AlphaESS
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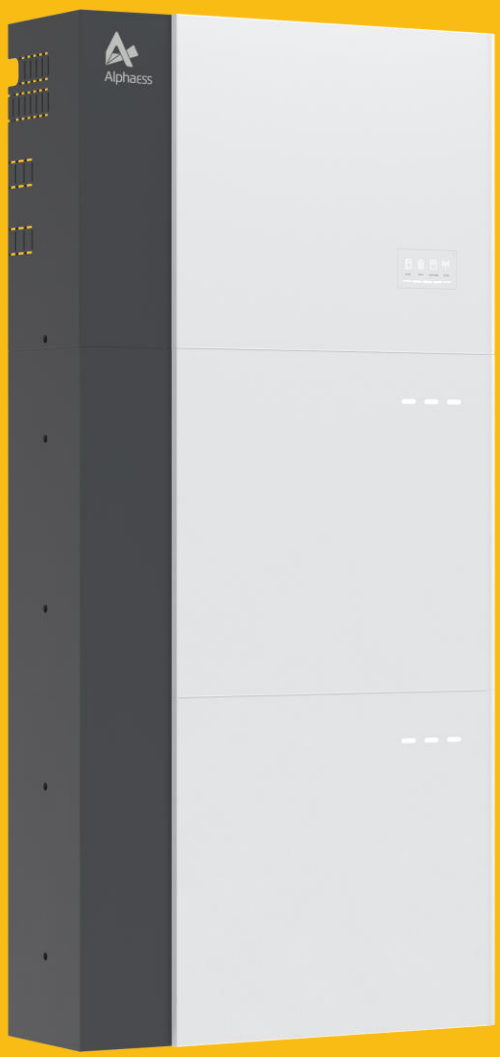
V02.1

User Manual of Energy Storage System(ESS)

SMILE - G3 - T4 / T5 / T6 / T8 / T10 System



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1. Introduction

1.1. Content and Structure of this Document

This document is valid for SMILE-G3 three-phase energy storage system, which includes inverter SMILE-G3-T4/T5/T6/T8/T10-INV and battery SMILE-G3-BAT-8.2P, SMILE-G3-BAT-3.6S/3.8S/4.0S. SMILE-G3-BAT-3.6S is only for the Greek market.
This document describes the mounting, installation, commissioning, configuration, operation, troubleshooting and decommissioning of the energy storage system as well as the operation of the user interface.
Please read all documentation that accompanies the product. Keep them in a convenient place and available at all times.
Illustrations in this document are reduced to the essential information and may deviate from the real product.

1.2. Target Group

This document is intended for qualified personnel. Only qualified personnel are allowed to perform the operations marked with a warning symbol in this document.
Qualified personnel must have:

- Knowledge of working principle of inverters.
- Knowledge of how to deal with the dangers and risks associated with installing and using electrical devices, batteries and energy storage system.
- Knowledge of the installation and commissioning of electrical devices and energy storage system.
- Knowledge of the applicable standards and directives relevant to the product and its installation.
- Understood and complied with this document, including all safety precautions.
- Understood and complied with the documents of the battery manufacturer and inverter manufacturer, including all safety precautions.

1.3. Levels of Warning Messages

The following levels of warning messages may occur when handling the product.

DANGER DANGER indicates a hazardous situation that will result in serious injury or even death if not avoided.
WARNING WARNING indicates a hazardous situation that could result in serious injury or even death if not avoided.
CAUTION CAUTION indicates a hazardous situation that could result in minor or moderate injury if not avoided.
NOTICE NOTICE indicates a situation that could result in property damage if not avoided.
INFORMATION provides tips for the optimal installation and operation of the product.

1.4. Definition of Abbreviations and Nouns

A

AC	alternating current
App	application
AUX	auxiliary

B

BAT	battery
BMS	battery management system

D

DC	direct current

E

EMS	energy management system

I

INV	inverter

P

PV	photovoltaic

2. Safety

2.1. Intended Use

The inverter, batteries and electricity meters together form a system designed to optimise the self-consumption of electrical energy in a household. The inverter transfers energy between AC current and DC current while the battery is used for the storage of energy (typically storing surplus energy produced by solar arrays).

SMILE-G3-T4/T5/T6/T8/T10-INV and SMILE-G3-BAT-3.6S/4.0S are suitable for indoor and outdoor installation.

SMILE -G3-BAT-8.2P and SMILE -G3-BAT-3.8S are only suitable for indoor installation.

The SMILE-G3-T4/T5/T6/T8/T10-INV must only be operated with PV arrays of protection class II in accordance with IEC 61730, application class A. The PV modules must be compatible with this product.

The product is not equipped with an integrated transformer and therefore has no galvanic isolation.

The product must not be operated with PV modules whose outputs are grounded. This can cause the product to be destroyed. The product may be operated with PV modules whose frame is grounded.

PV modules with a high capacity to ground can be used only when their coupling capacity does not exceed 1.0 µF.

All components must be used in a manner and environment in compliance with the requirements of this manual and in compliance with all relevant local Standards and directives. Any other operation may cause personal injury or property damage.

Alterations to the product, e.g. changes or modifications, are only permitted with the express written permission of AlphaESS. Unauthorized alterations will void the product warranty(s). AlphaESS shall not be held liable for any damage caused by such changes.

Any use of the product other than that described in the Intended Use section does not qualify as appropriate.

The enclosed documentation is an integral part of this product. Keep the documentation in a convenient place for future reference and comply with all instructions contained therein.

The type label must remain permanently attached to the product.

2.2. Safety Instructions for Battery

2.2.1. General Safety Precautions

- Before installing any part of the SMILE-G3, please read the Installation Manual completely. If additional hardware is being installed at the same time as the SMILE-G3 unit (e.g. a Backup device or a separate AC-coupled PV system), please read the Installation Manual for each component/system before commencing installation of any hardware. The installation of one piece of hardware may create hazards for the installation of another piece of hardware – be sure to read all Manuals to understand the interaction and safety implications of the combined systems.
- Overvoltage or incorrect wiring can damage the battery and cause deflagration, which can be extremely dangerous.
- All types of battery breakdown may lead to electrolyte or flammable gas leakage.
- The battery is not user-serviceable because there is high voltage in the device.
- Read the label with Warning Symbols and Precautions on the right side of the battery.
- Do not connect any AC conductors or PV conductors directly to the battery which should be connected only to the inverter.
- Do not charge or discharge a damaged battery.
- Do not damage the battery by dropping, deforming, impacting, cutting or penetrating it with a sharp object. Battery damage may cause a leakage of electrolyte or fire.
- Do not expose the battery to an open flame.

2.2.2. Response to Emergency Situations

The battery is designed to prevent the danger caused by malfunction.

- In the case of user exposure to the electrolyte or other internal materials of the battery cells, the list below details recommended actions dependent on the type of exposure:

1. Inhalation: Leave the contaminated area immediately and seek medical attention.
2. Eye injuries: Rinse eyes with running water for 15 minutes and seek medical attention.
3. Skin injuries: Wash the affected area thoroughly with soap and seek medical attention.
4. Ingestion: Induce vomiting and seek medical attention.

If a fire breaks out in the place where the battery is installed, please follow these measures:

- Fire extinguishing methods

1. A Respirator is not required during normal operations.
2. Use an FM-200 or CO_2 extinguisher for battery fire.
3. In the case of a fire in the property but where the fire has not yet reached the battery, if it is safe to do so, use an ABC fire extinguisher and prevent the fire from reaching the battery.

- Firefighting instructions

1. If a fire occurs when charging the batteries, if it is safe to do so, disconnect the battery circuit breaker to shut off the power to the batteries.

2. If the battery is not on fire yet, extinguish the fire before the battery catches fire.
3. If the battery is on fire, do not try to extinguish it but evacuate people immediately.

WARNING

There may be a possible explosion when batteries are heated above 150°C.
The battery leaks poisonous gases when it is burning. Do not approach.

- Effective ways to deal with accidents

1. On land: Place damaged battery in a segregated place and call local fire department or technical service engineer.

2. In water: Stay out of the water and don't touch anything if any part of the battery, inverter, or wiring is submerged.

3. Do not use submerged battery again and contact an AlphaESS-Accredited or Battery-Accredited technical service engineer.

2.3. Symbols Explanation

Symbols on the type label of the energy storage inverter:

Symbol	Explanation
	Beware of a danger zone This symbol indicates that the product must be additionally grounded if additional grounding or equipotential bonding is required at the installation site.
	Beware of electrical voltage The product operates at high voltages.
	Beware of hot surface The inverter can get hot during operation.
	Danger to life due to high voltages in the inverter, observe a waiting time of 5 minutes. High voltages within the live components of the inverter that can cause lethal electric shocks. Prior to performing any work on the inverter, disconnect it from all voltage sources as described in this document.
	WEEE designation Do not dispose of the product together with the household waste but in accordance with the disposal regulations for electronic waste applicable at the installation site.
	Read the Product documentation
	CE marking The product complies with the requirements of the applicable EU directives.
	Certified safety The product is TUV-tested and complies with the requirements of the EU Equipment and Product Safety Act.
	RCM (Regulatory Compliance Mark) The product complies with the requirements of the applicable Australian standards.
	UKCA marking The product complies with the regulations of the applicable laws of England, Wales and Scotland.

Symbols on the type label and warning label of the battery:

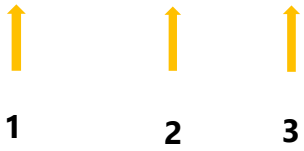
Symbol	Explanation
	Beware of a danger zone This symbol indicates that the battery must be additionally grounded if additional grounding or equipotential bonding is required at the installation site.
	Beware of electrical voltage The product operates at high voltages.
	Risk of chemical burns
	Risk of explosion
	Risk of electrolyte leakage
	Read the Product documentation
	Refer to the instruction for operation Observe all documentations supplied with the product.
	Use eye protection Wear eye protection for all work on the device.
	Fire, naked light and smoking prohibited
	Avoid close proximity. Do not approach the Product unnecessarily.
	Do not short circuit the battery. Touching the short-circuit connection of the battery can result in serious injuries or even death due to electric shock and massive energy release.
	WEEE designation Do not dispose of the battery together with the household waste but in accordance with the disposal regulations for electronic waste applicable at the installation site.

CE	CE marking The product complies with the requirements of the applicable EU directives.
RCM	RCM (Regulatory Compliance Mark) The product complies with the requirements of the applicable Australian standards.
UKCA	UKCA marking The product complies with the regulations of the applicable laws of England, Wales and Scotland.
UN38.3	Marking for transport of dangerous goods The product passes the certifications of the UN38.3.

3. Product Introduction and Application Scenarios

3.1. Naming Convention

SMILE-G3-T10



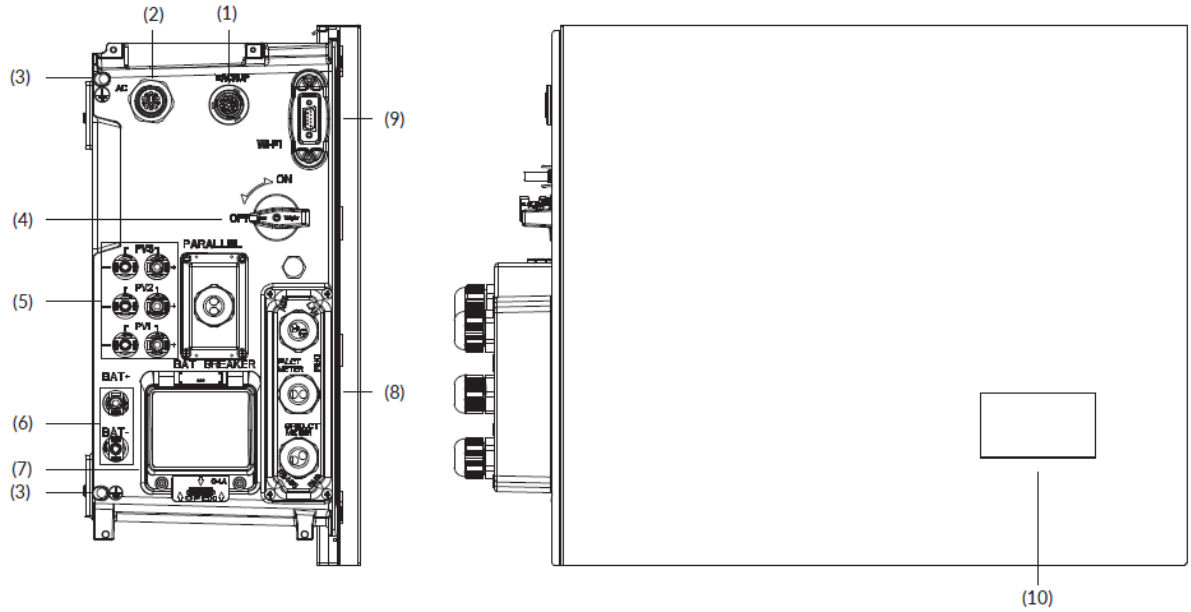
1 2 3

Location	Name	Explanation
1	SMILE	Residential energy storage system
2	G3	Generation 3 of SMILE series
3	T4	**4**kW Inverter with Solar Connections – Three-phase Hybrid energy storage system
	T5	**5**kW Inverter with Solar Connections – Three-phase Hybrid energy storage system
	T6	**6**kW Inverter with Solar Connections – Three-phase Hybrid energy storage system
	T8	**8**kW Inverter with Solar Connections – Three-phase Hybrid energy storage system
	T10	**10**kW Inverter with Solar Connections – Three-phase Hybrid energy storage system

