APstorage Sea Family ELS Series PCS Installation & User Manual

(For North America)

Rev1.2 2024-10-14

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1. Important Safety Instructions

This manual contains important instructions to be followed during installation and maintenance of the APstorage PCS. To reduce the risk of electrical shock and ensure the safe installation and operation of the APstorage PCS, the following symbols appear throughout this document to indicate dangerous conditions and important safety instructions.

DANGER:

This indicates a hazardous situation, which if not avoided, will result in death or serious injury.

WARNING:

This indicates a situation where failure to follow instructions may be a safety hazard or cause equipment malfunction. Use extreme caution and follow instructions carefully.

NOTE:

This indicates information that is very important for optimal system operation. Follow instructions closely.

1.1 Safety Instructions

IMPORTANT SAFETY INSTRUCTIONS. SAVE THESE INSTRUCTIONS. This guide contains important instructions that you must follow during installation and maintenance of the PCS. Failing to follow any of these instructions may void the warranty. Follow all of the instructions in this manual. These instructions are key to the installation and maintenance of the APstorage PCS. These instructions are not meant to be a complete explanation of how to design and install APstorage PCSs. All installations must comply with national and local electrical codes and standards.

DANGER:

- Only qualified professionals should install and/or replace the APstorage PCS.
- Perform all electrical installations in accordance with local codes.
- To reduce risk of burns, do not touch the body of the PCS.

WARNING:

- Do **NOT** attempt to repair the APstorage PCS. If it shows abnormal performance, Contact APsystems Customer Support to obtain adequate support. Damaging or opening the APstorage PCS will void the warranty.
- These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that specified in the operating instructions".

1.2 Radio Interference Statement

This equipment could radiate radio frequency energy which might cause interference to radio communications if you do not follow the instructions when installing and using the equipment. But there is no guarantee that interference will not occur in a particular installation. If this equipment causes interference to radio or television reception, the following measures might resolve the issues:

A) Relocate the receiving antenna and keep it well away from the equipment.
B) Consult the dealer or an experienced radio / TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance may void the user's authority to operate the equipment.

1.3 Communication Disclaimer

The EMA system provides a friendly interface to monitor the working status of the whole energy storage system. At the same time, it can also help to locate problems during system maintenance. If communication has been lost for more than 24 hours, please contact the technical support of APsystems.

1.4 Symbols replace words

APstorage	Trademark.
	**Caution**, risk of electric shock.
	**Caution**, hot surface.
	**NOTICE**, danger! This device directly connected with electricity generators and public grid.
Qualified personnel	Person adequately advised or supervised by an electrically skilled person to enable him or her to perceive risks and to avoid hazards which electricity can create. For the purpose of the safety information of this manual, a "qualified person" is someone who is familiar with requirements for safety, electrical system and EMC and is authorized to energize, ground, and tag equipment, systems, and circuits in accordance with established safety procedures. The inverter and storage system may only be commissioned and operated by qualified personnel.

2. Product Introduction

ELS series PCS is APstorage's Sea family product and the PCS is a battery Power Conversion System. APstorage PCS, together with a compatible battery (not offered by APstorage), becomes a complete and independent AC coupling storage solution for residential PV installations. It can be used with any new or already installed PV systems without changing equipment in place.

One PCS can be connected up to 40kWh compatible battery (see battery compatibility list). When multiple battery packs are connected, they need to be connected in parallel. (see connection diagram in the Battery User Manual)

APstorage will help home-owners to optimize their utility bill, offering full flexibility to manage their Electrical consumption. Several modes are available. (Backup power supply mode, Self-consumption mode, peak valley time mode and peak shaving mode)

2.1 Features

Safety

- Ingress protection IP65
- 48V low battery voltage input
- Intelligent charging technology, protecting battery life
- High and low voltage isolation topologies, ensuring personal safety

Flexible

- Compatible with multiple battery brands
- Provide dedicated interface for connecting generator
- AC-Coupled solution for new or existing installations
- Supports 120/240V split-phase output, no need to connect external transformer
- Provides dry contacts for controlling generator or load

Intelligent

- Support split-phase unbalanced output
- UPS-level switching time <10ms
- Innovative multiple energy control modes: Backup power supply, Self-consumption, Peak and valley, and Peak shaving
- 24-hour intelligent energy management system
- Intelligent operation and maintenance platform with EMA

Performance

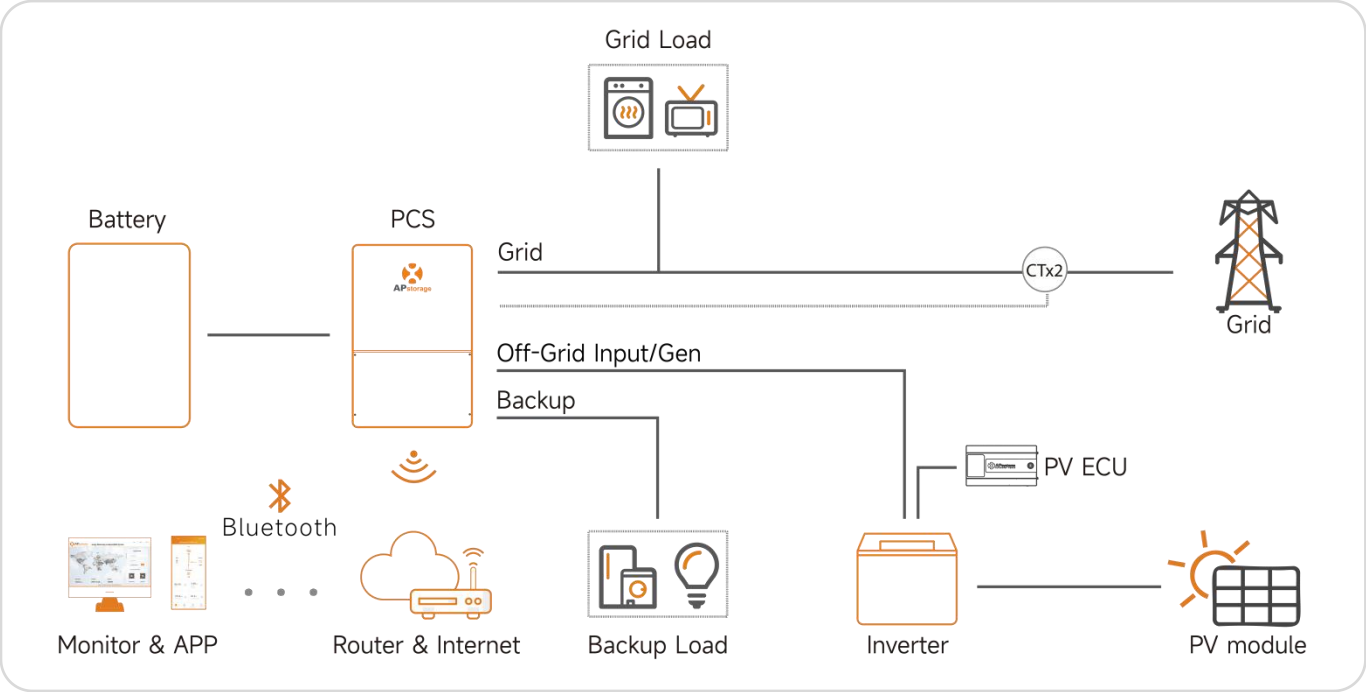
- Nominal power rating up to 11400VA
- Peak backup power up to 17100VA
- Max efficiency up to 95.6%

2.2 Basic System Architecture

A typical APstorage system includes two main elements:

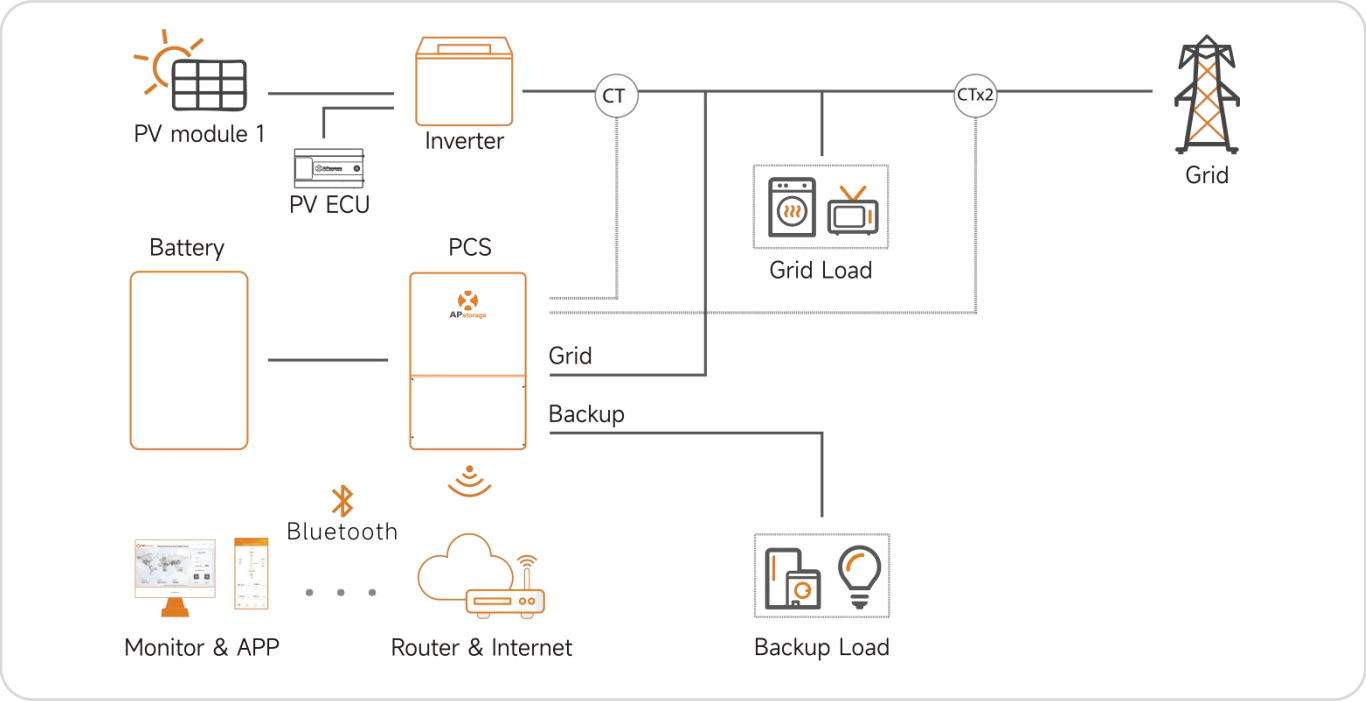
- **APstorage PCS, which is a smart battery Power Conversion System.**
- **A compatible Battery pack (see battery compatibility list)**

Option 1 : PV system working off-grid

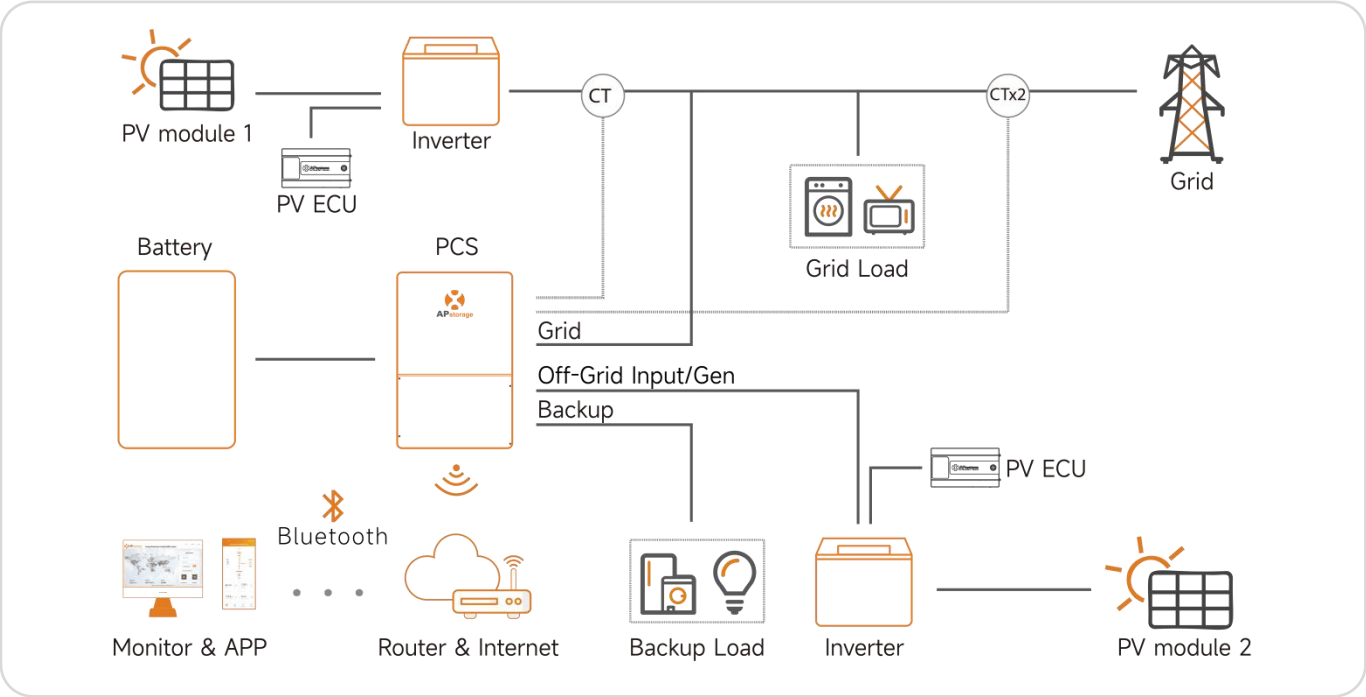


In option 1, Off grid function only compatible with APsystems DS3&DS3D microinverters(fully compatible).

