



XT SERIES



XT Series Hybrid Inverter User Manual

UL Version for USA and Canadian Markets

120Vac

Preface

This document mainly introduces the installation, electrical connection, commissioning, maintenance, and fault-handling methods of the XT inverter.

Please read this manual carefully before installation and use it to understand the safety information and familiarize yourself with the functions and features of the XT inverter.

All the manual details, installation instructions, operation, maintenance, and troubleshooting are intended to be for qualified electricians and expert installers.

This inverter can be used by the end user (non-expert person) only after proper training is carried out by the installing company. Before installing and debugging or running any equipment, the user must read and understand all the instructions contained in this manual and be familiar with the relevant safety symbols.

Readers need to have a certain degree of electrical theory, electrical wiring, and professional mechanical knowledge. Before installing this product, please read this manual carefully and ensure that the relevant personnel can easily access and use it. WECO Company shall not be liable for any losses caused by unreading or wrong installing and wrong using the product not according to this manual.

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Reader object

This manual is mainly intended for:

- Installation and maintenance person (Authorized provider).
- Owner or Users

Symbolic conventions

In order to ensure the safety of people and property during the use of the product, the following warning symbols are displayed on this manual and the box to remind the operator of the safety issues that must be followed. WECO Company shall not be liable for any losses caused by unreading or not following.

Warning symbol

Label	Label illustration
Danger!	It is used to warn of imminent dangerous situations that, if not avoided, could result in death or serious body injury.
Warning!	Used to warn of potentially dangerous situations that, if not avoided, could result in death or serious body injury.
Caution!	Used to warn of potentially dangerous situations that, if not avoided, could result in moderate or minor personal injury
Note!	Used to convey equipment or environmental safety warning information, which, if not avoided, may lead to equipment damage, data loss, reduced equipment performance or other unpredictable results. "Caution" does not involve personal injury.
Read Info	Used to highlight important/critical information, best practices, tips, etc. "Instructions" are not safety warning information, and do not involve information about people, equipment and environmental injuries.

Label	Meaning
	This label indicates there is high voltage within the product, and touch may cause an electric shock.
	This symbol indicates that the temperature here is higher than the acceptable range of the human body, and do not contact in order to avoid personal injury.
	This symbol indicates here is the protective grounding (PE) terminal, and solid grounding is needed to ensure operators' safety.



CAUTION-RISK of electric shock from energy stored in capacitor, never operate on the inverter couplers, the MAINS cables, Battery cables, PV cables or the PV generator when power is applied.

After switching off the PV, battery, and Mains, always wait for 5minutes to let the intermediate circuit capacitors discharge before unplugging DC, battery in plug and MAINS couplers.

When accessing the internal circuit of inverter, it is very important to wait 5 minutes before operating the power circuit or demounting the electrolyte capacitors inside the device. Do not open the device beforehand since the capacitors require time sufficiently discharge!



Surge Protection

Installation of SPDs to protect the inverter against mechanical damage and excessive stress include a surge arrester in case of a building with External lightning protection system (LPS) when separation distance is kept.

To protect the DC system, surge suppression device (SPD type2) should be fitted at the inverter end of the DC cabling and at the array located between the inverter and the PV generator, if the voltage protection level (VP) of the surge arresters is greater than 1100V, an additional SPD type 3 required for surge protection for electrical devices.

To protect the AC system, surge suppression devices (SPD type2) should be fitted at the main incoming point of AC supply (at the consumers cutout), located between the inverter and the meter/distribution system;

All DC cables should be installed to provide as short a run as possible, and positive and negative cables of the string or main DC supply should be bundled together. Avoiding the creation of loops in the system.



Note!

PE Connection and Leakage Current

protective device (RCD) with rated fault current $I_{fn} \leq 240\text{mA}$ which automatically disconnects the The end-use application shall monitor the protective conductor by residual current operated device in case of a fault.

The device is intended to connect to a PV generator with a capacitance limit of approx. 700nf.

Version revision history

Modification records accumulate a description of each document update. The latest version of the documentation contains updates for all previous document versions. Once a new document is published, the old document will automatically become invalid. Please go to the official website to obtain the latest version

Version	Date	Revised By
V1.0	2021.1.10	L.T, Newly formulated
V2.0	2023.4.15	L. T, Modified APP related information
V3.0	2023.12.8	Updated by After-Sales Dept. 1. Revise Chapter 4.8-CT part :Delete description part of CT connection for split single power phase & add notification points for CT installation. 2. Add Appendix H - Grid voltage protection Parameters. 3. Revise Appendix C-Technical data sheet based on latest info. 4. Revise chapter 6 Noor Cloud APP operation based on new Noor app version. 5. Revise Chapter 4.4 Grid Connection and Generation : Add dry contact instruction for GEN connection. 6. Delete any content of description for "Load 2" and " Three phase" using . 7. Revise Appendix E-Troubleshooting. 8. Add chapter 7- inverter parallel guide.
V3.1	2024.01.18	1. Update APP related information. 2. Add details installation instructions.
V3.2	2024.10.9	1. Add MPPT logic limitations

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1 Safety Instructions

General security considerations

Note !

- This manual is an integral part of the XT inverter and describes the installation, commissioning, maintenance and fault types of the product. Please read carefully before operation;
- The personnel responsible for the installation, electrical connection, commissioning, maintenance and fault handling of XT inverter products should be professionally trained, follow the correct operation methods, and have the corresponding operating qualifications and basic safety operation knowledge;

All operation of this equipment must strictly comply with the relevant equipment precautions and special safety instructions provided by WECO. The safety warnings listed in the manual represent only those known to WECO and WECO assumes no responsibility for violations of general safe operating requirements or safety standards for the design, production and use of the equipment.

Statement

WECO reserves the right not to provide quality assurance in any of the following cases:

- Shipping damage
- Damage caused by storage conditions not meeting the requirements of the product documentation
- Improper storage, installation and use of equipment
- Installation and use of equipment by unqualified personnel
- Failure to follow operating instructions and safety warnings in the product and documentation
- Operate in harsh environments beyond what is described in the product and documentation
- Operations that go beyond the parameters specified in the applicable technical specifications
- Unauthorized disassembly, alteration of the product, or modification of software code
- Equipment damage caused by abnormal natural environments (force majeure such as lightning, earthquakes, fires, storms, etc.).
- The warranty period has expired and the warranty service has not been extended
- any installation and operating environment beyond those specified by relevant international and WECO standards;

Personnel requirements

Personnel who can perform XT inverter installation, electrical and gas connection, commissioning, maintenance, fault handling and replacement must meet the following conditions:

- Operators should have received professional training
- Operators should read this manual in its entirety and master the safety matters related to operation
- Operators should be familiar with the relevant safety specifications of electrical systems
- The operator must be familiar with the working principle and composition of the optical volt storage system and familiar with the user manual for this product
- During operation, please do not wear metal objects such as rings, watches, key rings, etc., and do a good job of safety protection (such as wearing insulating gloves, wearing electrician shoes, etc.)

Box identification protection

- The markings on the XT inverter housing contain important information for safe operation. Alteration or damage is strictly prohibited
- There is a nameplate on the side of the XT inverter box that contains important parameter information related to the product. Alteration or damage is strictly prohibited

System installation

Danger!

It is strictly forbidden to operate the XT inverter with electricity during installation

- The process of lifting or placing the inverter must be carried out slowly and cannot be placed quickly, otherwise the product may be damaged
- When installing the XT inverter, make sure it is not electrically connected and energized;
- There should be a certain distance between the XT inverter and the surrounding objects to ensure sufficient space for installation and heat dissipation. If you have any questions about the installation distance, please consult a technical service engineer;
- During installation, liquids, debris or conductive particles must be prevented from entering the system, which could lead to internal short circuits or system failure.

Electrical connection

Danger!

Before electrical connection, please make sure that the XT inverter is undamaged and in a safe state, otherwise it may cause electric shock or fire

- All electrical connections must comply with national electrical standards;
- XT inverters can only be connected to the grid if the local power department permits it;
- The cable for connection must be firmly connected, well insulated and be appropriate specifications.

operate

Danger!

During the operation of the XT inverter, there is a high voltage that can cause electric shock, resulting in death, serious personal injury, or serious property damage. Please strictly follow the safety precautions listed in this manual and other relevant documents;

- When the XT inverter is first energized, it must be set up by a professional electrical technician. Incorrect settings may affect the normal operation of the XT inverter and cause the XT inverter to be inconsistent with the certification of the country
- Some components in the XT inverter box, such as capacitors, still have power after the electricity is cut off and must wait 5 minutes before operation.
- Operate the equipment in accordance with local regulations and laws.

Maintenance and replacement

Danger!

During the operation of the XT inverter, there is a high voltage that can cause electric shock, resulting in death, serious personal injury, or serious property damage. Therefore, before carrying out any maintenance work, it is necessary to turn off the power supply of the XT inverter and operate it in strict accordance with the safety precautions listed in this manual and other relevant documents.

- Please maintain the XT inverter if you are familiar with the contents of this manual and have the appropriate tools and test equipment
- Before maintenance, please turn off the XT inverter, disconnect the input and output switches, and wait at least 5 minutes for operating the XT inverter.
- During the maintenance period, please try to avoid unrelated personnel entering the maintenance site, and temporary warning signs or fences must be placed;
- The XT inverter can only be re-energized after the fault is handled, otherwise the fault may expand or the equipment may be damaged;
- During maintenance, please abide by ESD protection specifications and wear anti-static gloves;
- Some components in the XT inverter box, such as capacitors, still have power after the power is cut off and must wait 5 minutes before operation. Avoid opening cabinet doors in rainy or wet weather conditions to maintain or repair products
- When carrying out various operations such as equipment maintenance and inspection, relevant personnel need to take appropriate protective measures, such as wearing noise-proof earplugs, insulating shoes and anti-scald gloves.

2 Product Introduction

2.1 Product Introduction

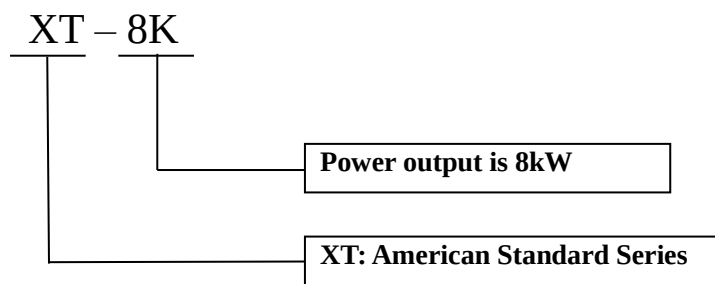
Function

XT inverter is an split phase input and output inverter, It can convert solar energy into AC or can store DC energy into the Energy Storage Battery. Use APP, The user can flexibly choose the best benefit working mode according to the actual using scenario, with different situation of photovoltaic, power grid, battery, load and so on.

Model

This paragraph defines product models: XT-6K, XT-8K, XT-10K.

Naming convention XT(using XT-8K as an example):

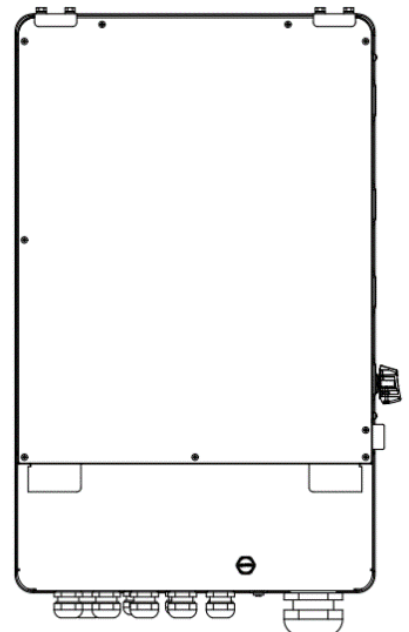


2.2 Inverter appearance

Front

Side

Back



2.3 Terminal Explain

Signal terminal

Port	Name
A	PV ON/OFF Switch
B	Battery Power Input
C	Wi-Fi Connection port
D*	Multiple port(See below for details)
E	PV1 - PV4 input (4 MPPT)
F	Generator Power Input
G	Grid Power Input
H	Load 1(EPS Load)
I	PE
J*	Load 2(Future features)
K	LED Bar
L	Inverter ON/OFF Switch



* Port Function

Port	Name	description
1	CAN1	For Inverter parallel communication use;
2	CAN2	For Inverter parallel communication use;
3	RS485	Read the internal data of inverter , Factory use, reserved;
4	CAN-BAT	CAN communication for Lithium batteries;
5	CT(L2)	1.CT(Current Trans meter) use for Anti Reflux function;2. Measure and support home consumption;
6	CT(L1)	1.CT(Current Trans meter) use for Anti Reflux function;2. Measure and support home consumption;
7	Type-C	Local maintenance use only
8	GEN Dry contact	Only ports of DRYO_1A and DRYO_1B are used for generator dry contact connection.

8

8



*The Load 2 function is future features, not available for now;

2.4 System and Schematics Design

system apply

3 Installation

3.1 Pre-installation Preparations

A. Package Inspection & Check

Before unpacking the inverter, check the outer packaging for visible damage, such as holes, cracks, or other signs of possible damage inside, and check the inverter model. If there is any abnormal packaging or inverter model does not match, do not open it and contact your dealer as soon as possible.

Note!

It is recommended to remove the outer packaging of the inverter within 24 hours before it is ready to be installed. Long distance power cable will cause power imbalance, Highly recommend install battery with inverter more closer.

Read Info

For the number of deliverable shipped with the box, please refer to the Packing List inside the box.

Check deliverable

After unpacking the inverter, please check whether the deliverable are complete and whether there is any obvious external damage. If any items are missing or there is any damage, please contact your dealer.

No.	Item	Unit	amount
1	WIFI dongle	PCS	1
2	CT transformer with cable	PCS	2
3	Inverter Parallel Communication Cable	PCS	1
4	Expansion screws M6*50mm	PCS	6
5	Combination Screw M6*20mm	PCS	4
6	Installing Hangers	PCS	1
7	Inverter	PCS	1
8	Desiccant	PCS	1
9	Certificate of Approval	PCS	1

B. Installation area Notice

- Long distance power cable will cause power imbalance, Highly recommend install battery with inverter more closer. Or keep the battery power cable to each inverter the length discrepancy < 0.25m.
- The inverter has a degree of protection of IP65 and it can be installed outdoors. It is recommended to choose a sheltered installation site or build a sunshade. Please also avoid long-term rain and accumulation of water vapor inside the equipment.
- Do not install inverters in areas where flammable, explosive materials are stored.
- Do not install the inverter in a location that can be reached by children.
- If the inverter is installed in a place with direct sunlight, it may cause a decrease in power as the temperature rises.
- During the operation of the inverter, the temperature of the air outlet will be relatively high, please installed in a well-ventilated environment to ensure good heat dissipation.
- The inverter installed in the salt-damaged area will be corroded and may cause fire, please do not install the inverter outdoors in the salt-damaged area. Salt-damaged areas are areas within 500m of the coast or affected by sea winds. Areas affected by sea breezes vary depending on meteorological conditions (e.g. typhoons, seasonal winds) or terrain (with dikes, hills).

3.2 Installation location Select

The inverter should be installed on the ground with good load-bearing. Installation angle requirements:

- Please install upright or backward $\leq 15^\circ$ to facilitate the stability of the device.
- Do not tilt the inverter forward, horizontally, invert, tilt too much back, and roll over.
- When installing the inverter, a certain amount of space should be reserved around the inverter to ensure that there is enough space for installation and heat dissipation.

Installation space diagram

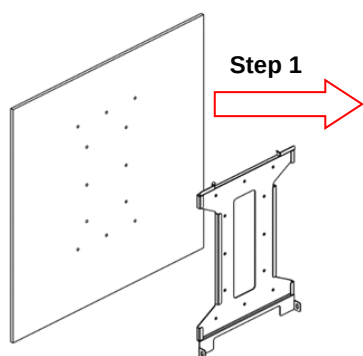
Environment requirements

- The inverter should be installed in a well-ventilated environment to ensure good heat dissipation.
- If the inverter is installed in a place with direct sunlight, it may cause a decrease in power as the temperature rises.
- It is recommended to choose a sheltered installation site or build a sunshade.

Safety protection requirements

- The inverter mounting must have fire resistance according with the local rules (please refer to the safety officer of your company for more details).
- Do not install the inverter nearby flammable materials, liquid or gas, the installation site must be approved by the local authorities.
- Please ensure that the installation surface is strong enough to support the inverter and the support screws can meets the load-bearing requirements of the installed inverter.

3.3 Install the inverter



Procedure :

Step 1 Take out the mounting bracket from the accessory, as shown in the figure. Use a drill to make four holes on the wall according to the mounting holes position of the of the mounting bracket, the hole depth shall be 50-60mm and the expansion screw shall be selected according with the wall type. Then install the mounting bracket on the wall securing it with the expansion screw

Step 2

Step 2 Lift the inverter, hang it on the installation bracket, then aligning the inverter with the installation hole on the right side of the bracket.

Step 3

Step 3 Fix with M6 * 16 screws at the bottom to secure the inverter on the bracket .

4 Electrical Connections

Danger!

Before making the electrical connection, make sure that all the switches of the inverter are in the "OFF" state, otherwise the high voltage of the inverter may cause a risk of electric shock.

Warning!

- Equipment damage caused by incorrect wiring is not covered by the equipment warranty.
- Operations related to electrical connections must be carried out by professional electrical technicians.
- When making electrical connections, operators must wear personal protective equipment.

Read Info

The color of the cable involved in all electrical connection diagrams in this section is for reference only, and the cable selection should comply with the local cable standards (yellow and green two-color wires can only be used for protective earthing).

4.1 Prepare the cable

Part description

serial number	parts	illustrate	source
A	Photovoltaic strings	Photovoltaic strings consist of photovoltaic modules connected in series. The XT inverter supports 4 string inputs.	Users bring their own
B	Energy storage equipment	XT inverter supports WECO energy storage device access.	Users bring their own
C	Generator	XT inverter supports generator access.	Users bring their own

Note !

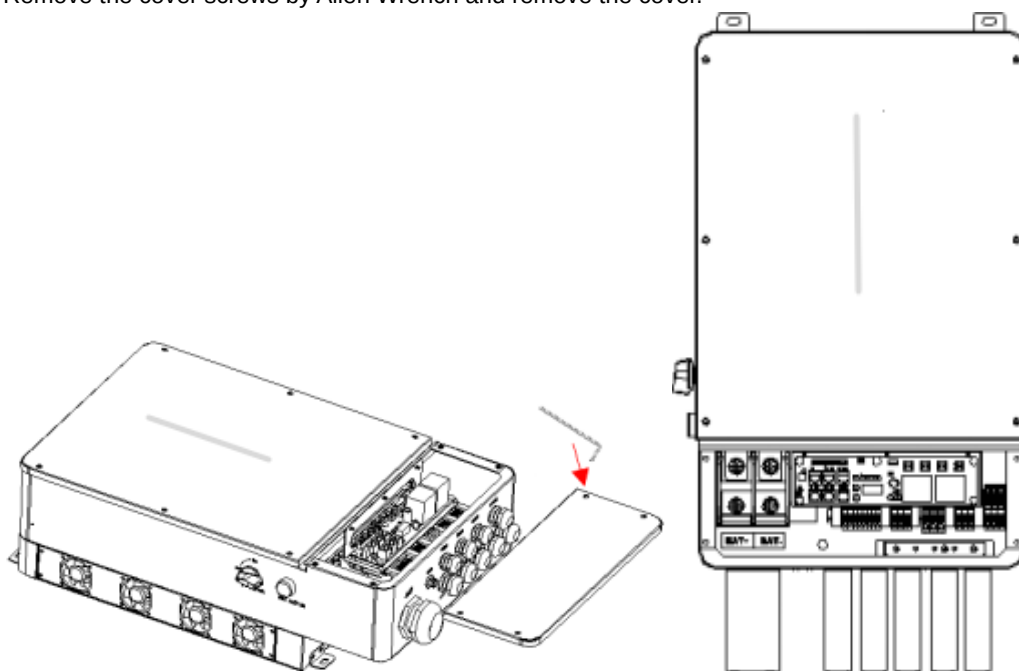
- To make sure the inverter power support balance. When parallel inverter, Must let battery-each inverter,Grid-each inverter,First load breaker-each inverter, every group the power cable discrepancy < 0.25 m.
- External AC switch 3 circuit breaker or other AC load circuit breaker to ensure safe disconnection of the inverter from the grid.
- If the external AC switch has a leakage protection function, its rated leakage operating current is required to be ≥ 100mA.
- The AC switch prohibits the use of knife gate switches.