Complete Designation	Designation in This Document
SMILE-G3-T4-INV SMILE-G3-T5-INV SMILE-G3-T6-INV SMILE-G3-T8-INV SMILE-G3-T10-INV	Energy storage inverter
SMILE-G3-BAT-8.2P	Parallel battery
SMILE-G3-BAT-3.6S SMILE-G3-BAT-3.8S SMILE-G3-BAT-4.0S	Series battery
SMILE-G3-T4 SMILE-G3-T5 SMILE-G3-T6 SMILE-G3-T8 SMILE-G3-T10	System/Energy storage system/BESS

3.2. Product Description

3.2.1. Inverter Electrical Interface & Connections Introduction



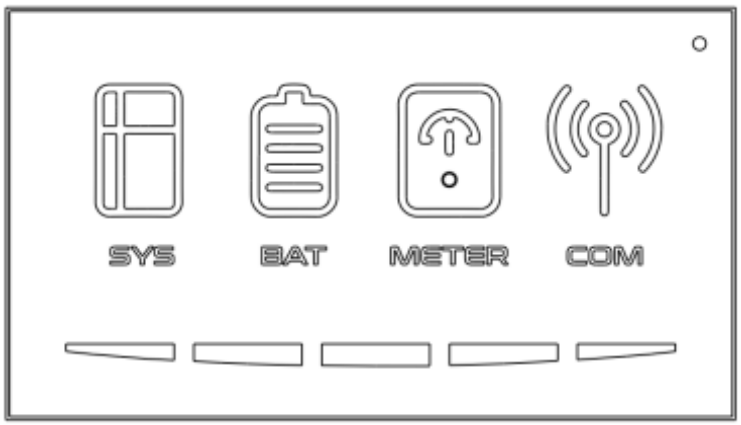
Position	Designation
1	Backup Connector
2	Grid Connector (AC Supply)
3	Grounding Point
4	PV Switch*
5	Positive and Negative PV Connectors, PV1/ PV2, PV3
6	Battery Positive Connector Battery Negative Connector
7	Battery Circuit Breaker*
8	Communication Ports (BMS, RS485, Meter, DRM**&RRCR, LAN, AUX1, AUX2), Refer to Chapter 6.6
9	Wi-Fi Port
10	LED Display

* Battery circuit breaker and PV switch of the inverter are switched off when shipped.

** The DRM is only for regions with AS/NZW 4777.2 safety regulations.

3.2.2. Inverter Display Interface Introduction

LED Display



The upper four LED indicators and one reset button are provided on the display panel. These LED indicators provide information about the operation status of the energy storage system.

Status	Explanation	Status	Explanation
	White light The system works normally		White light The battery works normally
	Red light The system is in fault		No light The battery is in fault
	White light Meter communication works normally		White light Connected to the server
	No light Meter lost		No light Disconnected to the server

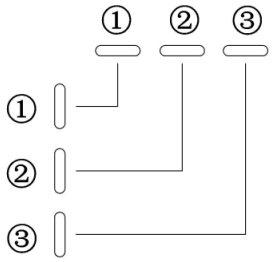
The lower five LED indicators provide information about the State of Charge (SOC) of the batteries connected to this energy storage system.

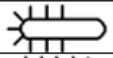
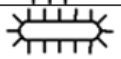
LED Indicator	SOC	Description
LEDs show the SOC of batteries		SOC＜5%
		5%≤SOC＜20%
		20%≤SOC＜40%
		40%≤SOC＜60%
		60%≤SOC＜80%
		80%≤SOC≤100%

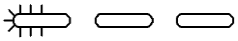
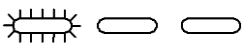
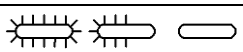
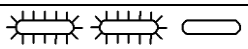
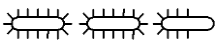
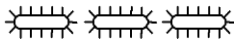
Note that the LED lights provide an approximation of the State of Charge and should be read as an indication and not as a set value.

3.2.3. Battery Display Interface Introduction

During normal operation of battery, three LED indicators on the front cover provide information the State of Charge (SOC) of the battery with white lights glowing and off or flashing (0.5s on, 1.5s off).



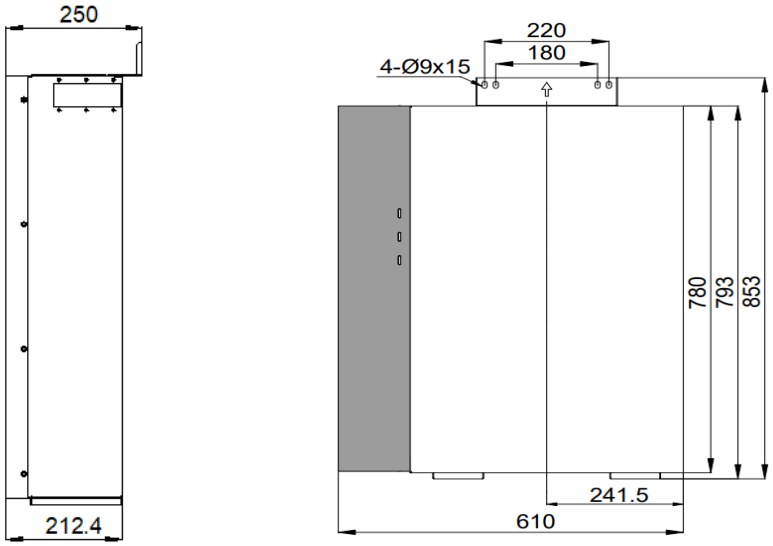
Status	Explanation
	White LED is off.
	White LED is flashing.
	White LED is glowing.

LED Indicator	No.	SOC	Description
LEDs show the SOC status	1		SOC≤10%
	2		10%＜SOC≤30%
	3		30%＜SOC≤50%
	4		50%＜SOC≤60%
	5		60%＜SOC≤90%
	6		90%＜SOC≤100%

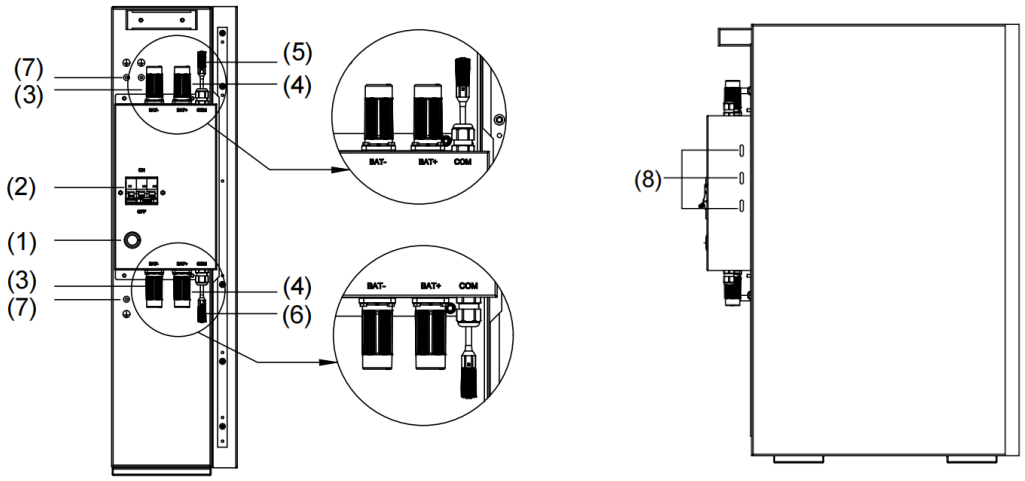
State Display
The LEDs indicate the operating state of the product.
Standby: All white LEDs are flashing (0.5s on and 0.5s off).
Normal: White LEDs are glowing or flashing (0.5s on and 1.5s off).
Protection: Yellow LEDs are glowing or flashing (0.5s on and 0.5s off).
Error: Yellow LEDs are glowing or flashing (0.5s on and 0.5s off).
Shutdown: All LEDs are off.

3.2.4. Battery Introduction of SMILE-G3-BAT-8.2P

Battery appearance and dimensions



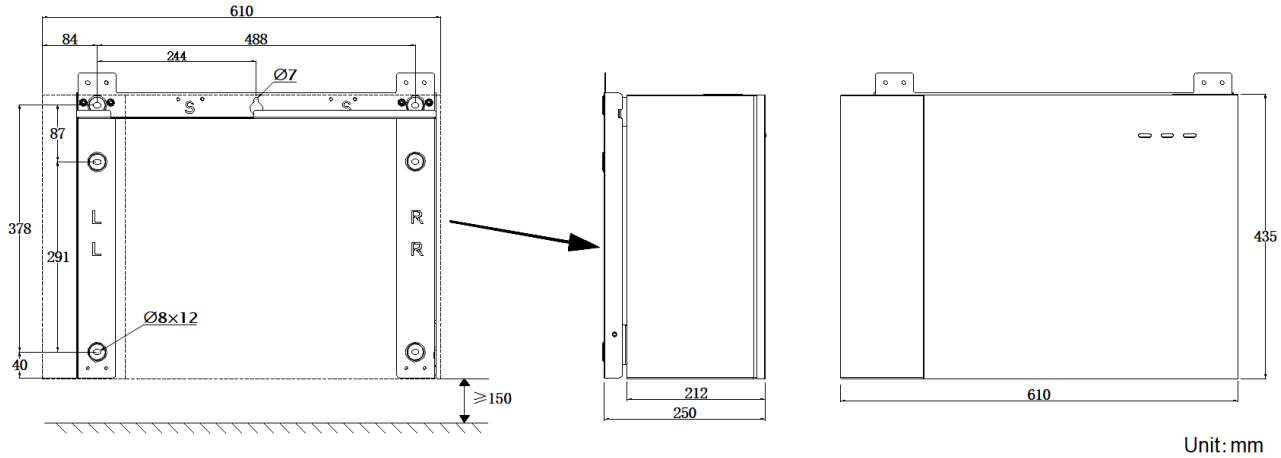
Connection area overview



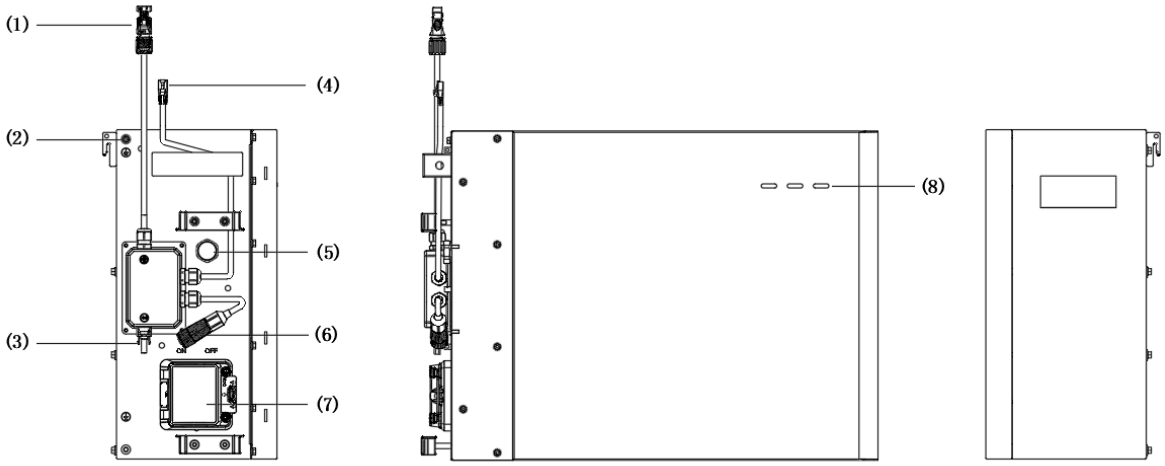
Position	Designation
1	Battery Power Button
2	Battery Breaker
3	Battery Negative Cable Connector
4	Battery Positive Cable Connector
5	BMS COM1
6	BMS COM2 (with Terminal Resistor)
7	Grounding Point
8	Battery LED Display

3.2.5. Battery Introduction of SMILE-G3-BAT-3.6S/4.0S

Battery appearance and dimensions



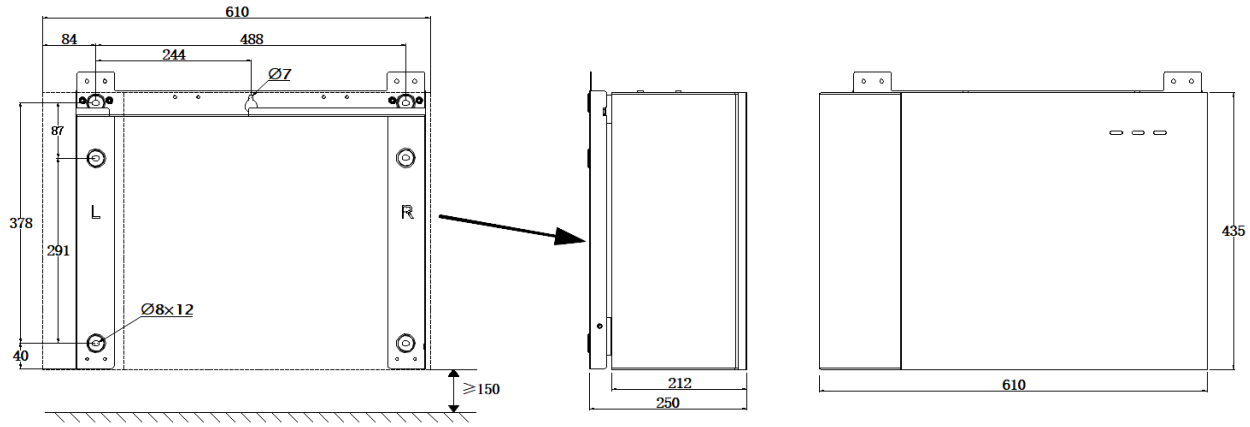
Connection area overview



Position	Designation
1	Battery Positive Cable Connector
2	Grounding Point
3	Battery Negative Cable Connector
4	BMS COM1
5	Pressure Relief Valve
6	BMS COM2 (with Terminal Resistor)
7	Battery Circuit Breaker
8	LED Display

