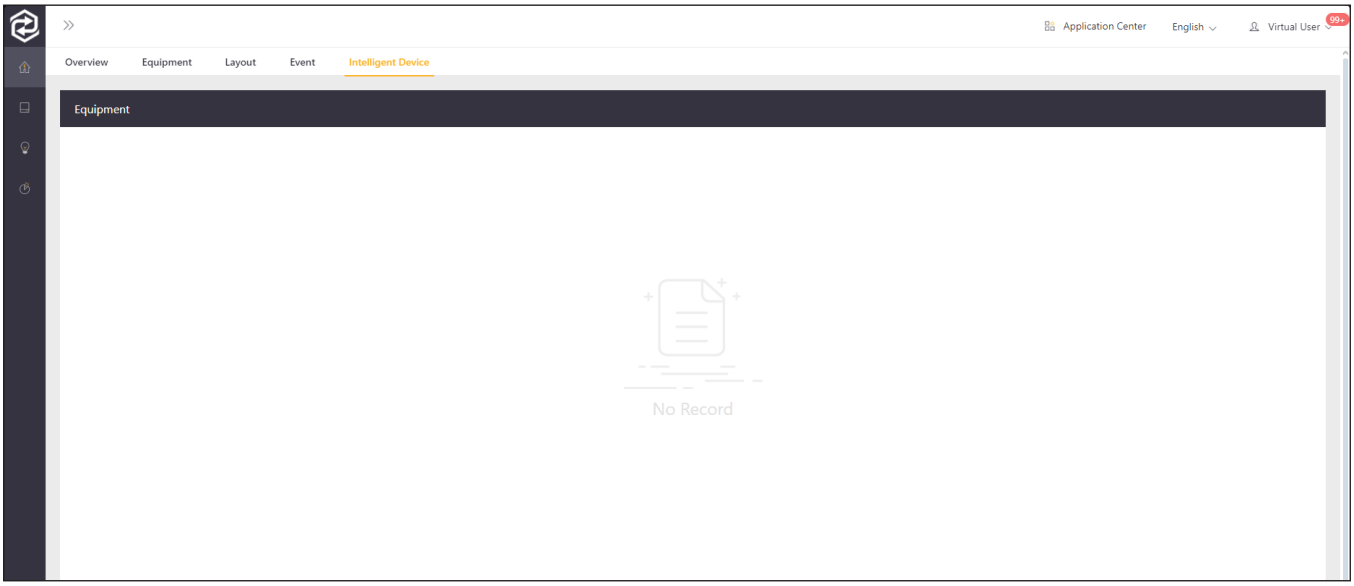


5 On the Plant Layout page, you can monitor the plant's layout.

6 Navigate to the 'Event' menu on the Plant Overview page to switch to the Event page. Here you can view the current plants abnormal information.



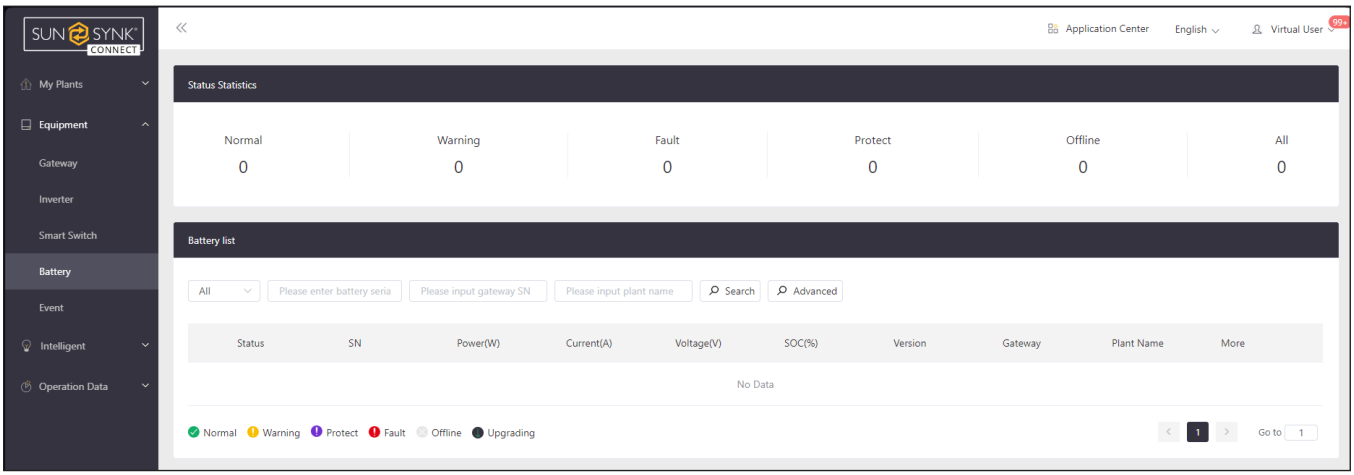
7 On the Plant Intelligent device...