Cable description

No.	location	Wire diameter (AWG).	Source
1	PV input cable	12	Provided by customer
2	Energy storage input cable	4, 2sets	
3	Grid-side input cable	8	
4	Generator input cable	8	
5	Generator communication cable	20, (Shielded twisted pair)	
6	Load output cable	8	

4.2 Open the bottom wiring cover

Remove the cover screws by Allen Wrench and remove the cover.

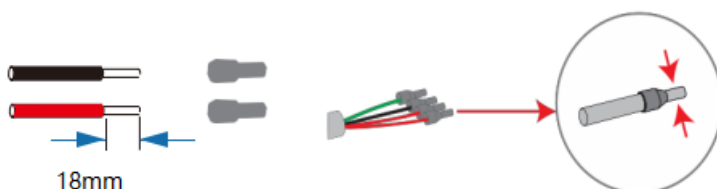


4.3 Back-up: Load1 Connection

XT inverter has parallel and off-grid operation functions. During on grid, the inverter connect to the grid and supply power to the load ; During off grid, inverter also can provides output power by using solar power or battery power to the back-up load . The XT inverter can provide an overload output via the Back-up function(Refer the newest data sheet). When the battery is not connected, it might require manual switch on-off to use the back-up function.

Procedure

Step 1: Select 8 AWG wire, strip off the 18 mm long insulation layer, and crimp the round terminal.

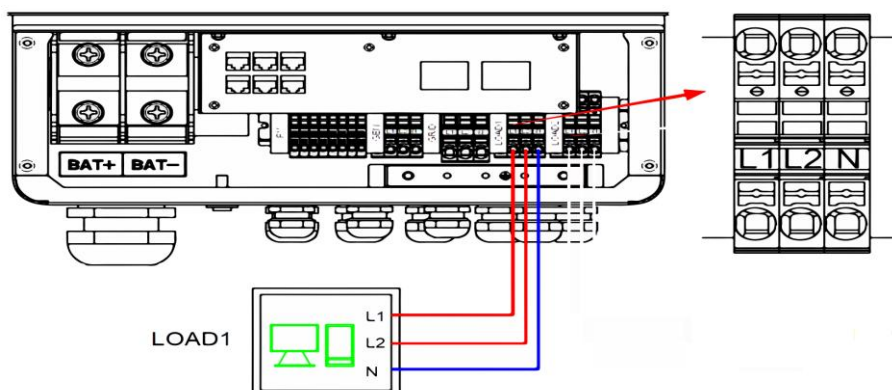


Step 2: Connect the finished wire through the bottom Back-up port to the Load1 terminal.



Note !

- Do not connect the wire without terminal directly to the Load terminal, a terminal for wire must be used.



4.4 Grid Connection and Generator Connection

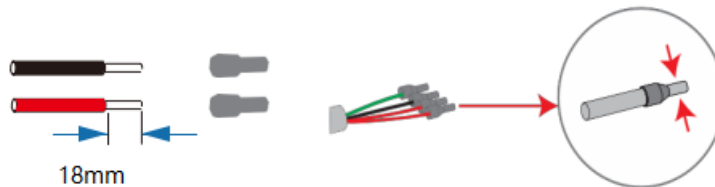


Warning!

Before connecting the input line on the AC grid side, please make sure that the other end of the cable is not connected to the grid, or that the AC pre-circuit breaker is in the disconnected state. Detect if the grid voltage is within the allowable range.

Procedure

Step 1 Select 8 AWG wire, strip off the 18mm long insulation layer, and crimp the round terminal.



Step 2 Connect the finished wire through the bottom Grid port and GEN port to the Grid and GEN terminal.

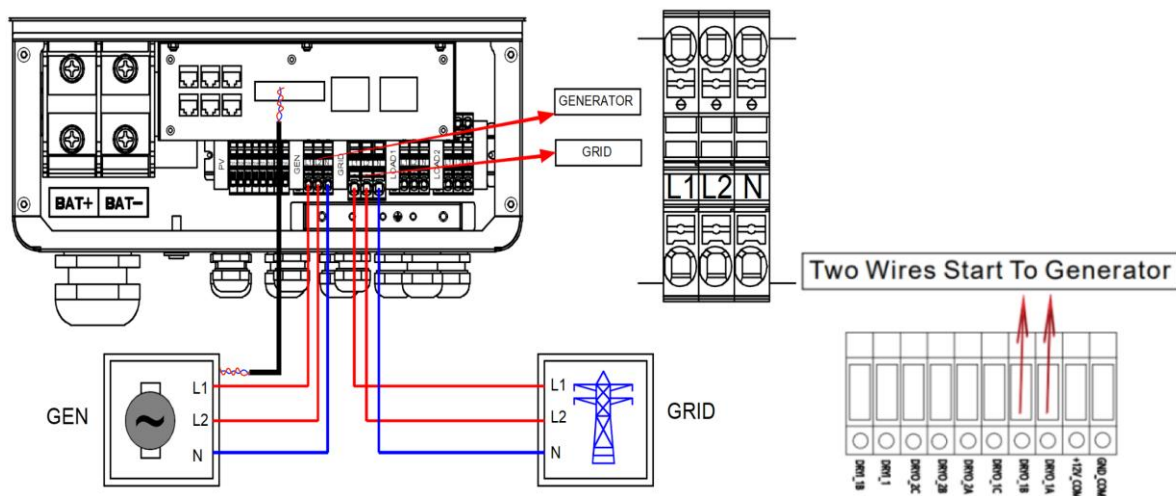
And connect the generator to the inverter dry contact terminal with generator communication cable 20AWG.

The premise of inverter control generator start wiring is that the generator has ATS function, and when the system is connected to the generator, it is recommended to replace the communication wire between the battery inverter with a shielded communication wire.



Note!

- Do not connect the wire without terminal directly to the GEN terminal and grid terminal, a terminal for wire must be used.



4.5 Connect the input cables of the energy storage device

Prerequisites



Danger!

- Before connecting the input cables on the side of the energy storage device, please confirm that the other end of the cable is not connected to the energy storage device, or the energy storage device is not powered on, and its main switch is in the disconnected state
- A short circuit in energy storage equipment can cause personal injury. The instantaneous high current caused by a short circuit will release a large amount of energy, which may cause a fire.

- When the inverter is running, it is forbidden to perform maintenance operations on the energy storage cables, such as connecting or exiting the energy storage equipment. Failure to do so will result in a risk of electric shock.
- Before connecting the energy storage cables, make sure that the “BATTERY SWITCH” of the inverter and all switches connected to the inverter are in the “OFF” state and The residual power has been drained, otherwise the high voltage of the inverter and energy storage equipment may cause a risk of electric shock.



Warning!

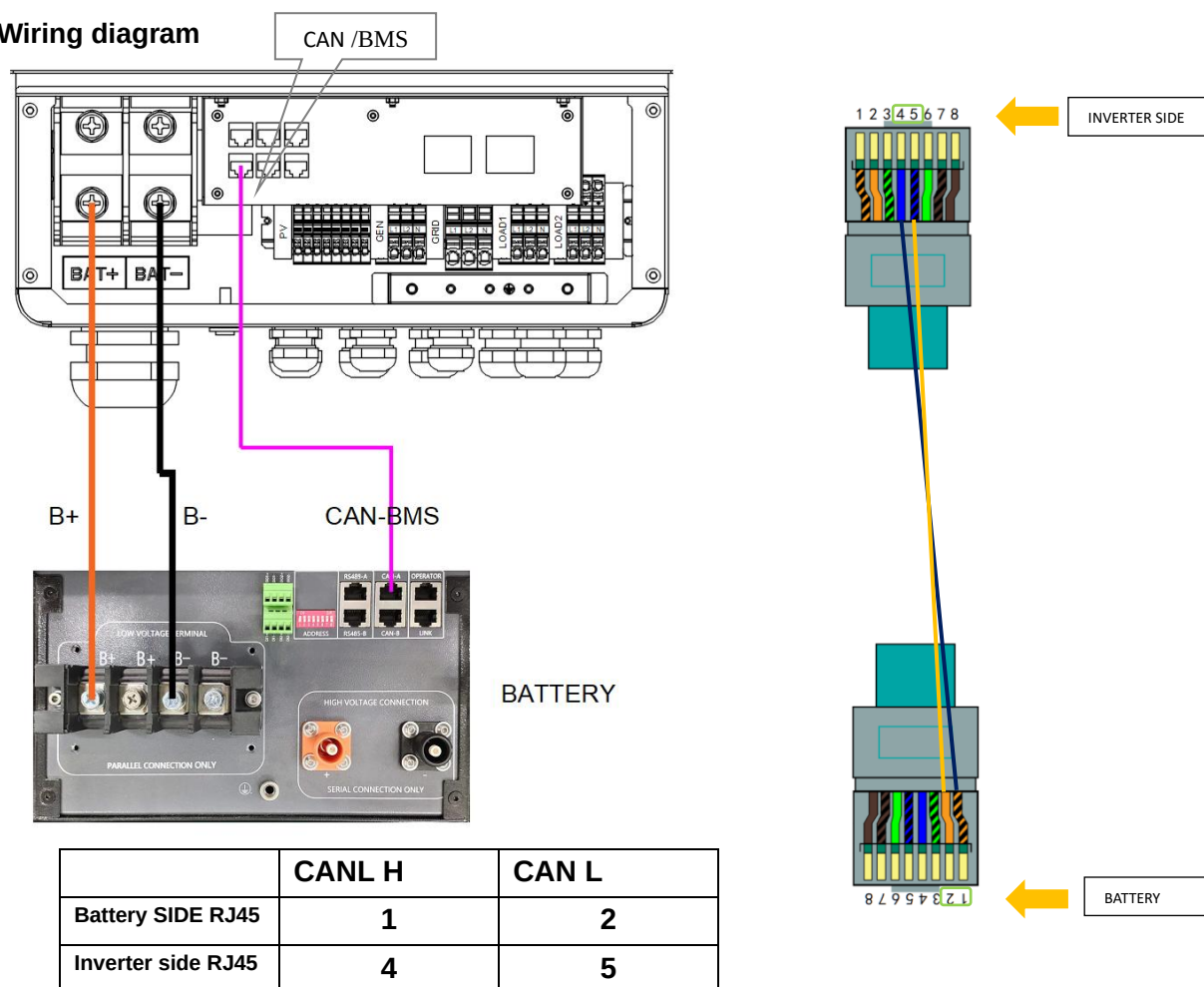
- Make sure that the following conditions are met. Failure to do so may result in damage to the inverter and even a fire hazard
- The polarity of the energy storage cable is correct, that is, the positive pole of the energy storage device is connected to the positive pole of the inverter energy storage circuit breaker, and the negative pole is connected to the negative pole of the energy storage terminal of the inverter energy storage circuit breaker.



Note!

- In the process of installing energy storage equipment and inverters, if the positive or negative electrodes of the energy storage equipment are short-circuited to ground due to the installation or routing of power distribution cables that do not meet the requirements, AC and DC short circuits may be caused during the inverter working process, resulting in equipment damage. Damage to the equipment caused by this is not covered by the equipment warranty.
- The trace distance between the energy storage device and the inverter is $\leq 10\text{m}$, and it is recommended to be within 5m. (More closer is more better.)

Wiring diagram



Installation of power cables

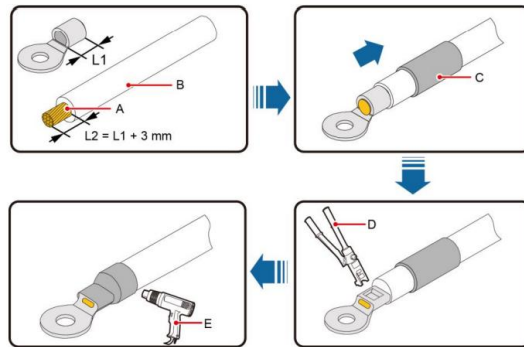
Procedure

Step 1: Make the cable, crimping the OT terminal, using a 25 mm² DC cable, stripping the wire, crimping OT 50-10 Terminals.



Note !

- When stripping the thread, do not scratch the core.
- The cavity formed after the conductor crimping sheet of the OT terminal is crimped should be completely covered with the wire core, and the wire core and the OT terminal should be tightly bonded and not loose.
- The crimping can be covered with heat shrink sleeve or insulating tape. Take heat shrink tubing as an example.
- During the use of the heat gun, pay attention to the protection to prevent the equipment from being burned.



(A) Core (B) Insulating layer (C) Heat shrinkable sleeve
(D) Hydraulic pliers (E) Heat gun

Step 2: Install the power input cables of the energy storage device

Use M10 screws to lock the positive and negative poles of the energy storage output with the input end of the inverter battery



Danger!

Energy storage equipment voltage is fatal, please use a special insulation tool when connecting cables.

When wiring, make sure that the polarity of the cable connection between the terminal of the energy storage device and the energy storage switch and the energy storage terminal of the inverter is correct.

Installation of communication cables

Communication interface between inverter and battery CAN with a RJ45 connector.



Note !

When arranging signal cables, please pay attention to separate the signal cable from the power cable, and avoid large interference sources when routing, so as to avoid signal interference and affect communication.

Step 1: Production of communication cables

One end of the communication wire is connected to the crystal head of the network cable. The wire sequence is shown in the figure above. The other end is made according to the CAN wiring pin position of the energy storage equipment

Step 2: Install the communication cable

Insert the terminals on both sides of the communication cable into the communication ports of the inverter and energy storage equipment.

**Note !**

The cable protection layer is located inside the connector.

The wire core is completely into the wiring hole without leakage.

Pay attention to the cable orientation to make sure that the cable is not twisted.

4.6 PV Connection

Hybrid can be connected in series with 4-strings PV modules. Select PV modules with excellent function and reliable quality. Open-circuit voltage of module arrays connected in series should be.

Prerequisites

**Danger!**

- Before connecting the input cables of the photovoltaic string, please confirm that the other end of the cable is not connected to the photovoltaic string group, or the photovoltaic string group is in a disconnected state, otherwise the high voltage of the photovoltaic string group may cause electric shock personal injury;
- If the inverter PV input terminal is not connected to the PV string, do not remove the waterproof cover of the DC input terminal, otherwise it will affect the protection level of the equipment.

**Warning!**

Make sure that the following conditions are met. Failure to do so may result in damage to the inverter or even a fire hazard.

- The polarity of the DC input side is correct, that is, the positive electrode of the photovoltaic string is connected to the positive pole of the inverter photovoltaic input terminal, and the negative electrode is connected to the negative pole of the inverter photovoltaic input terminal.



PHOTOVOLTAIC STRING CONFIGURATION AND VOLTAGE LIMITATIONS



- The maximum open-circuit voltage of each PV string must not exceed 500Vdc under any conditions.
- The best efficiency PV input is 350 ~ 400V, the maximum closed-circuit voltage of each PV string must not exceed 430Vdc to ensure proper charging of the batteries and to avoid derating in the power generated by the MPPTs.
- String configuration of each MPPT **shall not exceed 430Vdc** in order to avoid the power derating or MPPT stop due to exceed of working range.
- Consider the environment temperature and the NOCT of your PV panels when making the String Set UP

PV Max Input Voltage V_{oc}	500Vdc
PV Max Vcc Voltage	430Vdc
PV start input Voltage	90Vdc
MPPT start Voltage	120Vdc
MPPT Higer Voltage Tracking	430Vdc
PV Input Tracking Voltage Cut Off	490Vdc
MPPT Max Power	3500W

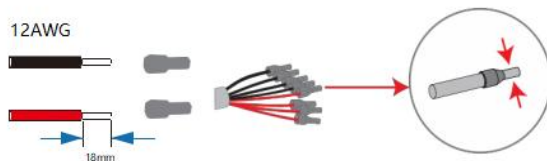


Note !

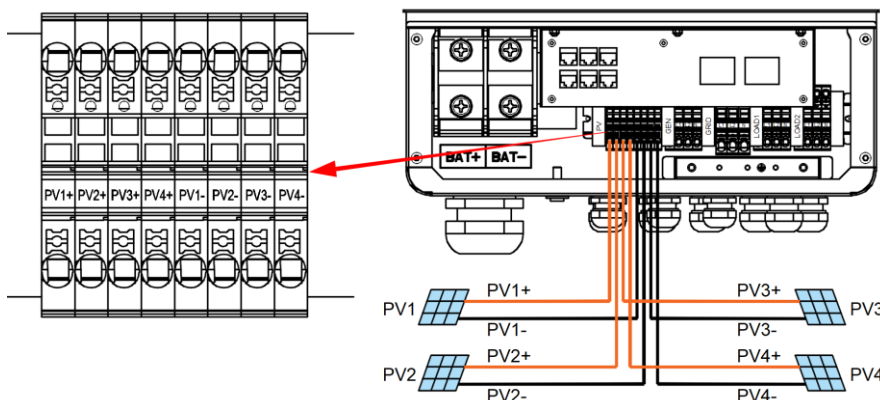
- The optical string output connected to the inverter does not support grounding. Please ensure that the output of the PV module is well insulated to ground.
- In the process of installing the optical string and the inverter, if the positive or negative pole of the optical string is short-circuited to ground due to the installation or wiring of the distribution cable does not meet the requirements, it may cause a short circuit of AC and DC during the inverter working process, resulting in equipment damage. Damage to the equipment caused by this is not covered by the equipment warranty.

Procedure

Step 1: Select 12AWG wire, strip off the 18mm long insulation layer, and crimp the round terminal.



Step 2: Connect the finished wire through the bottom PV port to the PV terminal.





Note!

- Do not connect the wire without terminal directly to the PV terminal, a terminal for wire must be used.

4.7 WiFi Connection

Step1. Plug WiFi into "WiFi" port at the bottom of the inverter.

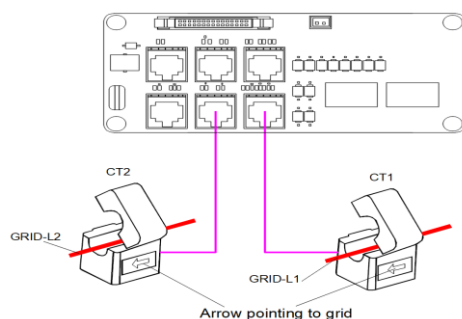
Step2. Build the connection between the inverter and router following the instruction of the WECO Noor APP

Step3. Create a user account online.(Please check the WiFi user manual for more details).

4.8 CT (current transform) Connection

CT is abbreviation for "current transform", is used to detect Grid current .

The inverter is intended to be connected to split phase power grid (North America), the accessories provide two CTS, The RJ45 connectors of the two CTs are connected to "CT-L1" and "CT-L2", and the two CTs are connected to L1 and L2 phase. "CT-L1" network interface is corresponds to L1 phase, and "CT-L2" network interface is connected to L2 phase



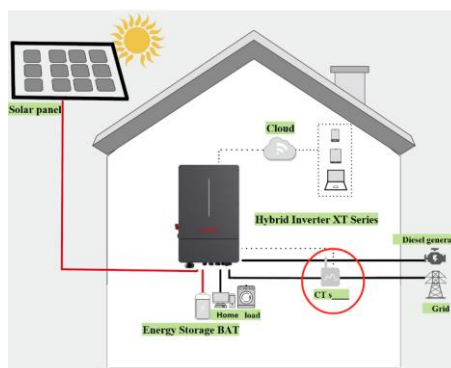
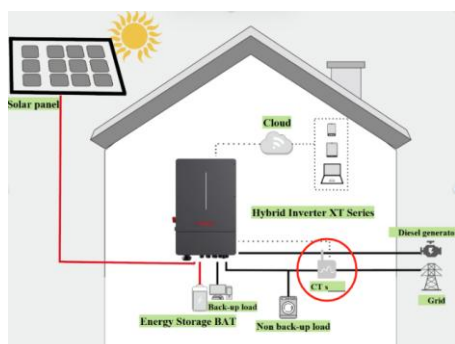
CT arrow pointing to Grid power source side



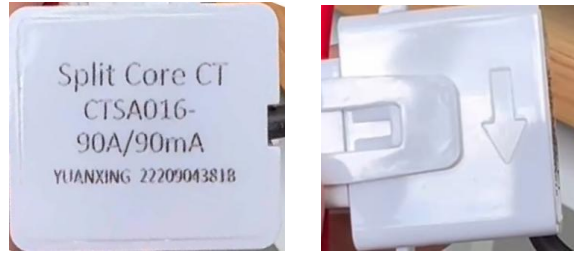
Note!