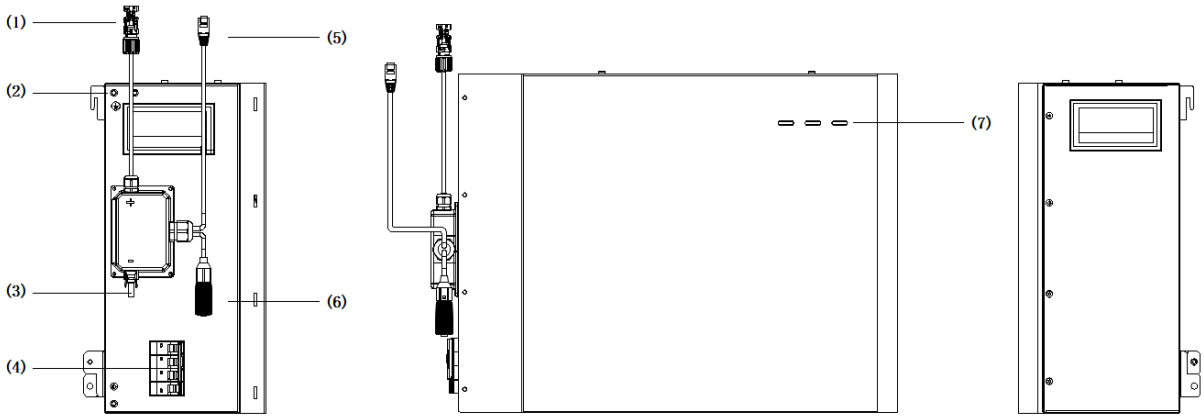
3.2.6. Battery Introduction of SMILE-G3-BAT-3.8S

Battery appearance and dimensions



Unit:mm

Connection area overview

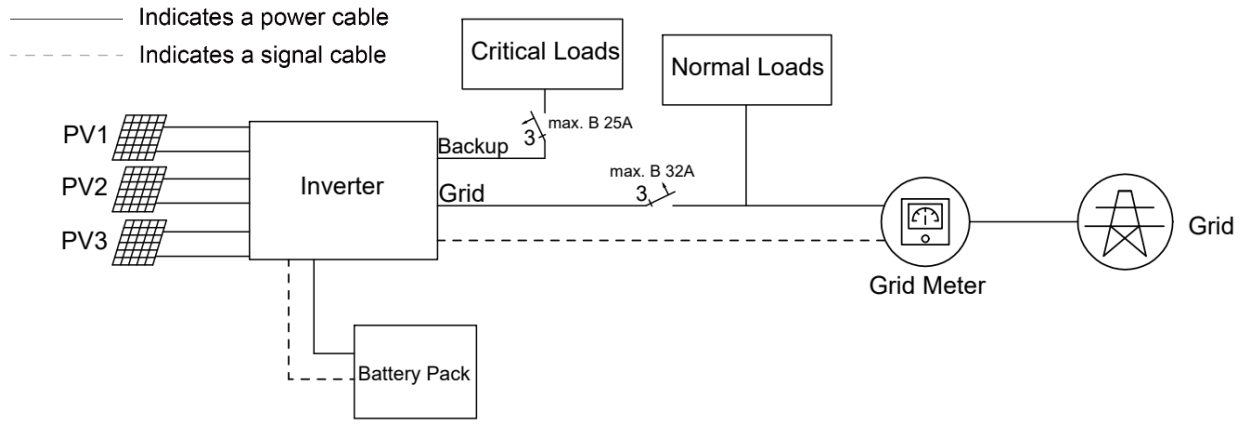


Position	Designation
1	Battery Positive Cable Connector
2	Grounding Point
3	Battery Negative Cable Connector
4	Battery Circuit Breaker
5	BMS COM1
6	BMS COM2 (with Terminal Resistor)
7	Battery LED Display

3.3. Application Scenarios

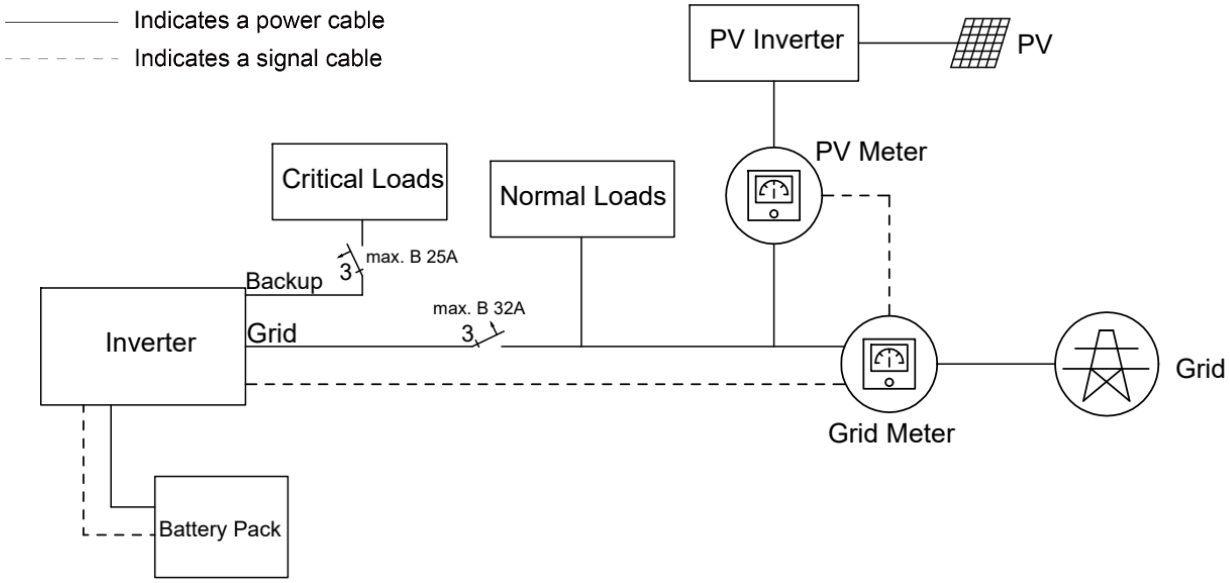
SMILE-G3 three phase system (includes inverter SMILE-G3-T4/T5/T6/T8/T10-INV and battery SMILE-G3-BAT-8.2P, SMILE-G3-BAT-3.6S/3.8S/4.0S) can be connected as a DC-Coupled systems (mostly new installation), AC-Coupled systems (mostly retrofit), Hybrid-Coupled systems (mostly retrofit, and increase the PV capacity), and Off-Grid (under development) systems as shown in the following diagrams:

3.3.1. DC-Coupled Energy Storage System



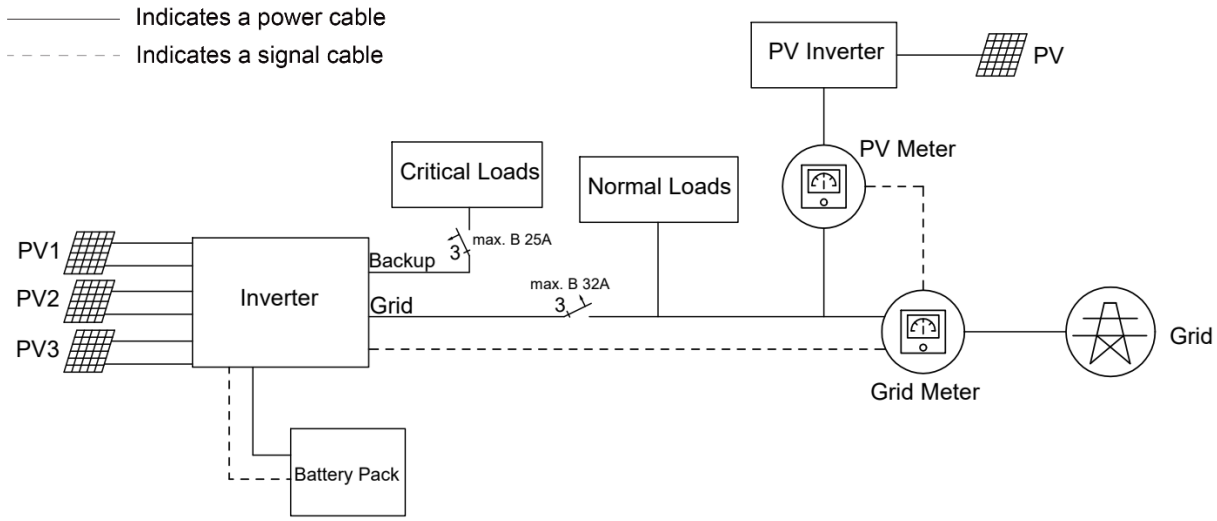
DC-Coupled Energy Storage System – Scheme

3.3.2. AC-Coupled Energy Storage System



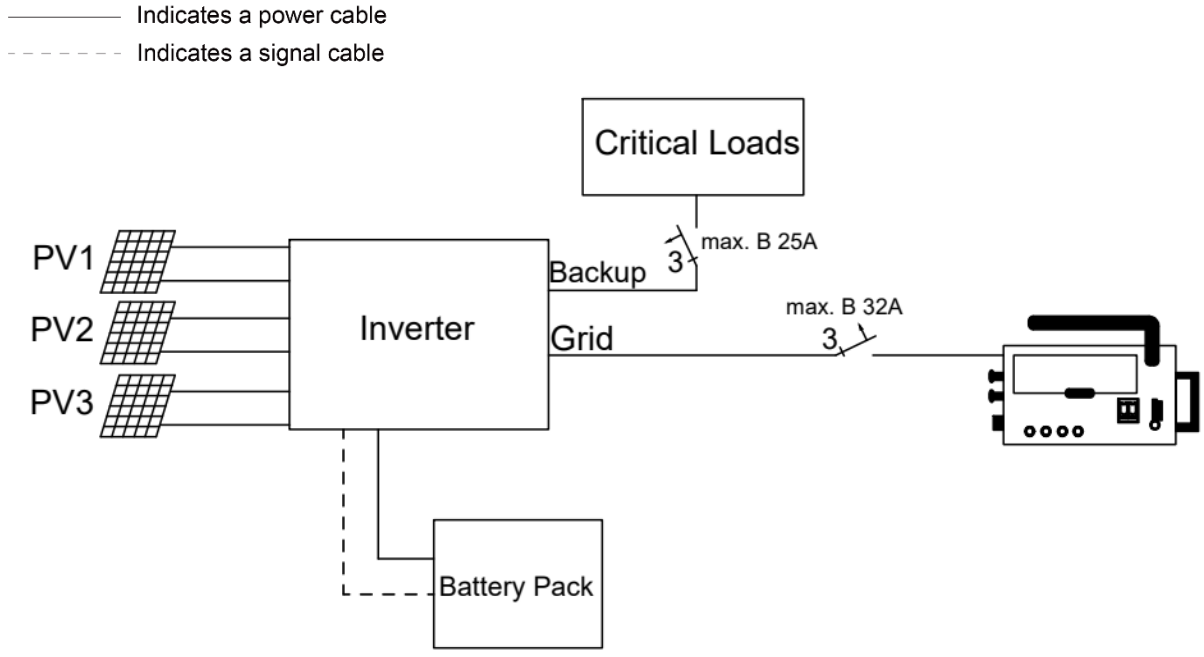
AC-Coupled Energy Storage System – Scheme

3.3.3. Hybrid-Coupled Energy Storage System



Hybrid-Coupled Energy Storage System – Scheme

3.3.4. Off-Grid Energy Storage System



Off-Grid Energy Storage System (with Diesel Generator) – Scheme

NOTES: In all cases, Normal Loads and Essential Loads must be appropriately protected by earth fault protection devices (e.g. Type A or Type B RCDs, RCBOs) in accordance with appropriate Standards.

Backup/Essential Loads should not exceed the rated capacity of the inverter, even during on-grid operation.

4. Storage and Transport

4.1. Storage

4.1.1. Inverter Storage

The following requirements should be met if the inverter is not put into immediate use:

1. Do not unpack the inverter.
2. Keep the storage temperature at -40~60°C and the humidity at 5%~95% RH.
3. The inverter should be stored in a clean and dry place and be protected from dust and water vapor corrosion.
4. A maximum of six inverters can be stacked. To avoid personal injury or device damage, stack inverters with caution to prevent them from falling over.
5. During the storage period, check the inverter periodically. Replace any damaged packaging promptly.
6. The inverters stored for more than 2 years should be inspected and tested before being put into service.

