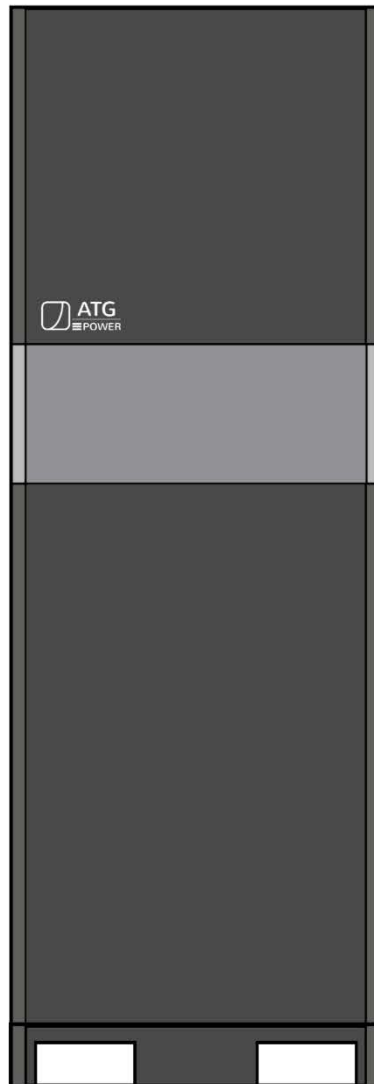




USER MANUAL

ATG-AL-L03-10kW-20kWh/40kWh

Version: 1.2



About this manual

This manual is intended for the ATG-AL-L03-10kW-20kWh/40kWh Energy Storage battery.

Statement

Compliant with Best Practice Guide for Battery Storage Equipment—Electrical Safety. Requirements- version 1- Pre-assembled integrated battery energy storage system equipment – Method 1 mandatory requirements and Optional requirements – a), c), e), f), g), h), i), j), k), l), m), n), o), p), q).

Declaration

ATG declares that the ATG-AL-L03-10kW-20kWh/40kWh is in compliance with the essential requirements.

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1. Introduction







1.1 Safety Symbols & Warnings

ATG-AL-L03-10kW-/20kWh is designed, manufactured, and tested as per international safety standards. However, as an electrical and electric product, it must be installed, operated, and maintained strictly according to related safety notices.




If you have any problems, please contact the service center or authorized dealer.
Please DO NOT install or repair the product by anyone who is not qualified by local authority.







We are not responsible for any damage or loss caused by misuse or misunderstanding of the information in the manual.

1.1.1 Symbols Explanation

	The system will be touchable or operable after at least 10 minutes disconnected, in case of any electrical shock
	Danger of high voltage and electric shock!
	Danger of hot surface and burn injury!
	Earth line!
	The wasted products must be sent to the authorized collecting center!
	Refer to the operating instructions.

1.1.2 Safety Warning

 Warning	The system must be installed according to the local standards and related standards for an electrical enterprise. Please follow the instructions in this manual to use and operate the system.
 Danger	Keep the PV array covered and the DC circuit breaker OFF. High voltage will be generated by the PV array exposed under sunshine. All the cables must be connected firmly.
 Danger	PV negative(PV-) and battery negative(BAT-) on the system side are not grounded as default design. Connect PV- or BAT- to the ground are strictly forbidden.

 Danger	<ol style="list-style-type: none"> 1. High voltage is a hazard, make sure the system device is away from children. 2. Any touch with the device or terminal may cause electric shock or fire. Please follow all the safety instructions. 3. Damaged devices or system faults may cause electric shock. Make sure that you have checked the package and the device before installation to avoid unnecessary damage or loss.
 Caution	Be aware of the hot surface while the device is running.
 Warning	Do not open the inverter cover or change any components without our authorization, otherwise the warranty commitment of the inverter will be invalid.
 Warning	<ol style="list-style-type: none"> 1. Grounding the PV generator. 2. Comply with the local requirements for grounding the PV modules and the PV generator. It is recommends connecting the generator frame and other electrically conductive surfaces in a manner which ensures continuous conduction and ground these in order to have optimal protection of system and persons
 Warning	<ol style="list-style-type: none"> 1. Ensure input DC voltage \leqMax. DC voltage. Over voltage may cause damage. 2. Permanent damage to inverter or other losses, which will not be included in warranty!
 Warning	<ol style="list-style-type: none"> 1. Authorized service personnel must disconnect both AC and DC power from inverter before attempting any maintenance or cleaning or working on any circuits connected to inverter. 2. Do not operate the inverter when the device is running.

1.1.3 Battery Handling Guide

- Use the battery pack only as directed.
- If the battery is defective, appears cracked, broken, or otherwise damaged, or fails to operate, contact the **ATG hotline at +1-951-245-6222** immediately.
- Do not attempt to open, disassemble, repair, tamper, or modify the battery.

The battery is not suitable for users to use by themselves.

- To protect the battery and its components from damage when transporting, handle them with care.
- Do not subject it to any strong force.
- Do not insert foreign objects into any part of the battery pack.
- Do not use cleaning solvents to clean the battery.
- The battery can not be connected directly to the SELV circuit.

1.2 Response to Emergency Situations

The ATG battery is designed with multiple safety strategies to prevent hazards resulting from failures. However, ATG cannot guarantee their absolute safety in uncertain situations.

1.2.1 Leaking Batteries

If the battery pack leaks electrolyte, avoid contact with the leaking liquid or gas. Electrolyte is corrosive and contact may cause skin irritation and chemical burns. If one is exposed to the leaked substance, do these actions:

Inhalation: Evacuate the contaminated area and seek medical attention immediately.

Eyes contact: Rinse eyes with flowing water for 15 minutes, and seek medical attention immediately.

Skin contact: Wash the affected area thoroughly with soap and water, and seek medical attention immediately.

Ingestion: Induce vomiting as soon as possible, and seek medical attention immediately.

1.2.2 Fire

In case of a fire, make sure that an ABC or carbon dioxide extinguisher is nearby and does not use water to extinguish the fire.



WARNING

The battery pack may catch fire when heated above 150°

If a fire breaks out where the battery is installed, do these actions:

1. Extinguish the fire before the battery catches fire.
2. If the battery has caught fire, do not try to extinguish the fire. Evacuate people immediately.

WARNING

If the battery catches fire, it will produce poisonous gases. Do not approach.

1.2.3 Wet Battery

If the battery is wet or submerged in water, do not try to access it. Contact **ATG hotline** or your distributor for technical assistance.

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1.2.4 Damaged Battery

If the battery is damaged, please contact **ATG hotline** or your distributor for help as soon as possible, because damaged batteries are dangerous and must be handled with extreme caution. Damaged batteries are not suitable for use and may pose a danger to people or property. If the battery seems to be damaged, return it to **ATG** or your distributor.

CAUTION

Damaged batteries might export electrolyte or flammable gas, so contact ATG for advice and information immediately and we will deal with it.

1.3 Installers

ATG Energy Storage battery is suggested being installed by skilled workers or electricians. A skilled worker is defined as a person who has been trained and is a qualified electrician or qualified with all of the following skills and experience:

- Knowledge of the functional principles and operation of on-grid Energy Storage systems.
- Knowledge of the dangers and risks associated with installing and using electrical devices and acceptable mitigation methods.
- Knowledge of the installation of electrical devices
- Knowledge of and adherence to this manual and all safety precautions and best practices.

1.4 Scrap Battery

For scrap batteries, please deal with local laws or regulations to recycle or scrap.

1.5 Contact Information

Use the contacts for technical assistance. The phone number is available only during business hours on weekdays.

Fax	(951)245-7770
Email	info@atgepower.com
Address	10588 Monte Vista Ave, Montclair, CA 91763

2. Guidance for Disconnection of System During Shipment

- ATG-AL-L03-10kW-20kWh/40kWh is not suitable for air transport.
- Cartons that have been crushed, punctured, or torn in such a way that contents are revealed shall be set aside in an isolated area and inspected by a skilled person. If the package is deemed not to be shippable, the contents shall be promptly collected, segregated, and either the consignor or consignee contacted.
- A precautionary label should have been affixed to the shipping carton to alert individuals that the batteries in the package are disconnected; otherwise, the battery should not be transported.
- We have conducted comprehensive tests to ensure the equipment distributed around the world is safe for shipping transport. These products shall be handled with care and immediately inspected if visibly damaged. If the cartoon is visibly damaged, please contact with **ATG customer service** to confirm whether the battery can be used safely or not.