Option 2 : PV system notworking off-grid



Option 3 : mix of option 1 and 2 following the conditions above



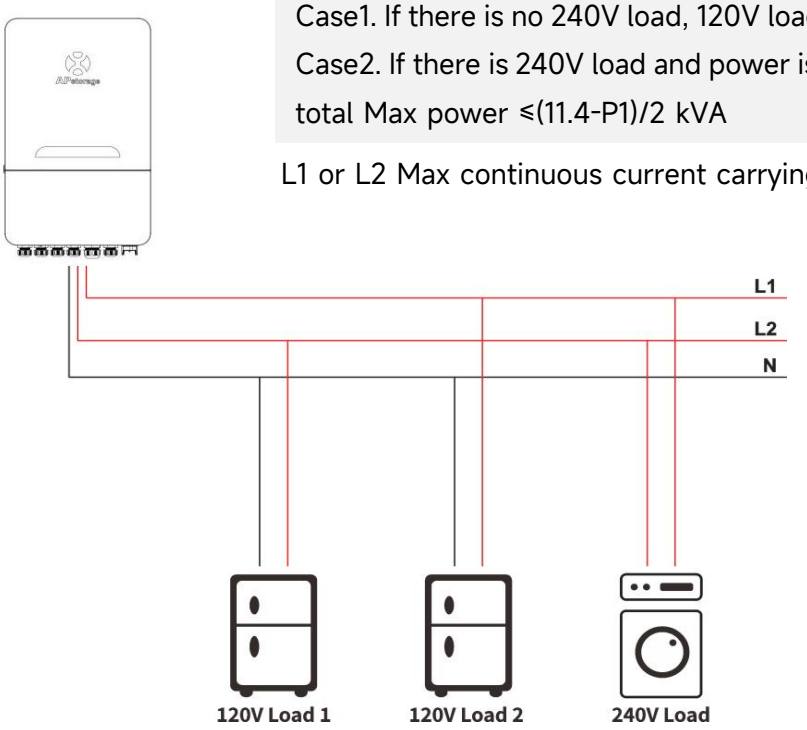
NOTE:

If the wireless signal in the area where the PCS is weak, it is necessary to add a Wi-Fi signal booster at a suitable place between the router and the PCS.

NOTE:

In a Storage System with APstorage PCS, the battery is one of the key components. Therefore, it is necessary to keep the installation environment well ventilated, please refer to Battery user manual.

2.3 Back-up Load Configuration



Case1. If there is no 240V load, 120V load1 or load2 total Max power ≤5.7kVA.
Case2. If there is 240V load and power is P1, P1 ≤11.4kVA, 120V load1 or load2 total Max power ≤(11.4-P1)/2 kVA

L1 or L2 Max continuous current carrying capacity ≤ 47.5A

Backup Port

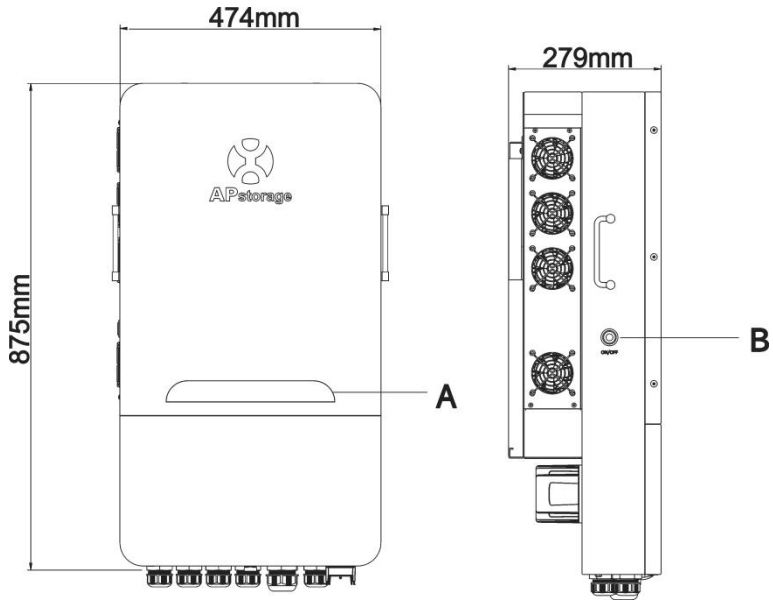
NOTE:

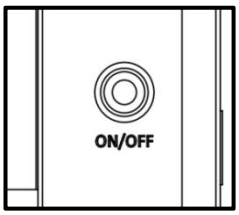
The 120V and 240V load configuration of auto-transformer should meet the below requirements. It is stipulated that the 120V load received by L1N and L2N do not exceed 5.7kW respectively. If there is 240V load, 240V load power needs to be subtracted and distributed equally. For example, 240V load power is P1, then (11.4kw-P1) / 2 is the remaining 120V power of the assemble able L1N and L2N. The imbalance load cannot exceed the new power distribution.

L1N: voltage between L1 and Neutral line

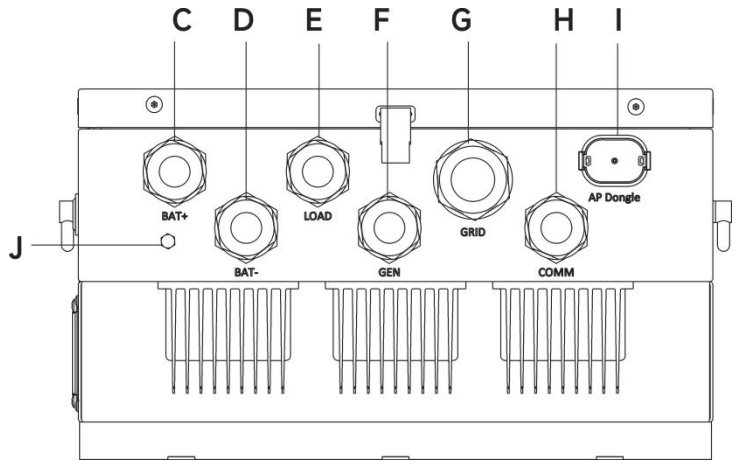
L2N: voltage between L2 and Neutral line

2.4 Casing Introduction





Once the PCS has been properly installed and the batteries are connected well, simply Press On/Off button (located on the left side of the case) to turn on the PCS and press On/Off button(ON/OFF button is switched off) to turn off the PCS.



* The image shown here is for reference only. The actual product received may differ.

Object	Name	Description
A	LED	LED indicators
B	On/Off Button	Turn on/off the PCS
C	BAT+	Battery positive cable inlet
D	BAT-	Battery negative cable inlet
E	LOAD	Backup Load cables inlet
F	GEN	Generator cables inlet
G	GRID	AC Grid cables inlet
H	COMM	Communication cables inlet
I	AP Dongle	AP Dongle insertion port
J	Exhaust valve	-

2.5 LED

There are eight LED indicators on the PCS unit, indicating the working state of the PCS.

LED	Condition	Description
SYSTEM	▬▬▬▬	The system is operating
	▮ ▮ ▮ ▮	The system is starting up
	———	The system shutdown
GRID	▬▬▬▬	The grid exists and is connected
	▮ ▮ ▮ ▮	The grid exists but is not connected
	———	The grid does not exist
BACK UP	▬▬▬▬	The backup system is operating
	———	The backup is off
ENERGY	▬▬▬▬	Buy energy from grid
	▮ ▮ ▮ ▮	Zero output
	▮▮▮▮▮▮▮▮	Supplying energy to grid
	———	The grid is not connected or system is not operating
BATTERY	▬▬▬▬	The battery is charging
	▮ ▮ ▮ ▮	The battery is discharging
	▮▮▮▮▮▮▮▮	The battery SOC is low
	———	The battery is disconnected
WI-FI	▬▬▬▬	The WiFi is connected to the router
	▮ ▮ ▮ ▮	The WiFi is not connected to the router
	———	The WiFi function is closed
COM	▬▬▬▬	The battery and the internet communication are normal
	▮ ▮ ▮ ▮	The battery communication is normal,
	▮▮▮▮▮▮▮▮	The battery communication is abnormal,
	———	The battery and the internet communication are abnormal
FAULT	▬▬▬▬	Fault has occurred
	▮ ▮ ▮ ▮	Back up output overload
	———	No fault

▬▬▬▬ : Light on

——— : Light off

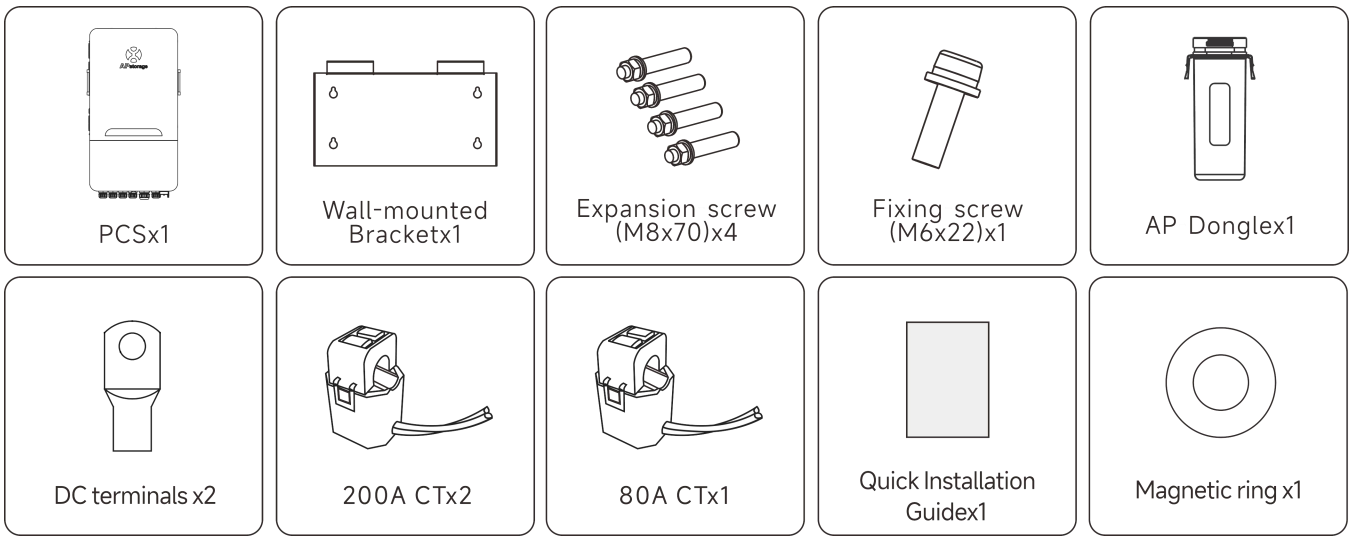
▮ ▮ ▮ ▮ : Every 5 seconds light on for 1 second.

▮▮▮▮▮▮▮▮ : Every 2 seconds light on for 1 second.

3. Installation

3.1 Packing List

Check the equipment before installation. Please make sure nothing is damaged in the package. You should have received the items in the following package:



NOTE:

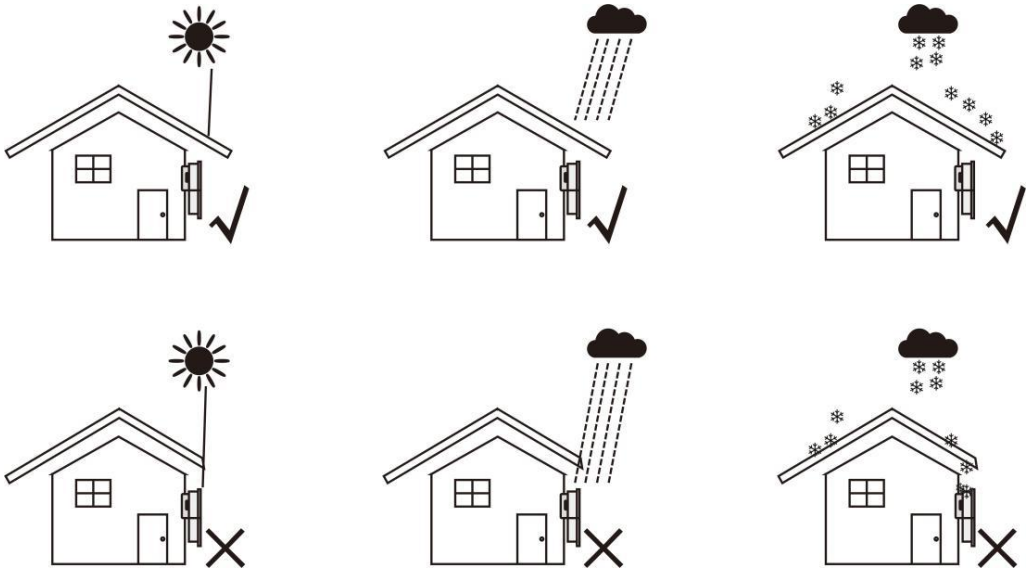
The expansion screws are applicable only to cement concrete walls. For other types of walls, install expansion screws based on the wall type.

NOTE:

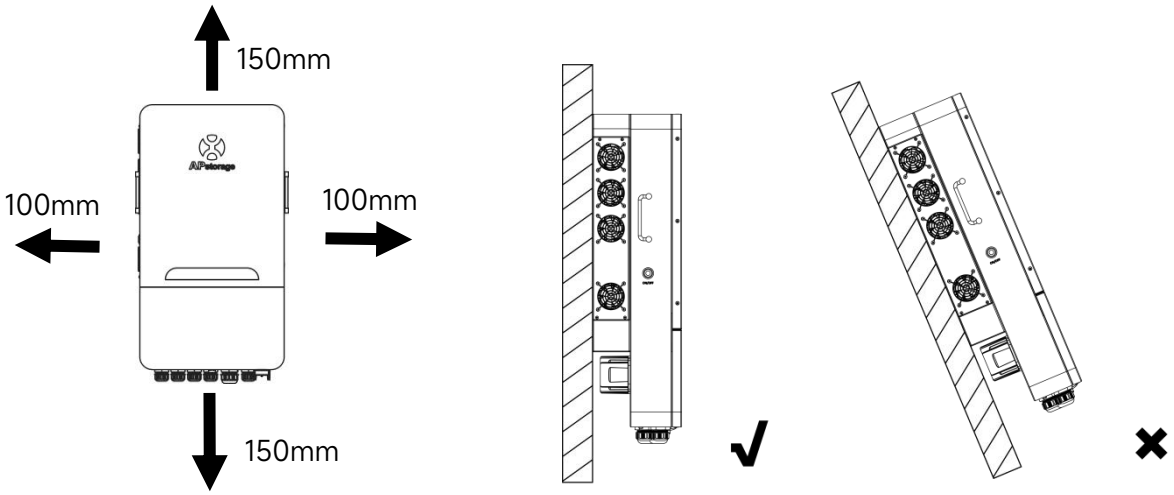
The customer will need to purchase a combiner box for parallel connection of the batteries. Combiner box requirements: rated current of each connector≧240A.