4.1.2. Battery Storage

The following requirements should be met if the battery is not put into immediate use:

1. Place batteries according to the signs on the carton during storage.
2. Stack battery cartons in accordance with the stacking requirements printed on the external carton.
3. Store the battery out of reach of children and animals.
4. Store the battery in an area where there is minimal dust and dirt.
5. Handle batteries with care to avoid damage.
6. The requirements for the storage environment are as follows:
   a. Ambient temperature: -10~55°C, recommended storage temperature: 15~30°C
   b. Relative humidity: 15%~85%
   c. Place batteries in a dry, clean, ventilated location free from dust.
   d. Store batteries in a place that is away from corrosive organic solvents and gases.
   e. Keep batteries away from direct sunlight.
   f. Keep batteries at least 2 meters away from heat sources.
7. The batteries in storage must be disconnected from external devices and the indicators (if any) on the batteries should be off.
8. Warehoused batteries should be delivered based on the "first in, first out" stock control.

9. The warehouse keeper should collect battery storage information every month and report to the planning department. Batteries stored for more than 6 months should be assessed and charged periodically.
10. Capacity loss may occur if a lithium battery is stored for a long time. After a lithium battery is stored for 12 months in the recommended storage temperature, the irreversible capacity loss rate is 3%~10%. It is recommended that batteries not be stored for a long period. If the batteries need to be stored for more than 6 months, it is recommended to recharge the batteries to 65~75% of the SOC.

5. Power On and Off the System

5.1. Power On the System

1) Switch on the battery circuit breaker which is at the lower left of the inverter.

2) Switch on the battery circuit breakers of all batteries (located on the left-hand side of the battery).

3) For series batteries, please skip this step.

Shortly press the power buttons of all parallel batteries. For more than one parallel battery installed, please press all power buttons within 30 seconds. This power button is located just beside the battery circuit breaker on each parallel battery.

4) Switch on the AC circuit breaker between the grid port of the energy storage inverter and the mains grid (this AC circuit breaker should be labelled Main Switch Battery ESS Supply or similar).

5) Switch on the AC circuit breaker between the backup port of the energy storage inverter and the loads (this AC circuit breaker should be labelled Main Switch Battery ESS Backup or similar).

6) Switch on the PV switch at the left middle of the inverter if there is PV string directly connected to the energy storage inverter.

7) Switch on the AC circuit breaker (if there is any) between any separate PV inverter and the mains grid. These separate PV inverters are also referred to as “AC-coupled PV inverters”.

5.2. Power Off the System

WARNING

After the energy storage system is powered off, the remaining electricity and heat may still cause electric shocks and body burns. Please put on protective gloves and operate the product 5 minutes after the system is powered off.

1) Switch off the AC circuit breaker between the energy storage inverter and the backed-up loads.
2) Switch off the PV DC Isolator(s) between the PV string and the energy storage inverter if there are any.
3) Switch off the PV switch on the left-hand side of the energy storage inverter (if there is PV string directly connected the energy storage inverter).
4) For series batteries, please skip this step.
   Hold the battery power button located next the battery circuit breaker for 6s to turn off each parallel battery.
5) Switch off the battery circuit breakers of all batteries (located on the left-hand side of the battery).
6) Switch off the battery circuit breaker which is at the lower left of the inverter.
7) Switch off the AC circuit breaker between the energy storage inverter and the mains grid.

6. Commissioning

6.1. Checks Before Power-On

No.	Check Item	Acceptance Criteria
1	Installation/Mounting environment	The installation environment is safe and the unit has adequate clearance as per the instruction in this manual as well as in compliance with local standards. The area around the installation should be free from clutter and should not be flood-prone.
2	Battery and inverter mounting	The battery and inverter should be mounted correctly, securely, and reliably.
3	Wi-Fi mounting	The Wi-Fi module should be mounted correctly, securely, and reliably.
4	Cable layout	Cables should be routed neatly and protected adequately where exposed, in accordance with standards.
5	Cable tie	Cable ties should be secured and trimmed evenly and no burr exists.
6	Grounding	The grounding cables should be connected correctly, securely, and reliably. Impedance/resistance checks should be conducted to confirm reliable Earth connections.
7	Switch and breakers status	The PV switch (if there is any) and battery breakers and any breakers connecting to the system should be OFF.
8	Cable connections	The AC cables, PV cables (if there are any), battery power cables, and communication cables should be connected correctly, securely, and reliably.
9	Unused ports	Unused power ports and communication ports should be sealed from water or dust ingress by watertight caps.

6.2. Power on the Product before Commissioning

WARNING

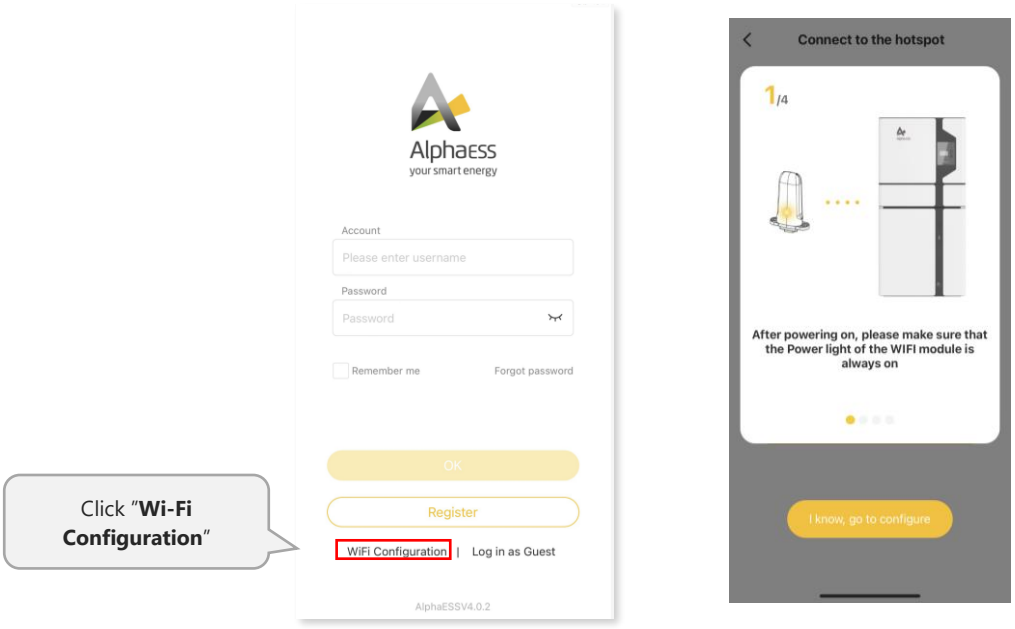
- Before doing electrical connection, please ensure the PV switch & all AC and BAT circuit breakers in the system are switched OFF and cannot be reactivated.
- Never power on the energy storage system without the correct and reliable installation and electrical connection.

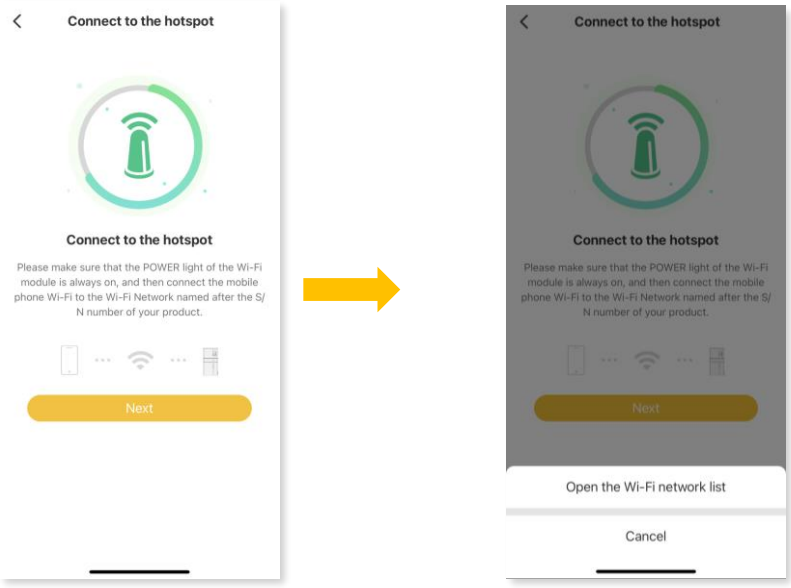
- Check the grid's voltage range and frequency range and the installation (including location, direction and phase sequence) of all CT(s) and/or meter(s).
- Switch on the battery circuit breaker at the left middle of the energy storage inverter.
- Switch on the battery circuit breakers of all batteries.
- Press the battery power button of the parallel battery (For series battery, there is no battery power button).
- Switch on the external AC circuit breaker between the grid and the energy storage inverter.
- Please strictly follow the aforementioned steps to power on the system.
  Don’t switch on the PV switch on the energy storage inverter.
  Don’t switch on the AC circuit breaker on the PV inverter (if there is any).

6.3. Wi-Fi Module Configuration and Basic Parameters Settings

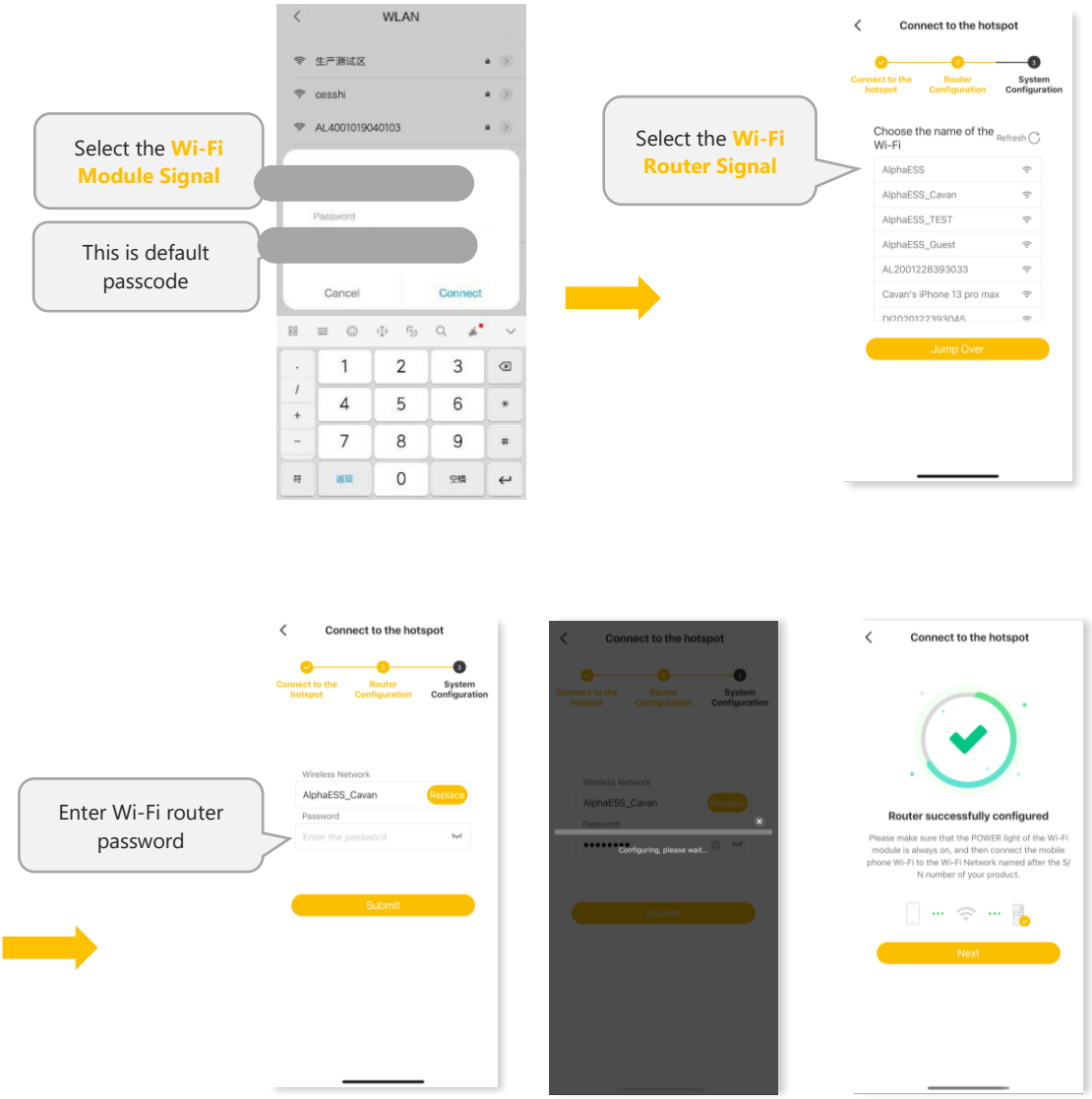
6.3.1. Wi-Fi Configuration

This section is for user who has an energy storage system with a Wi-Fi module.
The AlphaESS App is used to configure the network, set system basic parameter, monitor system operating status and check configuration information.





To ensure account security, change the password periodically and keep the new password in mind. Not changing the initial password may cause password disclosure. A password left unchanged for a long period of time may be stolen or cracked. If a password is lost, devices cannot be accessed.