3. Product Introduction

3.1 Technical Specifications

Inverter:

Model	ATG-I-L03-10kW
Input(DC)	
Max DC power(kW)	15
Max DC voltage(V)	500 Vd.c
MPPT voltage range(V)	120...500 Vd.c
Nominal Voltage(V)	335
Start Operation Voltage (V)	125
Max Input Current (A)	14
Number of MPPT	4
Number of string per MPPT	1
DC Switch	Integrated
Battery Input	
Battery Charge Method	Self-adaption to BMS
Max charging voltage(V)	58V
Battery voltage range(V)	40-58V
Max charge/dis charge current(A)	190/210A
Max charge/dis charge Power(W)	10000/10000
Output(AC)	
Nominal Apparent Power(VA)	10000
Max Apparent Power(VA)	11000
Max Input Power(VA)	11000
Grid Type	L1,L2,N,PE
Nominal Frequency(Hz)	50/60
Nominal Voltage(V)	110-120/220-240V(split phase), 208(2/3 phase),230 (single phase)

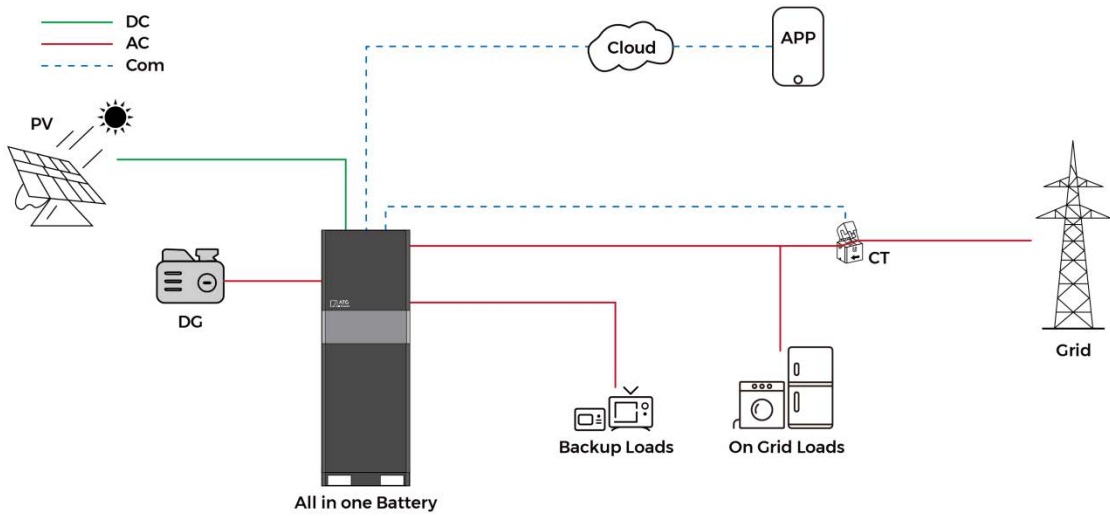
Max.Output/Input Current(A)	45.8
THDv(Rated power)	<3%
PF	-0.8~+0.8
Switch Time	10ms(Typical)
AC Output(Back-up)	
Rated power(kVA)	10
Rated output voltage(V)	120/240(split phase), 240(single phase)
Max output current(A)	45.8
Rated frequency(Hz)	50/60 Hz
Automatic switching time(ms)	<10
THDv(100%R Load)	<2
Overload capacity	125%<Load≤135%, 60S, Load>150%1S
Output Parallel(Pcs)	6
Efficiency	
Max.Efficiency(BAT to AC)	≥98.2%
Max.Efficiency(PV to AC)	≥98.0%
CEC.Efficiency	≥97.2%
Max.MPPT Efficiency	≥98.0%
General Parameters	
GFCI	YES
Anti-islanding Protection	YES
PV String Input Reverse Polarity Protection	YES
Output Over Voltage Protection	YES
Output Over Current Protection	YES
Insulation Resistor Detection	YES
AFCI	YES
RSD	YES
General Parameters	
Operating Temperature Range	-25~60°C(-13~140°F)[>45°C(>113°F)derating]
Relative Humidity	0~95%
Max. Altitude(m)	>2000m derating
Electronics Protection Degree	IP54/NEMA 3R
Topology Type	Transformerless
Night Self Consumption(W)	<25
Cooling	Forced air cooling
Dimension (L × W ×H)	650*400*1910mm(25.6*15.7*75.2in)
Weight	320kg(20kWh)/590kg(40kWh)
Noise(db)	<38
HMI	APP/LCD
COM	RS485/CAN/WIFI/4G/Bluetooth(Optional)
Certification	

Safety	UL1741, CSA C22.2 No. 107.1:16,UL1998
EMC	FCC Part 15 Class B
Grid Code	IEEE1547, CPUC Rule21, SRD V2.0, UL1741 SA, UL1741
EMC	FCC Part 15, Class B
On-grid	IEEE 1547, IEEE 2030.5, Hawaii Rule 14H, Rule 21 Phase I,II,III,NRS

Battery:

Model		ATG-B-L03 Series	
Total Energy*		20.0kWh	40.0kWh
Usable Energy(DC)*		18.4kWh	36.8kWh
Cell Type		LFP (LiFePO4)	
Voltage(In parallel)		48~56Vd.c	
Nominal Voltage(In parallel)		51.2Vd.c	
Max. Continuous Charge Current (A)		200A	200A
Max. Continuous Discharge Current (A)		200A	200A
Max. Charge Voltage(In parallel)		57.6Vd.c	
Protection Degree		IP20	
Max. Altitude (m)		4000 (>2000m derating)	
Operating Temperature	Charge	From 0~50°C(33.8~122°F)	
	Discharge	From -10~55°C (14~131°F)	
WIFI Frequency Range		2400MHz~2483MHz	
Humidity		<60%(No condensed water)	
Installation Location		Ground-Installation	
Cooling Type		Natural cooling	
Warranty		10 years	
Communication		CAN/ RS485	
Hazardous Material Classification		9	
Transportation		UN 38.3	
Certification		UL 1973 / UL 9540A/EMC	

3.2 System Diagram



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 LOCAL grid operator whether there are any special regulations for grid connection.

3.3 Operation Modes Introduction

ATG system normally has the following operation modes based on your configuration and layout conditions.

3.3.1 Self Consume Mode

In this mode, the inverter will provide energy to load as the priority. If there's excess energy, it will charge the battery; If still gets energy left, it will sell energy to the grid.



Daytime: When there is sufficient sunlight, the device first supplies power to the loads, and then charges the battery with excess, if there is still excess power, feed the power into the grid.

Night time: When there is no sunlight, the battery supplies power to the loads, if the battery power is not enough, get the power from grid..

3.3.2 Peak Shift Mode

According to the difference of electricity price, a day can be divided into three periods: peak, flat and valley.

1 During the charging time, if there is sufficient sunlight, it will charge the battery first, and then supply power to the loads, if has excess power, then feed the power into grid if still has excess power.

If there is not have enough sunlight, it will charge the battery from grid.



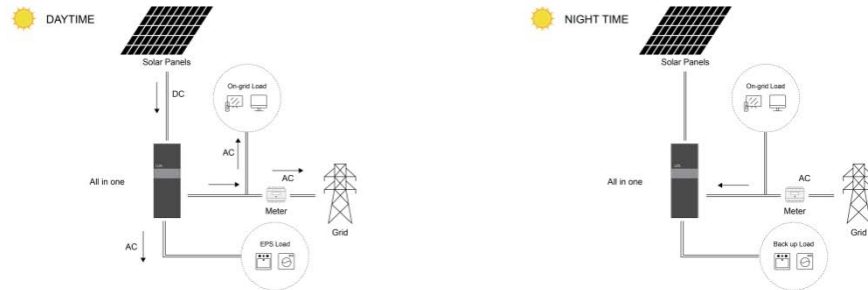
2 During the discharging time, if there is sufficient sunlight, power the loads first.

If there is insufficient sunlight, the battery supplies the power to the loads first until the battery is consumed to the SOC value that you set before, if there is still not enough, get the power from grid. If load power is less than battery, the battery supply power to load at first and then feed the power into grid with excess.



3.3.3 Battery Priority Mode

In this mode, it is necessary to ensure that the battery is charged regardless of whether there is photovoltaic or not.



Daytime: When there is sufficient sunlight, the device first supplies power to battery, if there is still excess power, it will supply power to loads, and feed the power into the grid with excess power.

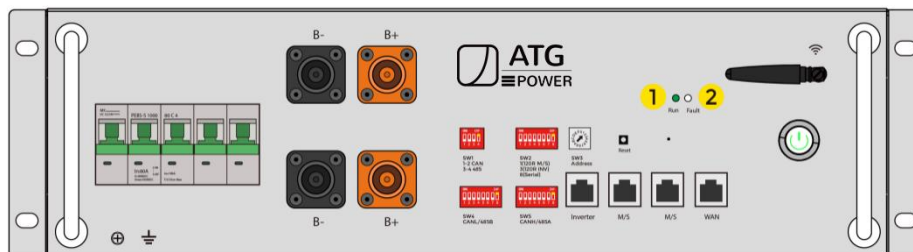
Night time: When there is no sunlight, it will get power from grid to charge battery fully.

3.4 Indicators and Ports

3.4.1 Battery

3.4.1.1 Battery Indicators

There are two LED indicators on the front of the battery to show its operating status.