Battery Management

1 In the menu, click 'Equipment', then 'Battery' to enter the Battery List page.

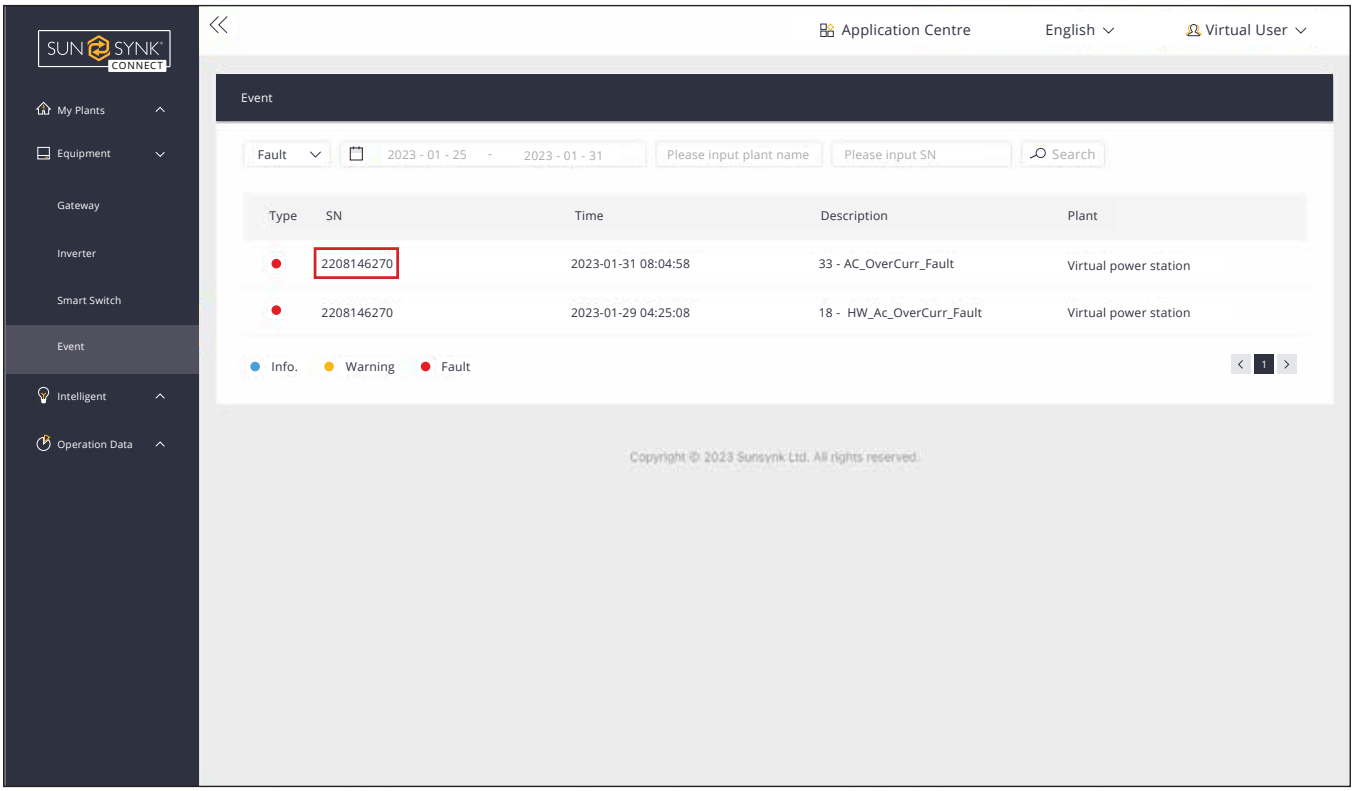
2 On the Battery List page, click on the serial number (SN) of a battery to view its detailed information and operational data.