- The inverter is intended to be used for split phase power grid(North America standard). Cross region market sales(single phase power grid) is not supported.
- Make sure the CT arrow pointing to grid power source direction, otherwise wrong direction of connection of CTs could cause abnormality.
- Make sure the CTs are not installed to wrong places of the Grid cables, such as home load side etc. It' s strongly recommended that CTs are installed nearest to grid power source side as follows (including partial-home and whole-home topologies)

Installation position of CTs:



- In case the communication cable length of CT is not enough for connecting to the inverter from installation place, regarding this situation, please prepare a extension communication cable (suggested) or a spare CT with same specs and longer cable length(Not suggested). Follows are the shipped CT specs for reference and extension cable picture for example:

CT specs :

CT Model Name: CTSA016 Ratio: 1000 Communication Cable Length: 2m

Extension wire example:

Notes: the extension wire length should not be more than 40m and should be shielded. Connect the RJ45 socket of the extension cable to the RJ45 connector of the CT communication cable connector, then connect the RJ45 connector of the extension cable to the corresponding port of the inverter.



5 System debugging

5.1 Check before powering on

Inspection items and acceptance criteria

Items	Check the item	Acceptance criteria
1	The inverter is installed in place	The inverter is installed correctly and is robust and reliable.
2	The WiFi antenna is in place	WiFi antennas are installed correctly and are robust and reliable.
3	The cables are well arranged	The cable arrangement is reasonable to meet the user's requirements.
4	Cable ties are beautiful to lash	The cable tie should be even, and no sharp corners should be left at the shear.
5	Reliable grounding	The ground wire connection is correct and reliable.
6	Disconnect the switch	The "PV SWITCH" and all switches connected to the inverter are in the "OFF" state.
7	wiring connections into right port	AC output lines, DC input lines, energy storage lines and signal lines are connected correctly and securely and reliably.
8	Seal unused terminals and connectors	Unused terminals and connections are covered with waterproof covers.
9	The installation environment meets the requirements	The installation space is reasonable, the environment is clean and tidy, and there are no construction residues.
10	CT and power cables for parallel are good	The 2 CT for Grid power input L1,L2, must well install and the CT arrow must towards to utility side;• When parallel inverter, Must let battery-each inverter,Grid-each inverter,First load breaker-each inverter, every group the power cable discrepancy < 0.25 m.

5.2 System power-up

Prerequisites

Before closing the AC switch between the inverter and the grid, it is necessary to measure whether the AC voltage on the grid side of the AC switch is within the allowable range of the inverter.

Before closing the inverter and the PV DC input switch, it is necessary to measure whether the DC voltage on the PV DC switch side is within the allowable range of the inverter.

Before closing the DC input switch between the inverter and the energy storage device, it is necessary to measure whether the DC voltage on the DC switch side of the energy storage device is within the allowable range of the inverter.

Procedure

Step 1 If the inverter energy storage port is connected to an energy storage device, close the energy storage switch first, and then the auxiliary power switch of the energy storage device.

Step 2 Close the AC switch between the inverter and the grid.

Step 3 If there is a PV switch between the inverter and the photovoltaic string, close the PV switch.

Step 4 Please make sure "PV SWITCH" at the left side of the inverter chassis in the "ON" position.

Step 5 Set the inverter parameters through the App, see 6 App operation for detailed operation.

Step 6 After setting, press the button switch on the left side of the inverter to start the operation of the inverter.

Step 7 (Optional) Use a spot thermometer to detect the temperature at the connection between the DC terminal and the energy storage terminal. After the inverter has been working for a period of time, the temperature at the DC terminal connection is detected to confirm that the DC terminal contact is good. Make sure the temperature rise does not exceed 30°C.

Step 8 Observe the LED indicator to check the operating status of the inverter.

5.3 Power down the system

Background information



Warning!

- After the inverter is powered down, there is still residual power and heat in the chassis, which may cause electric shock or burns. Therefore, after 5 minutes of powering down the inverter system, wear protective gloves before operating the inverter.
- If the inverter is connected to an energy storage device, please make sure to use the APP to issue a shutdown command, then perform the following power-down operation. Otherwise inverter will trig alarm in the app.
- If the user does not use the APP to issue the shutdown command, the inverter will switch to off-grid working mode after the power down on the grid side.

Procedure

- Step 1 Use the APP to issue shutdown commands.
- Step 2 Disconnect the inverter and the AC circuit breaker input on the grid side.
- Step 3 Disconnect the PV DC circuit breaker between the inverter and the PV string.
- Step 4 Switch off the PV switch on the inverter left side;
- Step 5 Press off the Inverter power button on the inverter left side;
- Step 6 If the inverter energy storage port is connected to an energy storage device, disconnect the energy storage input circuit breaker, Off the battery.
- Step 7 If the inverter generator input port is connected to the generator, disconnect the generator input circuit breaker.

6 Noor Cloud APP Operation

6.1 App Introduction

Function

Noor Cloud App (abbreviated as app) is a cloud through 2.4G network and an WIFI module.

The mobile application software of terminal communication can realize alarm query, parameter configuration, daily maintenance, debugging and other functions, and is a convenient maintenance platform.

Connection method

After the DC side or AC side of the inverter is powered on, it can be connected to the APP through wifi module and external router.

Statement

The interface shown in this app is NOOR V1.0.7 The picture is for reference only, and the specific application interface shall prevail.

The company has the right of final interpretation of this document and all related documents of this product.

Subject to update, revision or discontinuation without notice, please visit our official website for the latest product information.

6.2 Download and install the app



Download method: Search for "Noor" in the Google Play or App Store application market.

Mobile phone system requirements: It supports use on IOS 12.0 and Android 8.1.0 or above.



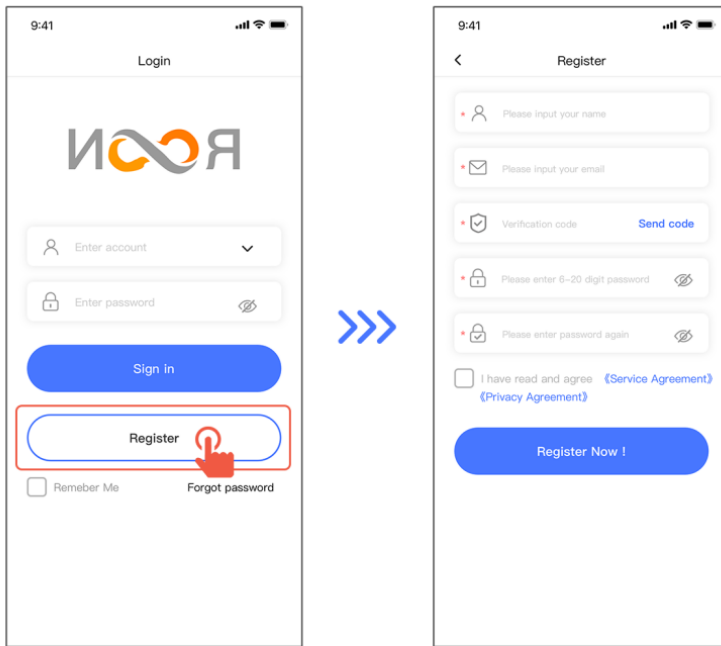
After the installation is complete, the "Noor" icon can be displayed.

6.3 Register a Noor APP account

Precondition

The DC or AC side of the inverter is powered on.

The phone is connected to the network.



Procedure

If you haven't a Noor App user account, please register according to the following steps:

Steps:

1. Go to the Noor App login page, click "Register Now!" at the bottom;
2. Complete the user account registration according to the prompts on the page. Fill in the registration information: country (required), email number (required), verification code (required), password (required), re-enter password (required), and finally check the user agreement and privacy registration to register;
3. After account registration, users can log in to the Noor App with the account name and password.

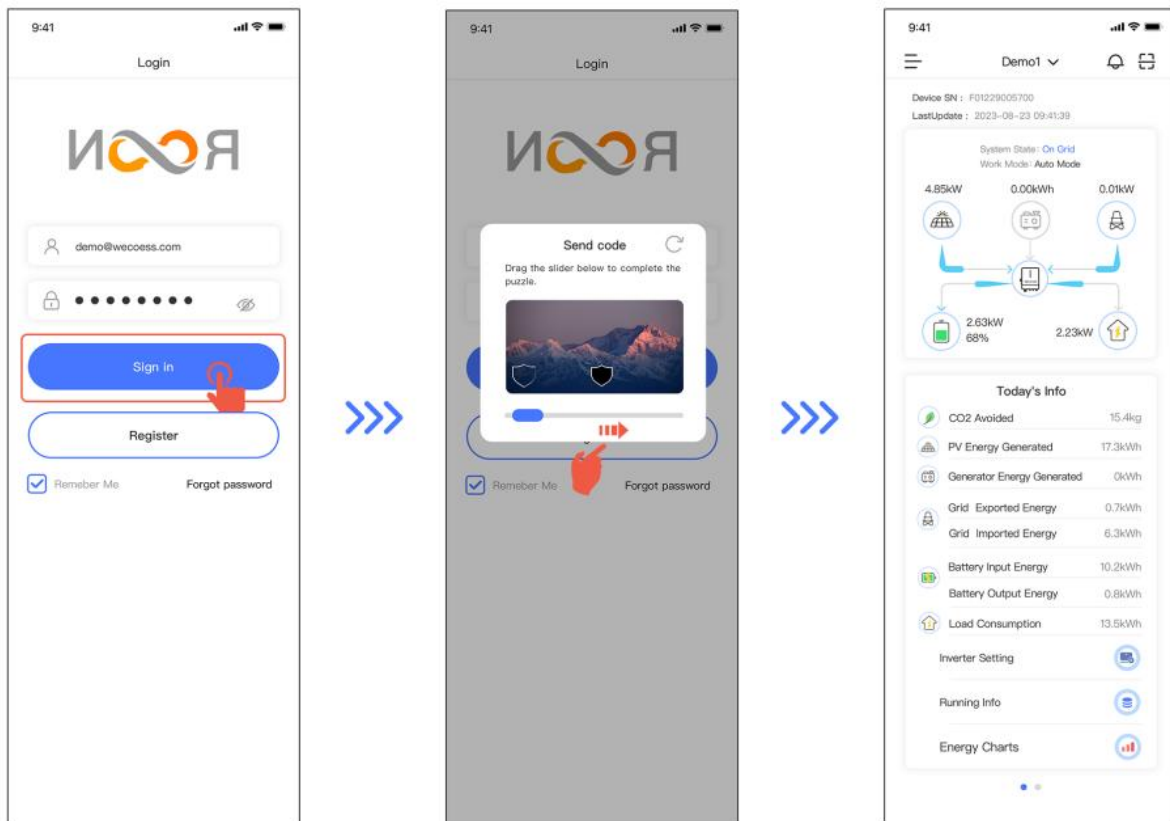
6.4 Login and Logout of the APP

6.4.1 Login APP

After correctly installing the app on your mobile phone, you can use it by logging into the app.

Steps:

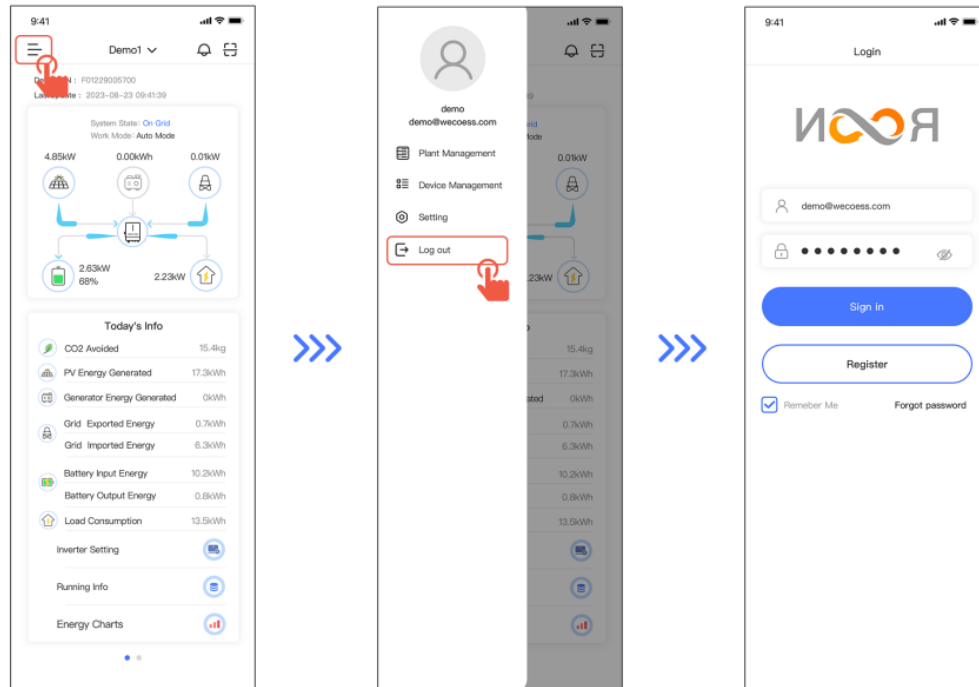
1. On the mobile desktop, use the Noor App application icon to login;
2. On the app login page, enter your account and password, then click "Sign in".



6.4.2 Logout APP

Steps:

1. Click "☰" in the upper left corner of the main page, and a pop-up page will appear on the left side.
2. On the pop-up page that slides out, click the "🚪" icon to log out.



6.5 Build a Power Station Wizard

Precondition

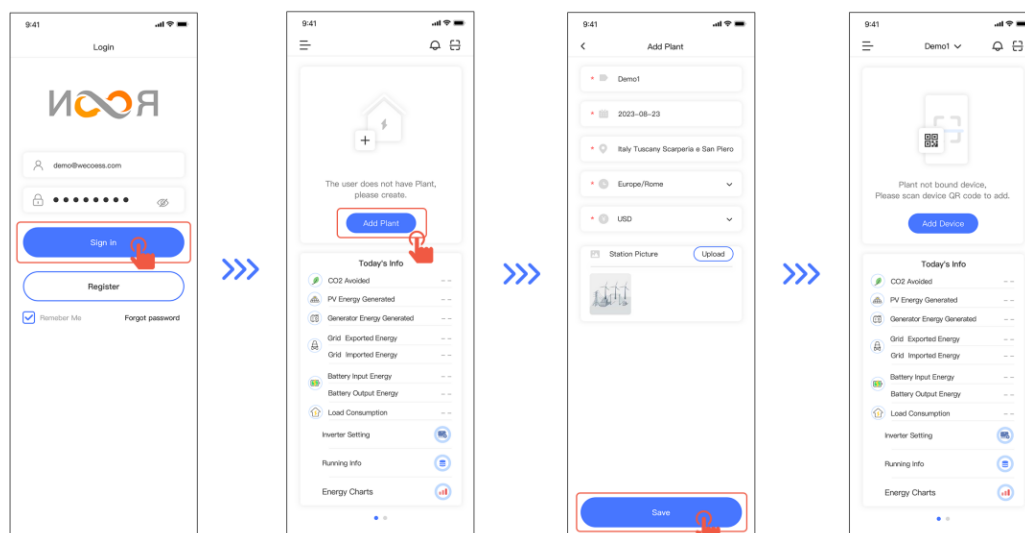
After completing the device commissioning, you can use Noor App to create a power station and configure the basic information, which enables centralized monitoring and management of the devices.

6.5.1 Login at the first time to create an initial power station

Steps1: After logging in to the Noor App, you can click the "Add plant" button to add a power station;

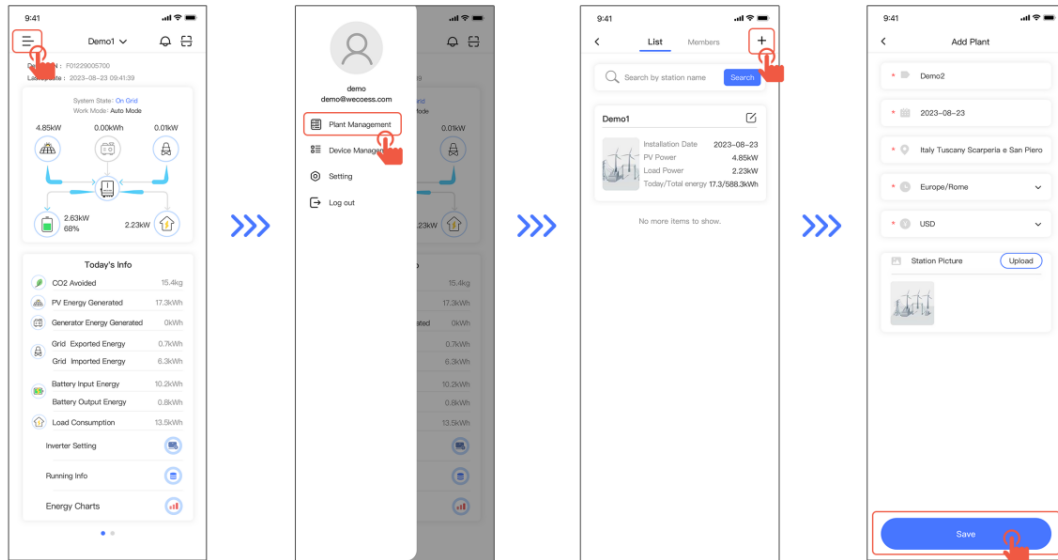
Steps2: You can fill in the information for the power station on the page, and then click the "Save" button to save the information and exit to the main page;

Steps3: If there is no device in the power station, you can click the "Add Device" button to add devices. Refer to section 7.6 "Build new device" for more information.



6.5.2 Add a power station

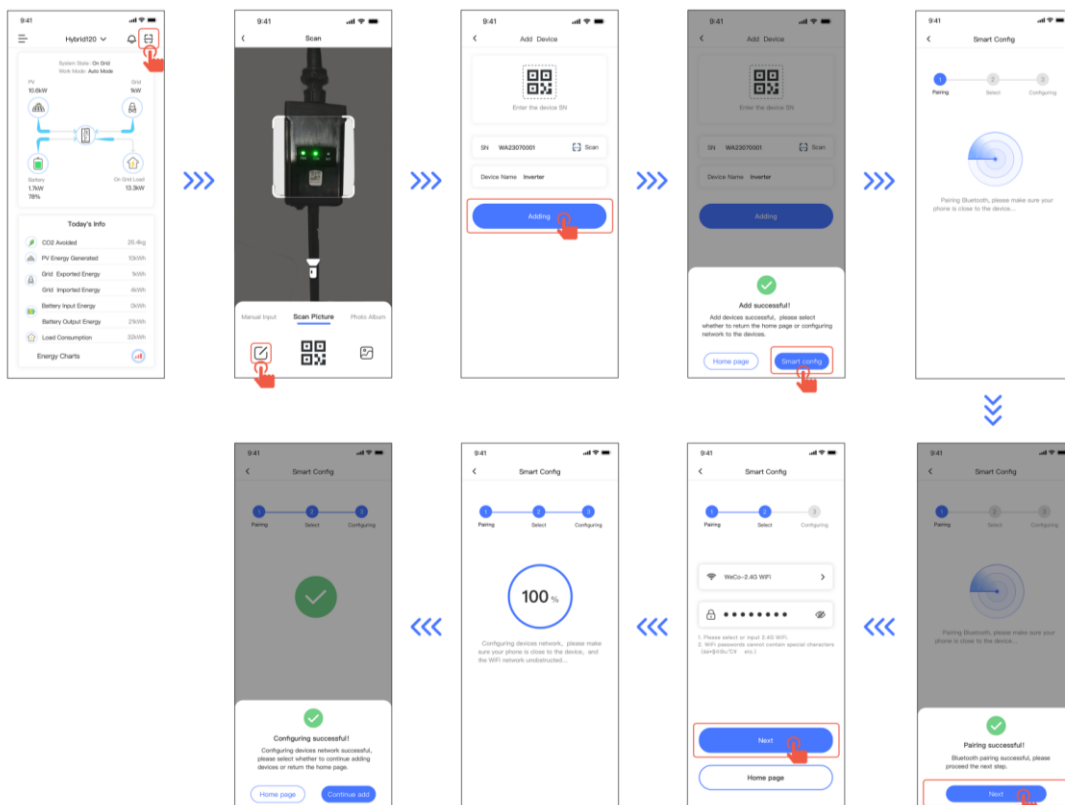
- Steps1: Click "≡" in the upper left corner of the main page, and a page will slide out from the left side;
- Steps2: Click on the "Plant Management" button in the slide-out page to view the power station list;
- Steps3: Click the "+" button in the upper right corner of the power station list page to enter the page adding a power station;
- Steps4: After filling in the power station information, use "Save" button to save.