The LED indicators are shown as above:

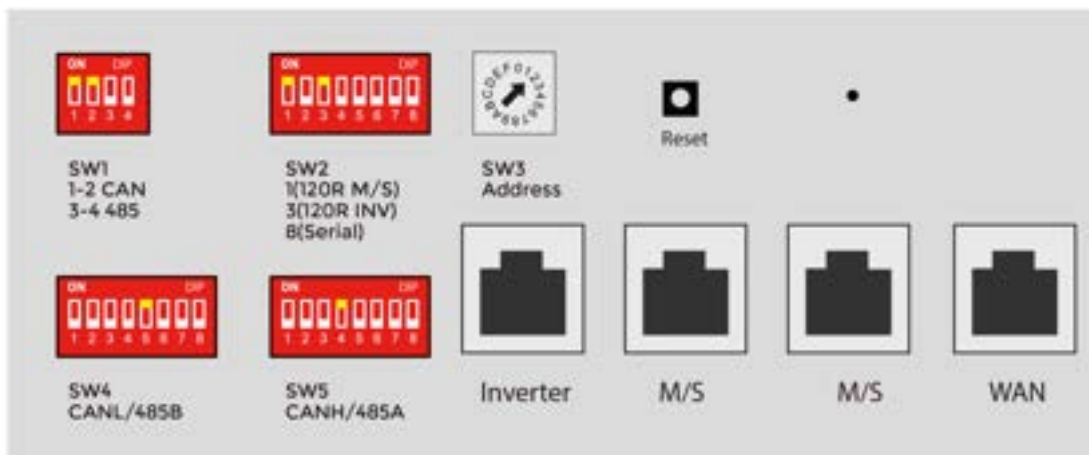
Item	Designation	Definition
1	Run	Battery working normally
2	Fault	Battery failures

3.4.1.2 Battery Ports

The power cable interface and communication cable interface.



3.4.1.3 Battery Communication Interface and DIP Settings

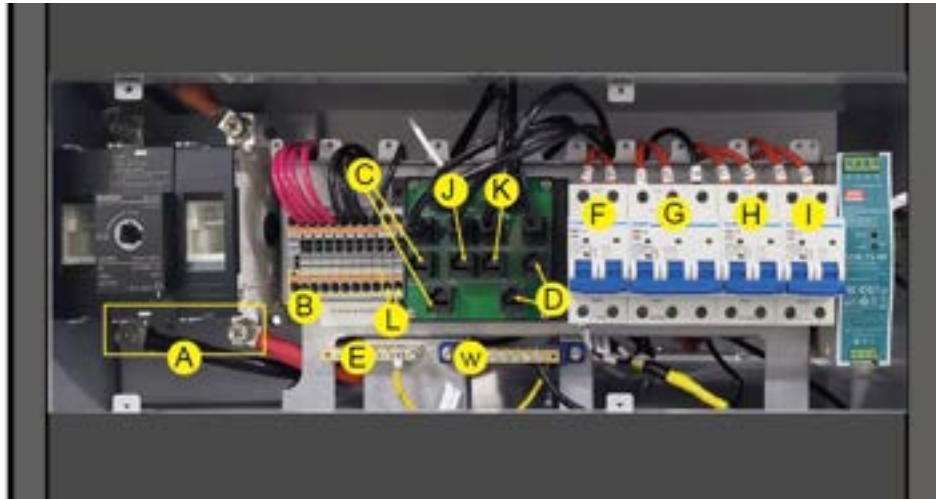


Designation	Definition
SW 1	DIP switch for CAN or RS485 communication(Defined in inverter's user manual.) For CAN Communication, SW1 = 1 & 2 For 485 Communication, SW1 = 3 & 4
SW 2	Resistance for communication and DIP switch for parallel or Series connection Master Battery SW2 setting: For Parallel connection, SW2 = 1 & 3
SW 3	Setting battery address
SW 4	Communication for battery between inverter
SW 5	Communication for battery between inverter
Reset	Reset WIFI or GPPS/GPS module configure
Inverter	Communication for primary battery between inverter
M/S	Communication between batteries
WAN	External network interface

3.4.2 Inverter

3.4.2.1 Inverter Ports

Open the cover plate in the front of the all-in-one device, Then you will see several ports as shown in the picture below.



Item	Name	Definition
A	Battery Terminal	Terminal for the battery pack.
B	PV Terminal	Terminal for 4 PV inputs. The 8 terminals from left to right are respectively PV1+; PV2+; PV3+; PV4+; PV1-; PV2-; PV3-; PV4-.
C	Communication port	Inverter parallel(CAN1/CAN2)
D	Communication port	RJ45 for communication between the Inverter and the CT meter(CT-L1/CT-L2)
E	Grounding bar	
F	Generator Terminal	Terminal for generator.
G	Grid Terminal	Terminal for the grid.
H	Load Terminal 1	The first terminal for load.The power of each Load is 5kW.
I	Load Terminal 2	The second terminal for load.The power of each Load is 5kW.
J	Communication port	Meter communication
K	Communication port	Communication between Inverter and battery
W	N bar	
L	RSD 12V+/RSD 12V-	connect to RSD


3.4.2.2 The Terminals on the Right Side



Item	Designation	Definition
1	LOAD1	Outlet of load1 cable
2	LOAD2	Outlet of load2 cable
3	GRID	Outlet of grid cable
4	GEN	Outlet of generator cable
5	PV+	Outlet of PV cable
6	PV-	Outlet of PV cable
7	LAN	Outlet of local area network
8	WIFI	WIFI module for configuration
9	RSD 12V GEN Dry	Outlet of RSD/GEN cable GEN: DRY0_1A and DRY0_1B (dry contact, normally closed): For generators, dry contact closure, generator start, dry contact disconnection, generator shutdown. DRY0_1A and DRY0_1C (dry contact, normally open): mutually exclusive with DRY0_1B and DRY0_1A.
10	Battery Extend	
11	COM Extend	Outlet of parallel inverters

3.4.2.3 The Terminals on the Left Side



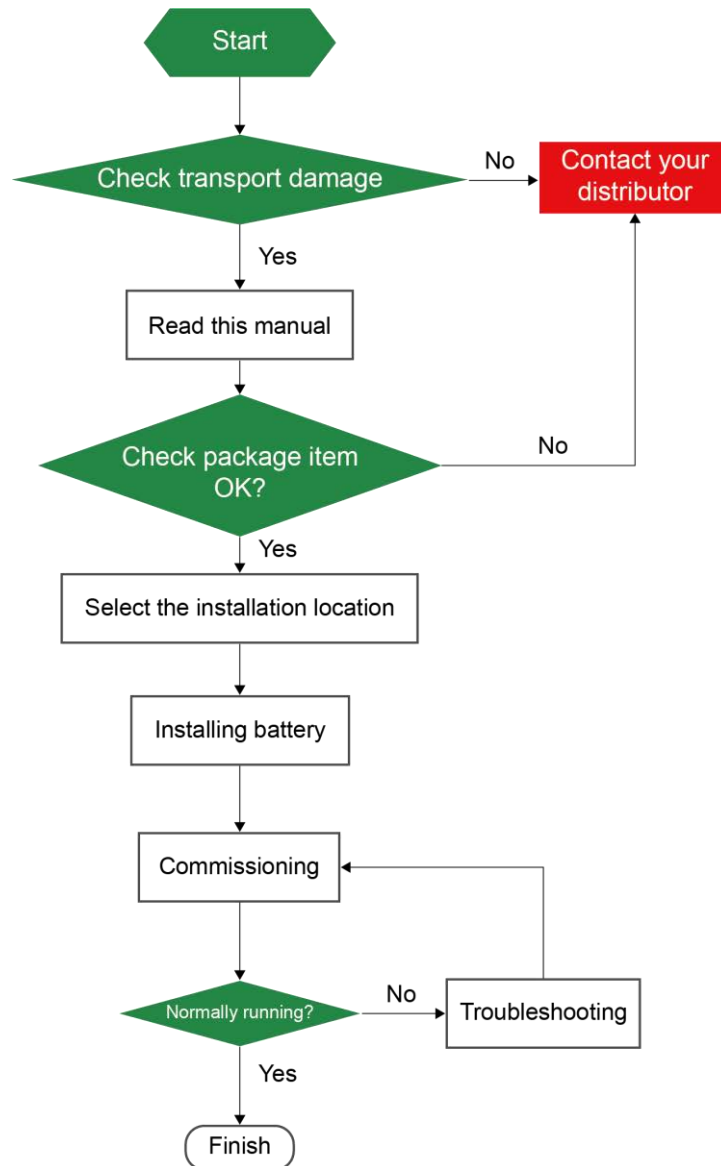
Item	Designation	Definition
A	PV Switch	PV DC input manual switch.
B	RSD Button	<p>This button combines two functions: RSD and E-stop. The button is a normally closed (NC) contact. When the button is pushed, the state of the e-stop is open. RSD is used to start or stop the drive of the inverter.</p>  <p>When it is set to “ENABLE”, you can power on or power</p>

		<p>off the inverter through the button at the left side. When is set to " DISABLE" , the Inverter will start automatically regardless of the status of the button.</p>
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4. Installation Prerequisite

4.1 Installation Process

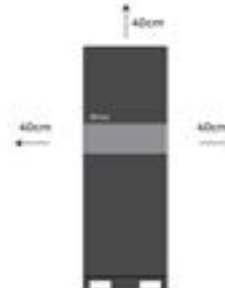
The system should be installed according to the following flow chart. The detailed installation process is described in chapter 5 "Install process".



4.2 Installation Position

1. The all-in-one device should be installed on level ground.
2. The all-in-one device should be installed indoor.
3. Leave enough space around the system as shown below.

Position	Min.Size(CM)
Left	40CM
Right	40CM
Top	40CM











4. The system should be installed in a ventilated & dry place with temperature from 0°C to 50°C (High ambient temperature will reduce the power of the system.).
5. To avoid burning and electric shock, the system should be installed beyond the reach of children.
6. Make sure the installation position does not shake.