3.2 Select Mounting Location

1. PCS should be installed on a solid surface, where is suitable for PCS's dimensions and weight.
2. Do not install PCS in a confined space with no ventilation.
3. If the PCS is installed outside, it should be protected under shelter from direct sunlight or bad weather conditions (like snow, rain, lightning, etc). Fully shielded installation locations are preferred.



4. Install the APstorage vertically on the wall.
5. Make sure that the PCS is mounted "face-up": Product logo is visible after installation.
6. Leave enough space around APstorage. The specific requirements are as follows:



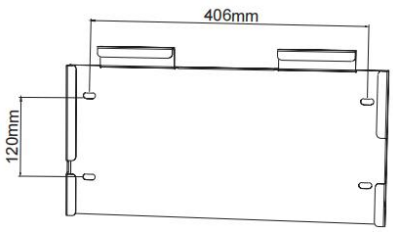
WARNING:

APstorage PCS cannot be installed near flammable, explosive or strong electro-magnetic equipment.

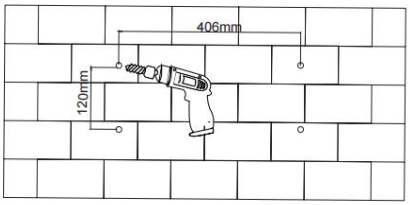
3.3 PCS installed on the wall

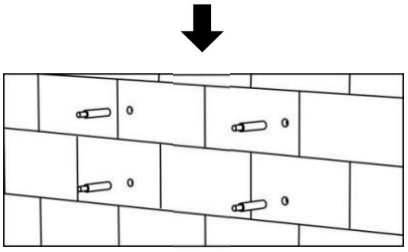
STEP 1

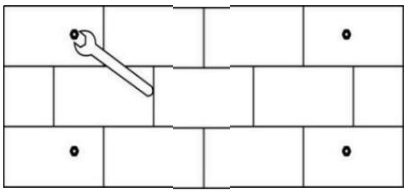
Mark the holes position on the wall and drill holes according to wall type and expansion screws type. The Configured expansion screw is drilled with a diameter of 12mm(0.5”) and a depth of 50-55mm(1.9-2.2”).

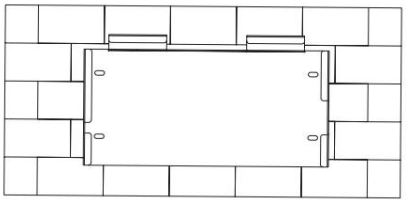


Mountng bracket









STEP 2

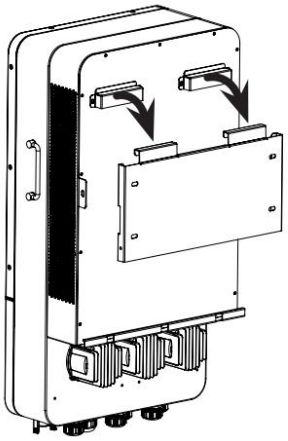
1. Put the expansion screws into the holes on the wall. Use a wrench to tighten the hex nuts, so that the expansion screws sleeve are fully expanded.

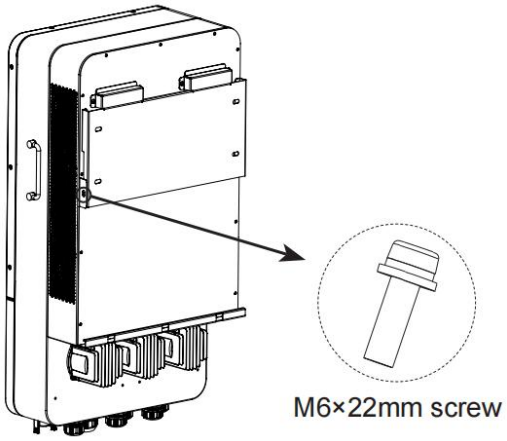
2. Then remove the hex nuts. Hang the wall mounting bracket into the expansion screws, and use the hex nuts to fix it firmly.

3. Make sure that the wall mounting bracket is horizontal after installation.

STEP 3

Lift the PCS to hang it into the wall mounting bracket, and fix the PCS on wall mounting bracket with the M6×22mm screw.

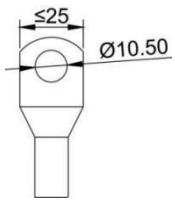




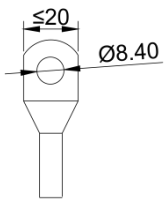
3.4 Terminals and Cables Introduction

When wiring, you need to crimp appropriate terminals on the cable (as shown for dimensions). The cables and terminals need to be prepared by yourself. (The DC terminal is a standard configuration, No need to purchase extra.)

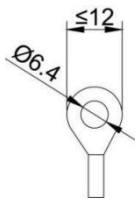
Please choose the appropriate terminal for the cable diameter:



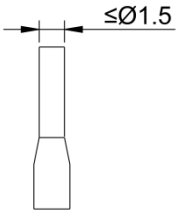
DC terminals



GRID terminals



GEN/LOAD terminals



ATS terminals

DC cable:

Model	Wire Size	Cable(mm^2)	Torque value
ELS-11.4	1/0AWG	60	10Nm

Grid cable:

Model	Wire Size	Cable(mm^2)	Torque value
ELS-11.4	3 AWG	25	2.5Nm

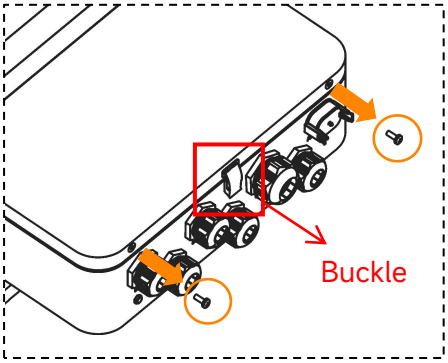
GEN/LOAD cable:

Model	Wire Size	Cable(mm^2)	Torque value
ELS-11.4	8 AWG	8	1.2Nm

Battery Inputs: "Use No. 90°C Copper Wire only";
AC Outputs: "Use No. 90°C Copper Wire only";
DC Ground: "Use No. 90°C Copper Wire only";
AC Ground: "Use No. 90°C Copper Wire only";

Remove the lower cover

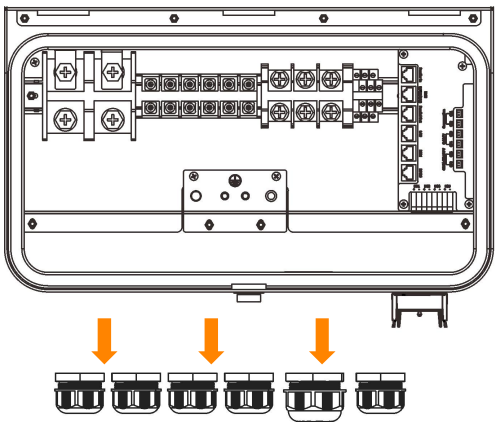
Before connecting all wires, please take off the metal cover by removing two screws as shown below:

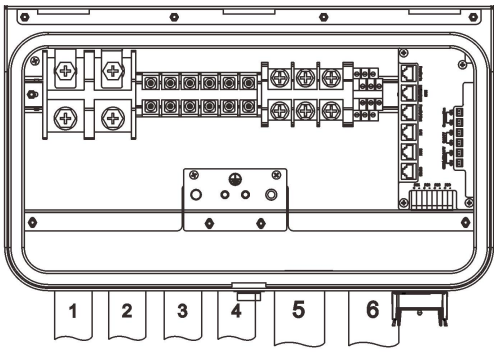


NOTE:

When removing the cover, please first remove the screws and then loosen the buckle.

PCS has been installed with cable glands before delivery. If connection is required through pipe **(prepare Pipe yourself)**, remove cable glands on the casing first.





PIPE 1/2/3/4/6 size: 1"

PIPE 5 size: 1 1/2"

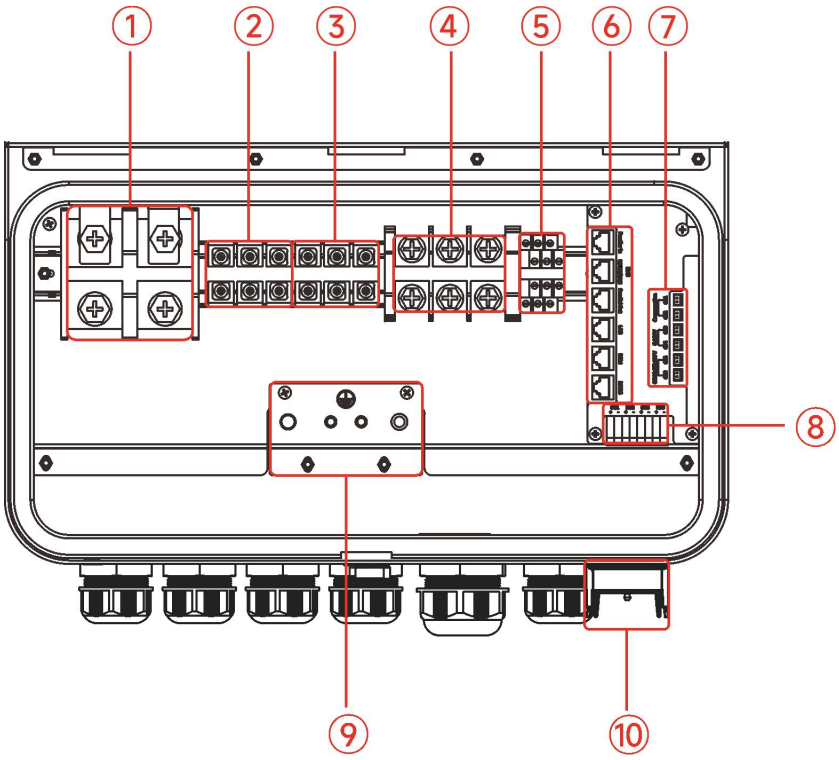
NOTE:

The pipe must be waterproof.

WARNING:

Do not drill holes in the casing at any location, otherwise we will not provide warranty.

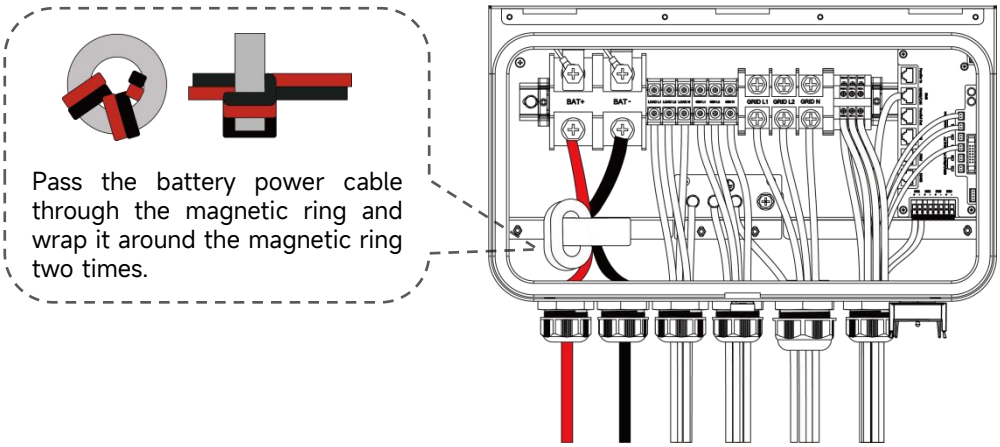
3.5 Interface Layout Introduction



Object	Description
①	BAT+ /BAT- Terminals
②	LOAD Terminals
③	Off-Grid Input/Gen Terminals
④	GRID Terminals
⑤	ATS Terminals
⑥	Communication Terminals
⑦	CT Terminals
⑧	DO1/DO2/DO3 Terminals/RSD Terminals
⑨	Ground Terminals
⑩	AP Dongle

3.6 Battery Connection

1. Connecting the battery with a suitable cable is important for safe and efficient operation of the system. To reduce the risk of injury, refer to Chapter 3.4 for recommended cables.
2. Use a suitable screwdriver to unscrew the bolts and fit the battery connectors in, then fasten the bolt by the screwdriver, make sure the bolts are tightened with torque of 10Nm in clockwise direction.
3. Make sure polarity at both the battery and PCS is correctly connected.



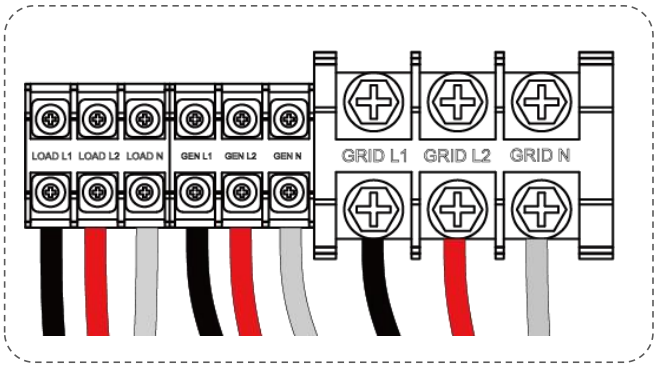
BAT+: Red or Orange;
BAT-: Black

WARNING:

Installation must be performed with care. Before making the final DC connection or closing DC breaker/disconnect, be sure positive(+) must be connect to positive(+) and negative(-) must be connected to negative(-). Reverse polarity connection on battery will damage the inverter.

3.7 AC Wiring Connection

Use a suitable screwdriver to unscrew the bolts and fit the AC connectors in, then fasten the bolt by the screwdriver, make sure the bolts are tightened in clockwise direction. GRID terminals torque is **2.5Nm**, GEN/LOAD terminals torque is **1.2Nm**. Please refer to Chapter 3.4 for recommended cables.



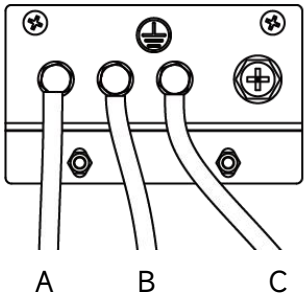
L1-Black; L2-Red; N-White;

NOTE:

Make sure to connect the two live wire to L1 and L2, connect the neutral wire to N, otherwise the precision of the CT will be affected.