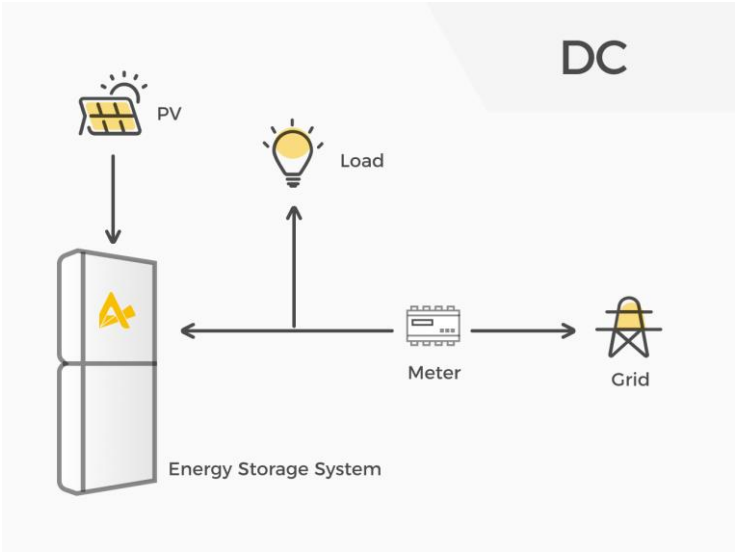


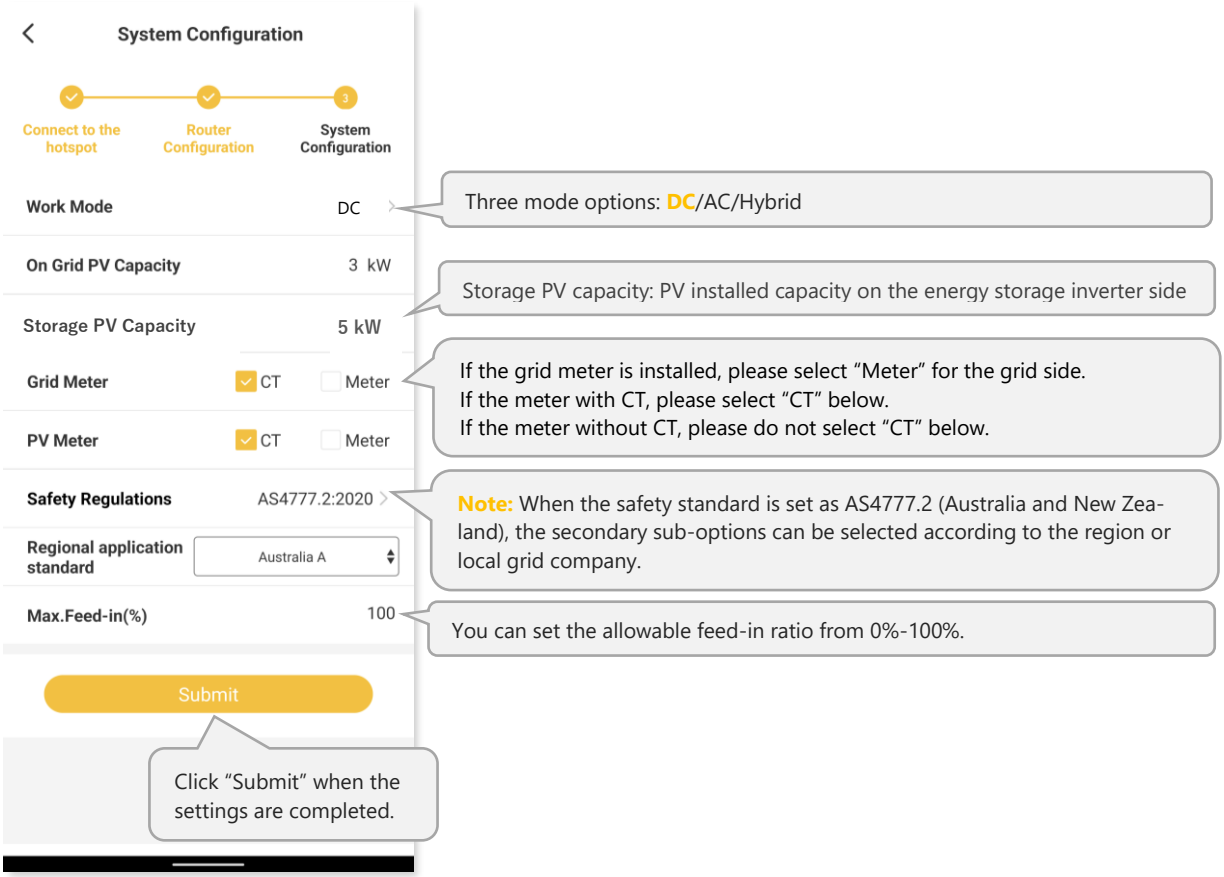
NOTICE

The system will not be able to connect to the internet without either a physical LAN cable connection or configured Wi-Fi if the Wi-Fi module is used.

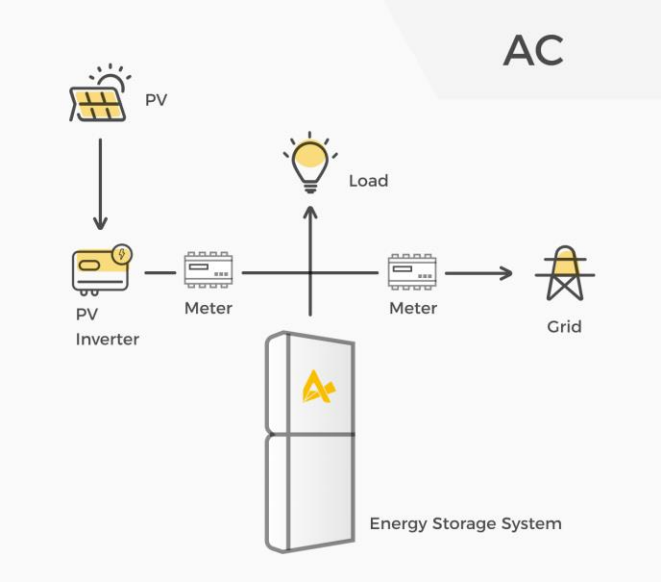
6.3.2. Basic Parameters Settings

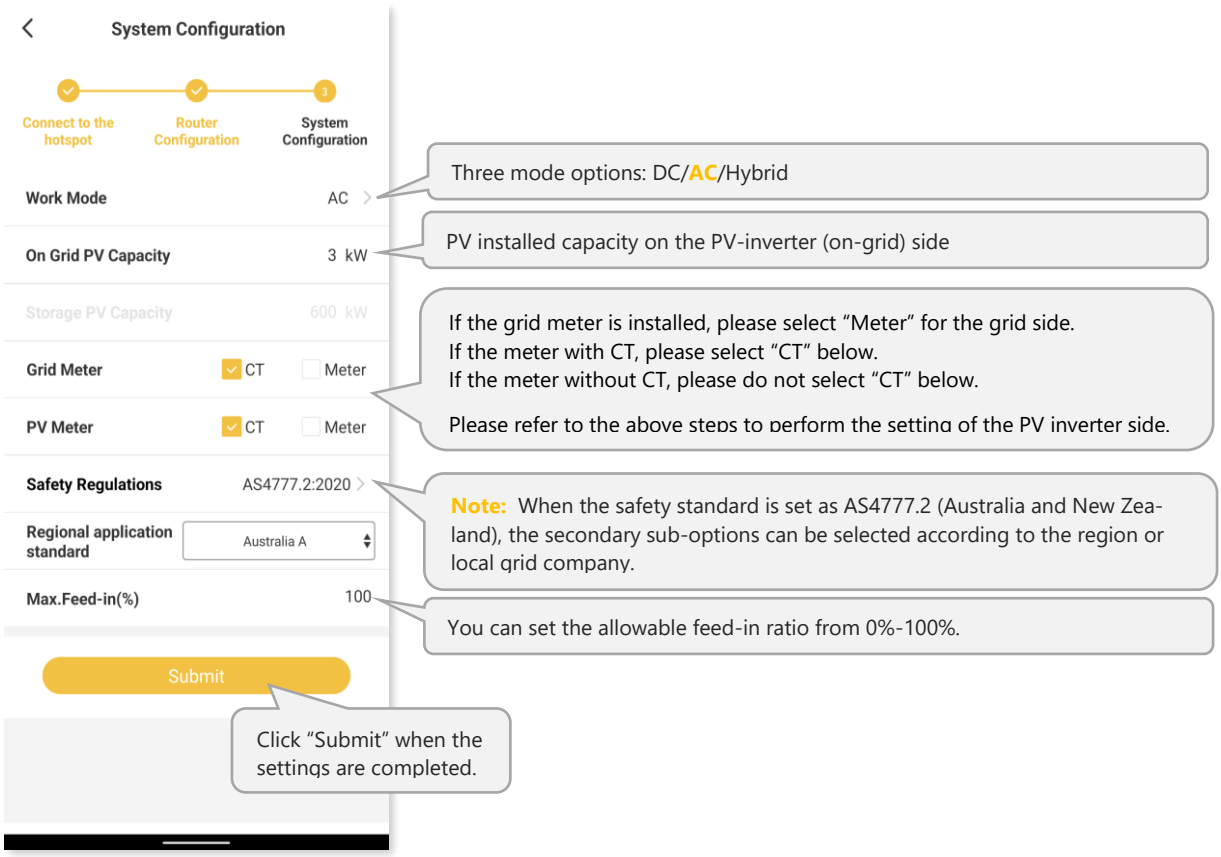
DC Mode



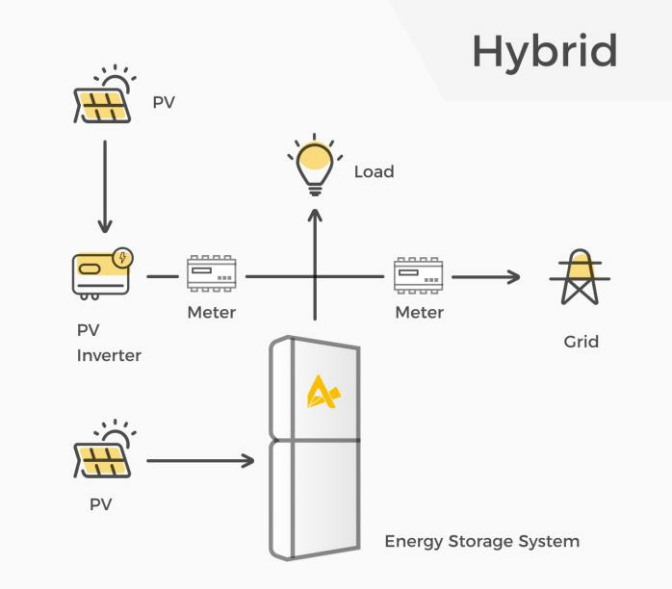


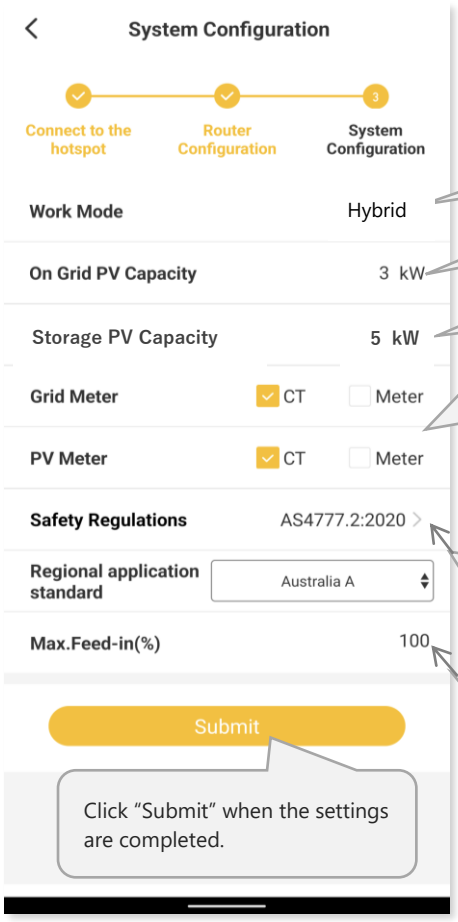
AC Mode


AC
PV
Load
PV
Inverter
Meter
Meter
Grid
Energy Storage System


System Configuration
Connect to the hotspot
Router Configuration
System Configuration
Work Mode
AC
On Grid PV Capacity
3 kW
Storage PV Capacity
600 kW
Grid Meter
CT
Meter
PV Meter
CT
Meter
Safety Regulations
AS4777.2:2020
Regional application standard
Australia A
Max.Feed-in(%)
100
Submit
Three mode options: DC/AC/Hybrid
PV installed capacity on the PV-inverter (on-grid) side
If the grid meter is installed, please select "Meter" for the grid side.
If the meter with CT, please select "CT" below.
If the meter without CT, please do not select "CT" below.
Please refer to the above steps to perform the setting of the PV inverter side.
Note: When the safety standard is set as AS4777.2 (Australia and New Zealand), the secondary sub-options can be selected according to the region or local grid company.
You can set the allowable feed-in ratio from 0%-100%.
Click "Submit" when the settings are completed.

Hybrid Mode





Three mode options: DC/AC/**Hybrid**

PV installed capacity on the PV-inverter (on-grid) side

Storage PV installed capacity: PV capacity on the energy storage inverter side

If the grid meter is installed, please select "Meter" for the grid side.
If the meter with CT, please select "CT" below.
If the meter without CT, please do not select "CT" below.

Please refer to the above steps to perform the setting of the PV inverter side.

Note: When the safety standard is set as AS4777.2 (Australia and New Zealand), the secondary sub-options can be selected according to the region or local grid company.

You can set the allowable feed-in ratio from 0%-100%.

CAUTION

The safety standard field must be set correctly

If you select a safety standard that is not valid for your country, region and purpose, it can cause a disturbance in the energy storage system and lead to problems with the Network Operator. When selecting the safety standard, you must always observe the locally applicable standards and directives as well as the properties of the PV system (e.g. PV system size, grid-connection point).