4.3 Tools

To install the system, the following tools are required:

			
Phillips screwdriver	Torque wrench	Cable crimper	Wire clamp
			
Voltmeter	Tape measure	Drill	Flat-head screwdriver

In order to protect the operator and the installer's safety, please select and use suitable tools and measuring instruments that are certified for precision and accuracy.

4.4 Safety Instruments

When dealing with the battery, the following safety gears should be equipped. Installers must meet the relevant requirements of UL or the domestic legislation and other relevant international standards.



4.5 Storage

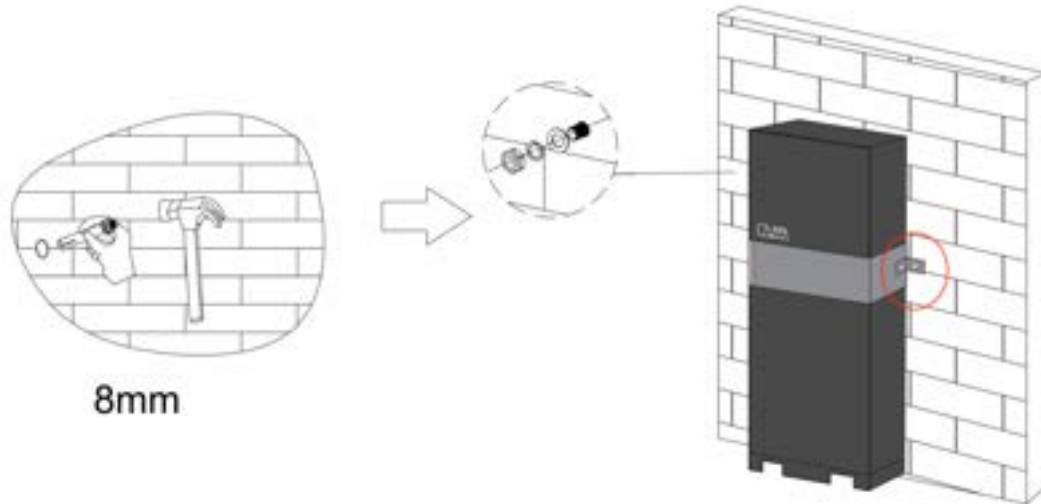
If the ATG-AL-L03-10kW-20kWh/40kWh is not to be installed immediately, or removed from operation and needs to be stored for a long period, please choose an appropriate location to store it. Instructions for storage are:

- The temperature of the system stored is recommended in the range of -4F(-20°C) to 113F(45°C).
- Do not expose the system to water.
- The ATG-AL-L03-10kW-20kWh/40kWh box should be upright and not stacked upside down when storing the battery box.
- If the battery needs to be stored for over 3 months, the main breaker of the battery is suggested to be disconnected. Otherwise, the battery would discharge at a minimum rate and its capacity will reduce depending on storage time, the battery self-consumption will be less than 5W.
- If the battery will be stored for over 6 months, it is suggested to connect the battery with an inverter and commissioning the system.

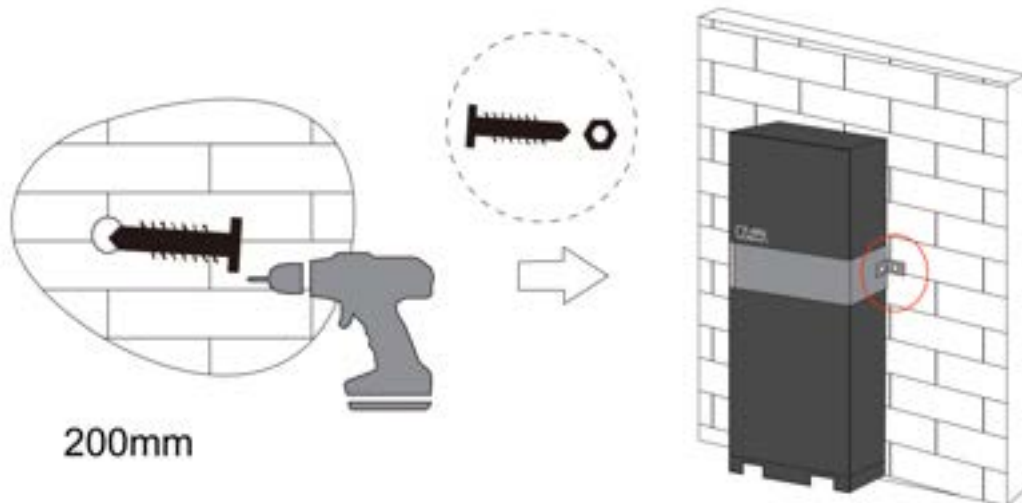
5 Installation

5.1 Ground Mounting

1. Fix the device to the wall with M6 expansion screws tightly.



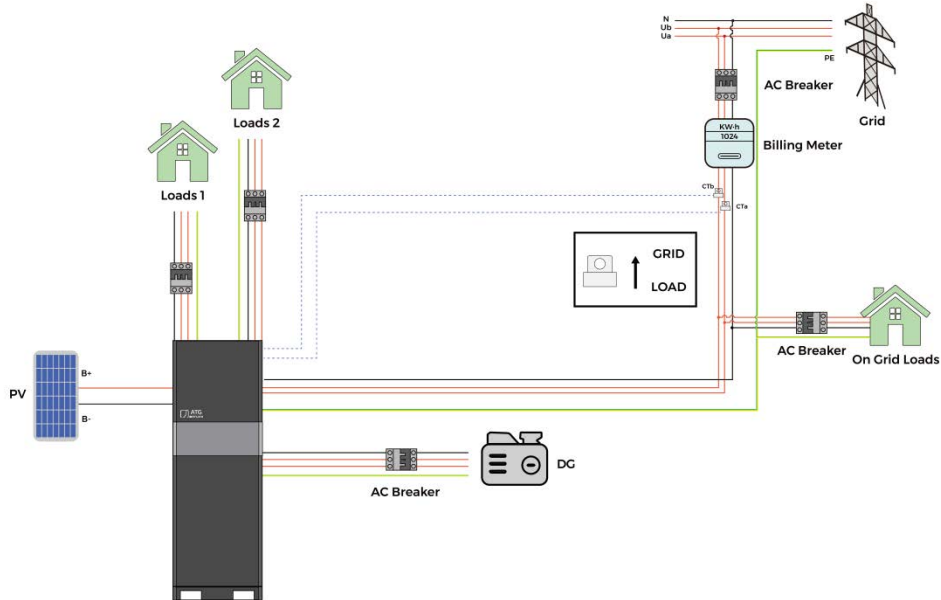
2. If you are installing in a wooden house, it is better to fasten it with bolts and then tighten the nuts at the back.



5.2 Electrical Connection

5.2.1 System Wiring Diagram

General wiring diagram of ATG all in one system.



Note

The arrow on the CT points to the power grid, showing as above. If the CT connector is improperly connected, the inverter cannot read the data correctly, so that the relevant working conditions cannot be realized normally.

6 Cable Connection

1. Open the cover of the all-in-one device.



6.1 PV Connection

Hybrid can be connected in series with 4-strings PV modules for ATG all in one. Select PV modules with excellent function and reliable quality.

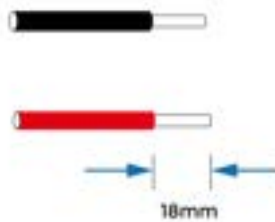
Open-circuit voltage of PV connected in series should be less than Max. DC input voltage; operating voltage should be conformed to MPPT voltage range.

Before connecting PV panels/strings to the inverter, please make sure:

1. Use the right PV connectors in the accessory box.
2. The voltage, current, and power ratings of the PV strings are within the allowable range of the inverter. Please refer to the Technical Data Sheet for voltage and current limits
3. Make sure the PV switch of the inverter is in the "OFF" position during wiring.
4. PV strings could not connect to the EARTH conductor.

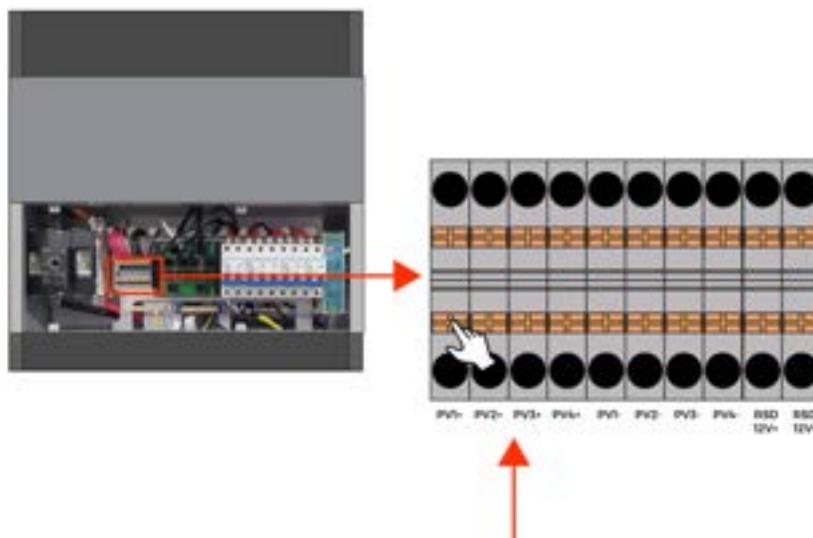
Step1:

Choose the 12 AWG wire to connect with the cold-pressed terminal. Remove 18mm of insulation from the end of wire.