6.6 Add new device

After the power station is created, if you want to add new device to the power station, you can add the new device to a power station by this function.

- Steps1: Click the "📷" icon in the upper right corner of the home page to enter the scanning page;
- Step 2: Scan or identify the QR code of the data collector from the album. This QR code is the device SN information. If the QR code is damaged or the scanning is abnormal, you can click "📄" to enter the SN;
- Step 3: After scanning or filling in the SN, enter the device name (name the device);
- Step 4: Click "Adding" to add; If you need to continue adding new devices, click "continue Add", otherwise click "Home Page" to return to the homepage.

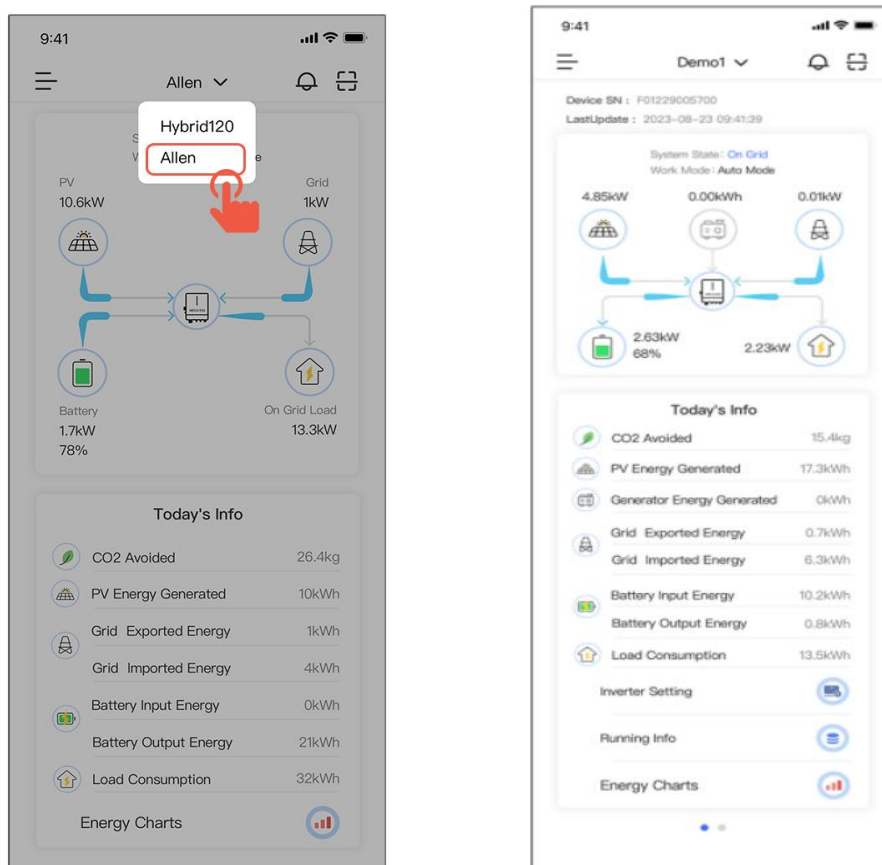


6.7 Check the power station status

The Noor App provides an overview of the power station, real-time status overview of the power station, energy output and consumption, revenue, energy flow diagrams, and other information.

6.7.1 View the details of the power station

After logging in to the App, you can view the details of the current power station, or you can click the "Hybrid120" icon on the "Home Page" and select the name of the power station to view the details of the power station.



Device information: displays the serial number of the current device and the time of the last data update.

Real-time operating status: system status, working mode, and power supply direction of the devices system under the plant.

Today's information: CO2 emission reduction and today's energy information such as photovoltaic, power grid, battery, load, etc.

Inverter Setting: Enable remote configuration of device system operating parameters.

Running Information: Display detailed real-time operational information of the device system, such as voltage, current, power, etc.

Energy charts: the energy usage status of the devices system under the plant at different times and dimensions helps analyze the trend of energy trends.

Note:

The system has the following status:

Offline: The device is offline or the WIFI module is not connected to the network;(Pleased keep system online)

Standby: The device is in BYPASS mode(inverter not using PV or battery power), grid power will allow to through inverter to power the load;

On Grid: The inverter is together provide power supply, and grid is connected;

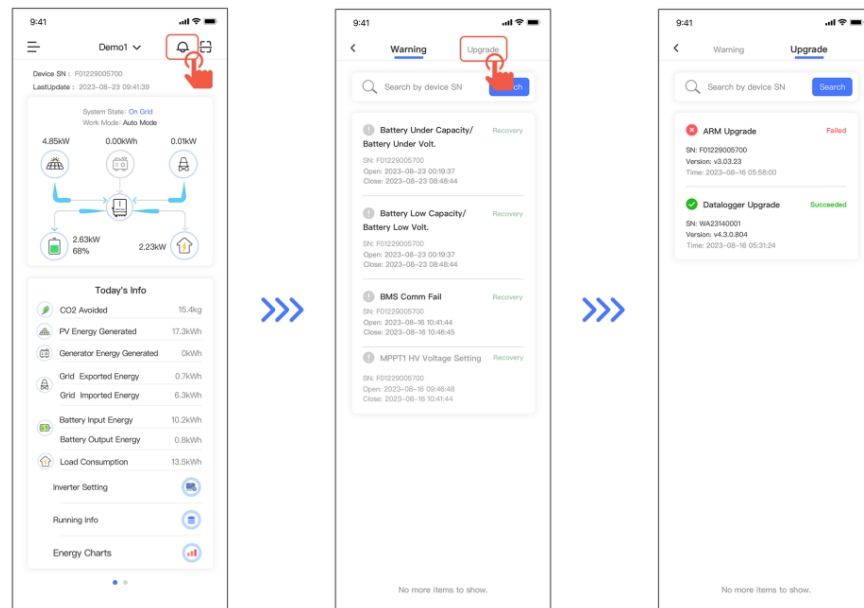
Off Grid: The inverter is working in EPS mode, and grid power is not stable or in off grid;

Off Grid PL: The device is working in an off-grid tracking state and is attempting to connect to the grid;

Inv to PFC: The process of switching from off-grid to on-grid when photovoltaic is in place;

6.7.2 Fault message reminder

Click “” to view the device current/historical event messages under plant.

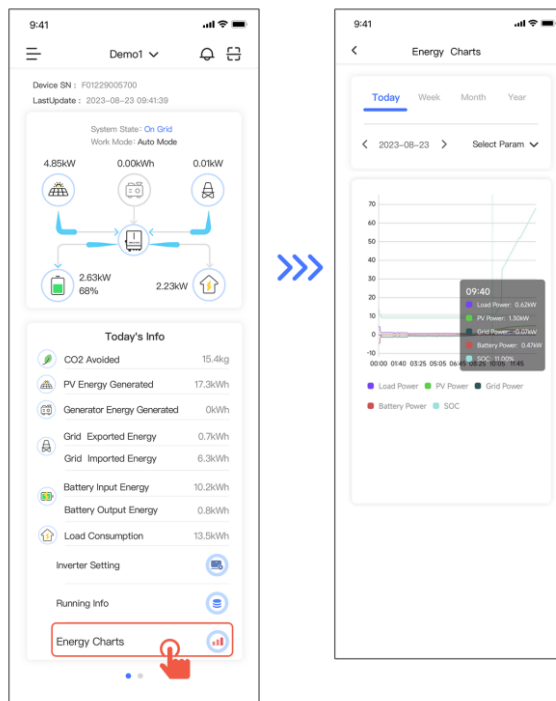


Warning: Display the fault alarm records of the device that are currently occurring/have been restored.

Upgrade: Display firmware update records that have occurred on the device.

6.7.3 Energy Information

On the main interface, select "Energy charts" to view energy information, as shown below

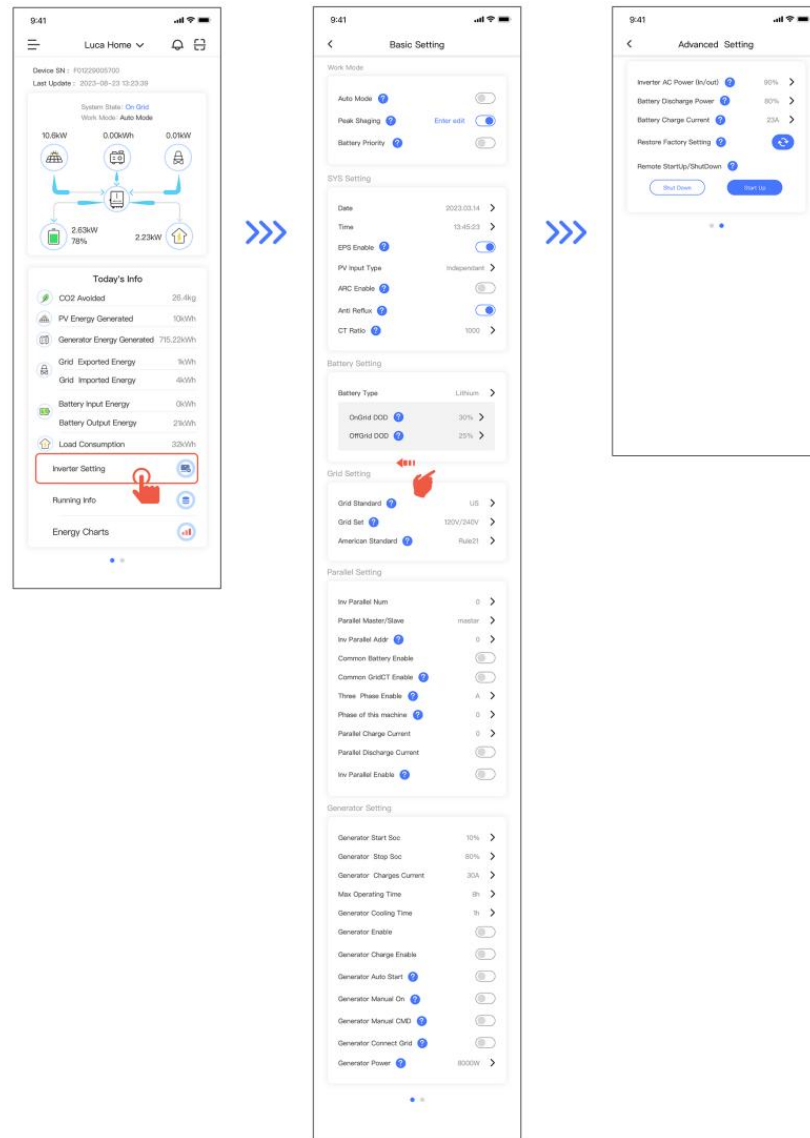


Select time: Click the "< 2023-08-23 >" area to select the data view on the specified date.

Select parameters: Click the "Select Param" area to select the parameters that need to be viewed for comparative analysis.

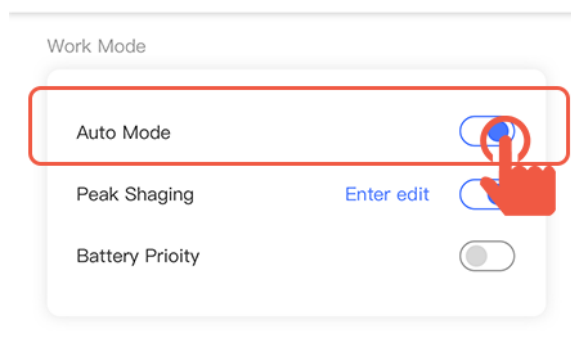
6.8 Inverter settings

On the “Home Page>Inverter Setting” tabs, remote param settings can be made for the device system under the current plant. The configuration page is divided into basic settings and advanced settings, and can be switched by sliding left and right.



6.8.1 Set working mode

In the inverter setting page, three working modes can be configured for the current power station: Auto mode, Peak Shaving and Battery Priority. The home page can display the working mode status of the current power station.



Note:

Auto mode

The priority of photovoltaic power generation is to ensure the load works, and then the remaining photovoltaic power is charged to the energy storage battery. After the battery is fully charged, the excess energy can be fed into the grid (the function of feeding into the grid can only be used with the permission of the grid company).

Peak Shaving

The system can run according to the set time and power, use photovoltaics and batteries when electricity prices are high, use the grid and charge batteries when electricity prices are low, and sell the remaining electricity generated by photovoltaic to the grid during the day (with the permission of the grid company first In order to use the function of feeding into the grid), it can save electricity costs. In the planning mode, it is necessary to set the charging and discharging time period and the corresponding power.

Description: In the process of setting the planning mode, the charging/discharging time periods cannot overlap.

Battery Priority

In this mode, the system prioritizes charging the battery until fully charged.

6.8.2 System settings

Settable functions: Date, Time, EPS Enable, PV Input Type, ARC Enable, Anti Reflux, CT Ratio.

SYS Setting

Date	2023.03.14	>
Time	13:45:23	>
EPS Enable	☒	
PV Input Type	Independant	>
ARC Enable	☐	
Anti Reflux	☒	
CT Ratio	1000	>

Date: Current date. The inverter's statistical function will be performed based on this set date

Time: The current time, the system's planning mode, will match this set time

EPS Enable: EPS enable switch. After setting the enable switch, the load will output and provide power after the inverter is off the grid

PV Input Type: Photovoltaic input type, default to independent input

ARC Enable: United state need to be set to enable

Anti Refulex: Use to mandatory control PV energy not export to the grid(PV power also will limits to meet the requirement).

CT Ratio: Transformation ratio of external current transformer for detecting current. No need to change the default value if the CT is provided with the inverter.

6.8.3 Battery Setting

6.8.3.1 Set Battery Type

In the battery type, two types of batteries can be configured: Lithium and Lead-acid.

Battery Setting

Battery Type	Lithium	>
OnGrid DOD	90%	>
OffGrid DOD	95%	>

Cancel	Battery Type	Yes
	Lead-Acid	
	Lithium	

6.8.3.2 Set Battery parameters

If battery type set to Lithium, Settable functions: On Grid DOD, Off Grid DOD.

Battery Setting

Battery Type	Lithium	>
OnGrid DOD	90%	>
OffGrid DOD	95%	>

On Grid DOD: The lower limit of the discharge SOC when inverter On grid. When SOC< 100% subtraction this value, the battery will keep battery energy for Off grid using .

Off Grid DOD: The lower limit of the discharge SOC when inverter Off grid.. When SOC< 100% subtraction this value, the battery will stop discharge battery energy until back to on grid .

If battery type set to **Lead-acid**, Settable functions: Float Charge Voltage, Charge Protect Voltage, AH Setting, Endoff Voltage, Constant Charging Voltage, OnGrid Disch. Voltage, Disch. Hysteresis Voltage.

Battery Setting

Battery Type	Lead-Acid >
Float Charge Voltage	55V >
Charge Protect Voltage	59V >
AH Setting	200A >
EndOff Voltage	43V >
Constant Charging Voltage	0V >
OnGrid Disch. Voltage	0V >
Disch. Hysteresis Voltage	1V >

Float Charge Voltage: inverter will maintain battery voltage in this value by using small current charge & discharge

Charge Protect Voltage: Charge cut-off voltage, to protect the battery from over-charge

AH Setting: Battery capacity, to be set according to the lead-acid battery's actual AH capacity(Notice high AH will dangerous)

Endoff Voltage: Discharge cut-off voltage when on grid, related return difference is 1V.

Constant Charging Voltage: Future feature, Not available now.

OnGrid Disch. Voltage: Future feature, Not available now

Disch. Hysteresis Voltage: Future feature, Not available now

6.8.4 Grid setting(Authorized operator only)

Settable functions: Grid Standard, Grid Set, American Standard Classification.

Grid Setting

Grid Standard ?	Latin America >
Grid Set ?	120V/240V >
American Standard ?	UL1741&IEEE1547.2020 >

Grid Standard: Select the region or national grid code , the voltage amplitude and frequency will be determined once it set. (Refer attached page for selection recommend)

Grid Set: Select 120/240 for split phase grid or load.

American Standard: First one for common grid standards use,Selection others if your local grid supplier standard was on the list.

6.8.5 Parallel Setting(Must share battery)

Settable functions: Inv Parallel Num, Parallel Master/Slave, Inv Parallel Addr, Common Battery Enable, Common GridCT Enable, Parallel Charge Current, Parallel Discharge Current, Inv Parallel Enable.

Parallel Setting

Inv Parallel Num	2 >
Parallel Master/Slave	Master >
Inv Parallel Addr ?	1 >
Common Battery Enable	☒
Common GridCT Enable ?	☒
Three Phase Enable ?	☐
Phase of this machine ?	A >
Parallel Charge Current	100A >
Parallel Discharge Current	200A >
Inv Parallel Enable ?	☒

Inv Parallel Num: Total numbers of the inverters including master and slave.

Parallel Master/Slave: In a parallel system, only one master inverter use RJ45 connect to the battery BMS; The master inverter also will through the RJ45 connect with slave inverters, to broadcasts the BMS and other control information to the slave inverter. Master only can have one in the system.

Inv Parallel Addr: Local unit in series address. The master inverter is 1, and the 2nd slave inverter through RJ45 connect to the master is 2, then is 3; (Addr need changed correspond, once a middle inverter was off)

Common Battery Enable: Enable this function to allow battery information broadcasts to other parallel inverters;

Common GridCT Enable: In parallel system, could only use 1 set CT to connect with master inverter and enable this one to share CT detections to other parallel inverters; (Please follow the 1 parallel system wiring diagram for connection)

Three Phase Enable: Future feature, Not available now

Phase of this machine: Future feature, Not available now

Parallel Charge Current: Total battery charge current command under shared battery, only be settable in master unit in parallel mode.

Parallel Discharge Current: Total battery discharge current command under shared battery, only be settable in master unit in parallel mode.

Inv Parallel Enable: Enable/Disable the parallel function. It needs to be turned on in parallel mode.

Settable functions: Generator Start SOC, Generator Stop SOC, Generator Charge Current, Max Operating Time, Generator Cooling Time, Generator Enable, Generator Charge Enable, Generator Auto Start, Generator Manual On, Generator Manual CMD, Generator Connect Grid, Generator Power.

Note: 1.Grid power and generator power can't use in same time;2.Generator Max power can't more than Inverter capacity;3.Generator function not support special DIY.

Generator Setting

Generator Start Soc	10%	>
Generator Stop Soc	80%	>
Generator Charges Current	30A	>
Maximum Operating Time	8h	>
Generator Cooling Time	1h	>
Generator Enable	☐	
Generator Charge Enable	☐	
Generator Auto Start	☐	
Generator Manual On	☐	
Generator Manual CMD	☐	
Generator Connect Grid	☐	
Generator Power	8000W	>

Common Settings:

Generator Enable: To enable generator function.

Charge Enable: Enable this function to close inverter Gen input power port relay to allow power going to inverter. and the battery will not be charged until the generator is started after setting the enable. (Must enable when using manual control or auto control)

Generator Charge Current: The current value for charging the battery after the generator is started. Please pay attention to the generator power and load power when setting this value.

Generator Connect Grid: Only used for long term off grid and the generator power cable connect into inverter grid power terminal.

Generator Power :Use to protect inverter and loads not damage when generator has high power output.

Auto Control Sets(Must enable below sets when auto control):

Generator Auto Start: To enable inverter auto control functions, The inverter will through dry contact to send the on-off signal to the external generator(Generator need support remote control).

Generator Start SOC: The generator automatically starts SOC setting. when the battery SOC lower than this setting, the inverter will through dry connect send a starting signal to generator to starts.

Generator Stop SOC: The generator automatically stops SOC setting. when the battery SOC greater than this setting, the inverter will through dry connect send a stop signal to generator to stop it.

Max Operating Time: Maximum operating time after generator startup

Generator Cooling Time: Cooling time for stop generator to cooling

Manual Control Sets(Must enable below sets when manual control):

Generator Manual On: Used when manually on-off generator or generator not support remote control.

Generator Manual CMD: Used when manually on-off generator or generator not support remote control.

6.8.7 Advanced setting

The advanced settings page is shown below,

Settable functions: Inverter AC Power(In/out), Battery Discharge Power, Battery Charge Current, Restore Factory Setting, Remote Start UP/ShutDown.