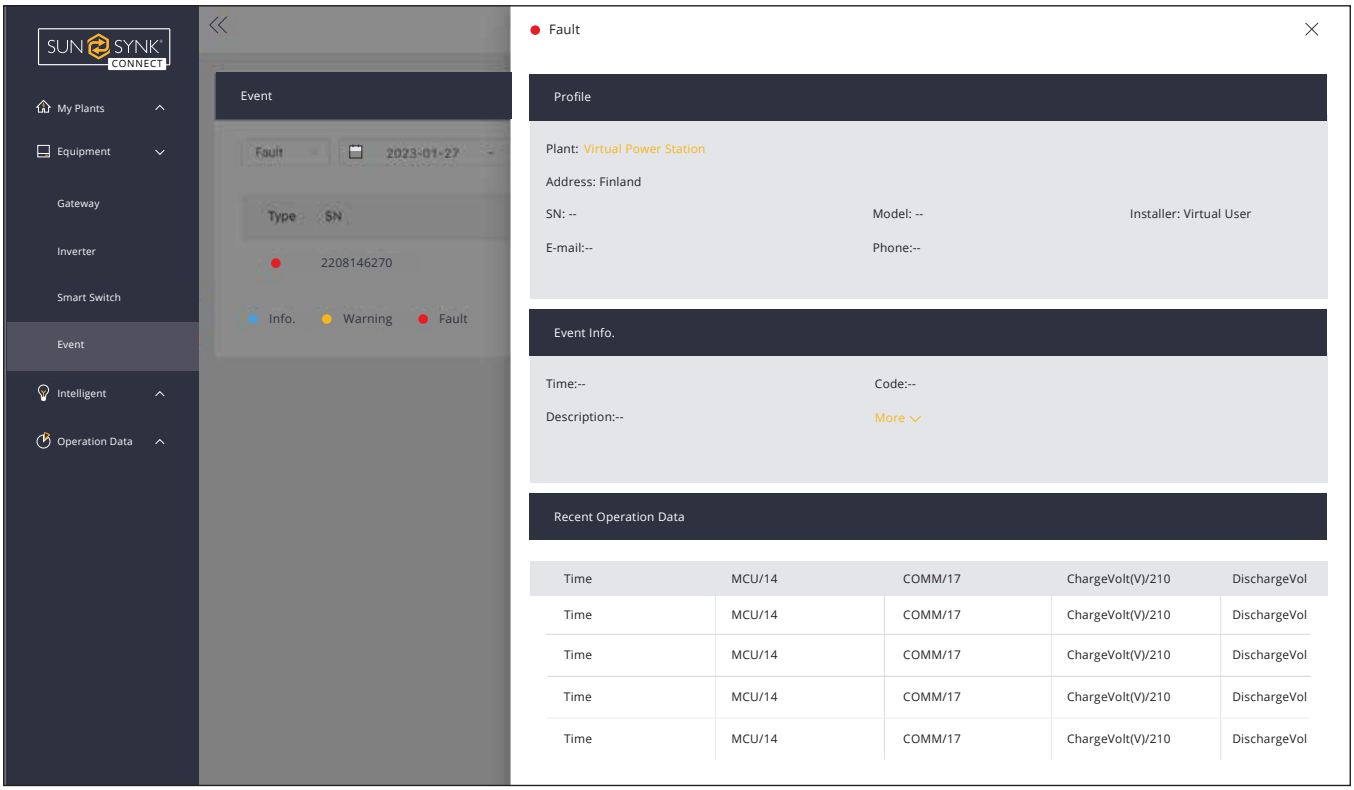


Event

1 In the menu, click 'Equipment', then 'Event' to enter the Event List page.

2 In the Event List page, click on the SN of an inverter to view the detailed information of the event and recent operational data.





INSPECTION, CLEANING AND MAINTENANCE

General Information

- The Sunsynk X 16.07kWh battery isn't fully charged upon shipment. We suggest installing it within three months of arrival.
- During maintenance, avoid reinstalling batteries in the Sunsynk X 16.07kWh to prevent reduced product performance.
- Do not dismantle or dissect any battery in the Sunsynk X 16.07kWh; it's strictly prohibited.
- After over-discharging the Sunsynk X 16.07kWh battery, recharge it within 48 hours. You can also charge the Sunsynk X 16.07kWh in parallel. Connect the charger to the output port of any Sunsynk X 16.07kWh after connecting batteries in parallel.
- Do not open or dismantle the battery as it doesn't contain serviceable parts internally.
- Before cleaning or performing maintenance tasks, disconnect the Sunsynk X 16.07kWh Li-Ion battery from all loads and charging devices. Use the enclosed protective caps on terminals during these activities to avoid terminal contact risks.

Inspection

Inspect the wiring and contacts for looseness or damage, including cracks, deformations, leaks, or any other type of damage. If any damage is found, replace the battery immediately.

- Do not attempt to charge or use damaged batteries under any circumstances.

IMPORTANT: Avoid contact with liquid from a ruptured battery.

Regularly monitor the battery's state of charge. Lithium Iron Phosphate batteries gradually discharge when not in use or during storage. Consider replacing the battery if you notice either of the following conditions:

1. The battery's run time decreases below 70% of the original run time.
2. The battery's charge time significantly increases.