Step2:

Press the button and cross the PV cables through the PV port, Connect PV cables to PV terminals. Release the button, and the cable will be locked in.

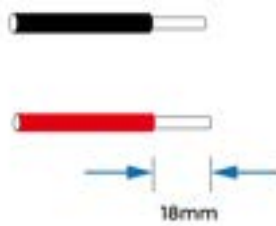


6.2 Grid Connection

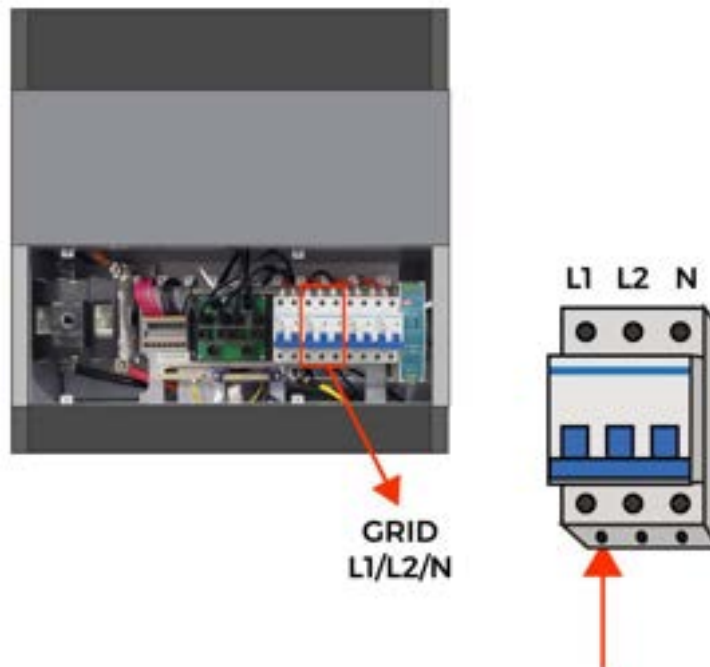
Step1. Check the grid voltage.

1. Check the grid voltage and compare with the permissive voltage range (Please refer to technical data).
2. Disconnect the AC breaker from all the phases.

Step2. Choose the 8AWG wire to connect with the cold-pressed terminal. (Remove 18mm of insulation from the end of wire.)



Step3. Cross the Grid cables through the grid port, Connect cables to Grid terminals.

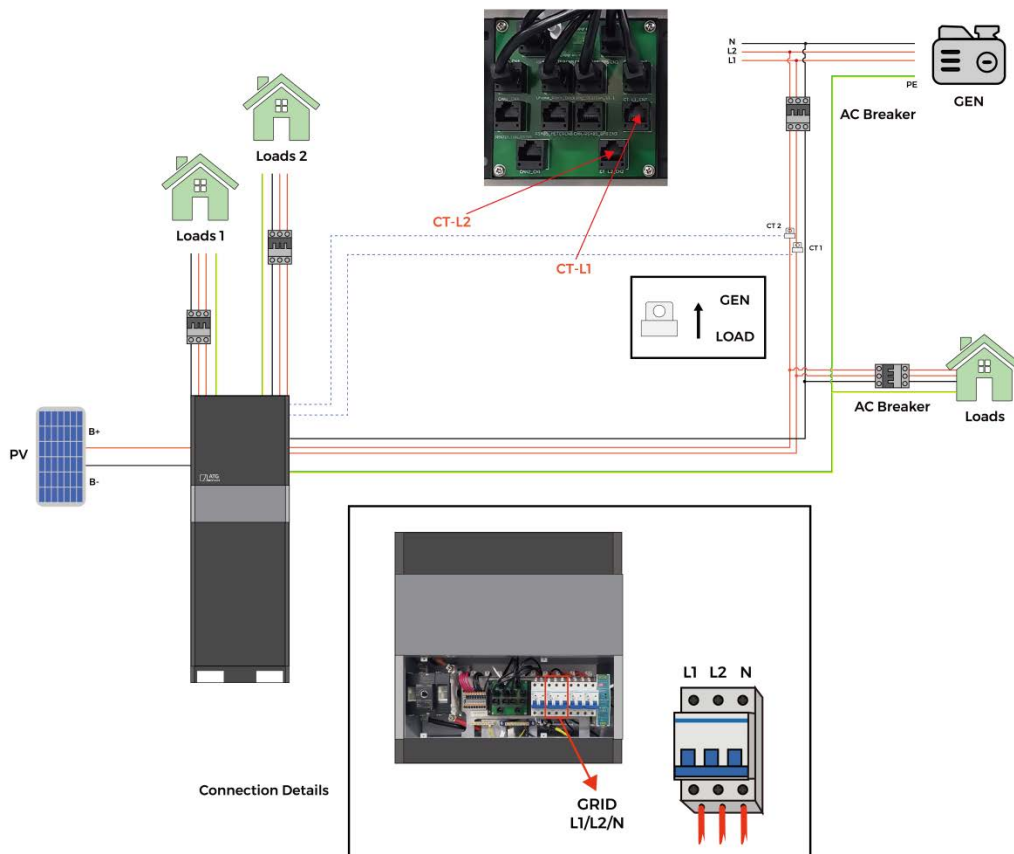


6.3 Gen Connection

There are two applications for gen connection:

1. Off grid system

The generator is connected to the grid port of the inverter. The connecting cable shall be covered with CT. The system diagram is showing as follows.



Note

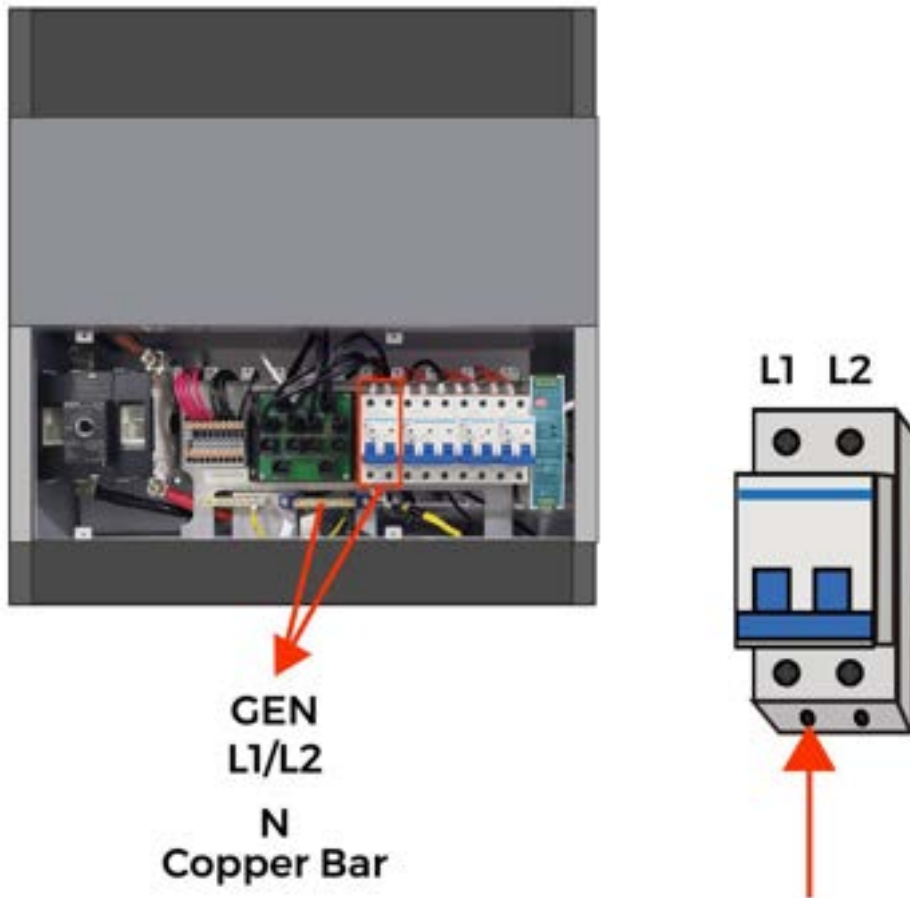
1. The two wires start signal DRYO_1A and DRYO_1B of the Generator is used to automatically control the start and stop of the Generator.



2. Don't forget to set the settings in APP to enable this function. (Chapter 10.4)

3. On grid system

The Generator is normally connected to the Generator port.



Note

The two wires start signals DRYO_1A and DRYO_1B of the Generator is used to automatically control the start and stop of the Generator.



6.4 Back-up: Load1 and Load2 Connection

Inverter has On and Off grid function, the inverter will deliver output power through AC port when the grid is on, and it will deliver output power through back-up port when the grid is off.

Auto & Manual

BACK-UP function can be achieved automatically or manually according to user's needs.

BACK-UP function can only be triggered automatically.

Load1 port: important load

Load2 port: Set the Aux load SOC option in advanced mode. When the battery SOC below the set value, the load relay on the interface will turn off. When the battery SOC is higher than the set value, load 2 is turned on again.