18:18 ● 5G 96

Advanced Setting

Inverter AC Power(In/out) ?	100%	>
Battery Discharge Power ?	40%	>
Battery Charge Current ?	39A	>
Restore Factory Setting ?		
Remote StartUp/ShutDown ?		

Inverter AC Power(In/out): Grid connected power dispatching. It will limits inverter working power, taking power from the grid and feeding back the maximum power value of the grid, using percentage settings.

Battery Discharge Power: Battery discharge power scheduling, maximum power value of battery discharge, usage percentage setting.

Battery Charge Current: Max Battery charging current

Restore Factory Setting: Restore factory settings.

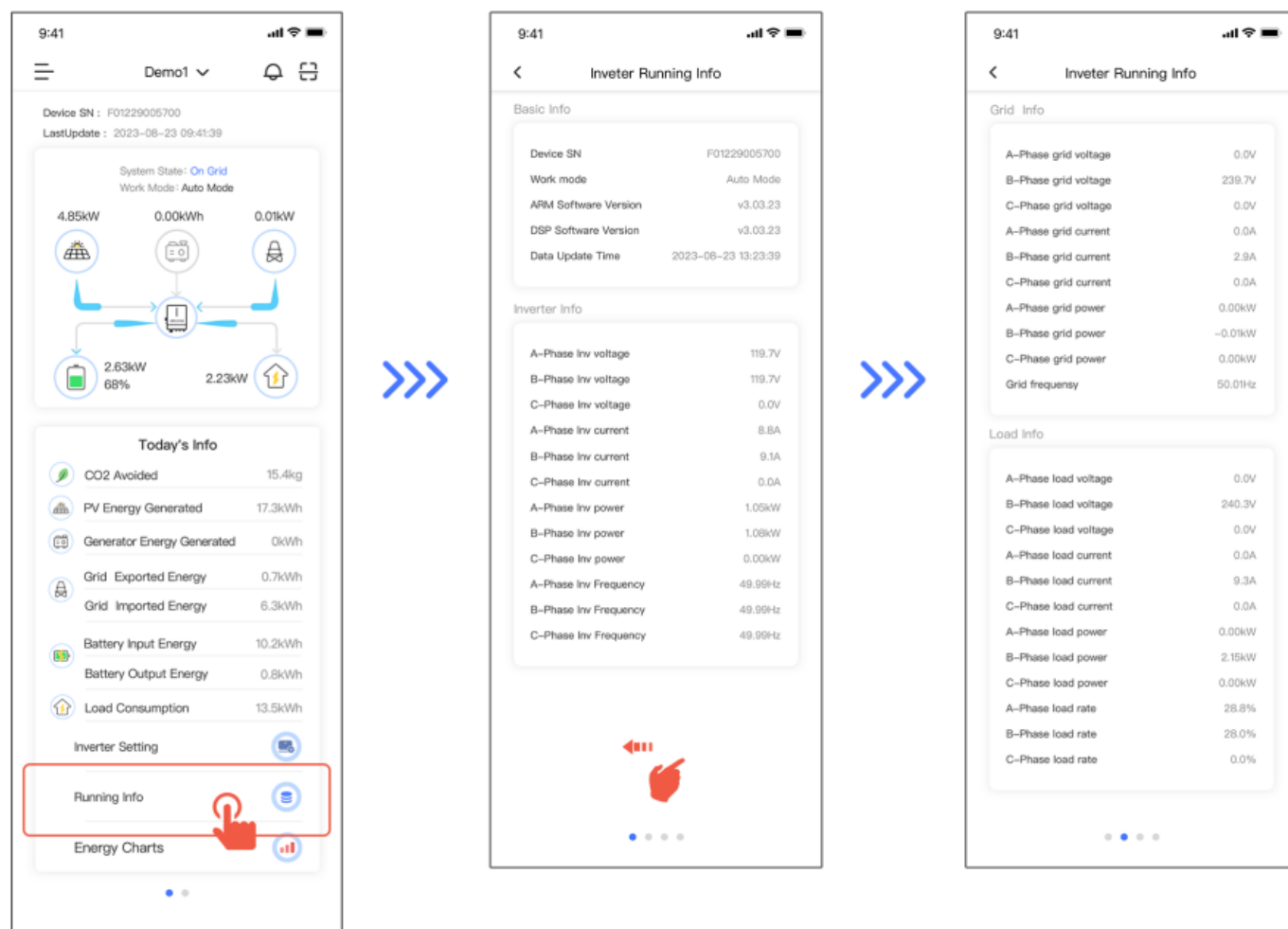
Remote StartUP/ShutDown: Used for system power-on and power-off .

6.9 Device Information

You can view the detailed real-time operation information of the devices system information under the current plant ; Such as Basic information, Inverter working information, Grid information ,Load information, photovoltaic information, battery information etc.

Procedure:

On the “Home Page>Running Info” tabs, you can view detailed real-time run information of the device system under the current plant, Such as Basic information, Inverter working information, Grid information ,Load information, photovoltaic information, battery information etc.



Note: In regards to the part of grid info in Running Information:

when the inverter connects to single phase grid:

Grid voltage, grid current and grid power are presented through "B-Phase Grid Voltage", "B-Phase Grid Current" and "B-Phase Grid Power".

when the inverter connects to split phase grid:

Grid voltage, grid current and grid power are presented through "A and B-Phase Grid Voltage", "A and B-Phase Grid Current" and "A and B-Phase Grid Power".

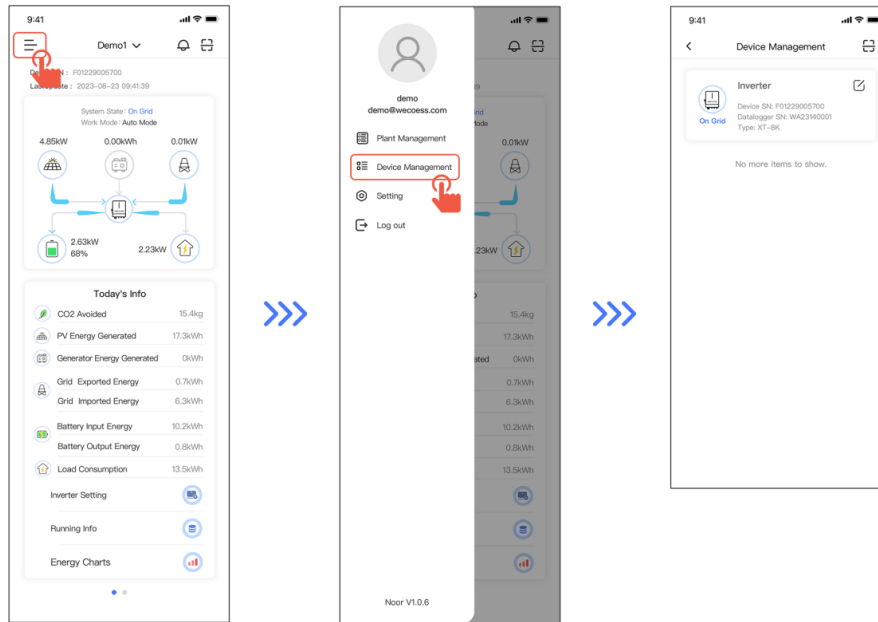
6.10 Device management

You can view the basic status of all devices added by the current plant.

Procedure:

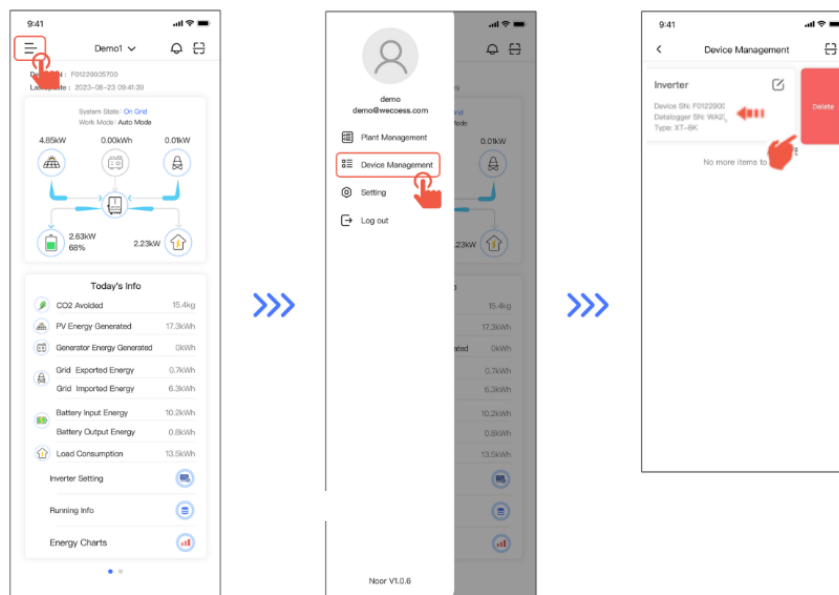
Step1: Click the “☰” icon in the upper left corner area of the homepage, and the page will pop up on the left side;

Step2: Click "Device Management" to enter the list page;



Device information: You can view the basic information and operation status of all devices under the current plant.

Device deletion: Swipe left on the device you want to delete to appear the red delete button, click to confirm the pop-up window and delete the device from your account **(used for link device to new app account)** .



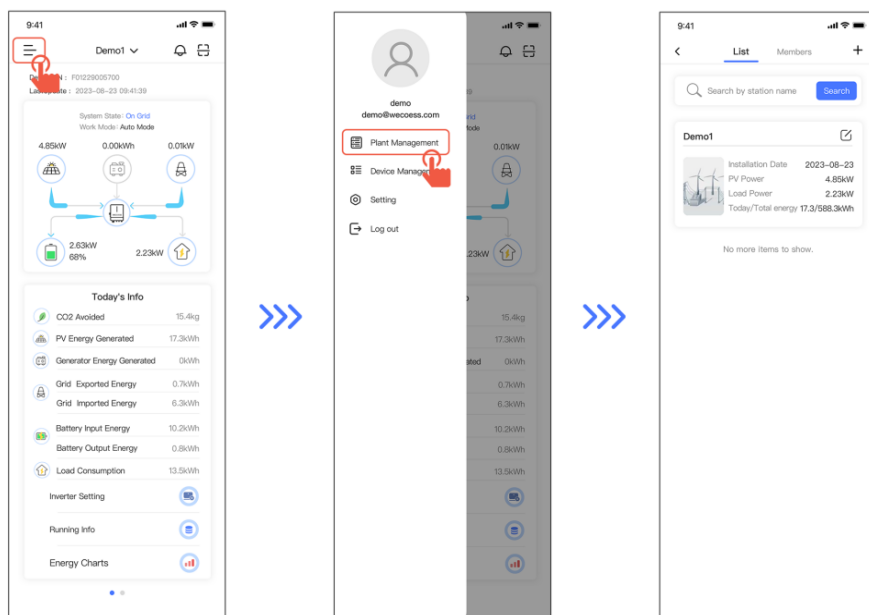
6.11 Plant Management

In the app, users can create plant, edit plant information, and delete plant.

To create a plant, see 6.5 Create a new plant.

6.11.1 View the list of power stations

Showcasing all the plant created, you can see when the plant were created and the energy generated by the devices system.



Procedure:

Step1: Click the “≡” icon in the upper left corner area of the homepage, and the page will pop up on the left side;

Step2: Click "Plant Management" to enter the list page.

6.11.2 Edit plant information

According to the actual situation, the name of the plant, the address of the plant and other information can be edited.

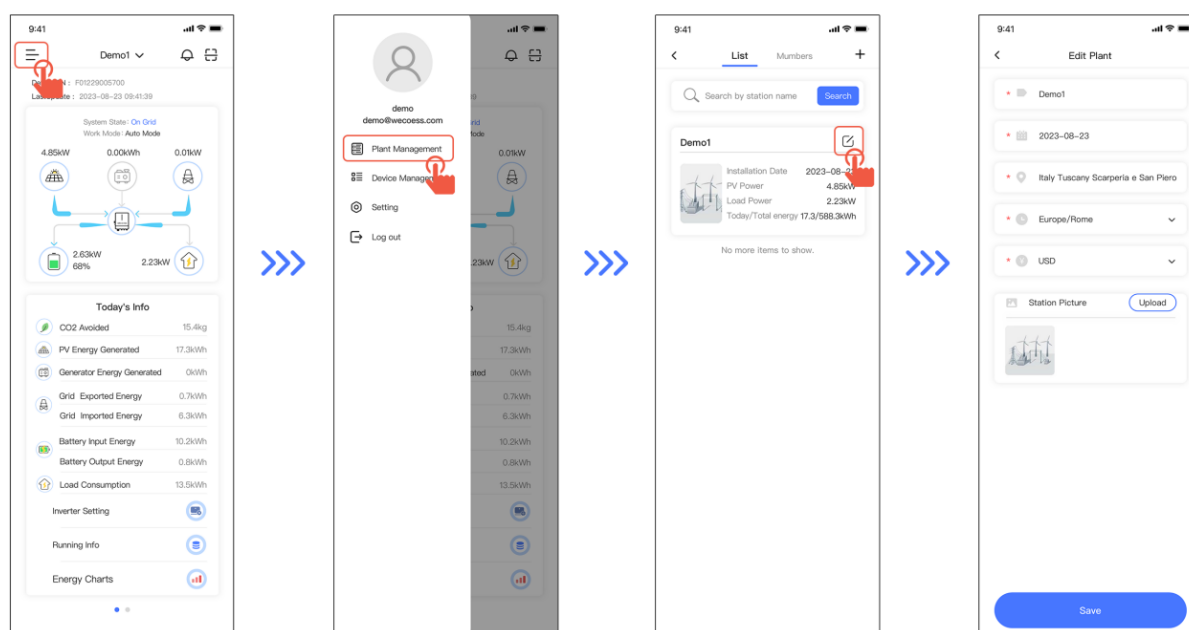
Procedure:

Step1: Click the “≡” icon in the upper left corner area of the homepage, and the page will pop up on the left side;

Step2: Click "Plant Management" to enter;

Step3: On the "Plant Management" page, click the “✎” icon in the upper right corner of the plant that needs to be edited;

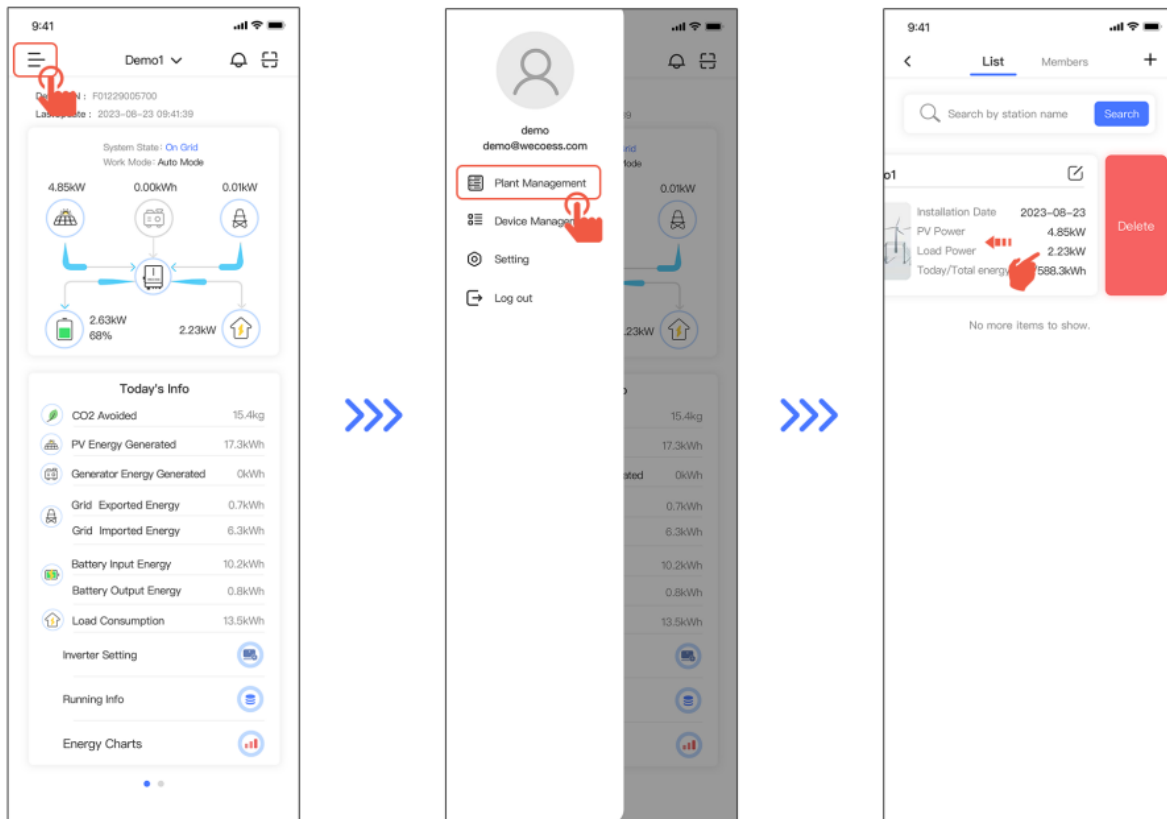
Step4: Modify the relevant content according to your actual needs, and then click "Save".



6.11.3 Delete the plant

Procedure:

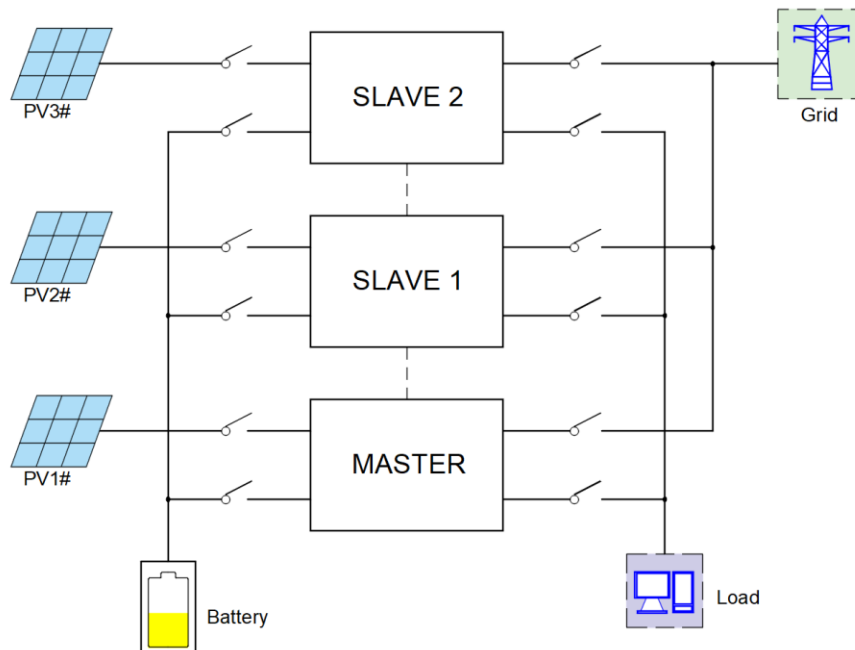
- Step1: Click the “☰” icon in the upper left corner area of the homepage, and the page will pop up on the left side;
- Step2: Click "Plant Management" to enter the plant list page;
- Step3: Select a plant to slide left and the "Delete" button will appear;
- Step4: Click "Delete" to display a confirmation pop-up window, click "OK" in the pop-up window to delete the selected plant.



7 Inverter Parallel Guide

7.1 Parallel System Diagram

Multiple inverters can be connected in parallel to provide more power. When AC loads are present, all units effectively share the load. The system schematic is as follows.



Note !

- All inverter in one residential power system must parallel together. Otherwise will cause system working abnormal.
- Inverter parallel only support share battery, grid and load. Otherwise will make power supply imbalance.
- Different model inverter can't parallel together. Otherwise will not working.
- Max inverter parallel only allow 3 device right now.
- Best PV input efficiency is 350 ~ 400V, Please make more strings and connect to different PV port to get best benefit.