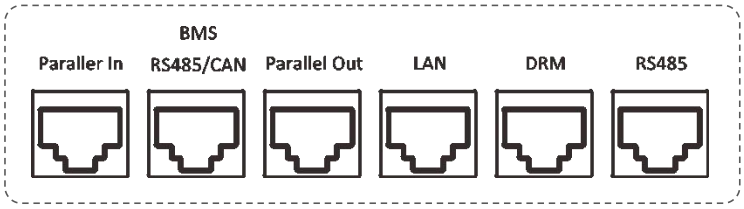
3.8 Ground Wiring Connection

Use a suitable screwdriver to unscrew the bolts and fit the Ground connectors in, then fasten the bolt by the screwdriver, make sure the bolts are tightened in clockwise direction. Ground terminals torque is **2.5Nm** for GRID, Ground terminals torque is **1.2Nm** for GEN/LOAD.



A: For GEN AC connection
B: For LOAD AC connection
C: For GRID AC connection

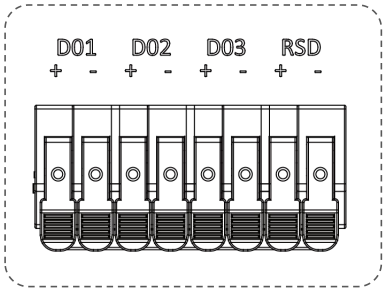
3.9 Communication Connection

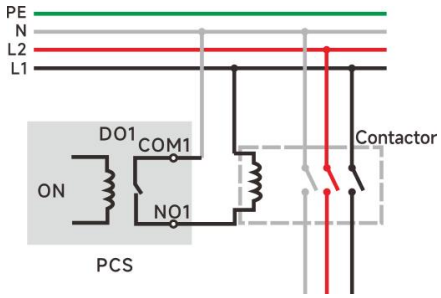


Parallel In: Parallel communication port (CAN interface).
BMS RS485/CAN: For battery communication.
Parallel Out: Parallel communication port (CAN interface).
LAN: Used for device and local area network connection.
DRM: It is used to accept the external control command.
RS485: Communication functions for external electric meters.

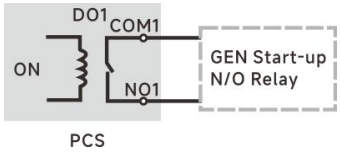
3.10 DO Connection

The PCS has integrated a multiple-function dry contact (DO1, DO2 and DO3). The DO can be set to one of the functions as follows, Generator Control and Load Control. For more information, please contact APstorage technical support team.





DO1/2/3-Load Control



DO1-Generator Control
(DO1 can be used for load control if the generator is not used).

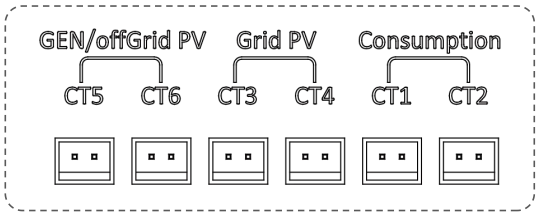
RSD(Rapid Shutdown Device): An external switch is required. When the switch is closed, PCS protection can be activated to quickly shut down the APstorage system.

3.11 CT Connection

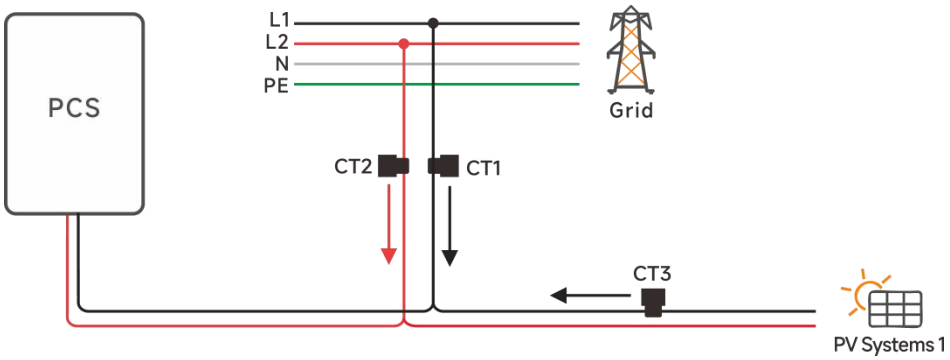
CT1/CT2: 200A

CT3: 80A

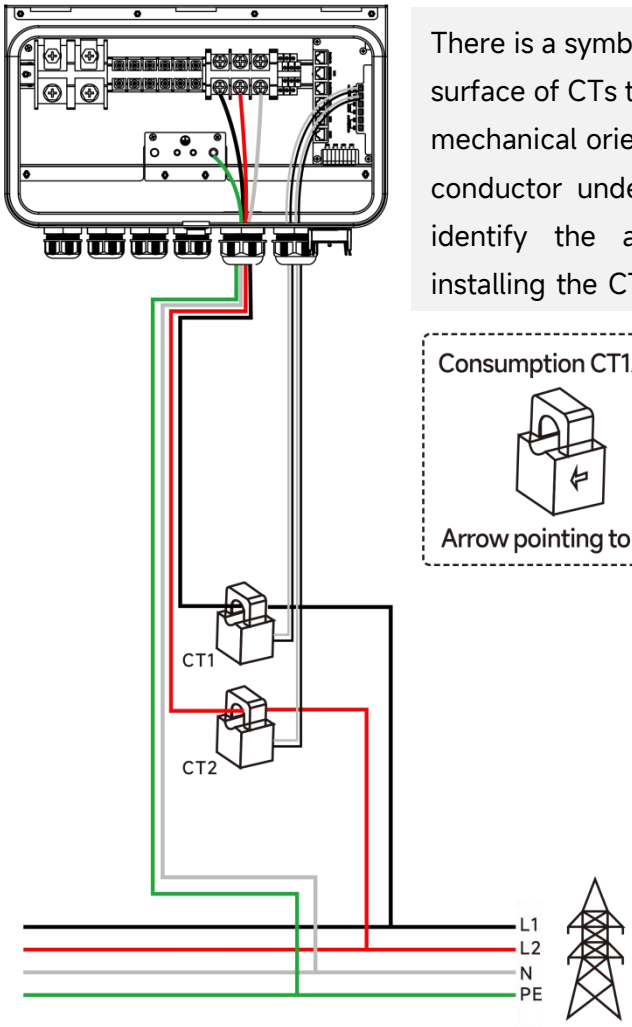
CT4/CT5/CT6: Reserve



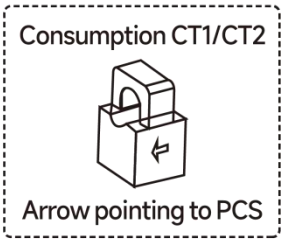
The direction of CTs: The arrows on the CT1/CT2 should point from grid to PCS. The arrows on the CT3 from PV Systems 1 to PCS.



CT1/CT2 wiring is shown in the diagram, please refer to this diagram for other CTs wiring.



There is a symbol (arrow) or label on the surface of CTs that indicates the correct mechanical orientation of the CT on the conductor under measurement. Please identify the arrow or label before installing the CT.



3.12 AP Dongle

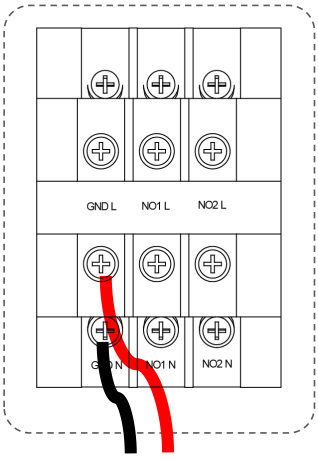
AP Dongle is an intelligent communication expansion module used in conjunction with PCS to achieve wireless communication between PCS and the management system through WLAN and Bluetooth.

❶ Pull out the protective cover of the USB interface.
❷ Insert AP Dongle into the USB interface.
❸ Check the LED status display to obtain the working status of the AP Dongle. (For detailed information, please refer to the manual of the AP Dongle.)

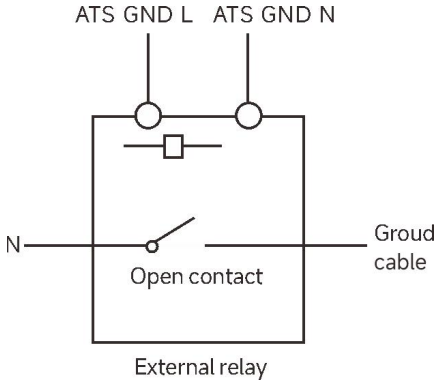
3.13 ATS Wiring Connection

According to local installation requirements, off grid neutral can be grounded internally or externally.

Connect the ATS cables to the PCS through the COMM cable gland. As shown, connect wire L and N to terminal Block. Please refer to Chapter 3.4 for recommended cables.



ATS GND N ATS GND L



ATS: 230V output port when PCS is on.

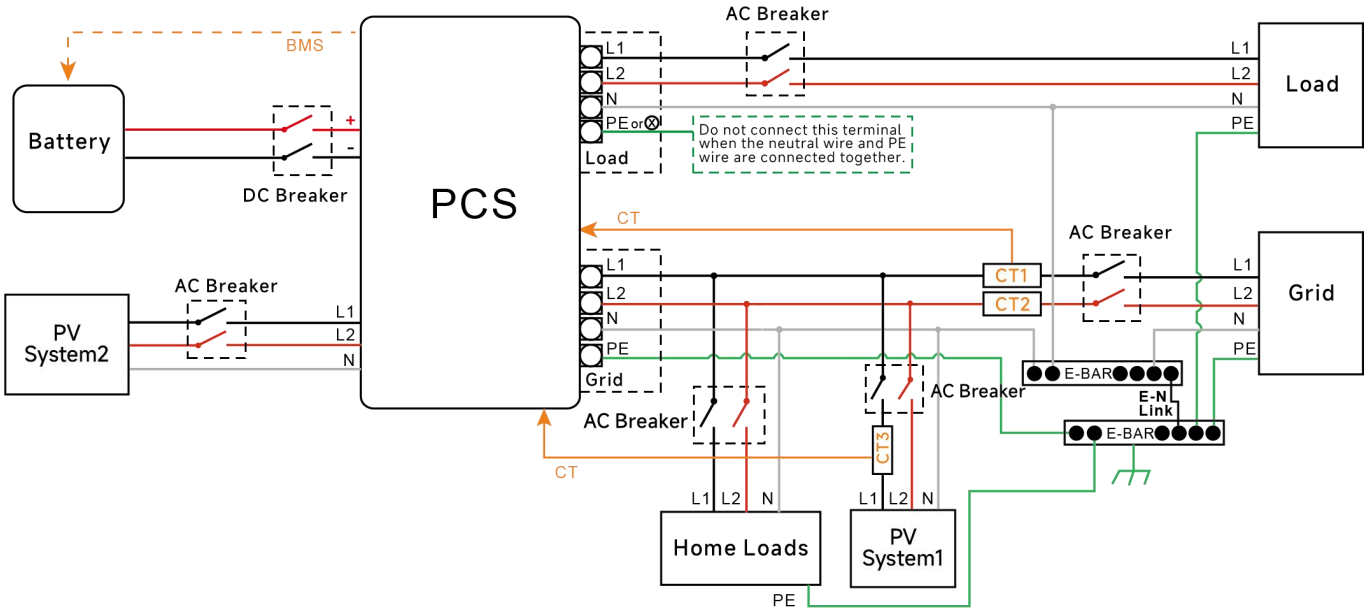
ATS_N01、ATS_N02：Reserved

NOTE:

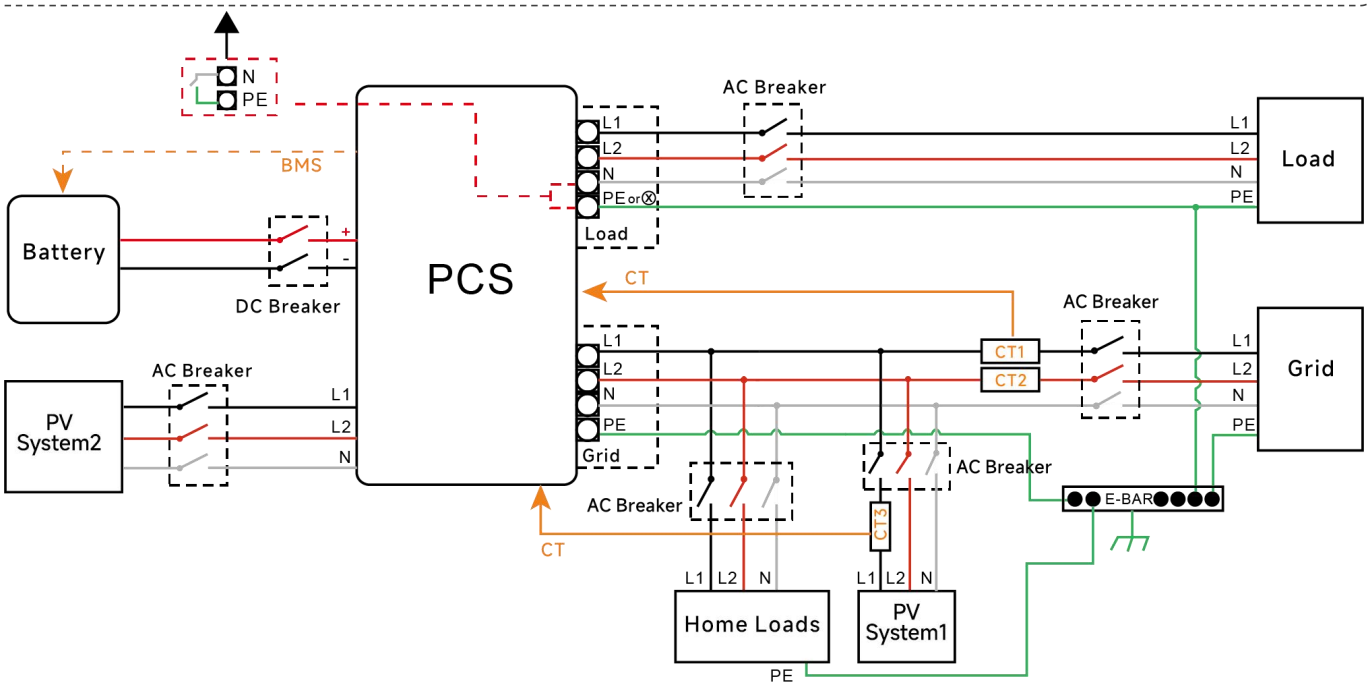
The ATS port is established based on mandatory external grounding requirements in certain countries, and users should choose whether to use it according to local requirements.