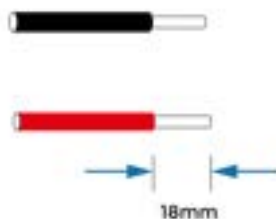
- 1). Hybrid inverters are able to supply over load output at its "Back-Up". For details, please refer to the technical parameters of inverter. And the inverter has self-protection dreading at high ambient temperature.
- 2). For complicated application, or Special load, please contact after-sales.
- 3). For inverter, the standard installation typically consists of the connection of the inverter with both PV and batteries. In case of systems not connected to the batteries, the Back-Up function is strongly not advised to use. It shall not cover the standard warranty and be liable for any consequences arising from users not following this instruction.

Note

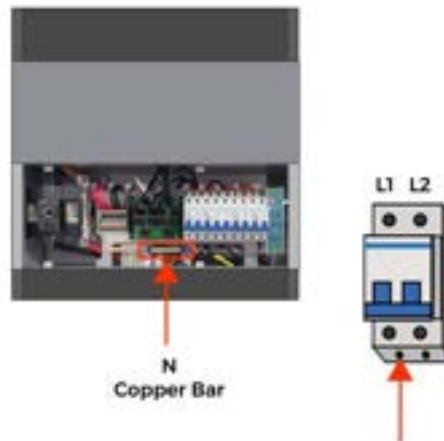
In case of discrepancies between wiring mode of local policy and the operation guide above, especially for the wiring of neutral line,grounding and RCD, please contact us before any operation!

When using the off-grid function, please add off grid AC breaker in off grid output cable to ensure safety.

Step1. Make BACK-UP 8AWG wires.



Step2. Connect the cables to the BACK-UP: Load1 and Load2 port of the inverter.



Inside the inverter, load2 is connected to load1 through a relay, and the relay disconnect when the SOC of battery is lower than set value. At that time, the load2 is powered off and load1 is still powered on (The total power of Load1 plus Load2 should not more than the rated BACK-UP power when GRID is off).

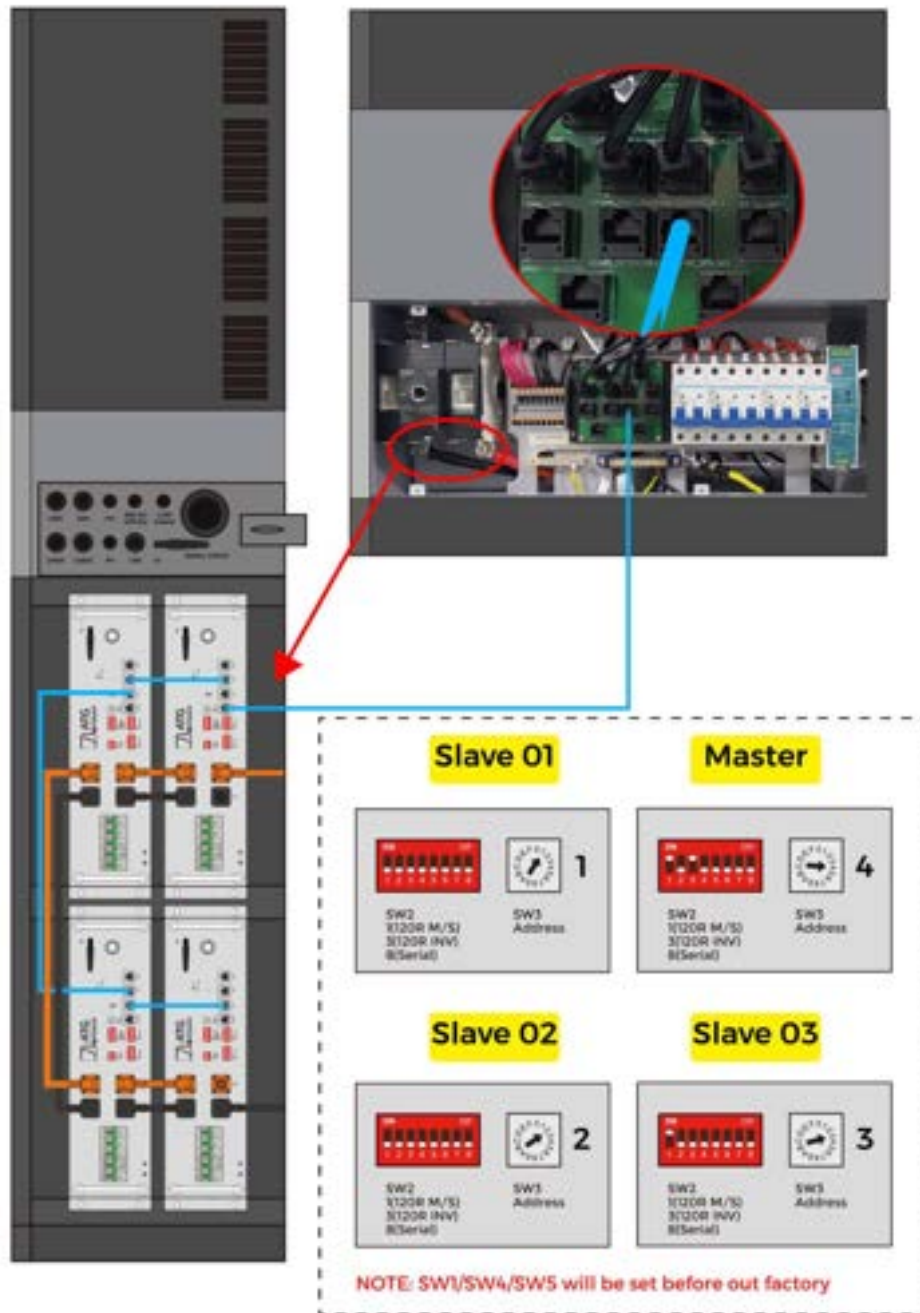
Note

- Make sure the BACK-UP load power rating is within BACK-UP output rating, otherwise the inverter will shut down with an “over load” warning.
- When an “over load” is appeared, adjust the load power to make sure it is within the BACK-UP output power range, then return the inverter.
- For the nonlinear load, please make sure the inrush power should be within the BACK-UP output power range.

6.5 Battery Connection

Battery connection diagram.

Connect the communication cables, and power cables with 2AWG and SC35-8 terminal between master batteries and inverters.



Warning
Positive and negative wires are not allowed to reverse.