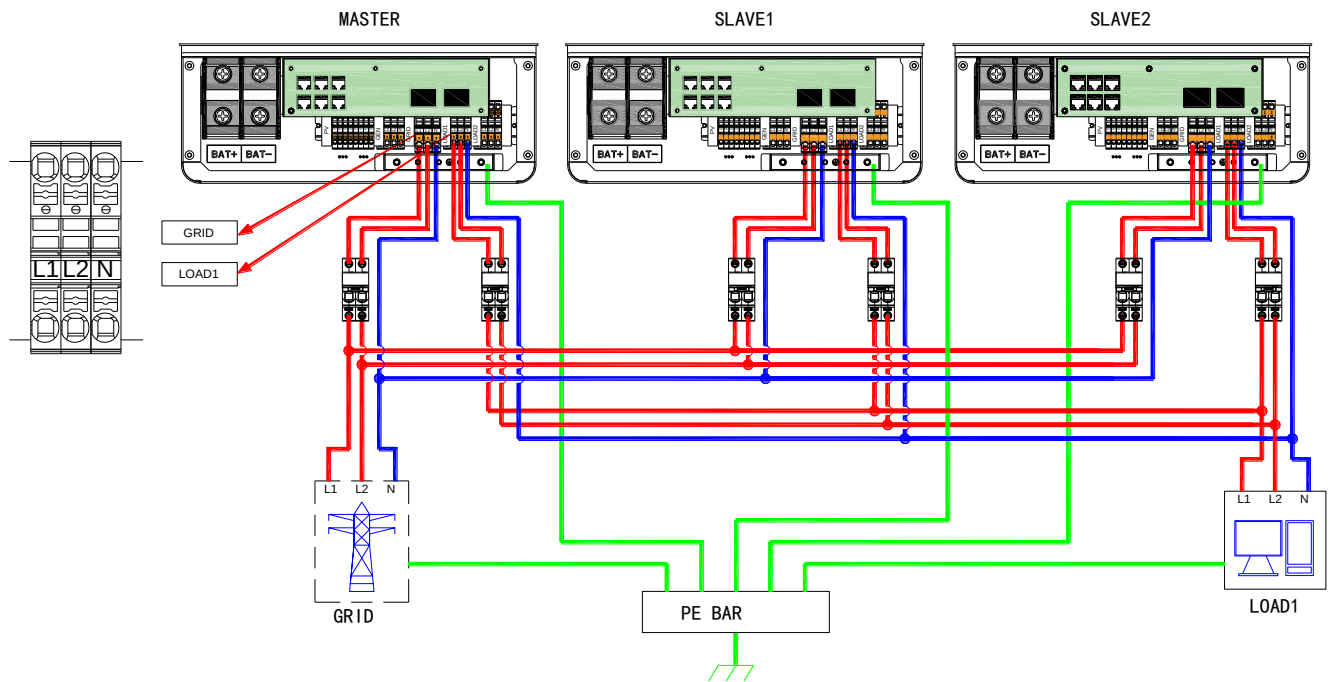
7.2 Parallel System Wiring Diagram

Prerequisites:

- The difference of the cable length between AC output port of each inverter and the confluence point to grid side should be less than the minor value between 0.3m and 10% of the cable length.
- The difference of the cable length between load output port of each inverter and the confluence point to load side should be less than the minor value between 0.3m and 10% of the cable length.
- The difference of the cable length between the terminal of each inverter and the battery output terminal should be less than the minor value between 0.3m and 10% of the cable length.

1) The grid side power supply of the inverters are connected in parallel to the main grid through a 40A circuit breaker; The grid power lines of the inverters should be roughly the same length;

2) The load end of the inverters can be output in parallel to the total load; The load power lines of the inverters should be roughly the same length;

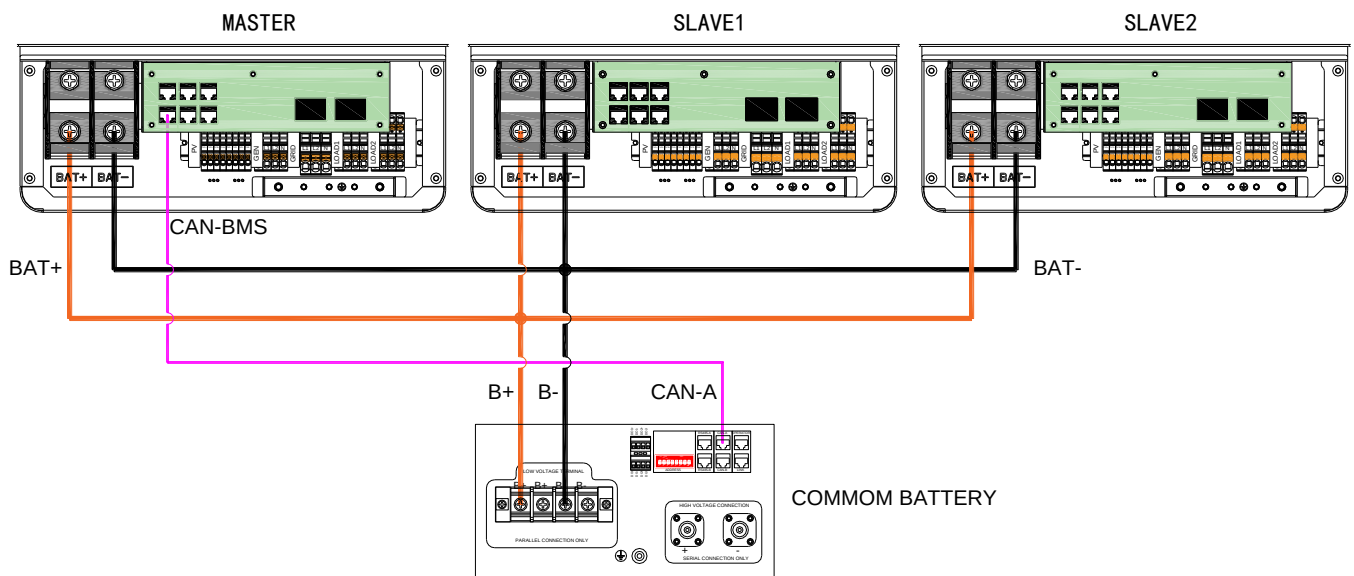


3) The inverters must share same batteries, and the BMS communicates with the inverter master through CAN(RJ45 terminal); The master inverters share BMS information through parallel communication(RJ45) to Slave 1, Slave 2;

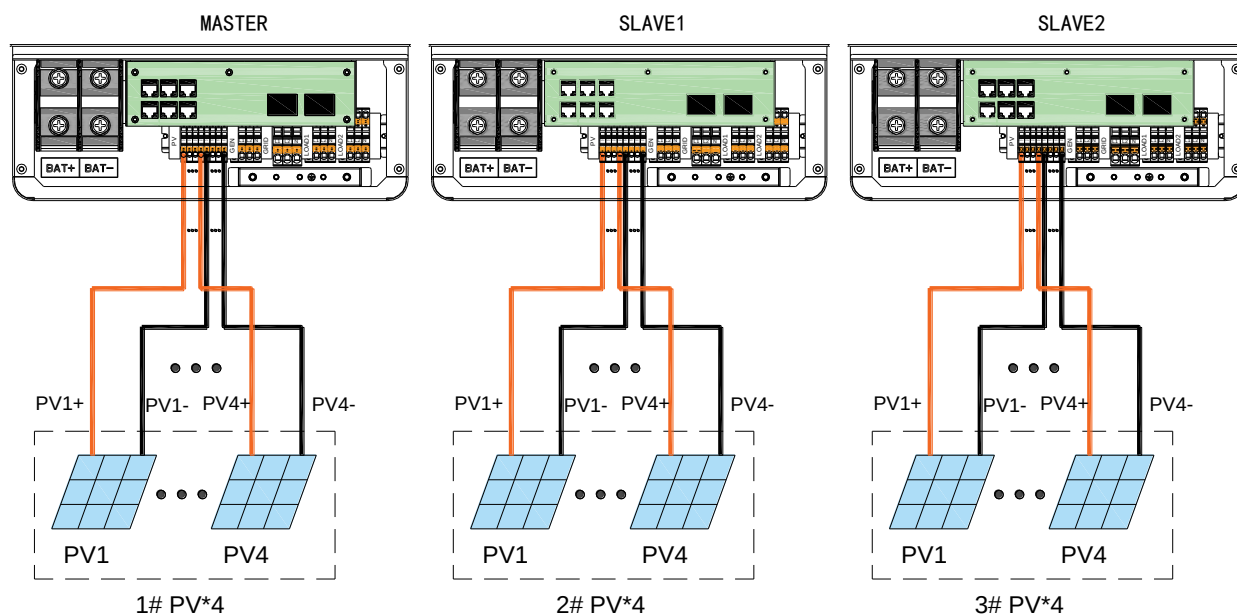


Note !

- Slave 2 inverter parallel information transfer from Slave 1, Please make sure Slave 1 parallel setting correct even in Slave 1 power off;
- Please change Slave 2 inverter "Parallel Addr" to 2 when Slave 1 was power off; Change it back to 3, when Slave 1 starts working later.

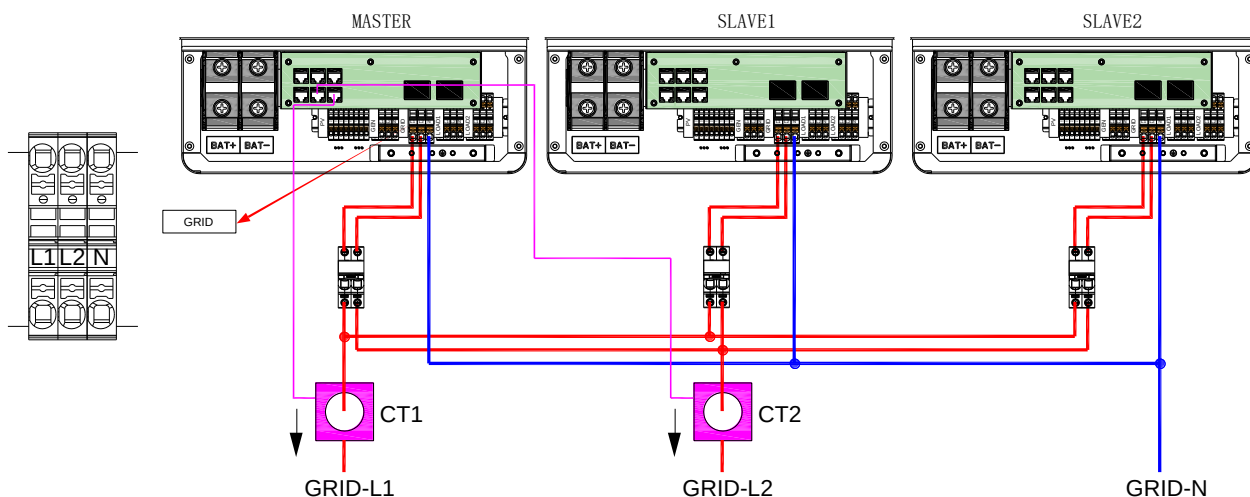


4) The photovoltaic power supply of the inverters are provided independently.



5) CT can use common or independent(When app enable Common CT setting only need 1 set CT);

a. When use common CT, the 2 CT is installed at before the parallel connection point of L-line and towards to the grid come from side . The CT communication cable only needs to be connected to the master inverter.

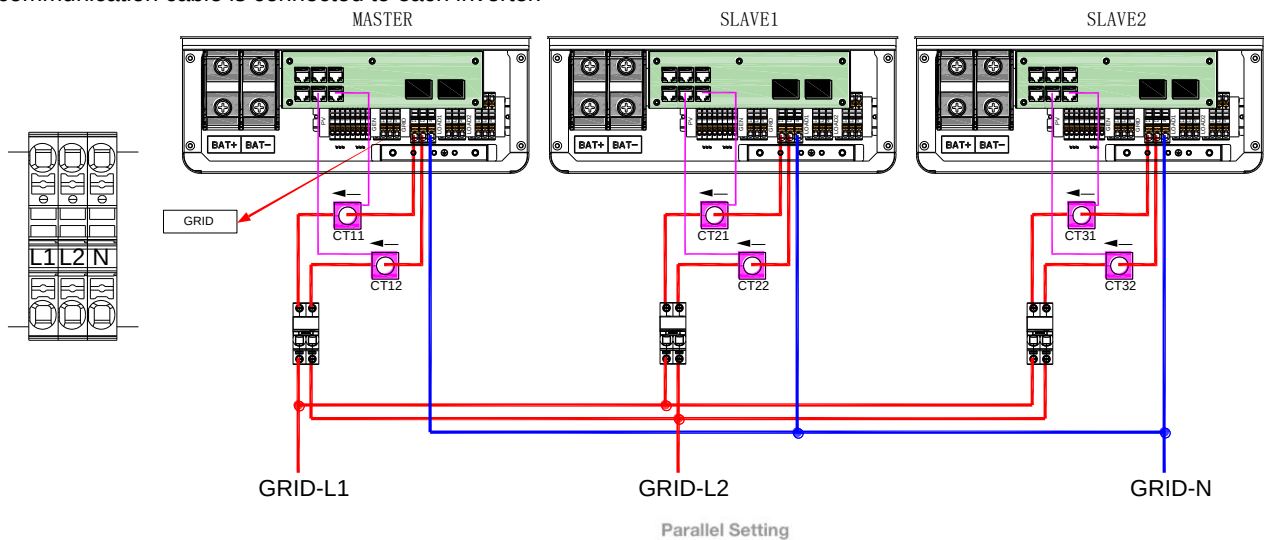


The recommended settings for the app are as follows (Put Parallel Num as 3 when have 3 inverter)

Parallel Setting

Inv Parallel Num	2 >
Parallel Master/Slave	Master >
Inv Parallel Addr ?	1 >
Common Battery Enable	☒
Common GridCT Enable ?	☒
Three Phase Enable ?	☐
Phase of this machine ?	A >
Parallel Charge Current	100A >
Parallel Discharge Current	200A >
Inv Parallel Enable ?	☒

b. When use independent CT, each CT is installed separately of L-line on the grid side of each inverter, and the CT communication cable is connected to each inverter.

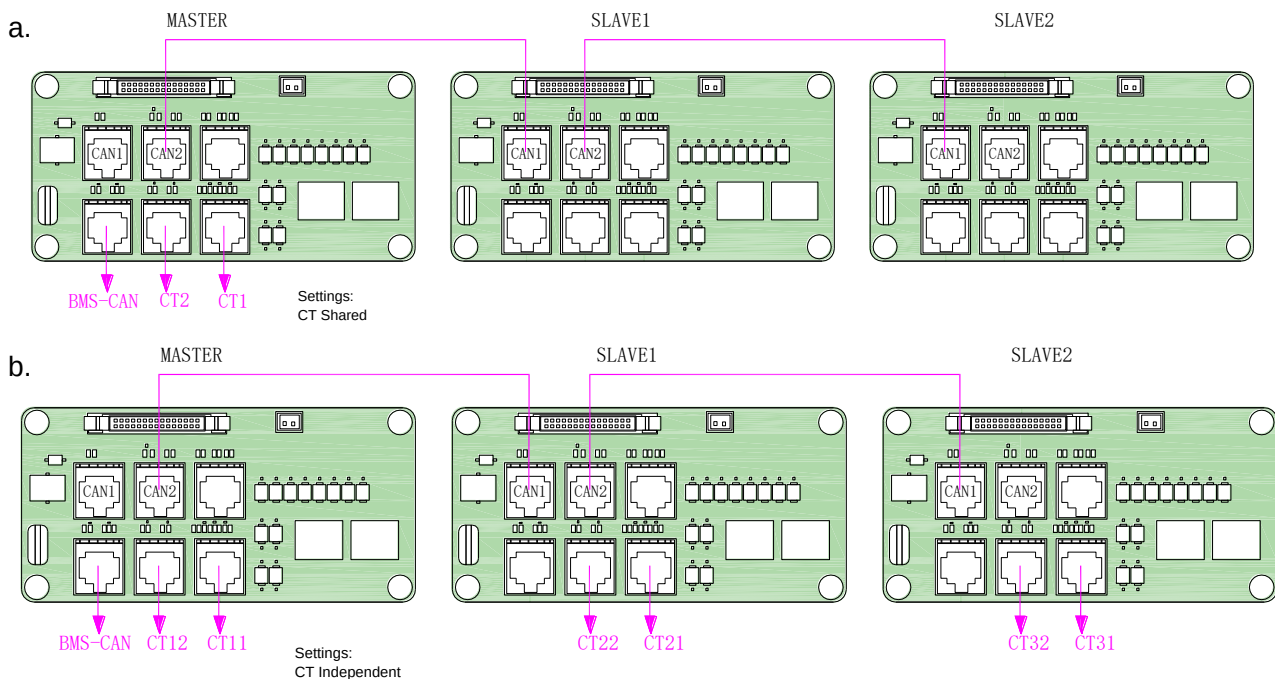


Parallel Setting

Inv Parallel Num	2 >
Parallel Master/Slave	Master >
Inv Parallel Addr ?	1 >
Common Battery Enable	☒
Common GridCT Enable ?	☐
Three Phase Enable ?	☐
Phase of this machine ?	A >
Parallel Charge Current	150A >
Parallel Discharge Current	300A >
Inv Parallel Enable ?	☒

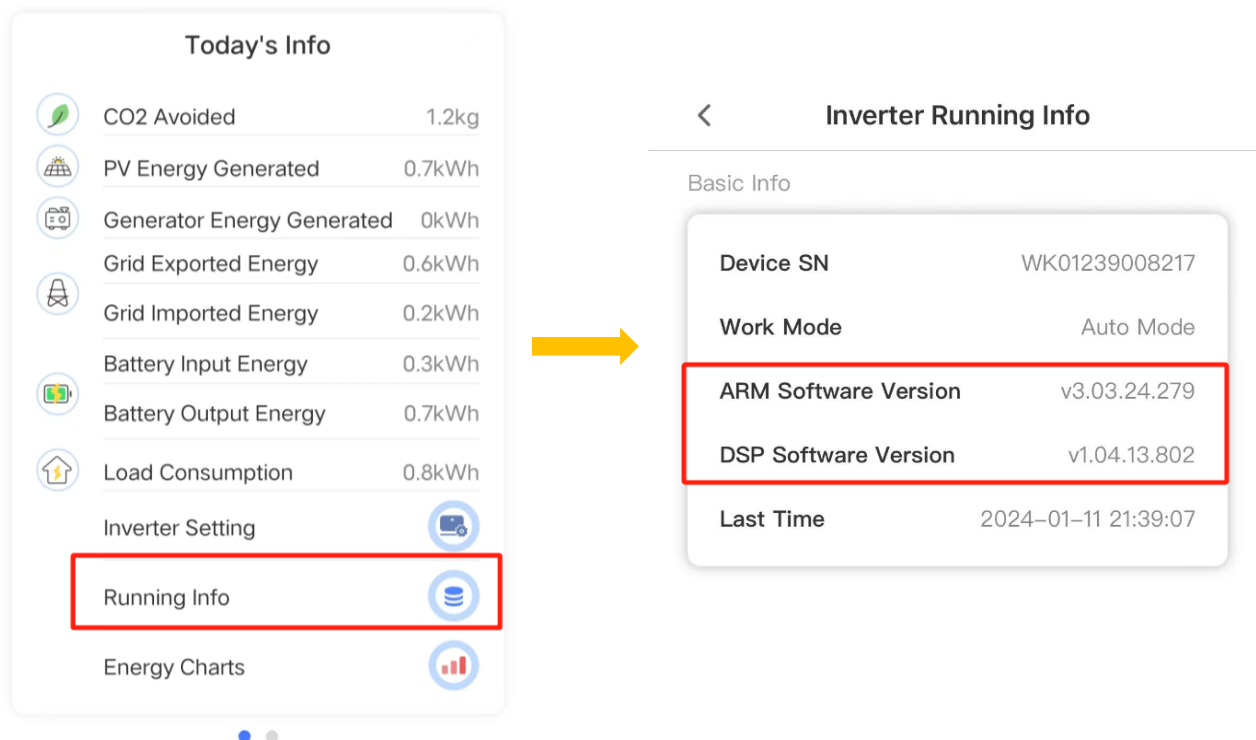
The recommended settings for the app are as follows:

6) CAN1 and CAN2 are parallel communication interfaces. The parallel communication between the master and the slaves can be connected through network cables hand by hand.