• If you are not sure which safety standard is valid for your country, region or purpose, contact your Network Operator for information on which safety standard should be used.

NOTICE

A Note on setting Feed-In limits with multiple PV systems

If the AlphaESS product is installed with DC-connected Solar Panels as well as with an existing AC-coupled PV system, Installers may need to set a Feed-In limit to comply with Local Regulations.

The Feed-in limit should be set to the total Phase feed-in limit set by the Network Operator, regardless of the size of the existing AC-coupled PV system. Only set the feed-in limit to *zero* if the Network Operator has dictated *zero feed-in* from the house.

6.4. Installing New System and Settings on the App

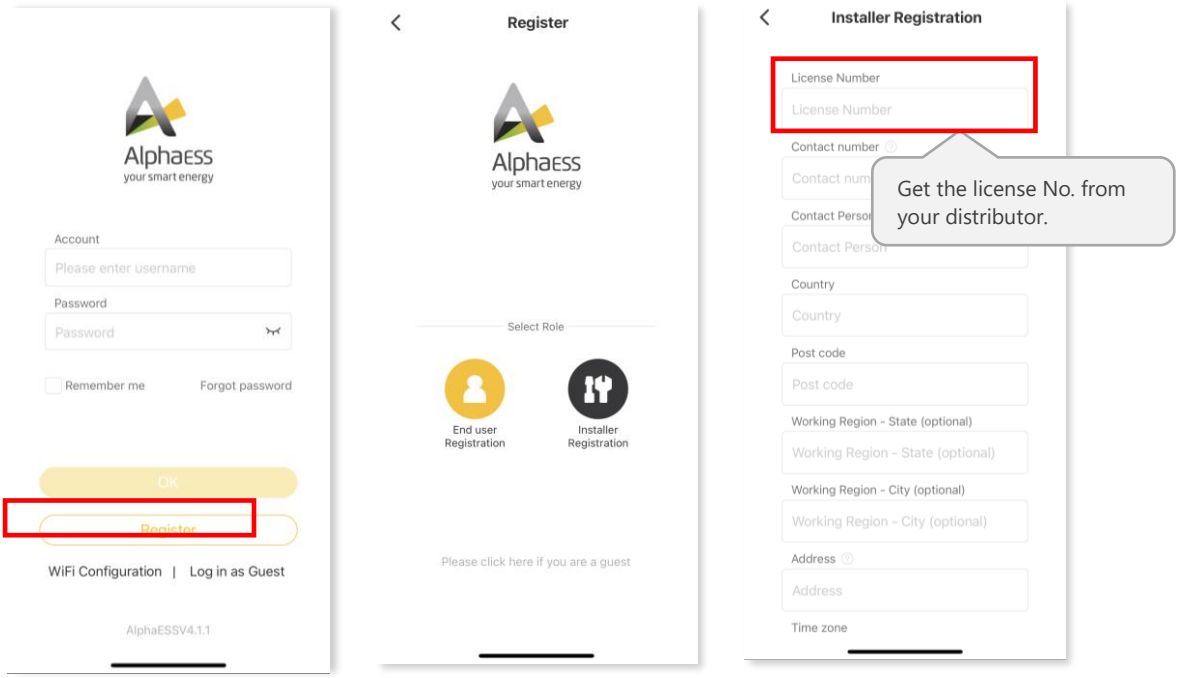
6.4.1. Download and Install the App

1. Android device users can download the App through major Android App stores such as Google Play.
2. IOS device users can search for “AlphaESS” in the App Store and download the App.

AlphaESS App

6.4.2. Register as an Installer

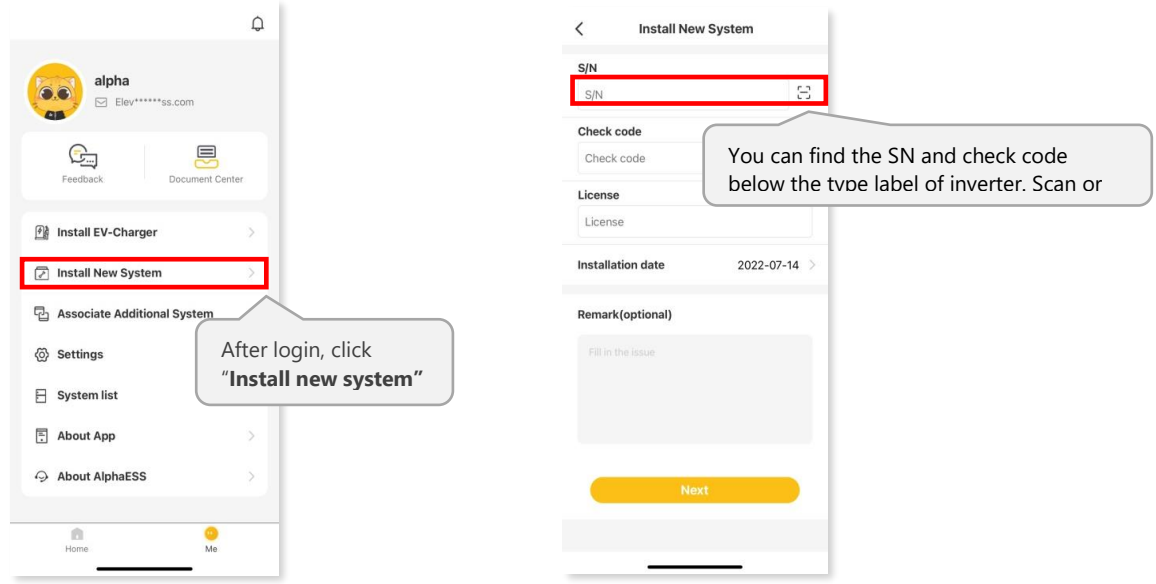
If you don’t have an installer account, please register first.

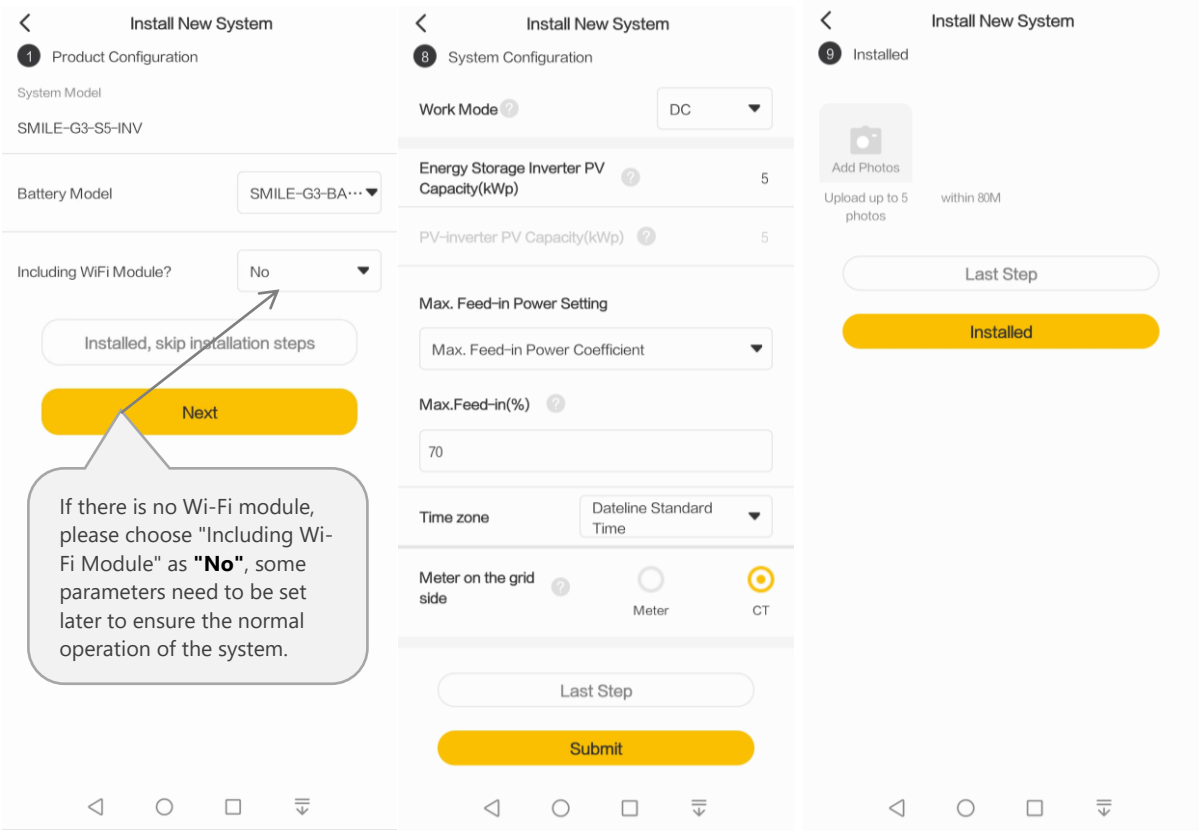


If you already have an installer account, please log in directly.

6.4.3. Install New System on the App

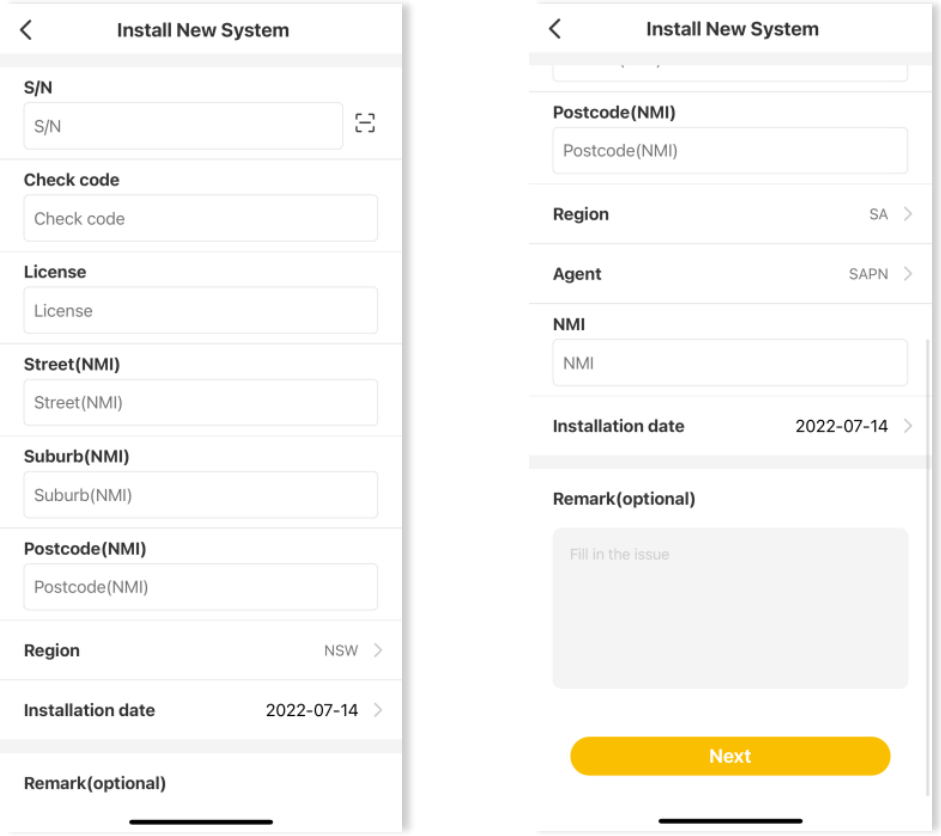
You can carry out “Install New System” as follows:





For regular installers, please click “Install New System”, enter your installer account ID in the “license” field to bind the system to your account and “activate” the system. Enter S/N, check code, license, installation time and click the “save” button.

Only for Australian installers, they need to do more settings. If you are an Australian installer, you will need to fill in the Street (NMI), Suburb (NMI) and Postcode (NMI) fields and the Region field, which has six fixed options (NSW, QLD, VIC, SA, TAS, WA). If SA is selected for Region, two more fields are added which are Agent and NMI. These fields are required in order to meet the requirements of the Network Operator for Dynamic Export and for PV output control by a Relevant Agent.



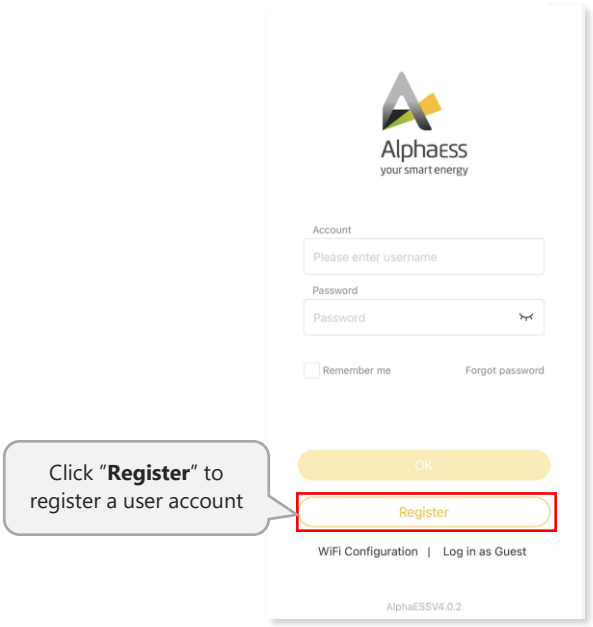
Australian Installer

Fields that are not marked "optional" need to be filled in.