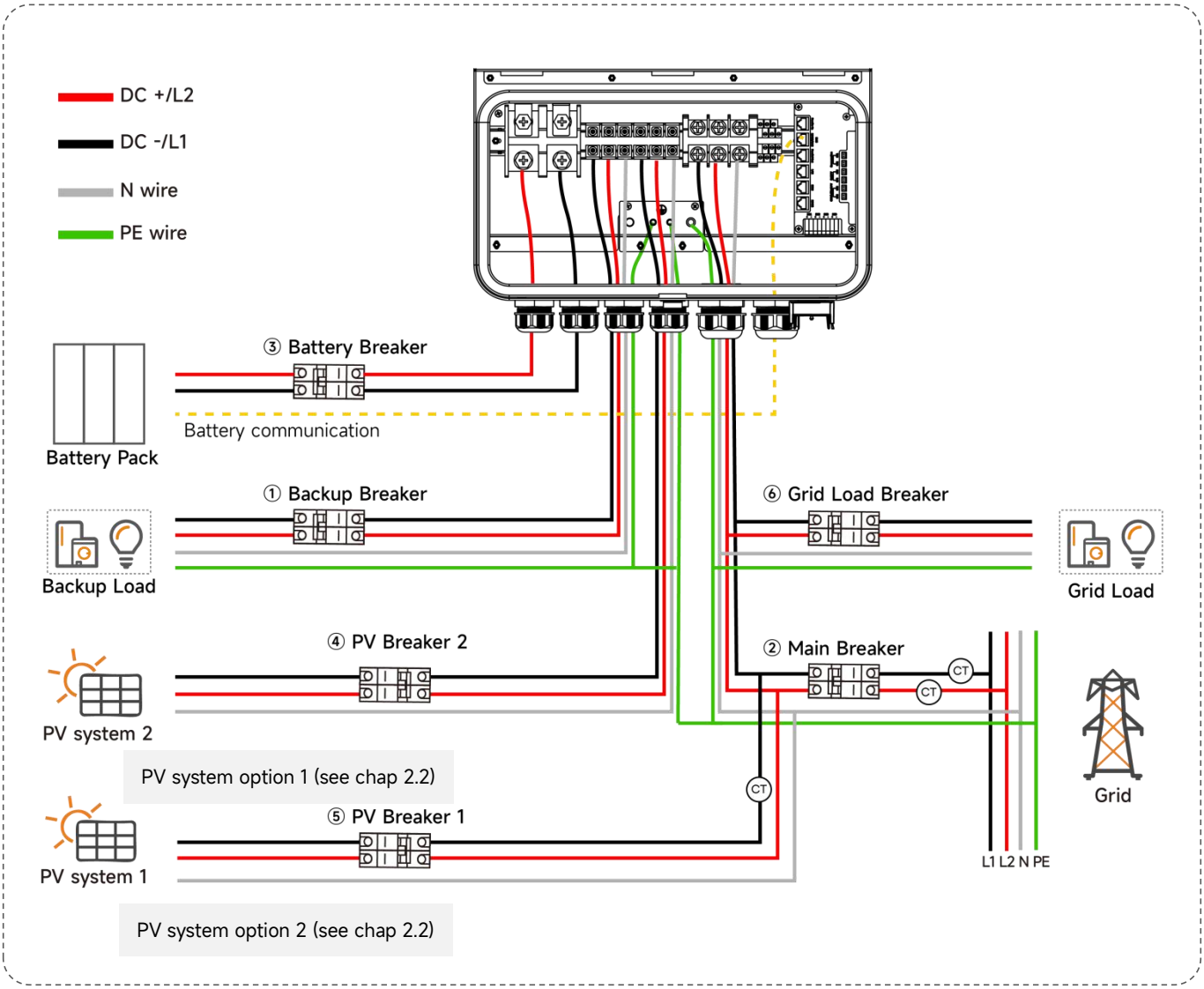
3.14 Wiring System for PCS

This diagram is an example for an application that neutral connects with the PE in a distribution box.
For countries such as Australia, New Zealand, South Africa, etc., please follow local wiring regulations!



When the inverter is working in backup mode, neutral and PE on the backup side are connected via the internal relay. Also,this internal relay will be open when the inverter is working in grid tied mode.

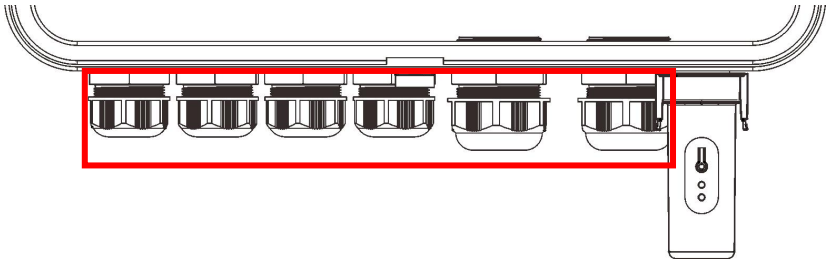




① Backup Breaker: 100A AC Breaker
② Main Breaker : 200A AC Breaker
③ Battery Breaker: 300A DC Breaker
④ PV Breaker 2: 100A AC Breaker
⑤ PV Breaker 1: Depends on PV system 1
⑥ Grid Load Breaker: Depends on Grid Load

NOTE:

After having completed the wiring, the nuts of the cable gland must be tightened.

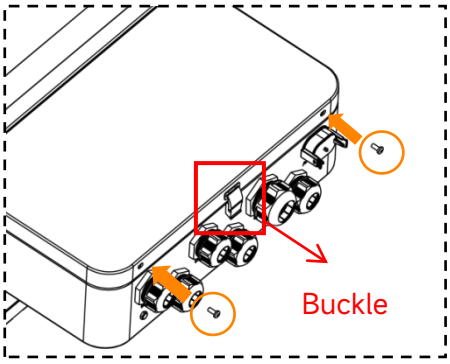


NOTE:

When there are two or more cables passing through the same gland, please use sealing putty to seal the gaps between the cables and the gland to prevent moisture from entering (prepare sealing putty yourself).

Install the Lower Cover

Complete wiring, screw the two screws back.



NOTE:

When installing the cover, please first fasten the buckle and then tighten the screw.

3.15 PCS Operation Procedures

3.15.1 Check all Below Steps Before Starting PCS

① Make sure the PCS is properly mounted to the wall.
③ Make sure all the DC wirings and AC wirings are completed.
④ Make sure the CT is connected properly.
⑤ Make sure the battery is connected properly.
⑥ Make sure all grounded busbar are connected property.
⑦ Make sure the PV system is connected properly.
⑧ Make sure the loads and critical loads are connected property, and the critical loads rating is within nominal rating range.

3.15.2 Power ON

Once the unit has been properly installed and the batteries are connected well, turn on the Battery DC Breaker, Grid AC Breaker, PV AC Breaker and Load AC Breaker, then turn on the batteries and press the on/ off button to power the system.

3.15.3 Check the system

Please refer to chapter 5.3.1 to check the system.

3.15.4 Power Off

Press the on/off button, turn off the Battery DC Breaker, Grid AC Breaker, PV AC Breaker and Load AC Breaker to shut down the system, then turn off the batteries.

WARNING:
Installation must be performed with care. Before making the final DC connection or closing DC breaker/ disconnect, be sure positive(+) must be connect to positive(+) and negative(-) must be connected to negative(-). Reverse polarity connection on battery will damage the inverter.

WARNING:
The installer is responsible for providing overcurrent protection.To reduce the risk of fire, install a circuit breaker or overcurrent device on both positive(+) and negative(-) conductors to protect the system.

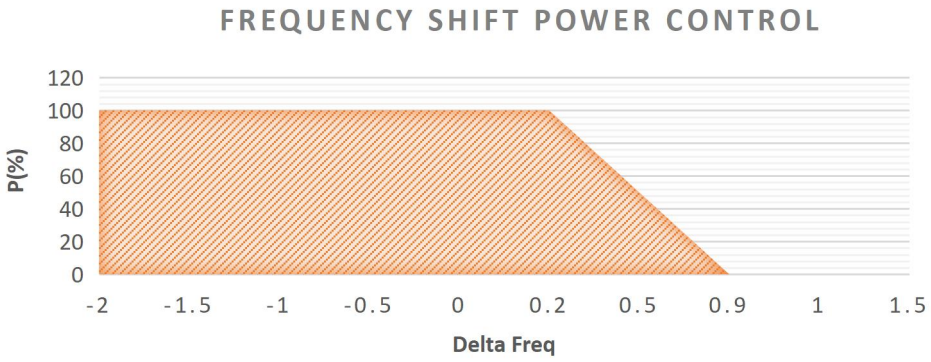
4. Off-Grid AC Coupling Installation

4.1 Frequency Shift Power Control

Functional Overview

If the PV inverter is connected to the off-grid side of the PCS in the system, the PCS must be able to limit its output power. This limitation is necessary when the battery of the PCS is fully charged and the available power of the photovoltaic system exceeds the power demand of the connected load. In order to prevent the battery from overcharging, the PCS uses the measured the photovoltaic power and the requested charging power from battery to adjust the frequency of the microgrid, and the photovoltaic inverter adjusts the output power by detecting the change of the frequency of the microgrid.

The Frequency Shift Power Control function needs to be enabled the off-grid charging function on the EMA App. At the same time, it is necessary to ensure that the PV module 2 is correctly connected to the Production CTs, the PV inverter function is enabled, and is set according to the APstorage over-frequency load reduction parameter setting table.



Example PV Inverter Function showing Power vs Delta Frequency

In the graph above, the horizontal axis is variation of the frequency, 0 is the rated frequency. The vertical axis represents the percentage of the current power to the rated power. The photovoltaic power changes with the microgrid frequency controlled by the PCS.

NOTE:

The frequency change curve shown in above figure is only for display purposes. The specific parameters of the photovoltaic inverter and PCS are set according to the local certification standards and APstorage over-frequency load reduction parameter setting table.

4.2 PV System Switch

Functional Overview

If the PV inverter cannot control its the power through Frequency Shift Power Control, we propose the PV System Switch solution. Through the PV System Switch, we can disable the photovoltaic inverter to prevent the battery from being fully charged and the photovoltaic Situations where power cannot be stopped.We can control off-grid energy storage photovoltaic systems by opening and closing GEN relays:

A) Backup contactor: when the Battery SOC is lower than the lower limit of Backup SOC protection, the PCS stops supplying power to the load to ensure that the battery does not enter a state of power loss. When there is enough solar power to meet the starting conditions of PV module 2, PV module 2 charges the battery through the PCS.
B) When the battery SOC is greater than Backup SOC limit, Backup Loads can be enabled.
C) PV contactor: when the battery SOC is greater than the upper limit of off-grid charging SOC, PCS will disconnect the photovoltaic inverter to prevent battery overcharging and ensure the normal operation of Backup Load.
D) When the battery SOC is lower than the upper limit of off-grid charging SOC recovery, PCS will wake up PV module 2 which will supply power to the energy storage system.

4.3 PV System to APstorage Pairing

1. Determine the maximum single load power rating (kW) to be backed up and select the absolute minimum number of PCS units required to meet the requirements of 2017 NEC 690.10->710.15(A).
2. Calculate the required energy storage capacity (kWh) based on the backup load estimate for the user-defined time period, capacity and the minimum number of batteries required.
3. Calculate the maximum power (PV module 2) of the photovoltaic system connected to the PCS in Table 1. Note the number is different if the PV inverter has Frequency Curtailment and/or not.

If the total power of the photovoltaic system is greater than the maximum power, the excess power (PV System1) is connected to the grid side.

Table 1: The maximum power of the photovoltaic system for storage system backup

ELS-11.4 units (1unit per 11.4kWac)	Battery power (kWac)	Max PV system power in System 2 with Frequency Shifting (kWac)
1	≤14.24	Battery power
1	≥14.24	14.24
2	≤28.5	Battery power
2	≥28.5	28.5

ELS-11.4 units (1unit per 11.4kWac)	Battery power (kWac)	Max PV system power in System 2 without Frequency Shifting (kWac)
1	≤11.4	Battery power
1	≥11.4	11.4
2	≤22.8	Battery power
2	≥22.8	22.8

Two calculation examples are given below for reference:

Step 1: Figure out Battery Max Charge Power.

Step 2: Figure out PCS Charge Power.

Step 3: Take the smaller number.

Step 4: Multiply by 1.25 (If using Frequency Power Control).