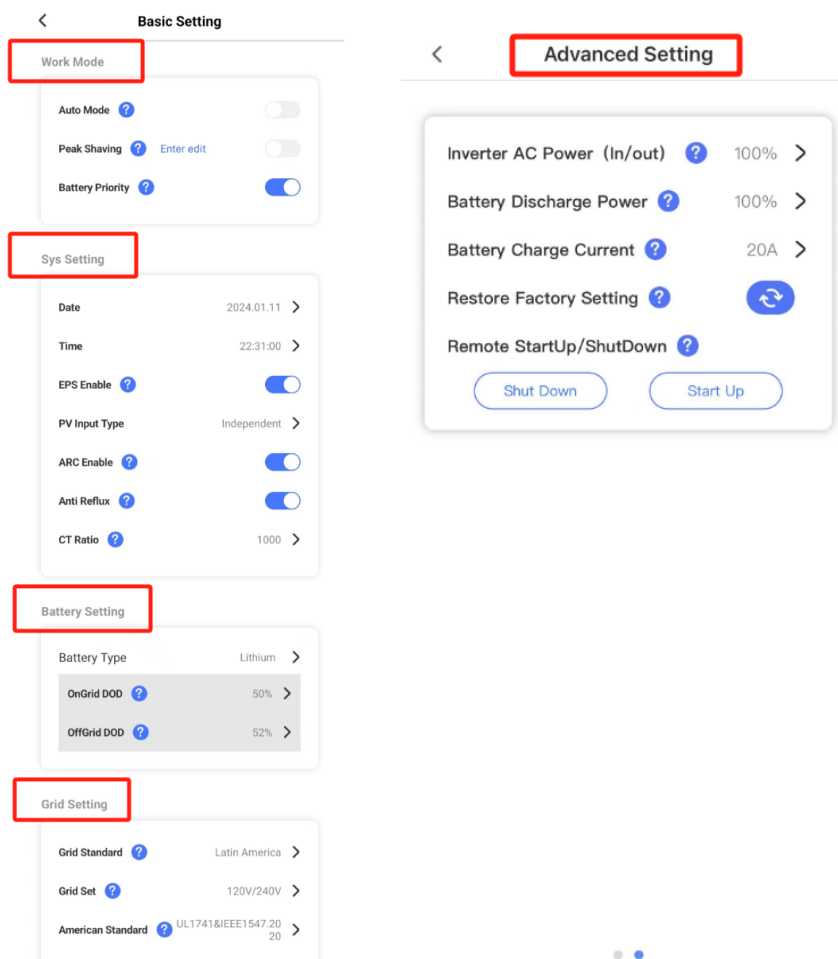


7.3 Parallel Operation Notes

1) Make sure all the units in parallel are with the same software version.



2) Make sure all the settings of the master and slaves are the same.



3) Set parallel parameters.

Inv Parallel Num: Total numbers of the inverters including master and slave.

Parallel Master/Slave: In a parallel system, only one master inverter use RJ45 connect to the battery BMS; The master inverter also will through the RJ45 connect with slave inverters, to broadcasts the BMS and other control information to the slave inverter. Master only can have one in the system.

Inv Parallel Addr: Local unit in series address. The master inverter is 1, and the 2nd slave inverter through RJ45 connect to the master is 2, then is 3; (Addr need changed correspond, once a middle inverter was off)

Common Battery Enable: Enable this function to allow battery information broadcasts to other parallel inverters;

Common GridCT Enable: In parallel system, could only use 1 set CT to connect with master inverter and enable this one to share CT detections to other parallel inverters; (Please follow the 1 parallel system wiring diagram for connection)

Three Phase Enable: Future feature, Not available now

Phase of this machine: Future feature, Not available now

Parallel Charge Current: Total battery charge current command under shared battery, only be settable in master unit in parallel mode.

Parallel Discharge Current: Total battery discharge current command under shared battery, only be settable in master unit in parallel mode.

Inv Parallel Enable: Enable/Disable the parallel function. It needs to be turned on in parallel mode.

Parallel Setting

Inv Parallel Num	2 >
Parallel Master/Slave	Master >
Inv Parallel Addr ?	1 >
Common Battery Enable	☒
Common GridCT Enable ?	☒
Three Phase Enable ?	☐
Phase of this machine ?	A >
Parallel Charge Current	100A >
Parallel Discharge Current	200A >
Inv Parallel Enable ?	☒

8 System Maintenance & Care

8.1 Routine Maintenance

In order to ensure that the inverter can operate well for a long time, it is recommended to maintain it routinely as described in this section.



Caution!

Perform system power-down operations while performing maintenance such as system cleaning, electrical connections, grounding reliability, etc. (see 6.3 System Power-down).

Maintain lists

Check the content	Check the method	Maintenance cycles
System cleaning	Regularly check the dust inside the box for dirt	Every six months to 1 time in a year
System operating status	Observe whether the appearance of the inverter is damaged or deformed. Listen to whether there is an abnormal sound during the operation of the inverter. When the inverter is running, check whether the parameters of the inverter are set correctly.	1 time every six months
Electrical connection	Check the cable connection for detachment and looseness. Check the cable for damage, focusing on whether the skin of the cable in contact with the metal surface has any traces of cuts .	Half a year after the first commissioning, and then once every six months to a year.
Grounding reliability	Check that the grounding cable is reliably grounded.	Half a year after the first commissioning, and then once every six months to a year.

8.2 Storage

If the inverter is not immediately put into service within 2 months from the production date , the storage specifications needs to be met as follow:

- Do not remove the outer packaging of the inverter.
- The storage temperature should be kept at $-20^{\circ}\text{C}\sim+60^{\circ}\text{C}$; The relative humidity should be maintained at 5% RH~95% RH.
- Store in a clean, dry place and protected from dust and moisture.
- Please place the inverter carefully to avoid personal injury or equipment damage caused by equipment dumping.
- During storage, regular checks are required. If it is found that there is a moth bite and the packaging is damaged, the packaging material needs to be replaced in time.
- After long-term storage, the inverter needs to be inspected and tested by professionals before it can be put into use.

8.3 Inverter Disposal

A. Disassemble the inverter

Procedure

Step 1 Perform a system power-down operation (see 6.3 System Power-down).

Step 2 Disconnect all electrical connections to the inverter, including signal lines, PV input lines, energy storage input lines, AC output lines, and protective ground wires.

Step 3 Remove the inverter fixing screws.

B. Packaging inverters

If you also have the original packaging of the inverter, please put it inside the original packaging and seal the package securely with tape.

If you can't find the original packaging of the inverter anymore, use a wooden box suitable for the weight and size of this inverter to seal it firmly.

C. Scrap inverters

At the end of the inverter's useful life, dispose of it in accordance with the electrical waste disposal law applicable at the place of installation.

Appendix A Grid Standard Code

The list of grid standard codes will be refreshed from time to time, please refer to the actual product.

Table A-1 List of grid standard codes

serial number	Grid standard code name	illustrate	Grid voltage	Grid frequency
1	US	Only for United State	120/240 V	60Hz
2	Latin America	For Latin America& Caribbean area	120/240 V	60Hz
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Appendix B abbreviations

A

AC Alternating Current

D

DC Direct Current

I

ID Identifier

L

LED Light Emitting Diode

LVRT Low Voltage Ride-Through

M

MAC Media Access Control

MPPT Maximum Power Point Tracking

P

PC Personal Computer

PE Protective Earthing

PV Photovoltaic

R

RCD Residual Current Device

RCMU Residual Current Monitoring Unit

RH Relative Humidity

S

SN Serial Number

T

THDI Total Harmonic Current Distortion

W

WEEE Waste Electrical and Electronic Equipment

WiFi Wireless Fidelity

Appendix C Technical Datasheet

Technical Data	XT-6K	XT-8K	XT-10K
Solar			
Nominal Input (PV)	6	8	10
Max. Power[kW]	9	12	15
Max. PV Open Circuit DC Voltage [V]	500		
MPPT Voltage Range [V]	120-500		
MPPT Best Efficiency Range[V]	350 ~ 400		
Max. Input Current of Single MPPT [A]	14		
MPPT Tracker/Strings	4		
Short Circuit Current	22Adc		
Channels per MPPT	1		
AC output			
Rated Output Power [kW]	6	8	10
Max. AC Output Power [kW]	6.6	8.8	11
Max. Output Current [A]	27.5	36.7	45.8
Ac Output Voltage [V]	120/240 (split phase)		
Frequency [Hz]	50/60		
THDI	<2%		
Power Factor	-0.8 +0.8		
Topology	Split Phase		
Battery			
Battery Voltage Range [V]	40 - 60		
Max. Charge/Discharge Current [A]	135/135	190/190	190/210
Battery Type	Li-Ion or Lead-acid		
Communication Interface	WECO-CAN		
EPS output			
Rated power [kVA]	6	8	10
Rated output voltage [V]	120/240 (split phase)		
Rated output current [A]	25	33.3	41.7
Rated frequency [Hz]	50/60		
Automatic switching time [ms]	<10		
THDI	< 2%		
Overload capacity	120%,60s / 150%, 1S		
General data			
Max. Efficiency	≥97.8%		
Ingress Protection	IP65/NEMA 3R		

Noise Emission [dB]	<38		
Operating Temperature [°C]	-25° ~ 60°(>45° derating)		
Cooling	Natural		
Relative Humidity	0~95% (non-condensing)		
Elevation	3000mt		
Dimensions W *D *H [mm]	460*225*760		
Weight[kg]	41	43	46
Isolation Transformer	No		
Self-consumption at night[W]	<50		
Display			
Logic Multicolor LED bar	LED BAR		
COMM 1	WiFi		
COMM 2	CAN		
Safety standard			
	EMC		
North America	UL1741SA all options, UL1699B, CSA 22.2		
	FCC Part 15, Class B		
	IEEE 1547, IEEE 2030.5, Hawaii Rule 14H, Rule 21 Phase I,II,III,NRS		

Appendix D Label Description

Box identification

icon	name	meaning
	Anti-scald warning sign	The inverter has a high shell temperature when working, there is a risk of scalding, and it is strictly forbidden to touch it
	Delayed discharge identification	There is a high voltage after the inverter is powered on. All operations on inverters must be carried out by trained electrical professional people. There is still a residual voltage after the inverter is powered down, and it takes 5 minutes to discharge to a safe voltage
	Check the manual logo	Remind the operator to pay attention to check the instruction manual of the inverter box
	Inverter grounding label	Protect the ground wire connection location
	Inverter warning label	When working, do not unplug the antenna directly
	Inverter serial number label	Serial number information
	Inverter login QR code label	Scan the code to connect to the inverter APP



Read Info

The icon is for reference only, please refer to the actual product.

Nameplate

 Model: XT-6K (North America) Grid Support Interactive Inverter		 Model: XT-8K (North America) Grid Support Interactive Inverter		 Model: XT-10K (North America) Grid Support Interactive Inverter	
PV Input		PV Input		PV Input	
Max. PV Input	9000W	Max. PV Input	12000W	Max. PV Input	13000W
PV MPPT Input Voltage Range	120-500Vdc	PV MPPT Input Voltage Range	120-500Vdc	PV MPPT Input Voltage Range	120-500Vdc
MPPT Efficiency	99.9%	MPPT Efficiency	99.9%	MPPT Efficiency	99.9%
MPPT Max. Input Current	14Adc*4	MPPT Max. Input Current	14Adc*4	MPPT Max. Input Current	14Adc*4
Number of MPPT	4	Number of MPPT	4	Number of MPPT	4
Short Circuit Current	22Adc	Short Circuit Current	22Adc	Short Circuit Current	22Adc
AC Output		AC Output		AC Output	
Rated Output Power	6000W	Rated Output Power	8000W	Rated Output Power	10000W
Rated Output Current	25A	Rated Output Current	33.3A	Rated Output Current	41.7A
Grid Voltage	120/240Vac Split Phase	Grid Voltage	120/240Vac Split Phase	Grid Voltage	120/240Vac Split Phase
Grid Frequency Range	55~65 Hz	Grid Frequency Range	55~65 Hz	Grid Frequency Range	55~65 Hz
EPS Output Power	6000W	EPS Output Power	8000W	EPS Output Power	10000W
EPS Output Voltage / Frequency	120/240Vac Split Phase / 55~65 Hz	EPS Output Voltage / Frequency	120/240Vac Split Phase / 55~65 Hz	EPS Output Voltage / Frequency	120/240Vac Split Phase / 55~65 Hz
Power Factor Range	-0.8 ~+0.8	Power Factor Range	-0.8 ~+0.8	Power Factor Range	-0.8 ~+0.8
Battery		Battery		Battery	
Battery Voltage Range	40-60Vdc	Battery Voltage Range	40-60Vdc	Battery Voltage Range	40-60Vdc
Max. Charging / Discharging Current	135 Adc	Max. Charging / Discharging Current	190 Adc	Max. Charging / Discharging Current	190 Adc / 210 Adc
System		System		System	
Ingress Protection	IP65	Ingress Protection	IP65	Ingress Protection	IP65
Humidity	0-95% no condensation	Humidity	0-95% no condensation	Humidity	0-95% no condensation
Elevation	3000m	Elevation	3000m	Elevation	3000m
Operation Temperature	-25 ~ + 60 °C (>45°C derating)	Operation Temperature	-25 ~ + 60 °C (>45°C derating)	Operation Temperature	-25 ~ + 60 °C (>45°C derating)
Inverter Efficiency	97.8%	Inverter Efficiency	97.8%	Inverter Efficiency	97.8%
Weight	41kg	Weight	43kg	Weight	46kg
Topology	Transformerless / non isolated	Topology	Transformerless / non isolated	Topology	Transformerless / non isolated
Serial Number		Serial Number		Serial Number	
Production Week		Production Week		Production Week	
WeCo (Guangdong) Energy Storage Technology Co., Ltd. Guangdong China. E-mail: support@wecoess.com    		WeCo (Guangdong) Energy Storage Technology Co., Ltd. Guangdong China. E-mail: support@wecoess.com    		WeCo (Guangdong) Energy Storage Technology Co., Ltd. Guangdong China. E-mail: support@wecoess.com    	

- (1) Trademark and product model
- (2) Important technical parameters
- (3) Conformity of the certification system logo
- (4) Company name and origin



Read Info

The icon is for reference only, please refer to the real object.

Description of the certification mark.

icon	name	meaning
	American FCC certification mark	This product meets FCC certification standards
	SGS certification mark	This product conforms to SGS certification standard
	High voltage hazard sign	This product has high voltage inside, please pay attention to protection
	EU WEEE logo	It is not possible to dispose of the inverter as household waste

Appendix E Troubleshooting

Alarm levels are defined as follows:

Important alarm: the inverter fails, enters shutdown mode, and stops running.

Minor alarm: Some parts of the inverter have failed, but they are still able to work normally.

Prompt alarm: The inverter functions normally, because external factors cause its output power to decrease

List of common fault alerts

Fault & Alarm Display	Code	Explanation	Solutions
Discharge Over Current	0	Battery discharge over current. When the battery is loaded, the load is too large.	(1) Nothing need to do, Wait 1 minute for the inverter to restart. (2) Check whether the load is in compliance with the maximum power of the inverter. The inductive load should be calculated according to the instantaneous starting power. (3) Disconnect all power supplies (PV, Grid, Battery) and shutdown the battery and inverters; After disconnecting the load, wait 1 minute then power up the battery and inverter to check whether it runs normally in no-load condition. (4) Contact local installer or customer service if error continues occur.
Over Load	1	The load power is too high.	(1) Check whether the load is in compliance with the maximum power of the Inverter. The inductive load should be calculated according to the instantaneous starting power. (2) Disconnect all power supplies (PV, Grid, Battery) and shutdown the battery and inverters; After disconnecting the load, wait 1 minute then power up the battery and inverter, check the fault has been cleared or not, check the load again for a short circuit. (3) Contact local installer or customer service if error continues occur.
Battery Disconnected	2	Battery Disconnect. (Battery voltage not identified)	(1) Check and make sure the battery is connected and with the right terminal. (2) Check and make sure the battery wiring port is no open circuited and has voltage in battery side terminals. (3) Contact local installer or customer service if error continues occur.
Battery Under Volt Battery Under Capacity	3	Battery voltage lower than normal range.	(1) Checking System Settings, If so, power off and disconnect whole system, Wait 1 minute then restart. (2) Check if the Grid outage or not. If so, wait for the Grid comes back on, the inverter will automatically charge. (3) Check the PV is outage or not. If so, wait the PV back on, the inverter will automatically charge. (4) Contact local installer or customer service if error continues occur.
Battery Low Volt Battery Low Capacity	4	It generated when the battery capacity is lower than the set value	(1) Battery Low that setting capacity. (SOC < 100% - DOD) (2) Checking System Settings, If so, power off and disconnect whole system, Wait 1 minute then restart. (3) Check is there has Grid or PV outage or not. If so, wait for the Grid/PV comes back on, the inverter will automatically charge. (4) Contact local installer or customer service if error continues occur.
Battery Over Volt	5	The battery voltage is greater than the Inverter maximum voltage.	(1) Checking System Settings, If so, power off and disconnect whole system, Wait 1 minute then restart. (2) Contact local customer service if error warning continues.

Fault & Alarm Display	Code	Explanation	Solutions
Gird low volt	6	Grid voltage is abnormal	(1) Check if the Grid is outage or has abnormal. (2) Set parameters to improve the upper and lower limits of the Grid voltage.
Grid over volt	7		(3) Power off and disconnect whole system, Wait 1 minute then restart.wait until it functions normally. (4) Contact local installer or customer service if error continues occur.
Grid low Freq	8	Grid Frequency is abnormal.	(1) Check if the Grid is outage or has abnormal. (2) Set parameters to improve the upper and lower limits of the Grid Frequency.
Grid over Freq	9		(3) Power off and disconnect whole system, Wait 1 minute then restart.wait until it functions normally. (4) Contact local installer or customer service if error continues occur.
GFCI over	10	Inverter GFCI exceeds standard.	(1) Check PV string for direct or indirect grounding phenomenon. (2) Check is there has the inverter wiring leakage phenomenon or not. (3) Power off and disconnect whole system, Wait 1 minute then restart.wait until it functions normally (4) Contact local installer or customer service if error continues occur.
Parallel CAN Fail	11	The communication of parallel Inverter has fault	(1) Check and make sure the communication cable, crystal Line sequence is right and not broken. (2) Check and make sure all the inverter switch is turned on or the switch is working properly. (3) Check and make sure the system setting is right. Correct the system setting when it not right, Make sure the RJ45 internet cable not exceed 20m; Power off and disconnect whole system, Wait 1 minute then restart.wait until it functions normally. (4) Contact local installer or customer service if error continues occur.
Grid CT Reverse	12	Check the external CT wiring	(1) Check and make sure the external CT wiring is correctly connected. (2) Check and make sure the external CT orientation is towards to the grid power in. (3) Power off and disconnect whole system, Wait 1 minute then restart.wait until it functions normally (4) Contact local installer or customer service if error continues occur.
Bus under volt	13	Bus voltage is lower than normal.	(1) Check and make sure the input mode setting is correct. (2) Power off and disconnect whole system, Wait 1 minute then restart.wait until it functions normally. (3) Contact local installer or customer service if error continues occur.
Bus over volt	14	BUS voltage is over maximum value..	(1) Check and make sure the input mode setting is correct. (2) Power off and disconnect whole system, Wait 1 minute then restart.wait until it functions normally. (3) Contact local installer or customer service if error continues occur.
INV over current	15	The inverter current exceeds the normal value.	(1) Power off and disconnect whole system, Wait 1 minute then restart.wait until it functions normally (2) Contact local installer or customer service if error continues occur.

Fault & Alarm Display	Code	Explanation	Solutions
Charge Over Current	16	Battery charge current over than the Inverter maximum voltage.	(1) Check and measure the battery wire make sure there is no short circuit. (2) Check and measure the charging current make sure the settings is right. (3) Power off and disconnect whole system, Wait 1 minute then restart.wait until it functions normally (4) Contact local installer or customer service if error continues occur.
Bus volt OSC	17	Bus voltage instability.	(1) Check the input and output make sure the mode setting is correct. (2) Power off and disconnect whole system, Wait 1 minute then restart.wait until it functions normally (3) Contact local installer or customer service if error continues occur.
INV under volt	18	INV voltage is abnormal	(1) Check and measure all the Inverter Input voltage, Make sure there is no abnormal. If so, please contact those product manufacture . (2) Power off and disconnect whole system, Wait 1 minute then restart.wait until it functions normally (3) Contact local installer or customer service if error continues occur.
INV over volt	19		
INV Freq Abnor	20	INV frequency is abnormal	(1) Check and measure all the Inverter Input Frequency, Make sure there is no abnormal. If so, please contact those product manufacture . (2) Power off and disconnect whole system, Wait 1 minute then restart.wait until it functions normally (3) Contact local installer or customer service if error continues occur.
IGBT Temp. High	21	The inverter temperature is higher than the allowed value	(1) Disconnect all power supplies (PV, Grid, Battery) and shutdown the battery and inverters; After disconnecting the load, wait 1 hour to let the system cooling, then power up the battery and inverter to check whether it runs normally or not . (2) Contact local installer or customer service if error continues occur.
BMS System Error	22	Internal communication of the battery has error	(1) Check and make sure the battery communication wire is connected and with the right terminal. (2) Check and make sure the battery DIP and Setting is right . (3) Ask the authorized people to check the backlog or battery host, If there don't have, then will be a fake error. (4) Contact local installer or customer service if error continues occur.
Battery Over Temp.	23	Battery temperature is higher than the allowed value.	(1) Disconnect all power supplies (PV, Inverter) and shutdown the battery ; Wait 1 hour to let the battery system cooling, then power up the battery and inverter to check whether it runs normally or not. (2) Contact local installer or customer service if error continues occur.
Battery Under Temp.	24	Battery temperature is lower than the allowed value.	(1) Check and make sure the ambient temperature near the battery is meet the working conditions. (2) Contact local installer or customer service if error continues occur.