Click "Next".

6.4.4. Instruct the End User to Install the App

Please make sure that end user has downloaded the App, registered the account correctly, and bound the system SN.



6.5. Register on AlphaCloud

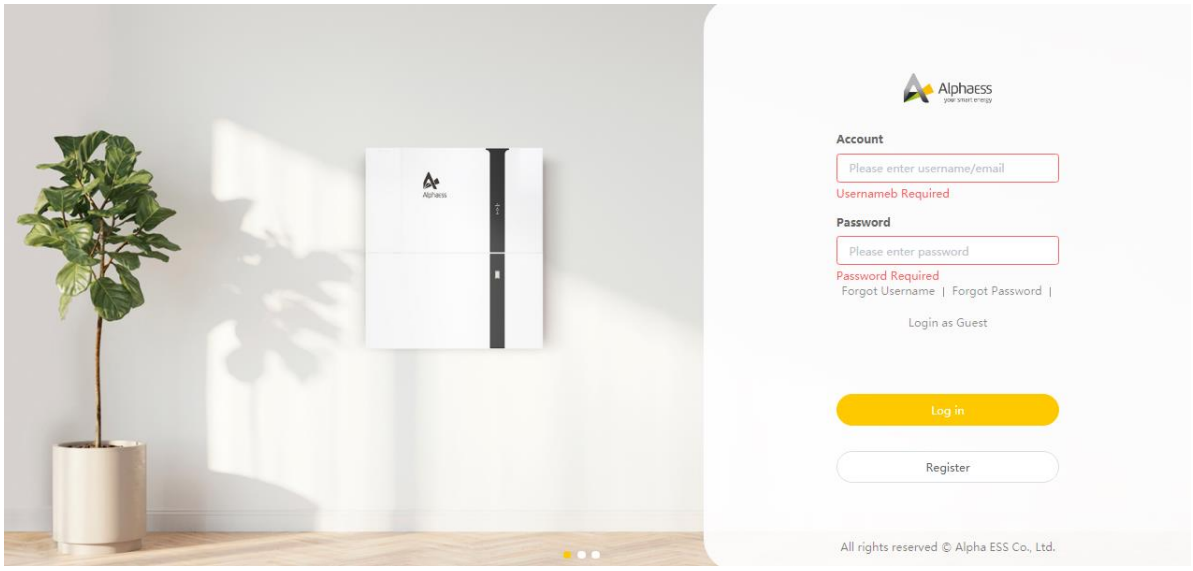
6.5.1. Register an Installer Account on AlphaCloud

If you do not already have an Installer account, you can create a new account on our web server for system monitoring purposes. In addition, AlphaESS Warranty is predicated on this connection to our web server.

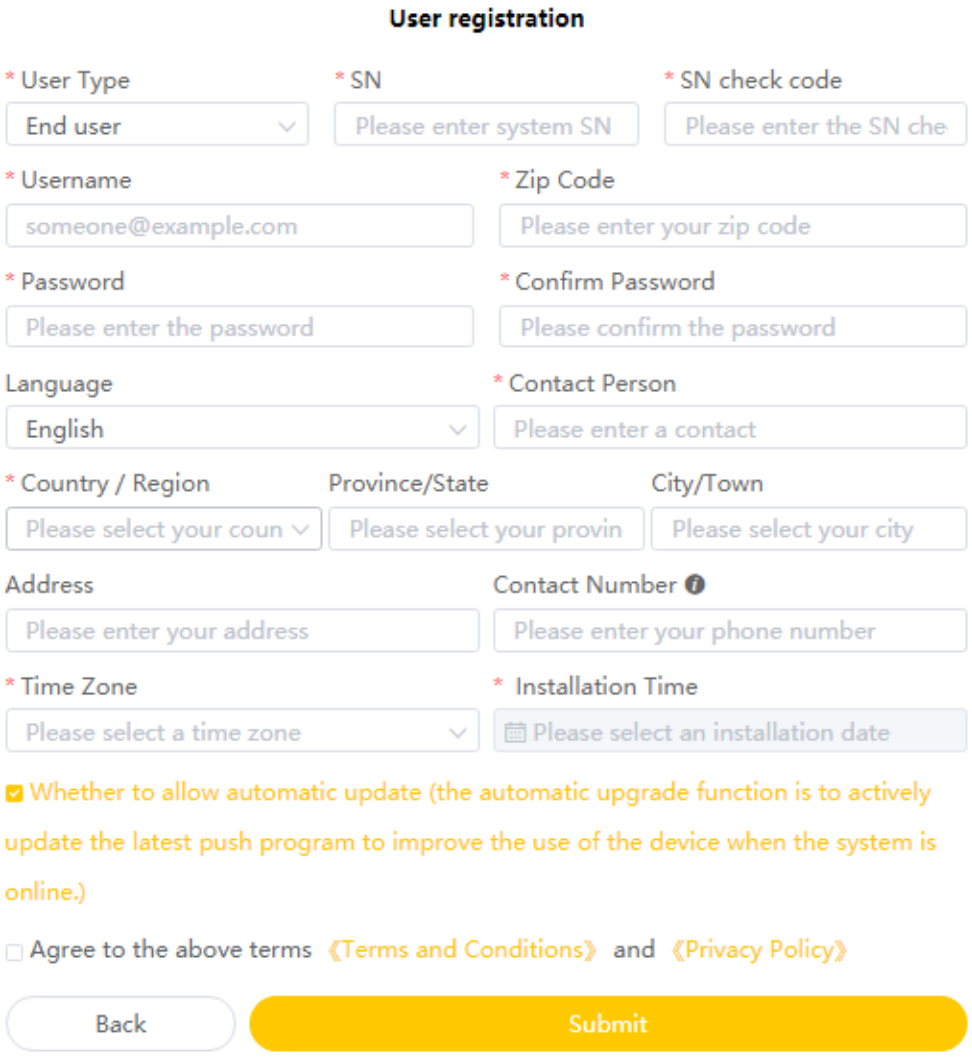
The data produced prior to registration can be synchronized to the web server.

Step 1: Please open the portal: www.alphaess.com.

Step 2: Please fill in "Username", "Password" and click "Login" if you have already registered.



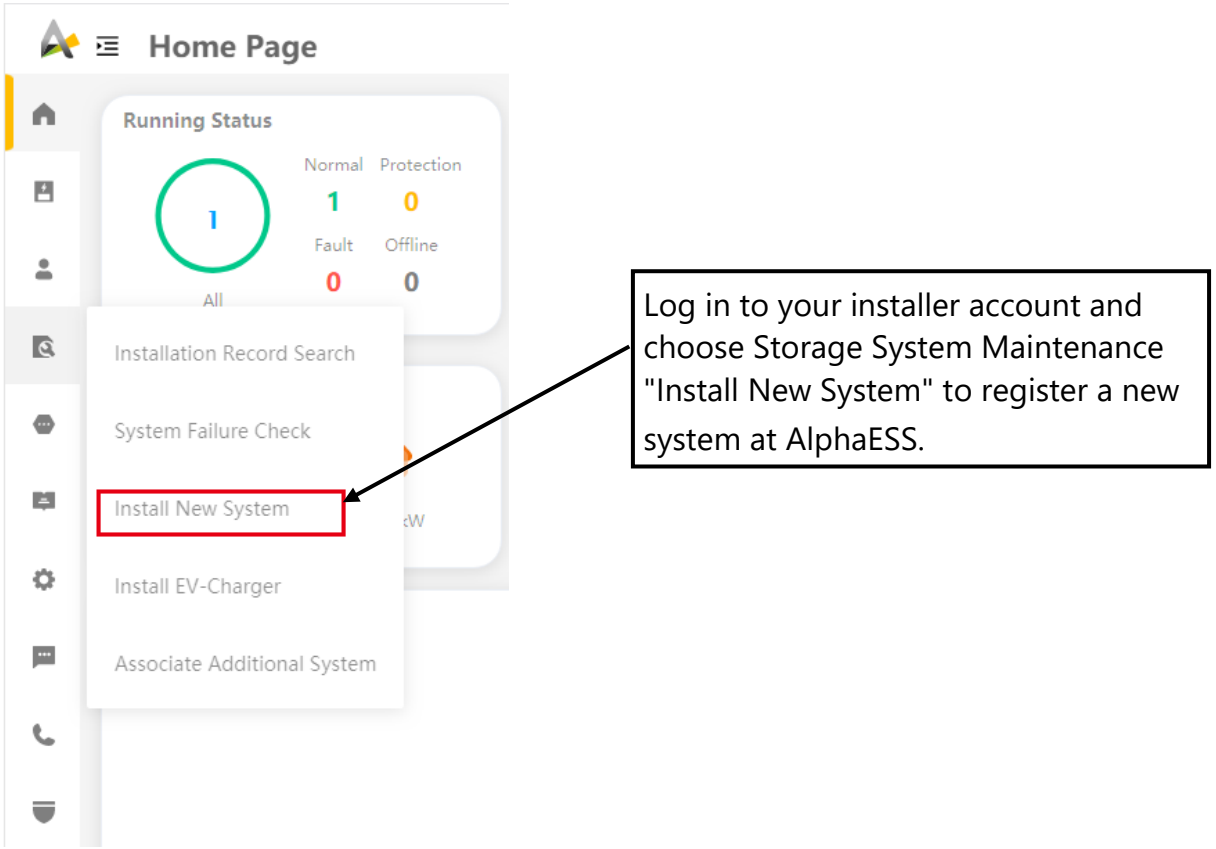
If not, please register by filling in the following web form.

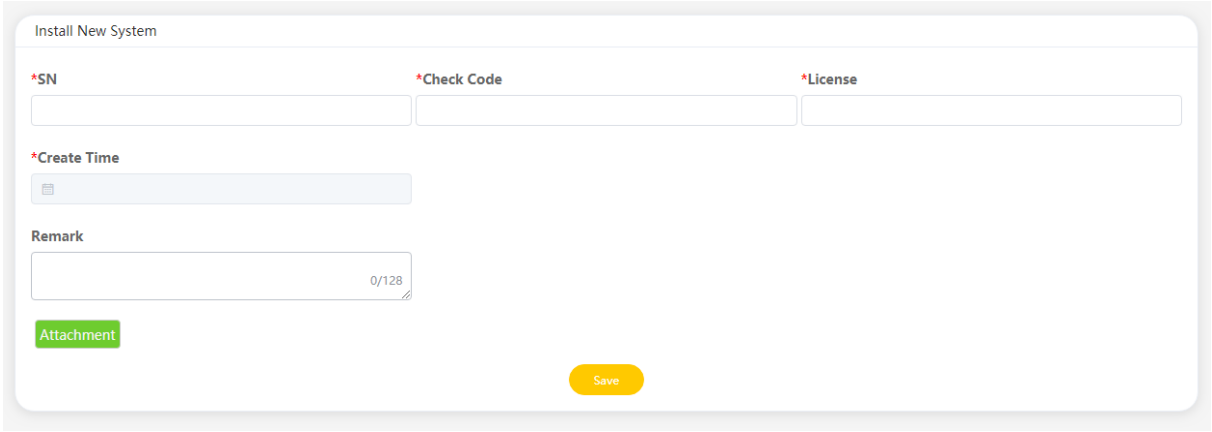


In this form, all fields with a red star are required.
***Serial Number:** SN (please see the type label of the inverter)
***Username:** 5-15 letters / numbers
***Password:** 5-15 letters / numbers / characters
More details are available in the Online Monitoring Web Server Installers User Manual, which can be downloaded from the AlphaESS homepage.

6.5.2. Install New System on AlphaCloud

Installers who haven't yet registered need to click “Register” to visit the registration page. Please refer to the “AlphaCloud Online Monitoring Web Server Installers User Manual”, which you can get from the AlphaESS sales team and get an AlphaESS Installer license number.





Enter the system S/N, check the code, license, and installation date, then click the “Save” button. The red * indicated a required field. Click the “Browse” button to select any attachment you want to add.

7. Maintenance

7.1. Routine Maintenance

Normally, the energy storage system needs no maintenance or calibration.
However, in order to maintain the accuracy of the SOC, it is recommended to perform a full charge calibration for SOC (charge the battery until the charge power is 0W) on the battery at regular intervals (such as two weeks).
Before cleaning, ensure that the system is disconnected from all power sources. Clean the housing, cover and display panel with a soft cloth.
To ensure that the energy storage system can operate properly in the long term, it is advised to perform routine maintenance as described in this chapter.

Maintenance Checklist

Check Item	Acceptance Criteria	Maintenance Interval
Product cleanliness	The enclosure of the inverter should be free from obstacles or dust.	Once every 6 to 12 months
Product visible damage	The product should be not damaged or deformed.	Once every 6 months
Product running status	1. The product should operate without any abnormal sound. 2. All parameters of the product should be set correctly. Perform this check when the product is running.	Once every 6 months
Electrical connections	1. Cables should be securely connected. 2. Cables should be intact, and in particular, the cable jackets touching the metallic surface should not be scratched. 3. Unused cable glands should be blocked by rubber sealing which are secured by pressure caps.	Perform the first maintenance 6 months after the initial commissioning. Thereafter, perform the maintenance once every 6 to 12 months.

⚠ CAUTION

Risk of burns due to hot enclosure of the inverter

The enclosure of the inverter can get hot during operation.

- Do not touch any parts other than the display panel during operation.
- Wait approximately 30 minutes for the inverter to cool down before cleaning.