Table 2: Examples Calculation of Off-grid Solar

Examples Calculation of Off-grid Solar	
1 ELS-11.4+3 APbattery-48V/5.76kWh 1. Battery Power = 7.5kW 2. ELS Power =11.4kW 3. 7.5kW is smaller 4. 7.5kW*1.25= 9.375kW of Off-grid PV	1 ELS-11.4+HomeGrid 4 Stack 1. Battery Power = 14.4kW 2. ELS Power = 11.4kW 3. 11.4kW is smaller 4. 11.4kW*1.25= 14.25kW of Off-grid PV

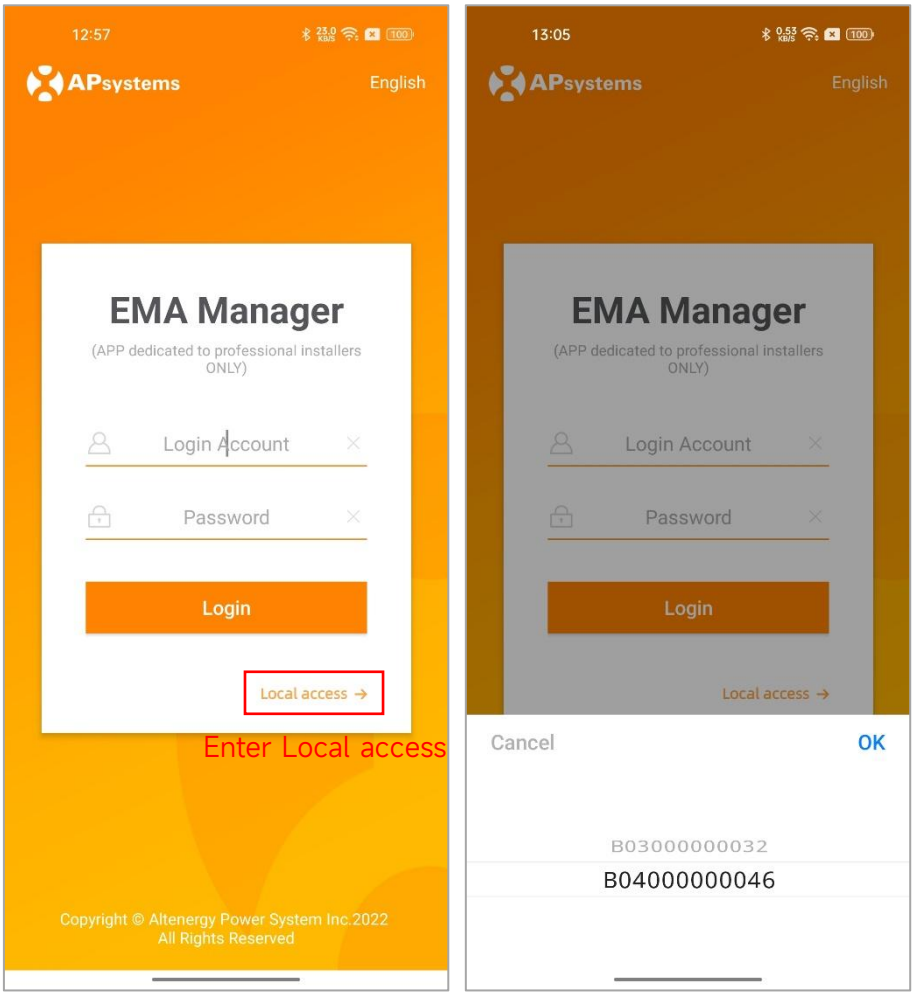
5. APstorage User Interface

Professional and certified Installer can commission, monitor and maintain the APstorage solution and performance via the EMA Manager APP. Please search for the APP in APP Store or Google Play, or use mobile browser to scan the QR codes to download the APP. (EMA App is for end-users, EMA Manager is for installers). You can also click on the link below to download the APP: http://q-r.to/1OrC

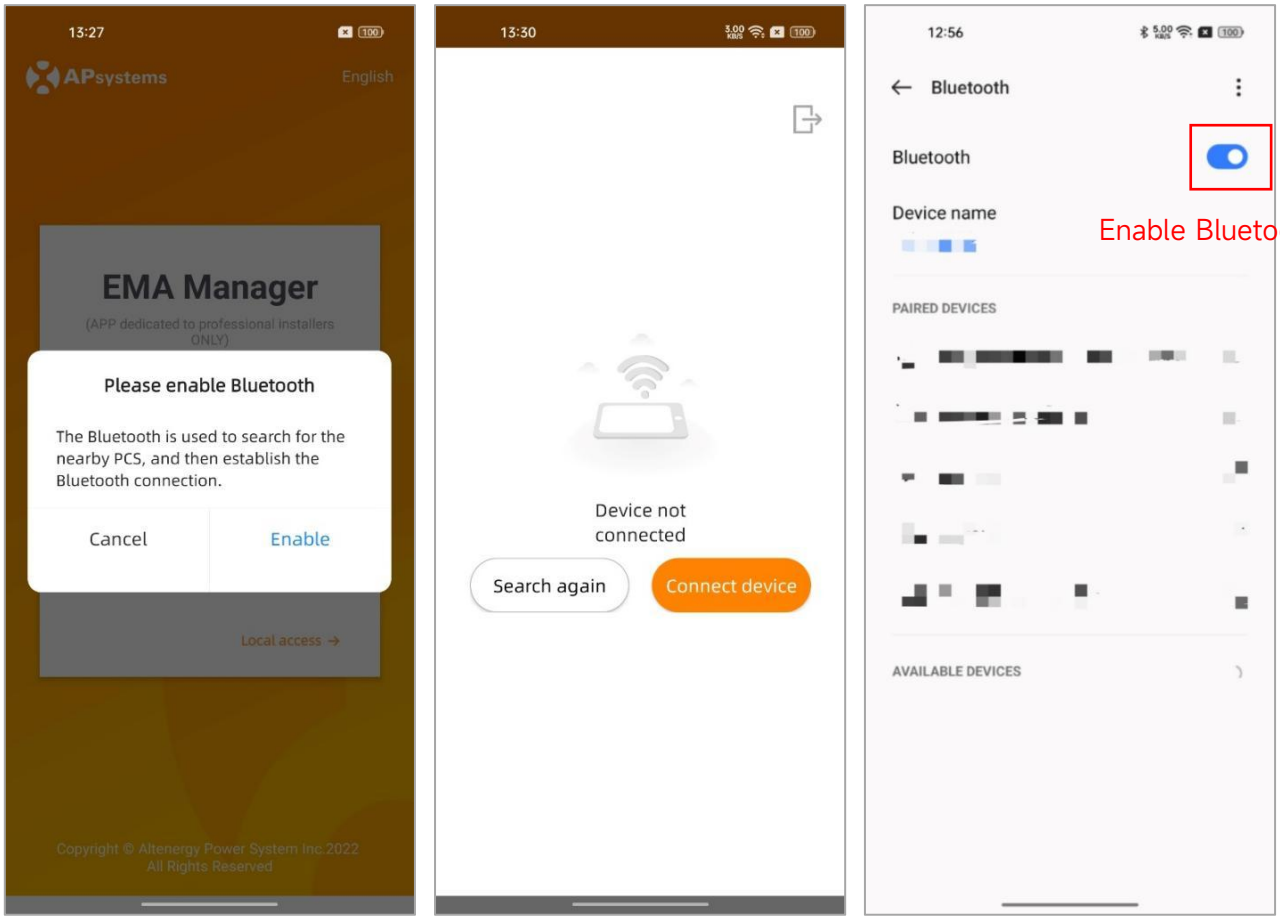
5.1 Configure APstorage with EMA Manager

The APstorage PCS has been designed with local connection and management functionality. You can access this local functionality through EMA Manager.

Click "*Local access*" to enter this function.



You will be noticed if your smartphone or tablet is not enable Bluetooth or is too far away from the APstorage PCS.



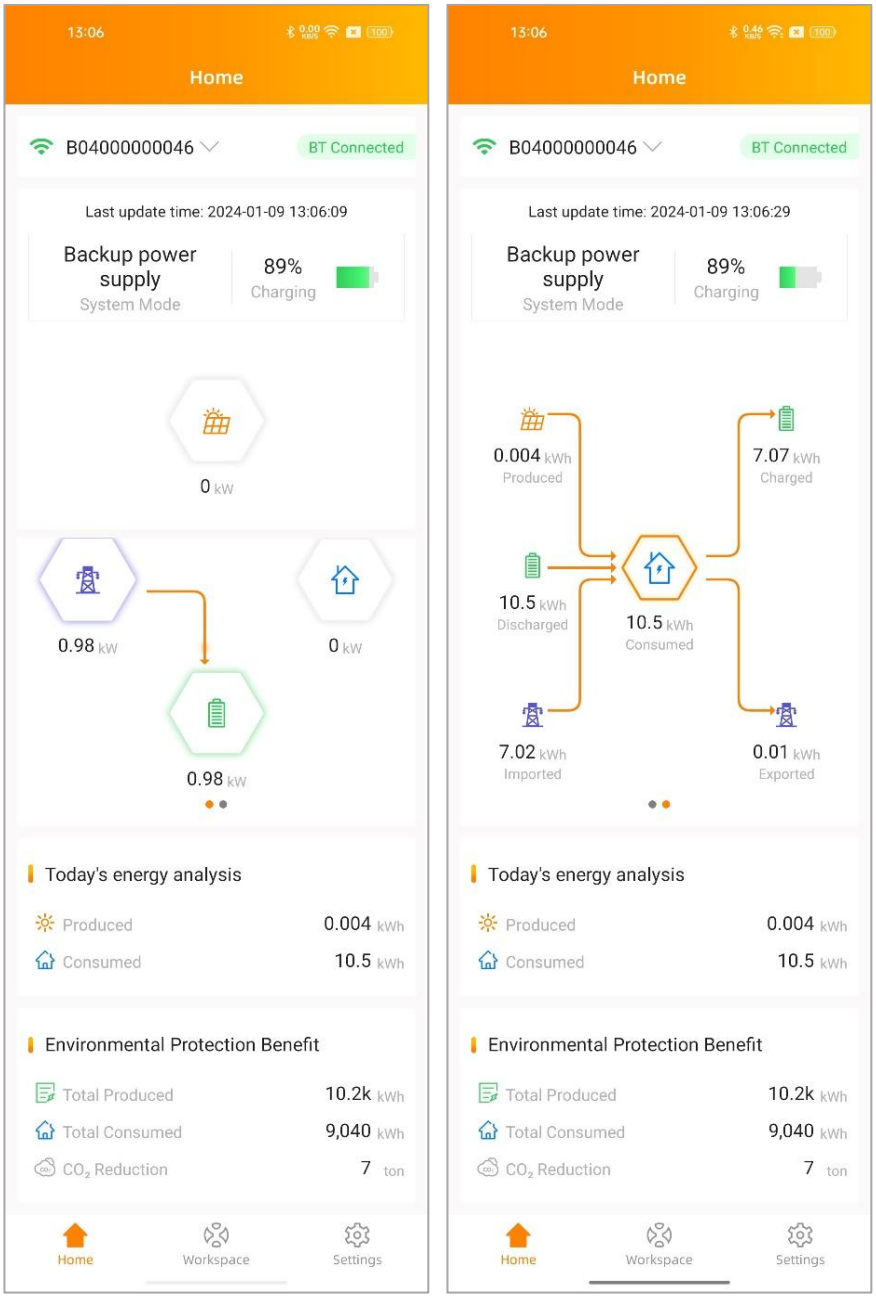
- Step1: Open Bluetooth setting in your smartphone,and enable Bluetooth.
- Step 2: Open EMA Manager.
- Step 3: Click “Local access”

You can use this APP to connect the APstorage PCS to the router via Wlan. (Please refer to chapter 5.5.3)

5.2 Home Page

5.2.1 After selecting the ID of APstorage PCS, you can access the homepage. If you have multiple APstorage PCS, you can switch by clicking on the dropdown menu.

5.2.2 You can view the system ID, charge and discharge status, real-time power, SOC, today's charged energy, total charged energy since installed, and CO_2 reduction.

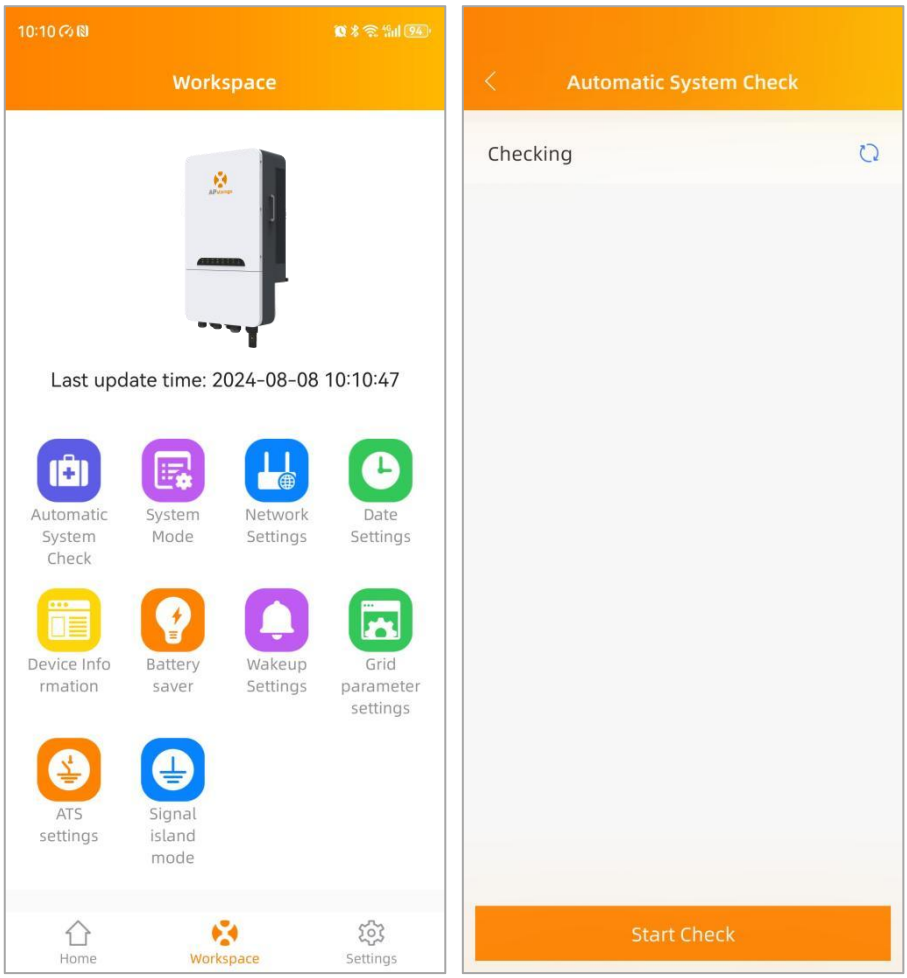


5.3 Workbench

The workbench displays the latest communication time, and currently supported function catalog. Click the corresponding button to enter the function page.

5.3.1 Automatic System Check

Enter the Automatic System Check interface, you can check the APstorage information. If there is an alarm, you can click to view the detailed information.



5.3.2 System Mode

The system mode of the APstorage PCS includes backup power supply mode, residual power Self-Consumption mode and advanced mode. If you need to set the system working mode, please select the corresponding working mode and set the parameters, and then click "OK".

Backup power supply mode:

Emergency power supply (EPS) mode, the system charge when grid connected and discharge when off grid.