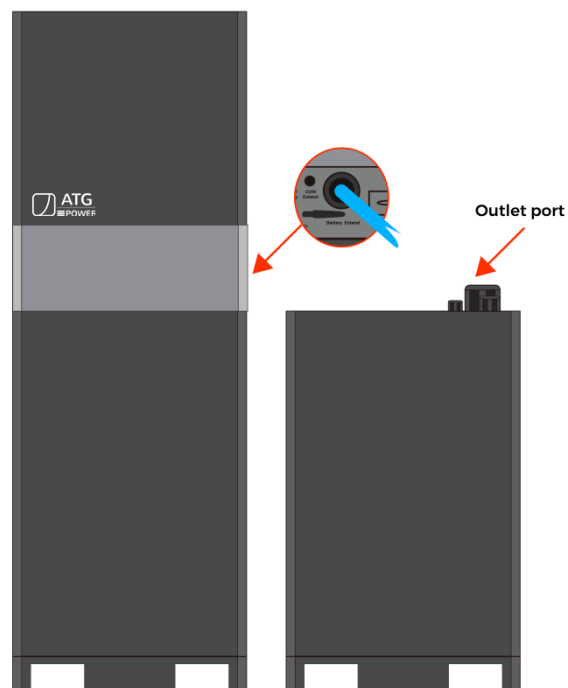
RJ-45 Pin 1

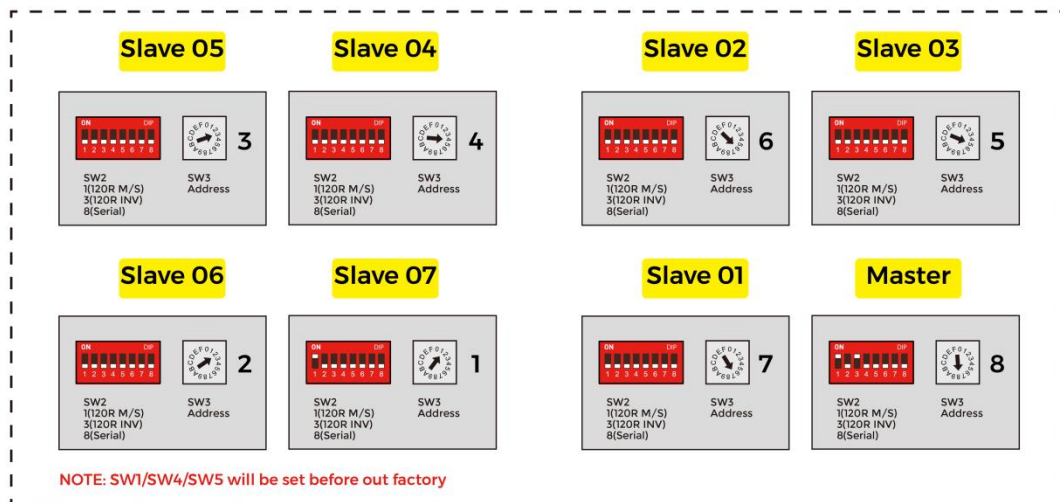
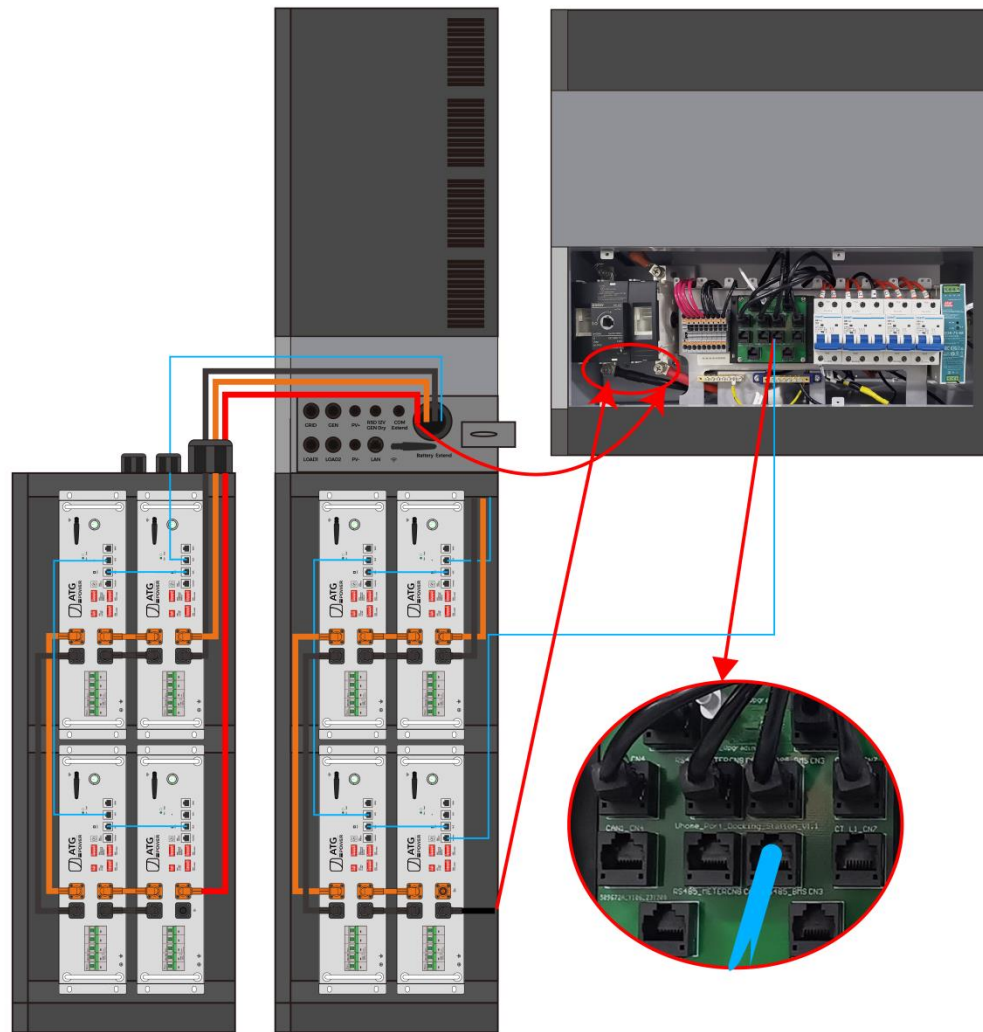


Position	Color	CAN
1	Orange&white	X
2	Orange	X
3	Green&white	X
4	Blue	CAN_H
5	Blue&white	CAN_L
6	Green	X
7	Brown&white	X
8	Brown	X

6.6 Battery Expand

Our all in one device can support expansion of a single battery pack, showing as below:

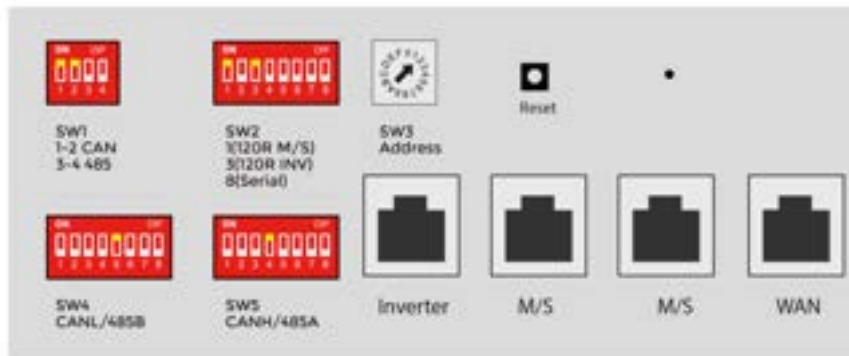




















6.7 Battery DIP Switch Settings

















Set the DIP switch of SW4/SW5 (CAN 4H5L) and set SW1(1&2 on) as the picture above.

















Note
SW1/SW4/SW5 will be set up before leave the factory, please check there are no change by accident.



































Connected Battery Numbers	Group	Set of SW 2	Address(Set of SW3)
		Parallel connect	
1	/		
2	Primary		
	Sub 1		
3	Primary		

















	Sub 1		
	Sub 2		
4	Primary		
	Sub 1		
	Sub 2		
	Sub 3		
5	Primary		
	Sub 1		

















	Sub 2		
	Sub 3		
	Sub 4		
6	Primary		
	Sub 1		
	Sub 2		
	Sub 3		
	Sub 4		

















	Sub 5		
7	Primary		
	Sub 1		
	Sub 2		
	Sub 3		
	Sub 4		
	Sub 5		
	Sub 6		

















8	Primary		
	Sub 1		
	Sub 2		
	Sub 3		
	Sub 4		
	Sub 5		
	Sub 6		
	Sub 7		

















9	Primary		
	Sub 1		
	Sub 2		
	Sub 3		
	Sub 4		
	Sub 5		
	Sub 6		
	Sub 7		

















	Sub 8		
10	Primary		
	Sub 1		
	Sub 2		
	Sub 3		
	Sub 4		
	Sub 5		
	Sub 6		

















	Sub 7		
	Sub 8		
	Sub 9		
11	Primary		
	Sub 1		
	Sub 2		
	Sub 3		
	Sub 4		

















	Sub 5		
	Sub 6		
	Sub 7		
	Sub 8		
	Sub 9		
	Sub 10		
12	Primary		
	Sub 1		

















	Sub 2		
	Sub 3		
	Sub 4		
	Sub 5		
	Sub 6		
	Sub 7		
	Sub 8		
	Sub 9		

















	Sub 10		
	Sub 11		
13	Primary		
	Sub 1		
	Sub 2		
	Sub 3		
	Sub 4		
	Sub 5		

















	Sub 6		
	Sub 7		
	Sub 8		
	Sub 9		
	Sub 10		
	Sub 11		
	Sub 12		
14	Primary		









	Sub 1		
	Sub 2		
	Sub 3		
	Sub 4		
	Sub 5		
	Sub 6		
	Sub 7		
	Sub 8		

	Sub 9		
	Sub 10		
	Sub 11		
	Sub 12		
	Sub 13		
15	Primary		
	Sub 1		
	Sub 2		

	Sub 3		
	Sub 4		
	Sub 5		
	Sub 6		
	Sub 7		
	Sub 8		
	Sub 9		
	Sub 10		

	Sub 11		
	Sub 12		
	Sub 13		
	Sub 14		
16	Primary		
	Sub 1		
	Sub 2		
	Sub 3		

	Sub 4		
	Sub 5		
	Sub 6		
	Sub 7		
	Sub 8		
	Sub 9		
	Sub 10		
	Sub 11		

	Sub 12		
	Sub 13		
	Sub 14		
	Sub 15		

6.8 CT Installation

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

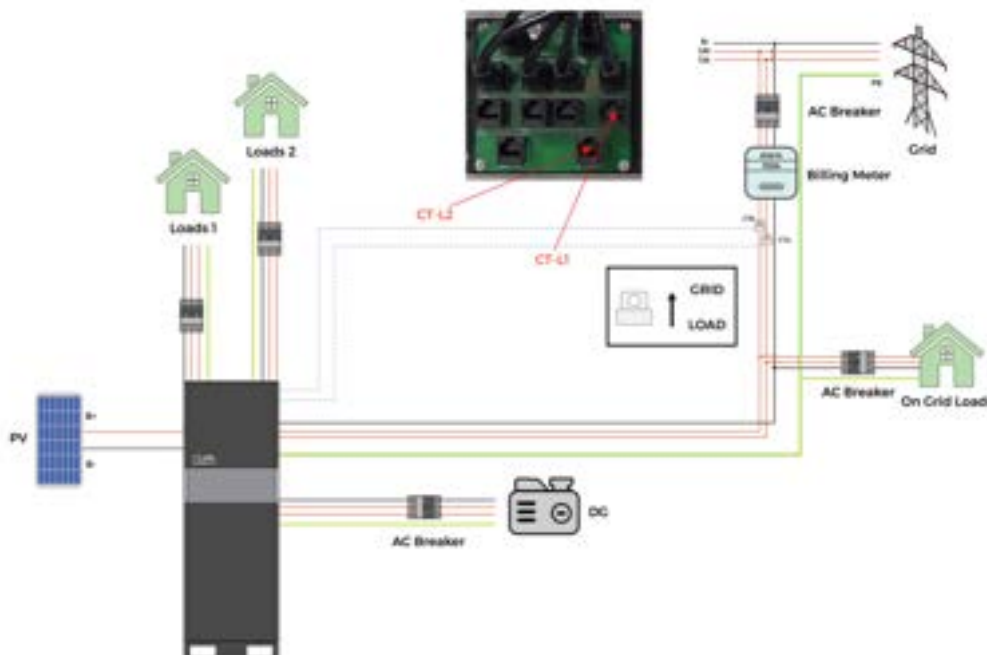
Note

If CT is not installed or installed reversely, the functions of "Anti-reflux", "Self-use", "Peak-shift" will not be realized.