8. Product Removal & Return

8.1. Removing the Product

Procedure

- Step 1: Power off the energy storage system as described in Chapter 8.2 Powering off the System.
- Step 2: Disconnect all cables from the system, including communication cables, PV power cables, battery power cables, AC cables, and PE cables.
- Step 3: Remove the Wi-Fi module.
- Step 4: Remove the cable covers of the inverter and the battery.
  Remove the right cover of the inverter.
- Step 5: Remove the inverter from the top of the battery.
- Step 6: Remove the battery wall brackets.
- Step 7: Remove the batteries.

8.2. Packing the Product

If the original packaging is available, put the product inside it and then seal it using adhesive tape.

If the original packaging is not available, put the product inside a suitable cardboard box and seal it properly.

8.3. Disposing of the Product

- If the product's service life expires, dispose of it according to the local disposal rules for electrical equipment and electronic waste.
- Dispose of the packaging and replaced parts according to the rules at the installation site where the device is installed.
- Do not dispose the product with regular household waste.

9. Technical Data

9.1. Datasheet of Inverter (SMILE-G3 Three Phase Inverter)

Item	SMILE-G3-T4-INV	SMILE-G3-T5-INV	SMILE-G3-T6-INV
Input DC (PV Side)			
Recommended Max. PV Power	8000 W	10000W	12000 W
Max. PV Input Voltage	1000 V		
Rated Voltage	720 V		
Start-up Voltage	120 V		
MPPT Voltage Range	140 to 950 V		
Max. Input Current per MPPT	16 A / 16 A / 16 A		
Max. Short Circuit Current per MPPT	24 A / 24 A / 24 A		
MPPT Number	3		
Max. Input Strings Number per MPPT	1		
Surge Category in Accordance with IEC 62109-1	III		
Battery			
Battery Type	LFP ($LiFePO_4$)		
Battery Voltage Range	90 to 700 V		
Max. Charge Power	4 kW	5 kW	6 kW
Max. Discharge Power	4 kW	5 kW	6 kW
Max. Charge/ Discharge Current	40 A / 40 A		
Communication	CAN		
Output AC (Back-up, On Grid)			
Rated Output Power	4 kW	5 kW	6 kW
Rated Apparent Output Power	4 kVA	5 kVA	6 kVA
Rated Output Current	5.8 A	7.2 A	8.7 A
Max. Continuous Output Power	6 kW	7.5kW	9 kW
Max. Continuous Output Apparent Power	6 kVA	7.5 kVA	9 kVA
Max. Output Current	8.7 A	10.8 A	13 A
Rated Output Voltage	3L/N/PE, 230 / 400V		
Rated Frequency	50 / 60 Hz		

Output AC (Back-up, Off Grid)			
Rated Output Power	4 kW	5 kW	6 kW
Rated Apparent Output Power	4 kVA	5 kVA	6 kVA
Rated Output Current	5.8 A	7.2 A	8.7 A
Max. Continuous Output Power	4.4 kW	5.5 kW	6.6 kW
Max. Continuous Output Apparent Power	4.4 kVA	5.5 kW	6.6 kVA
Max. Output Power ≤ 30s	6 kW	7.5 kW	9 kW
Max. Output Apparent Power ≤ 30s	6 kVA	7.5 kVA	9 kVA
Max. Output Power ≤ 1s	8 kW	10 kW	12 kW
Max. Output Apparent Power ≤ 1s	8 kVA	10 kVA	12 kVA
Back-up Switch Time	<20 ms		
Rated Output Voltage	3L/N/PE, 230 / 400V		
Rated Frequency	50 / 60 Hz		
Input AC (Grid Side)			
Rated Output Voltage	3L/N/PE, 230 / 400V		
Rated Frequency	50/60 Hz		
Max. Input Power	8 kW	10 kW	12 kW
Max. Input Current	11.6 A	14.5 A	17.4 A
Output AC (Grid Side)			
Rated Output Power	4 kW	5 kW	6 kW
Rated Apparent Output Power	4 kVA	5 kVA	6 kVA
Rating Grid Output Current	5.8 A	7.2 A	8.7 A
Operation Phase	Three-phase		
Rated Grid Voltage	3L/N/PE, 230 / 400V		
Grid Voltage Range	150 to 288 V		
Rated Grid Frequency	50 / 60 Hz		
Power Factor	>0.99 (0.8 leading to 0.8 lagging)		
Protection Class	I		
Overvoltage Category	III		
Surge Category in Accordance with IEC 60664-1	II		

Efficiency			
Max. Efficiency, η_{max}	97.8%	97.8%	97.8%
European Weighted Efficiency, η_{EU}	97.0%	97.0%	97.0%
Protection			
Anti-Islanding Protection	Integrated		
Insulation Resistor Detection	Integrated		
Residual Current Monitoring Unit	Integrated		
Output over Current Protection	Integrated		
Output Short Protection	Integrated		
Output Overvoltage Protection	Integrated		
PV Reverse Polarity Protection	Integrated		
PV Overvoltage Protection	Integrated		
PV Switch	Integrated		
Battery Breaker	Integrated		
General Data			
Dimensions (W*H*D)	610*416*212.5 mm		
Weight	29kg		
Topology	Transformerless		
Operation Temperature Range	-25 to +60 °C		
Max. Permissible Value for Relative Humidity (Condensing)	100%		
Ingress Protection	IP65		
Display	LED		
Noise Emission	<30 dB(A) @1m		
Cooling Concept	Natural convection		
Max. Operating Altitude above MSL	3000 m		
Features			
PV Connection	Vaconn D4 connectors		
Grid Connection	Plug-in connector		
Backup Connection	Plug-in connector		
BAT Connection	Amphenol H4 connectors		
Communication	LAN, Wi-Fi		

Item	SMILE-G3-T8-INV	SMILE-G3-T10-INV
Input DC (PV Side)		
Recommended Max. PV Power	16000 W	20000W
Max. PV Input Voltage	1000 V	
Rated Voltage	720 V	
Start-up Voltage	120 V	
MPPT Voltage Range	140 to 950 V	
Max. Input Current per MPPT	16 A / 16 A	
Max. Short Circuit Current per MPPT	24 A / 24 A	
MPPT Number	3	
Max. Input Strings Number per MPPT	1	
Surge Category in Accordance with IEC 62109-1	III	
Battery		
Battery Type	LFP ($LiFePO_4$)	
Battery Voltage Range	90 to 700 V	
Max. Charge Power	8 kW	10 kW
Max. Discharge Power	8 kW	10 kW
Max. Charge/ Discharge Current	40 A / 40 A	
Communication	CAN	
Output AC (Back-up, On Grid)		
Rated Output Power	8 kW	10 kW
Rated Apparent Output Power	8 kVA	10 kVA
Rated Output Current	11.6 A	14.5 A
Max. Continuous Output Power	12 kW	15 kW
Max. Continuous Output Apparent Power	12 kVA	15 kVA
Max. Output Current	17.4 A	21.7 A
Rated Output Voltage	3L/N/PE, 230 / 400V	
Rated Frequency	50 / 60 Hz	
Output AC (Back-up, Off Grid)		
Rated Output Power	4 kW	5 kW
Rated Apparent Output Power	4 kVA	5 kVA
Rated Output Current	5.8 A	7.2 A

Max. Continuous Output Power	4.4 kW	5.5 kW
Max. Continuous Output Apparent Power	4.4 kVA	5.5 kW
Max. Output Power ≤ 30s	6 kW	7.5 kW
Max. Output Apparent Power ≤ 30s	6 kVA	7.5 kVA
Max. Output Power ≤ 1s	8 kW	10 kW
Max. Output Apparent Power ≤ 1s	8 kVA	10 kVA
Back-up Switch Time	<20 ms	
Rated Output Voltage	3L/N/PE, 230 / 400V	
Rated Frequency	50 / 60 Hz	
Input AC (Grid Side)		
Rated Output Voltage	3L/N/PE, 230 / 400V	
Rated Frequency	50 / 60 Hz	
Max. Input Power	12 kW	15 kW
Max. Input Current	17.4 A	21.7 A
Output AC (Grid Side)		
Rated Output Power	8 kW	10 kW
Rated Apparent Output Power	8 kVA	10 kVA
Rating Grid Output Current	11.6 A	14.5 A
Operation Phase	Three-phase	
Rated Grid Voltage	3L/N/PE, 230 / 400V	
Grid Voltage Range	150 to 288 V	
Rated Grid Frequency	50 / 60 Hz	
Power Factor	>0.99 (0.8 leading to 0.8 lagging)	
Protection Class	I	
Overvoltage Category	III	
Surge Category in Accordance with IEC 60664-1	II	
Efficiency		
Max. Efficiency, η_{max}	97.8%	97.8%
European Weighted Efficiency, η_{EU}	97.0%	97.0%

Protection	
Anti-Islanding Protection	Integrated
Insulation Resistor Detection	Integrated
Residual Current Monitoring Unit	Integrated
Output over Current Protection	Integrated
Output Short Protection	Integrated
Output Overvoltage Protection	Integrated
PV Reverse Polarity Protection	Integrated
PV Overvoltage Protection	Integrated
PV Switch	Integrated
Battery Breaker	Integrated
General Data	
Dimensions (W*H*D)	610*416*212.5 mm
Weight	29kg
Topology	Transformerless
Operation Temperature Range	-25 to +60 °C
Max. Permissible Value for Relative Humidity (Condensing)	100%
Ingress Protection	IP65
Display	LED
Noise Emission	<30 dB(A) @1m
Cooling Concept	Natural convection
Max. Operating Altitude above MSL	3000 m
Features	
PV Connection	Vaconn D4 connectors
Grid Connection	Plug-in connector
Backup Connection	Plug-in connector
BAT Connection	Amphenol H4 connectors
Communication	LAN, Wi-Fi

9.2. Datasheet of Battery

9.2.1. Datasheet of Battery SMILE-G3-BAT-8.2P

Model	SMILE-G3-BAT-8.2P
Battery Type	LFP ($LiFePO_4$)
Weight	78.3 kg
Dimensions (W*H*D)	610*793*212 mm
Ingress Protection	IP21
Installed Energy	8.2 kWh
Usable Energy	7.8 kWh
DoD	95%
Nominal Voltage	256 V
Operating Voltage Range	240 to 288 V
Max. Charge Current*	32 A
Max. Discharge Current*	32 A
Operating Temperature Range	Charge: 0 < T ≤ 55 °C Discharge: -10 < T ≤ 55 °C
Monitoring Parameters	System voltage, current, cell voltage, cell temperature, PCBA temperature
BMS Communication	CAN
System	
Safety	IEC62619 / IEC63056 / IEC62040
Transportation	UN38.3

* Max. charge/discharge current derating may occur with changes in temperature and SOC.

9.2.2. Datasheet of Battery SMILE-G3-BAT-3.6S

Model	SMILE-G3-BAT-3.6S
Battery Type	LFP ($LiFePO_4$)
Weight	43.2 kg
Dimensions (W*H*D)	610*435*212.5 mm
Ingress Protection	IP65
Installed Energy	3.6 kWh
Usable Energy	3.6 kWh
DoD	100%
Nominal Voltage	96 V
Operating Voltage Range	90 to 108 V
Max. Charge Current*	42 A
Max. Discharge Current*	42 A
Operating Temperature Range	Charge: 0 < T ≤ 60 °C Discharge: -10 < T ≤ 60 °C
Monitoring Parameters	System voltage, current, cell voltage, cell temperature, PCBA temperature
BMS Communication	CAN
System	
Safety	IEC62619 / IEC63056 / IEC62040
Transportation	UN38.3

* Max. charge/discharge current derating may occur with changes in temperature and SOC.
SMILE-G3-BAT-3.6S is only for the Greek market.

9.2.3. Datasheet of Battery SMILE-G3-BAT-3.8S

Model	SMILE-G3-BAT-3.8S
Battery Type	LFP ($LiFePO_4$)
Weight	38.5 kg
Dimensions (W*H*D)	610*435*212 mm
Ingress Protection	IP21
Installed Energy	3.84 kWh
Usable Energy	3.65 kWh
DoD	95%
Nominal Voltage	96 V
Operating Voltage Range	90 to 108 V
Max. Charge Current*	40 A
Max. Discharge Current*	40 A
Operating Temperature Range	Charge: 0 < T ≤ 50 °C Discharge: -10 < T ≤ 50 °C
Monitoring Parameters	System voltage, current, cell voltage, cell temperature, PCBA temperature
BMS Communication	CAN
System	
Safety	IEC62619 / IEC63056 / IEC62040
Transportation	UN38.3

* Max. charge/discharge current derating may occur with changes in temperature and SOC.

9.2.4. Datasheet of Battery SMILE-G3-BAT-4.0S

Model	SMILE-G3-BAT-4.0S
Battery Type	LFP ($LiFePO_4$)
Weight	43.2 kg
Dimensions (W*H*D)	610*435*212.5 mm
Ingress Protection	IP65
Installed Energy	4.0 kWh
Usable Energy	3.8 kWh
DoD	95%
Nominal Voltage	96 V
Operating Voltage Range	90 to 108 V
Max. Charge Current*	42 A
Max. Discharge Current*	42 A
Operating Temperature Range	Charge: 0 < T ≤ 60 ℃ Discharge: -10 < T ≤ 60 °C
Monitoring Parameters	System voltage, current, cell voltage, cell temperature, PCBA temperature
BMS Communication	CAN
System	
Safety	IEC62619 / IEC63056 / IEC62040
Transportation	UN38.3

* Max. charge/discharge current derating may occur with changes in temperature and SOC.

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