Self-Consumption mode:

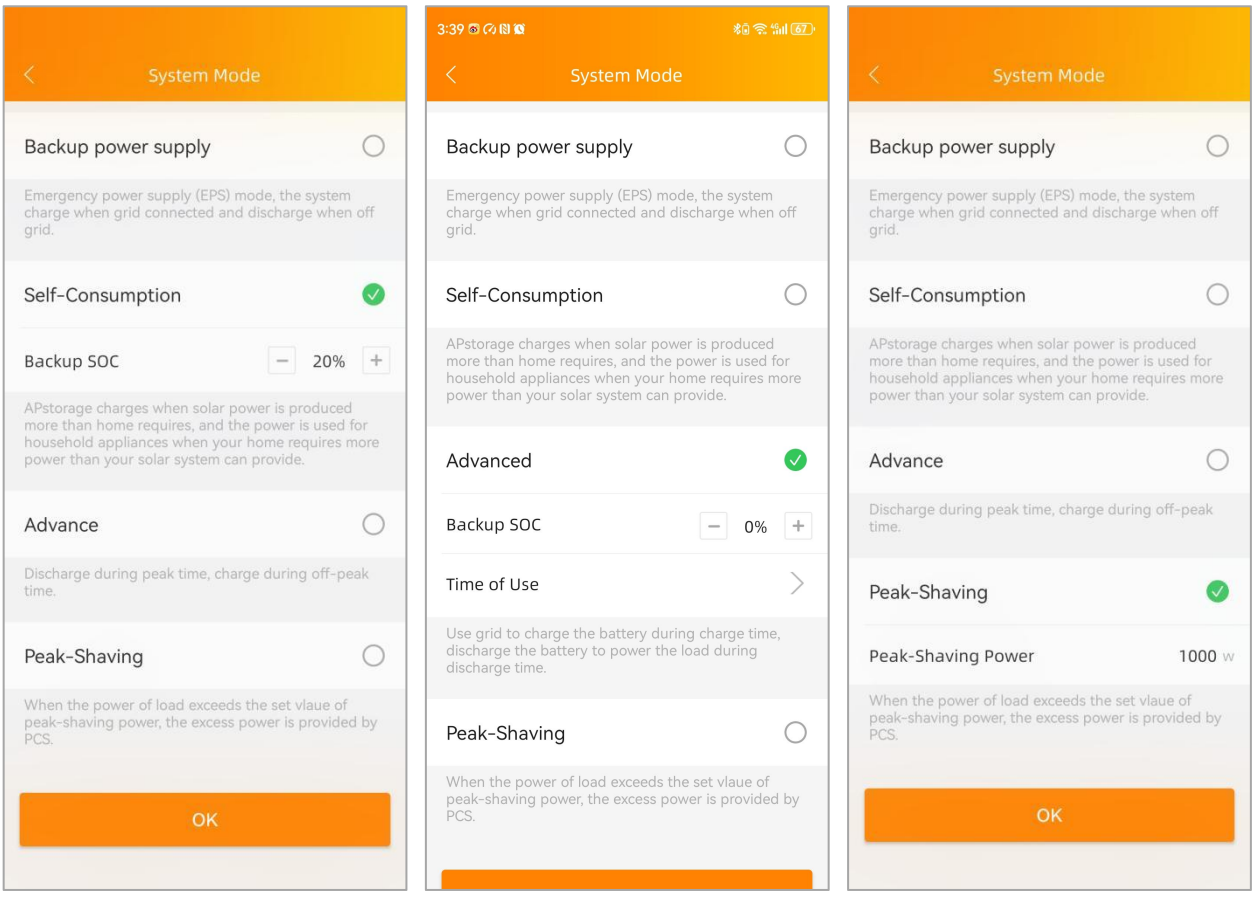
APstorage charges when solar power is produced more than home requires, and the power is used for household appliances when your home requires more power than your solar system can provide.

Advanced mode:

Discharge during peak time, charge during off-peak time.

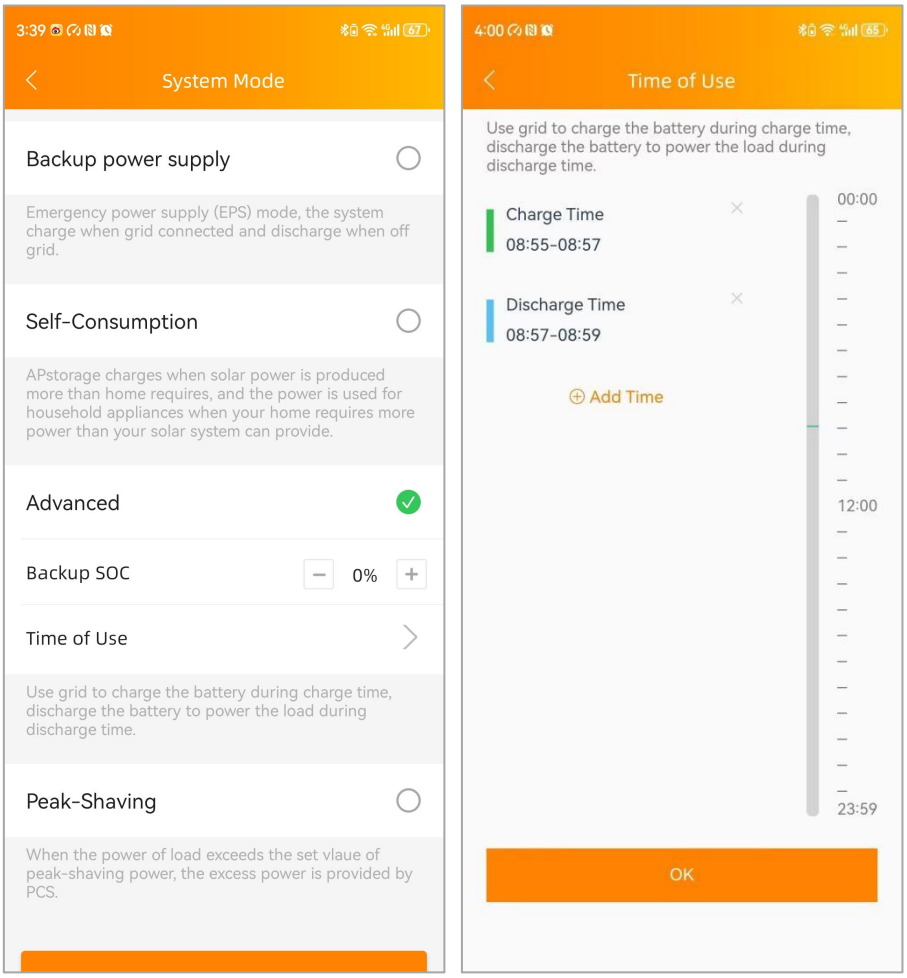
Peak-Shaving mode:

Input peak-shaving power,when the power of load exceeds the set value of peak-shaving power, the excess power is provided by PCS.



5.3.2.1 Time of Use

Click “Time of Use”, you can view the list of charge time and discharge time currently set. You can edit the time ranges by clicking on it. Click on the "Add Time" button to select the charge time or discharge time to be added.

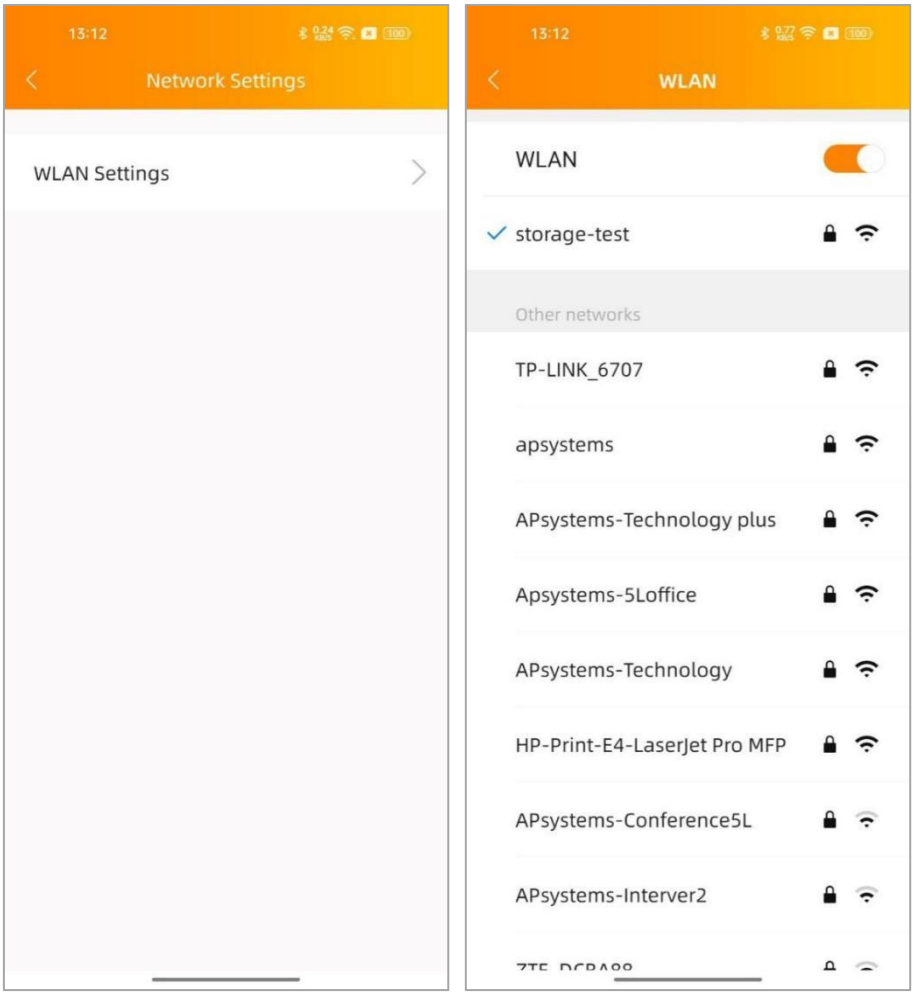


5.3.3 Network Setting

Click the button to enter the WLAN Settings page.

5.3.3.1 WLAN Settings

This interface will display the WLAN connection status of the APstorage PCS. Scroll down the screen and the available SSID will be displayed. Click SSID, and enter the password.

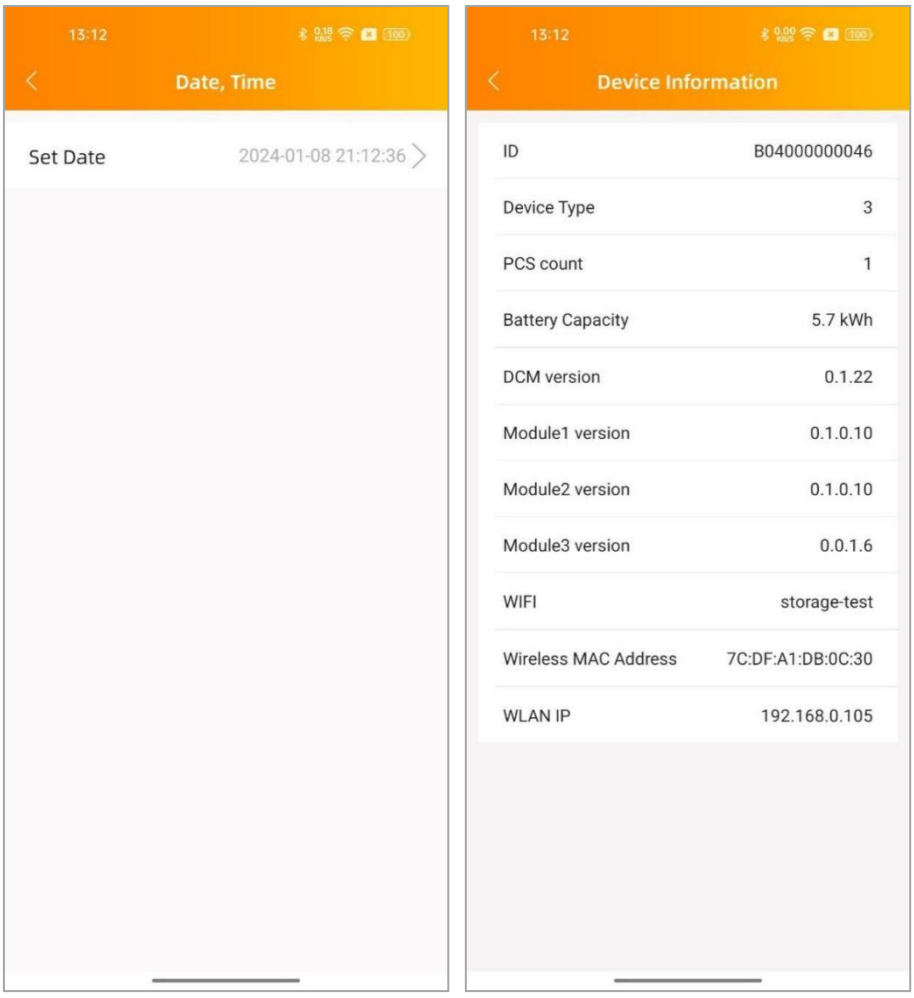


5.3.4 Data Settings

After entering this page, the time will be displayed on the right. Click on the date, time to modify.

5.3.5 Device Information

The device information page displays the device ID, device type, PCS number, battery capacity, DCM version number, Module version number , wireless network MAC, currently connected router SSID, IP address.