Fault & Alarm Display	Code	Explanation	Solutions
Battery Cell Unball	25	Battery cell voltage or current unbalance;	(1) Disconnect all power supplies (PV, Grid, Battery) and shutdown the battery and inverters; After disconnecting the load, wait 1 minute then power up the battery and inverter, check the fault has been cleared or not. (2) If it occurs by chance, It maybe caused by temporary change in the system, and the device will return to normal after the system is stable. (3) Contact local installer or customer service if error continues occur.
Battery Reverse	26	The wiring connection between battery and inverter may have fault;	(1) Check the positive and negative wire connection between inverter and battery is right. Warning:Reverse of the wire connection will damage the system and not repairable. (2) Power off and disconnect whole system, Wait 1 minute then restart.wait until it functions normally (3) Contact local installer or customer service if error continues occur.
Battery Comm. Fail	27	Communication between battery and inverter is abnormal.	(1) Check and make sure the communication cable, crystal Line sequence is right. (2) Check and make sure the battery switch is turned on or the switch is working properly. (3) Check and make sure the system setting is right. Correct the system setting when it not right, Power off and disconnect whole system, Wait 1 minute then restart.wait until it functions normally. (4) Contact local installer or customer service if error continues occur.
Battery Fault	28	The battery module is abnormal	(1) Disconnect all power supplies (PV, Grid, Battery) and shutdown the battery and inverters; After disconnecting the load, wait 1 minute then power up the battery and inverter, check the fault has been cleared or not. (2) Contact local installer or customer service if error continues occur.
Grid Over Load	29	Inverter Grid input exceed the standards.	(1) Disconnect all power supplies (PV, Grid, Battery) and shutdown the battery and inverters; After disconnecting the load, wait 1 minute then power up the battery and inverter, check the fault has been cleared or not. (2) Check the battery charging current ;with all load,Make sure it not exceed the inverter grid input power. (3) Contact local installer or customer service if error continues occur.
Grid Phase Error	30	The power grid phase sequence is incorrectly connected.	(1) Check and make sure the Grid power wiring is correct. (2) Check and make sure the external CT phase also connected accordingly to the phase sequence. (3) Power off and disconnect whole system, Wait 1 minute then restart.wait until it functions normally (4) Contact local installer or customer service if error continues occur.
Grid LN Reverse			
ARC Fault	32	PV ARC Fault	(1) Please contact your PV provider or installer to check the PV panels, PV wires. Make sure it all working well. (2) Power off and disconnect whole system, Wait 1 minute then restart.wait until it functions normally. (3) Contact local installer or customer service if error continues occur.

Fault & Alarm Display	Code	Explanation	Solutions
Bus Soft Fault	33	Bus soft start fault;	(1) Power off and disconnect whole system, Wait 1 minute then restart.wait until it functions normally. (2) Contact local installer or customer service if error continues occur.
INV Soft Fault	34	Inverter soft start fault;	
Bus Short	35	Bus line short circuit;	
INV Short	36	Inverter short circuit; Warning: May cause the Inverter damage.	
Fan Fault	37	Fan startup failure	(1) Check and confirm the Inverter is working in high temperature or high power condition or not.If not, the system is good; (2) Check whether the fan runs properly.(If you can see it or hearing it) (3) Power off and disconnect whole system, Wait 1 minute then restart.wait until it functions normally. (4) Contact local installer or customer service if error continues occur.
PV Isolate low	38	PV insulation impedance is low.	(1) Check if the PE line is connected to the inverter and it connected to the ground. (2) Set parameters to improve the upper and lower limits of the PV insulation values. (3) Contact local installer or customer service if error continues occur.
Bus Relay Fault	39	The Bus Relay may have fault; Warning: May cause the Inverter damage.	(1) Disconnect all power supplies (PV, Grid, Battery) and shutdown the battery and inverters; After disconnecting the load, wait 1 minute then power up the battery and inverter, check the fault has been cleared or not. (2) Contact local installer or customer service if error continues occur.
Grid Relay Fault	40	The Grid Relay may have fault; Warning: May cause the Inverter damage.	(1) Disconnect all power supplies (PV, Grid, Battery) and shutdown the battery and inverters; After disconnecting the load, wait 1 minute then power up the battery and inverter, check the fault has been cleared or not. (2) Turning on-off the Grid breaker of Inverter, listen there has relay on-off "click" sound or not; If have and system has grid power, The fault is fake. (3) Contact local installer or customer service if error continues occur.
EPS Relay Fault	41	The EPS Relay may have fault; Warning: May cause the Inverter damage.	(1) Disconnect all power supplies (PV, Grid, Battery) and shutdown the battery and inverters; After disconnecting the load, wait 1 minute then power up the battery and inverter, check the fault has been cleared or not. (2) Contact local installer or customer service if error continues occur.
GFCI Fault	42	The GFCI device may have fault; Warning: May cause the Inverter damage.	(1) Disconnect all power supplies (PV, Grid, Battery) and shutdown the battery and inverters; After disconnecting the load, wait 1 minute then power up the battery and inverter, check the fault has been cleared or not. (2) Contact local installer or customer service if error continues occur.

Fault & Alarm Display	Code	Explanation	Solutions
CT Fault	43	The CT device may have fault; Warning: May cause the Inverter damage.	(1) Disconnect all power supplies (PV, Grid, Battery) and shutdown the battery and inverters; After disconnecting the load, wait 1 minute then power up the battery and inverter, check the fault has been cleared or not. (2) Check and make sure the external CT orientation is towards to the grid power in. (3) Check and make sure the external CT wires connect to the right terminal. (4) Contact local installer or customer service if error continues occur.
PV short	44	The Inverter device or PV may have fault; Warning: May cause the Inverter damage.	(1) Disconnect all power supplies (PV, Grid, Battery) and shutdown the battery and inverters; After disconnecting the load, wait 1 minute then power up the battery and inverter, check the fault has been cleared or not. (2) Check and measure the PV string and check the PV wiring to confirm there is fake alarm or not. (3) Contact local installer or customer service if error continues occur.
Byp Relay Fault	45	The Bypass relay device may have fault; Warning: May cause the Inverter damage.	(1) Disconnect all power supplies (PV, Grid, Battery) and shutdown the battery and inverters; After disconnecting the load, wait 1 minute then power up the battery and inverter, check the fault has been cleared or not. (2) Contact local installer or customer service if error continues occur.
System Fault	46	The Inverter system may have fault or working in system protection mode; Warning: May cause the Inverter damage.	(1) Disconnect all power supplies (PV, Grid, Battery) and shutdown the battery and inverters; After disconnecting the load, wait 1 minute then power up the battery and inverter, check the fault has been cleared or not. (2) Contact local installer or customer service if error continues occur.
Current Dcover	47	The DC bias current of Inverter AC output is too high or device have fault; Warning: May cause the Inverter damage.	(1) Disconnect all power supplies (PV, Grid, Battery) and shutdown the battery and inverters; After disconnecting the load, wait 1 minute then power up the battery and inverter, check the fault has been cleared or not. (2) Contact local installer or customer service if error continues occur.
Voltage Dcover	48	The DC bias voltage of Inverter AC output is too high or device have fault; Warning: May cause the Inverter damage.	(1) Disconnect all power supplies (PV, Grid, Battery) and shutdown the battery and inverters; After disconnecting the load, wait 1 minute then power up the battery and inverter, check the fault has been cleared or not. (2) Contact local installer or customer service if error continues occur.

Appendix F Working Mode & Light Language

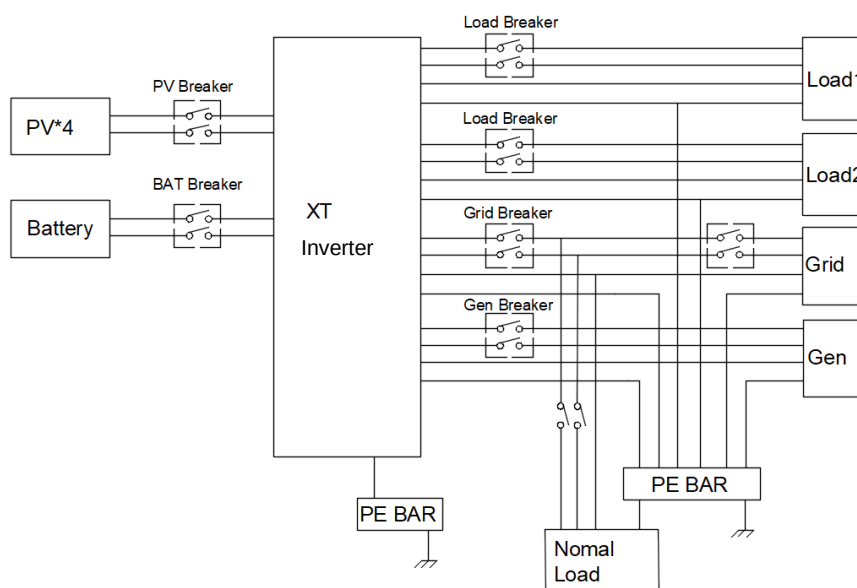
The XT inverter can be connected up to 4 PV strings, and it has 4 MPPT, and each MPPT circuit can support only 1 string of solar panel as the input current is limited to 14A.

Maximum power point tracking, DC to single-phase AC conversion through inverter circuit, and surge protection function on both DC and AC side.

The XT inverter can expand the energy storage function through the energy storage interface, and the energy generated by the PV string is supplied to the local load for use, and the excess energy is stored in the energy storage equipment.

The electrical energy stored in the energy storage equipment can be released to the grid according to the user's load situation, and the peak-valley regulation of the grid can be realized to obtain maximum benefits.

Schematic:



Note!

Please control the home loads, and make sure it's within the "BACK-UP output rating" under BACK-UP mode, otherwise the inverter will shut down with an "overload fault" warning.

Please confirm with the mains grid operator whether there is any special regulations for grid connection.

Description of the LEDs.

The LED Bar is described in the following table.

Equipment Status	Light Language	Remarks
Standby	Blink light blue light for 6s once (3S lights on, 3S lights off)	The device is normal, and APP remote shutdown does not work
On-Grid Work	Blink light, green light for 6s once (3S lights on, 3S lights off)	
Off-Grid Work	Blink light green light for 3s once (0.5S lights on, 2.5S lights off)	
Alarm	Blink light orange light for 3s once (1.5S lights on, 1.5S lights off)	Recoverable alarm, automatic recovery
Fault	Red light continuously	The fault causes the system to stop working and requires manual maintenance
Updating	White light continuously	The system is updating.

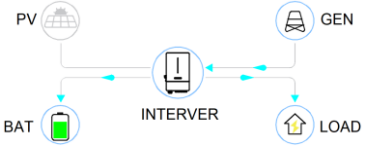
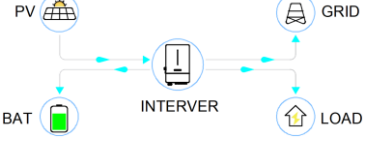
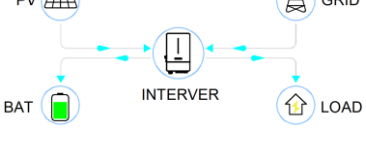
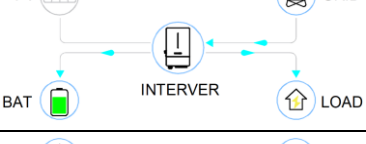
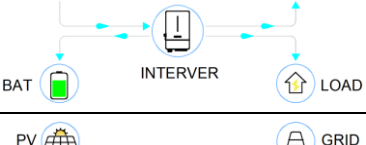
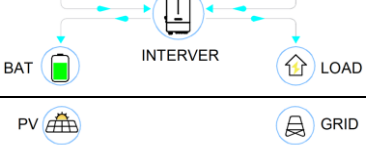
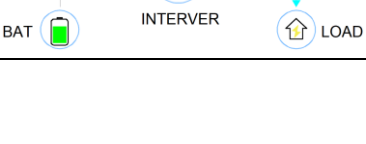
Description of the WORKING MODE

Note: when the load is connected in parallel with the AC input line it is mandatory to install the CT sensor and making sure that the sensor direction is correct.

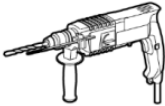
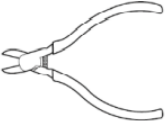
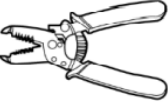
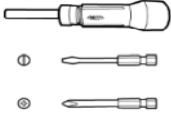
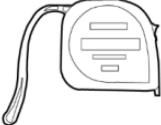
Note:

- Generator power and Grid power has same logic, Generator and Grid only can have one input, Otherwise will broken.
- XT inverter will provide seamless backup power supply when there has battery connected (EPS function);
- XT inverter may not precise control the power input when load less than 500 W;
- Noor APP Peak Shaving Mode "power input/output KW" will limits inverter power capacity, Even change to the other Mode. To disable this limits, you can change the battery information page all settings in 100%.
- XT inverter will work as below basic logic to make best solar power and battery power benefit for owner; With some different and special settings, Inverter may working as different, but the aim still was provide best benefit and secure.

Working mode	Scenario	Brief Description
Auto Mode (Day time)		Photovoltaic, battery, grid power are available: Photovoltaic energy is sufficient, priority load use; When there is surplus, the battery will charge to full after; If Anti-Reflux not enable, extra PV power will discharge to grid; If enable, Inverter will limit the PV power generation.
Auto Mode (Day time) (Off grid)		Photovoltaic, battery are available, grid is not available: Photovoltaic energy is sufficient, priority load use; When PV power has extra, the battery will charge to full after; At the end, Inverter will limit the PV power generation make sure $PV = Load\ power + BAT\ charge\ power$.
Auto Mode (Day time) (Off grid)		Photovoltaic, battery are available, grid is not available: Photovoltaic is insufficient, priority load use; BAT power if not meet Off grid DOD, Inverter will make sure $BAT\ discharge + PV = Load\ power$; If meet Off grid DOD, User need stop the heavy load.
Auto Mode (Day time)		Photovoltaic, battery, grid power are available: Photovoltaic is insufficient, priority load use; BAT power if not meet On grid DOD, Inverter will make sure $BAT\ discharge + PV = Load\ power$; If meet On grid DOD, $Grid + PV = Load\ power$
Auto Mode (Day time) (No BAT)		Photovoltaic, grid power are available, battery is not available: Photovoltaic is sufficient, priority load use; when there is surplus, If Anti-Reflux not enable, extra pv power will discharge to grid; If enable, Inverter will limit the pv power generation.
Auto Mode (Day time) (No BAT)		Photovoltaic, grid power are available, battery is not available: Photovoltaic is insufficient, priority load use; Inverter will make sure $Grid + PV = Load\ power$;
Auto Mode (Day time) (Night) (No PV)		Battery, grid power are available, PV is not available: BAT power if not meet On grid DOD, Inverter will make sure $BAT\ discharge + Grid = Load\ power$; If meet On grid DOD, $Grid\ power = Load\ power$
Auto Mode (Day time)		Battery, photovoltaic, generator power are available Photovoltaic is insufficient, priority load use; Inverter will make sure $Gen\ power / BAT + PV = Load\ power$; Battery charge will controlled by GEN settings on the app; When generator stop, Battery power will take the hand.

Working mode	Scenario	Brief Description
Auto Mode (Day time) (Night) (No PV)		Battery, generator are available, photovoltaic are not available Battery charge will be controlled by GEN settings on the app; When generator stop, Battery power will take the hand. Inverter will make sure Gen power=Load power+ BAT charge; BAT discharge = Load power (when Gen Stop)
BAT Priority (Day time)		Photovoltaic, grid, and batteries are available: Photovoltaic energy is sufficient, priority battery charge use; When there is surplus or battery full, the PV will supply Load ; If Anti-Reflux not enable, extra PV power will discharge to grid; If enable, Inverter will limit the PV power generation.
BAT Priority (Day time) (Night) (No PV)		Photovoltaic, grid, and batteries are available: Photovoltaic energy is insufficient, priority battery charge use; Inverter will use full power with grid and PV charger to battery; When PV are not available or night, Grid will full power charge BAT.
BAT Priority (Day time) (Night) (Off grid)		Battery, PV is available, Grid not available: Inverter will work same as "Auto Mode" "Off Grid".
Peak Shaving Mode (Charge Time)		In Peak Shaving Mode "Charge Time", XT inverter will work same as "BAT Priority" Mode;
Peak Shaving Mode (Discharge)		In Peak Shaving Mode "Discharge Time", XT inverter mandatory discharge the battery to supply the load like the grid power in "Auto Mode" until reach battery on-grid DOD; If Anti-Reflux not enable, extra battery power will discharge to grid; If enable, Inverter will limit the battery power generation.
Peak Shaving Mode (Rest Time)		In Peak Shaving Mode "Rest Time", XT inverter mandatory charge or discharge the battery. Battery will be backup until status change.
Peak Shaving Mode (Off grid)		In Peak Shaving Mode "Off grid" condition, XT Inverter will work same as "Auto Mode" "Off Grid".

Appendix G Recommend Tools

	Tools and gauges		
Installation	 Hammer drill (drill bit $\Phi 12\text{mm}$).	 Torque socket wrench (sleeve opening: 8mm, for M6 bolts; Torque range: $0\text{N}\cdot\text{m} \sim 15\text{N}\cdot\text{m}$).	 Torque wrench (opening size: 13mm; Torque range: $0\text{N}\cdot\text{m} \sim 1.5\text{N}\cdot\text{m}$).
	 Diagonal pliers	 Wire strippers	 Torque screwdriver (head: M4, M6; Torque range: $0\text{N}\cdot\text{m} \sim 5\text{N}\cdot\text{m}$).
	 Rubber hammer	 Tool knife	 Wire cutters
	 Crimping pliers (Model: H4TC0001; Manufacturer: Amphenol).	 Open Wrench (Model: H4TW0001; Manufacturer: Amphenol).	 Cable ties
	 vacuum cleaner	 Multimeter (DC voltage range $\geq 600\text{V DC}$).	 Markers
	 Steel tape measure	 Horizontal ruler	 Hydraulic pliers
	 Heat shrink tubing	 Heat guns	

Personal protective equipment	 Safety gloves	 Protective goggles	 Dust masks
	 Safety boots		

Appendix H Grid Voltage Protection Parameters

List of overvoltage and undervoltage protection points corresponding to different national power grid standards selection as Follows(Below table listed values based on the Grid standard)

NO.	Region	Code	HV						LV					
			HV1(1000 ~ 1400; 0.1%Un)	HV2(1000 ~ 1500; 0.1%Un)	HV3(1000 ~ 1400; 0.1%Un)	HV1 time(0 ~ 3000; 0;0.1s)	HV2 time(0 ~ 6000; ;0.1s)	HV3 time(0 ~ 6000; ;0.1s)	LV1(1000 ~ 1000; 0.1%Un)	LV2(1000 ~ 1000; 0.1%Un)	LV3(1000 ~ 1000; 0.1%Un)	LV1 time(0 ~ 3000; 0;0.1s)	LV2 time(0 ~ 3000; 0;0.1s)	LV3 time(0 ~ 30000; ;0.1s)
1	United States of America	US	1100	1200	1300	130	1	1	880	800	500	200	20	1
2	Latin America & Caribbean area	Latin America	1200	1200	1200	130	110	210	700	500	500	200	20	1

*For your quick selection, recommend select as below settings:

you can set up according to bellow in the following table.Select “Grid Setting”in the “Inverter Setting” page of the Noor app.

Grid Standard	Grid Set	American Standard
US	120V/240V	UL1741&IEEE1547.2020
Latin America	120V/240V	UL1741&IEEE1547.2020