Cleaning

If cleaning is required, use a soft, dry cloth to clean the Li-Ion battery. Avoid using liquids, solvents, or abrasives for cleaning purposes.

Maintenance

The Li-Ion battery is maintenance-free. Charge the battery to approximately over 80% of its capacity at least once every year to maintain its capacity.

STORAGE

The battery product should be stored in a dry and cool environment. Typically, the maximum storage period at room temperature is six months. If storing the battery for over six months, it's recommended to check the battery voltage. If the voltage exceeds 51.2V, you can continue storing the battery. However, it's important to check the voltage at least once a month until it drops below 51.2V. Once the voltage is lower than 51.2V, charge the battery according to the following strategy:

1. Discharge the battery to the cut-off voltage using a 0.2C (20A) current.
2. Charge the battery with a 0.2C (20A) current for approximately 3 hours.
3. Maintain the State of Charge (SOC) of the battery at 40%-60% during storage.

When storing the battery, ensure it's kept away from explosive and flammable areas, and keep ignition sources and high temperatures distant from the battery.

BATTERY RECOVERY

The advanced hydro-metallurgical process is used to recover aluminium, copper, lithium, iron, and other metal materials from discarded $LiFePO_4$ batteries. This process can achieve a recovery efficiency of up to 80%. Here are the steps involved in the process:

Recovery Process and Steps of Cathode Materials

Aluminium foil, being an amphoteric metal, is dissolved in a NaOH alkali solution to form $NaAlO_2$, which enters the solution. After filtration, the filtrate is neutralized with sulphuric acid and precipitated to obtain $Al(OH)_3$. When the pH is above 9.0, most of the aluminium precipitates, and the obtained $Al(OH)_3$ achieves chemical purity after analysis.

The filter residue is dissolved with sulphuric acid and hydrogen peroxide. This process allows lithium iron phosphate to enter the solution in the form of $Fe_2(SO_4)_3$ and Li_2SO_4, separating it from carbon black and carbon coating on the lithium iron phosphate surface. After filtration and separation, the pH of the filtrate is adjusted with NaOH and ammonia water. Iron is first precipitated with $Fe(OH)_3$, and then the remaining solution is precipitated with saturated Na_2CO_3 solution at 90°C.

Since $FePO_4$ is slightly soluble in nitric acid, the filter residue is dissolved with nitric acid and hydrogen peroxide. This process directly precipitates $FePO_4$ and separates impurities like carbon black from the acid solution. It also leaches $Fe(OH)_3$ from the filter residue and precipitates Li_2CO_3 with saturated Na_2CO_3 solution at 90°C.

Recovery of Anode Materials

The recovery process for anode materials is relatively straightforward. Following the separation of the anode plates, the purity of copper can exceed 99%. This high-purity copper can then undergo further refining to produce electrolytic copper.

Recovery of Diaphragm

The diaphragm material is mainly harmless and has no recycling value.

List of Recycling Equipment

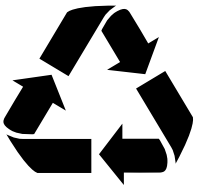
Automatic dismantling machine, pulverize, wet gold pool, etc.

ENVIRONMENTAL DISPOSAL

Used batteries can not be disposed of as household waste. You are obliged to handle waste batteries, such as removal of privacy on product, and return them to designated or authorized recovery point according to applicable regulations and standards on waste battery disposal.

NOTICE

- Do not dispose of batteries and rechargeable batteries as domestic waste!
  You are legally obliged to return used batteries and rechargeable batteries.
- Waste batteries may contain pollutants that can damage the environment or your health if improperly stored or handled.
- Batteries also contain iron, lithium and other important raw materials, which can be recycled.



For more information, please visit sunsynk.org

Do not dispose of batteries as household waste!

TRANSPORTATION REQUIREMENTS

Transport battery products immediately after packaging using cars, trains, or ships. During transportation, avoid exposing the packaging to severe vibration, impact, or compression, as well as direct sunlight or rain.

Always ensure compliance with local, national, and international regulations before transporting Lithium Iron Phosphate batteries. Note that the transport of end-of-life, damaged, or recalled batteries may be restricted or prohibited in some cases.

The transport of Li-Ion batteries is classified under hazard class UN3480, class 9, falling into packaging group PI965 Section I for transport by water, air, or land.

For transportation of lithium-ion batteries assigned to Class 9, use Class 9 Miscellaneous Dangerous Goods and UN Identification labels. Refer to relevant transportation documents for further guidance.

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