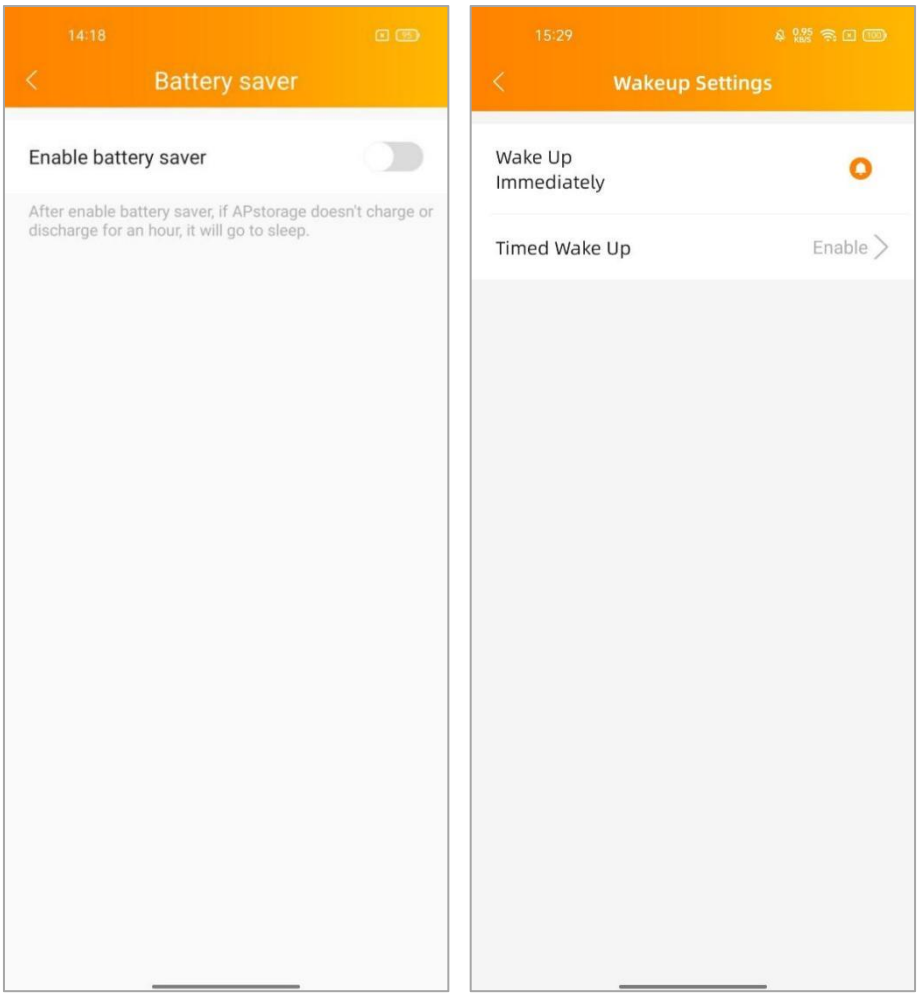


5.3.6 Battery saver

Enter this page, you can enable the "battery saver" function. After enabling the "battery saver" function, if APstorage doesn't charge or discharge for an hour, it will go to sleep.

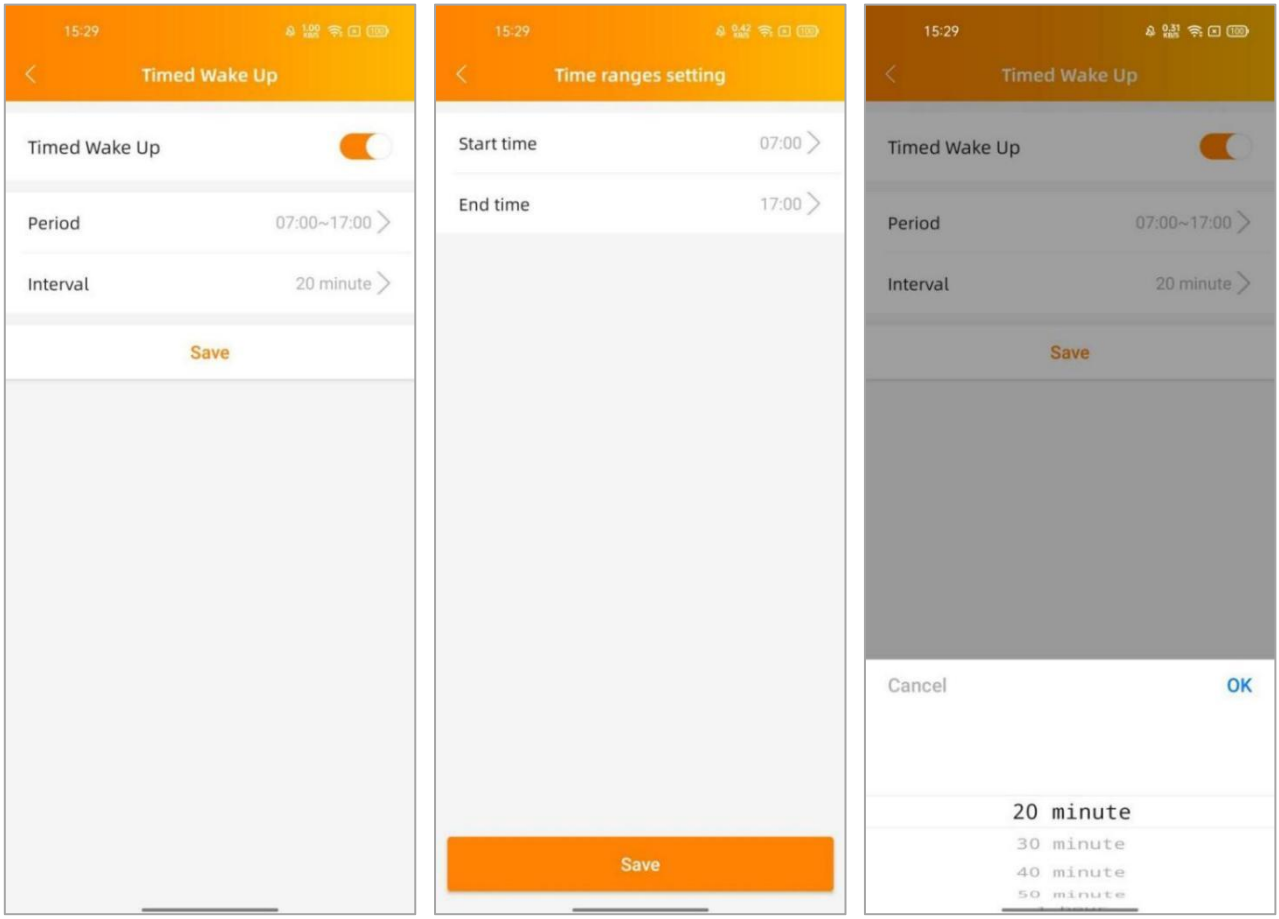
5.3.7 Wake up Settings

When system enters into sleeping mode, you can wake it up by clicking on "Wake Up Immediately".



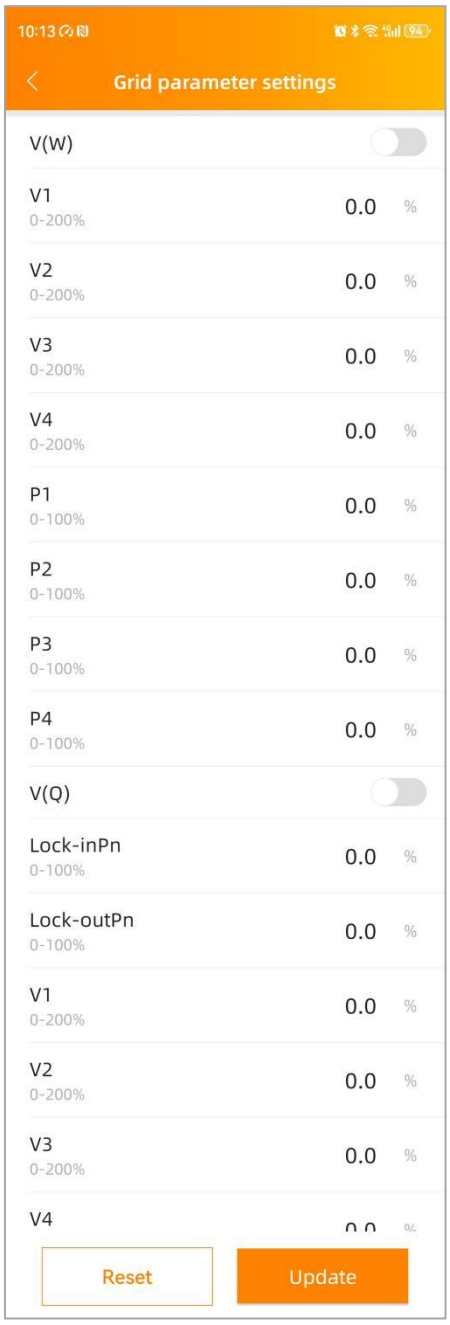
5.3.7.1 Timed Wake Up

On this page, you can set the wake-up time period and interval.



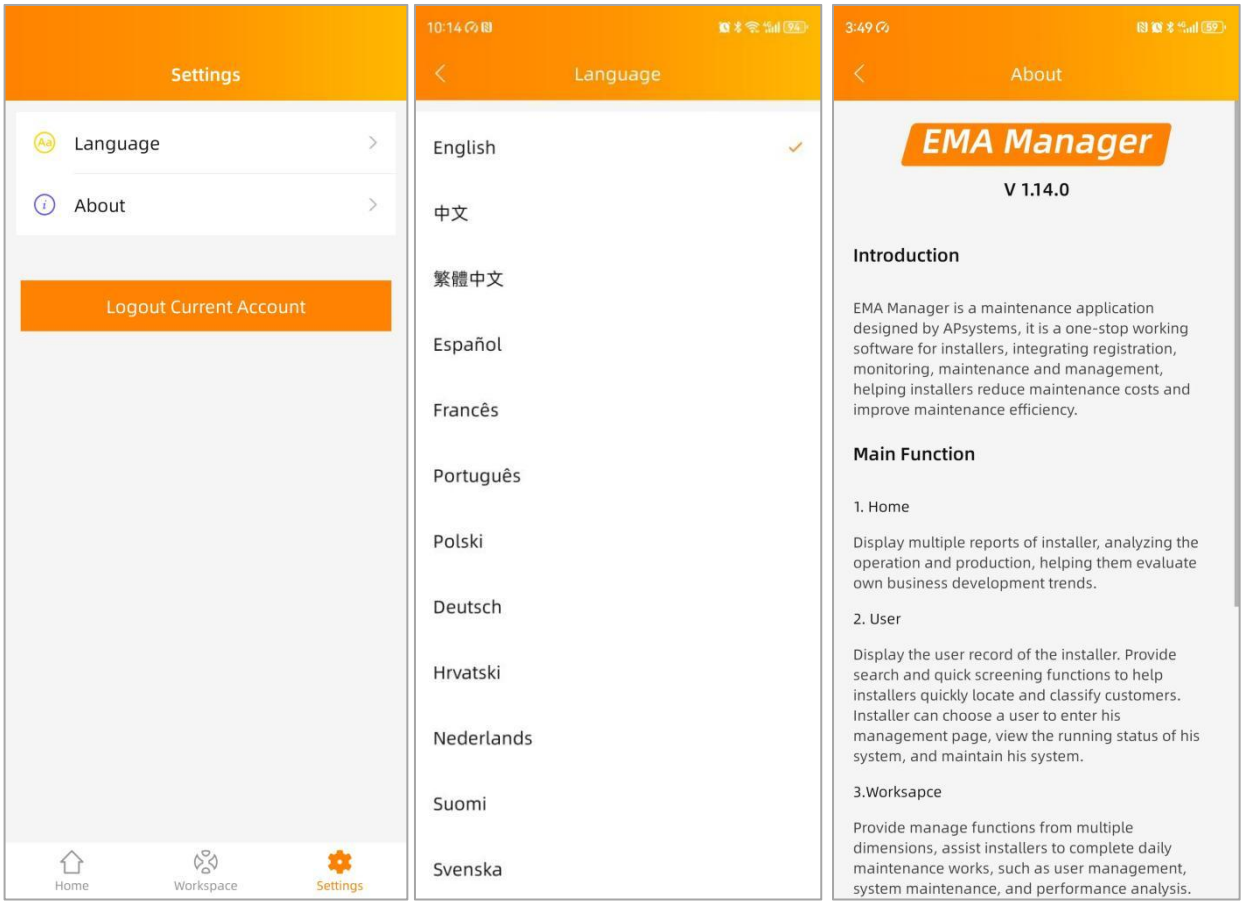
5.3.8 Grid parameter settings

Adjust the Over voltage power limit, Q (U) mode, P (Q), and Specific Power Factor mode of PCS according to the set values.



5.4 Settings

Select "Language" to set the APP language, and "About" to view the APP introduction.



6. Technical Data

Model	ELS-11.4
Region	**NA**
General Specifications	
Dimensions W/H/D	875×474×279mm (34.4"x18.7"x11")
Weight	49.5kg (109lbs)
Maximum Efficiency	95.6%
Operating Ambient Temperature Range	-25°C-65°C (-13°F-149°F), >45°C derating
Storage temperature Range	-40°C-85°C (-40°F-185°F)
Ingress Protection	IP65
Relative Humidity	10%-90%
Ventilation	Smart cooling
Communication Ports	Ethernet/RS485/CAN
Warranty	10 Years
Grid Regulation	UL1741; CSA C22.2 No. 107.1-16; CA Rule21; UL1741 CRD
Safety and EMC Compliance	UL1741SB; IEEE1547; SRD-V2.OSRD-V2.O; FCC part15; ICES-003
Battery Input /Output Data	
DC Battery Input Voltage	40.0-60.0VDC
Charging Strategy for Li-Ion Battery	Self-adaption to BMS
Charging Curve	3 Stages / Equalization
Max Continuous Charge Current	240A
Max Continuous Discharge Current	240A
AC Input/Output Data (On-grid)	
Max. Continuous Output Power(1)	11400VA, 10000VA
Max. Continuous Output Current	47.5A/48A
Max. Continuous Input Power(1)	22800VA, 20000VA
Max. AC Current From Utility Grid	95.0A/96A
Nominal Output Voltage (L1-L2/L-N, L-N)	240VAC/120VAC , 208VAC
Adjustable Output Voltage Range	211-264V,183-228V(2)
Nominal Output Frequency/Range	60Hz/58.8-61.2Hz(2)
Output Power Factor	>0.99(Adjustable from 0.8 leading to 0.8 lagging)
THD	< 3%
Grid Connection	Single-phase
AC Output Data (Backup)	
Max. Output Apparent Power(1)	11400VA, 10000VA
Peak Output Apparent Power(1)	17100VA, 15000VA(10s)
Max. Output Current	47.5A/48A
Nominal Output Voltage (L1-L2/L-N, L-N)	240VAC/120VAC,208VAC
Nominal Output Frequency	60Hz
AC Input Data (Off-Grid Input/Gen)	
Max. Input Apparent Power(1)	11400VA, 10000VA
Peak Input Apparent Power(1)	17100VA, 15000VA(10s)
Max. Input Current	47.5A/48A
Nominal Input Voltage (L1-L2/L-N, L-N)	240VAC/120VAC,208VAC
Nominal Input Frequency	60Hz

(1) xxVA@240VAC/120VAC, xxVA@208VAC
(2) Voltage/frequency range can be adjusted if required by local utility

APsystems America

8701 N. Mopac Expy, Ste 160, Austin, TX 78759

Mail: info.usa@APsystems.com

Web: usa.APsystems.com