The direction of the arrow on the CT points from this inverter to the GRID!

When connected to single-phase power grid (Europe, Africa, Asia, Australia). Only one CT is provided in the accessories. The RJ45 connector of CT is connected to "CT-L1", and the CT is connected to L phase.

When connected to split phase power grid (North America), there are two CT, "CT-L1" network interface is connected to L1 phase, and "CT-L2" network interface is connected to L2 phase.

**6.9 RSD/E-Stop Installation**

This button combines two functions: RSD and E-stop. The button is a normally closed (NC) contact. When the button is pushed, the state of the e-stop is open. RSD is used to start or stop the drive of the inverter.

E-stop is used to turn the PV on or off. The voltage of the photovoltaic module is prevented from being transferred to the photovoltaic wire so that the first aid personnel can perform work in or on the building.

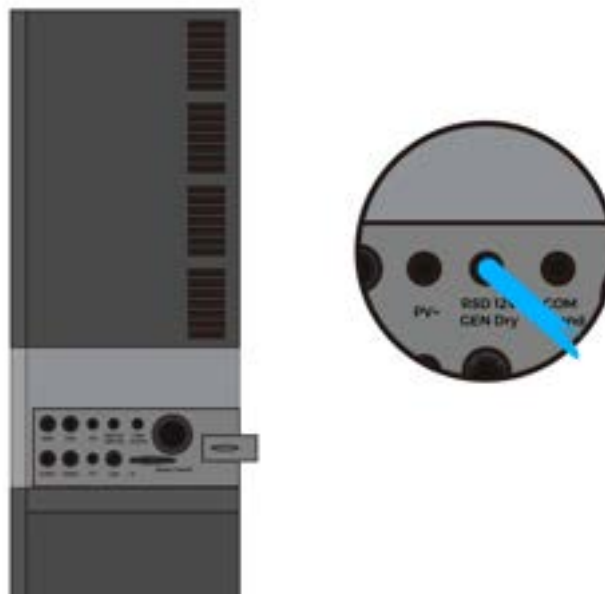
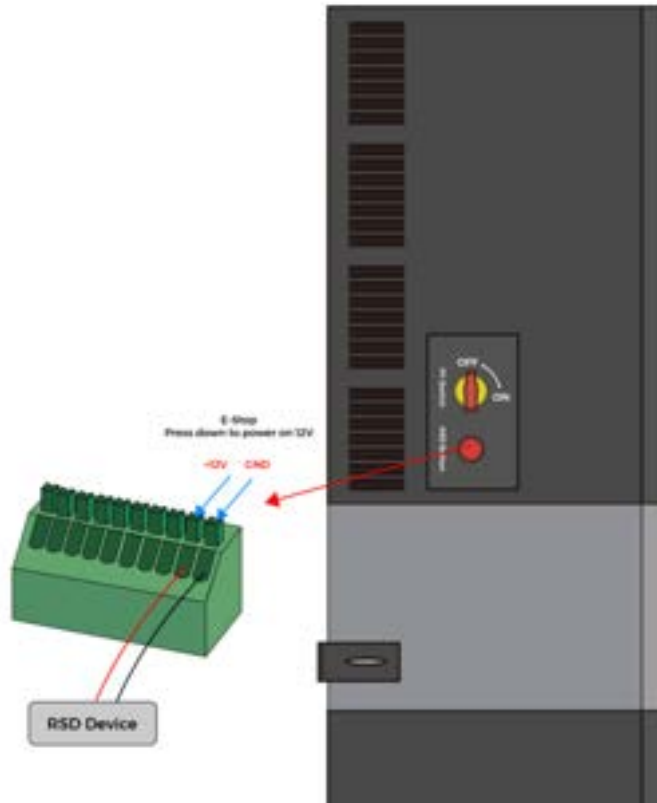
The connection between the e-stop and inverter uses two 18-22 AWG wires. The power input

ATG EPOWER, INC.

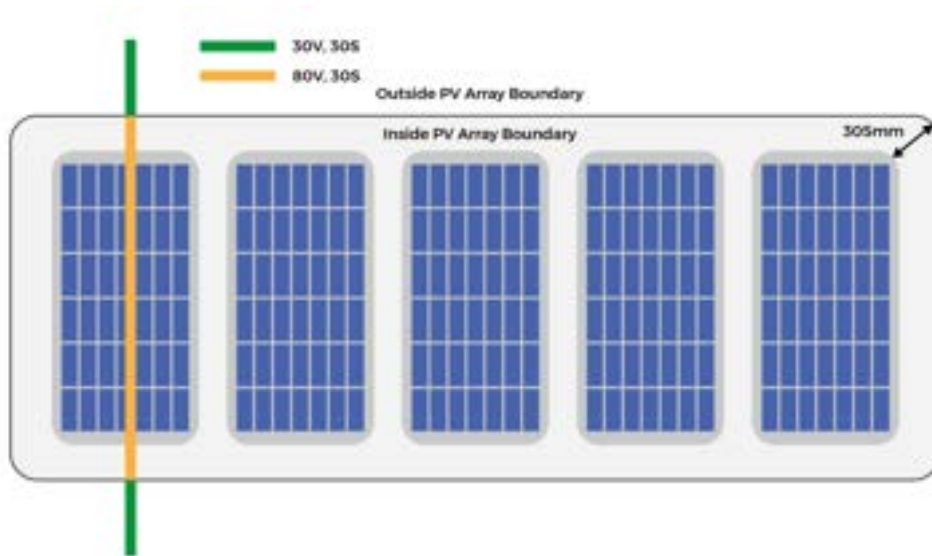
Always Think Green



of E-stop is provided through the 10pin connector of the inverter communication board, and the two wires are connected to + 12V and GND respectively. Press the button, the communication board outputs 12 V voltage, the E-stop device is turned on, and the PV is connected. On the contrary, the communication board cuts off the 12 V output, turns off the E-stop device, and disconnects the PV.

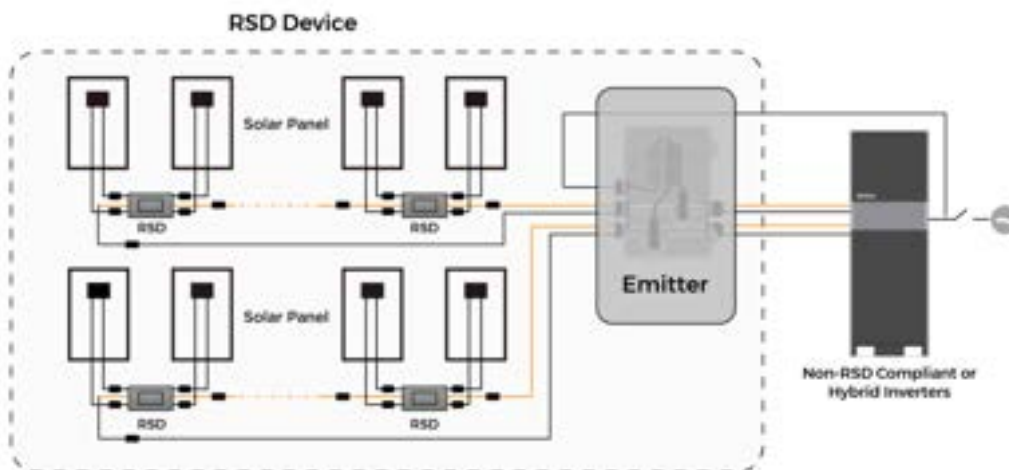


According to National Electric Code, with the distance to the photovoltaic array 305mm as the limit, in the fast shutdown device after starting 30S, the voltage outside the limit range is reduced to 30V below, the voltage within the limit range is reduced to 80V below, which is required to achieve "module level shutdown".



Rapid Shutdown Solution

RSD (receiver) connects to PV module to realize module-level rapid shutdown, receiving the "heart-beats" signals sent from Emitter(Transmitter)



Note
These are all purchased by clients, not standard parts

7 Startup Procedure

- Step 1: Turn on the battery breaker and press the battery power button one by one.
- Step 2: Turn on the PV switch.
- Step 3: Turn on the grid breaker.
- Step 4: If the generator is applied, turn on the gen breaker.
- Step 5: If the back-up load is applied, turn on the backup breaker.
- Step 6: Press the RSD Button of inverter.
- Step 7: Configure the WIFI stick (Only if this is the first time turning on the system).

8 Shutdown Procedure

- Step 1: If the backup load is applied, turn off the backup load first and then turn off the backup breaker.
- Step 2: Turn off the grid breaker.
- Step 3: If the generator is applied, turn off the gen breaker.
- Step 4: Turn off the PV switch.
- Step 5: Open the battery breaker covers and turn off the battery breakers.
- Step 6: Turn off the battery switch on every battery module.
- Step 7: Release the RSD Button of inverter.

9 Inverter Parallel System

Multiple inverters can be installed together to deliver more power. When AC loads are present, all units effectively share the load.

The grid power cable and the load cable of the two inverters should be roughly the same length.

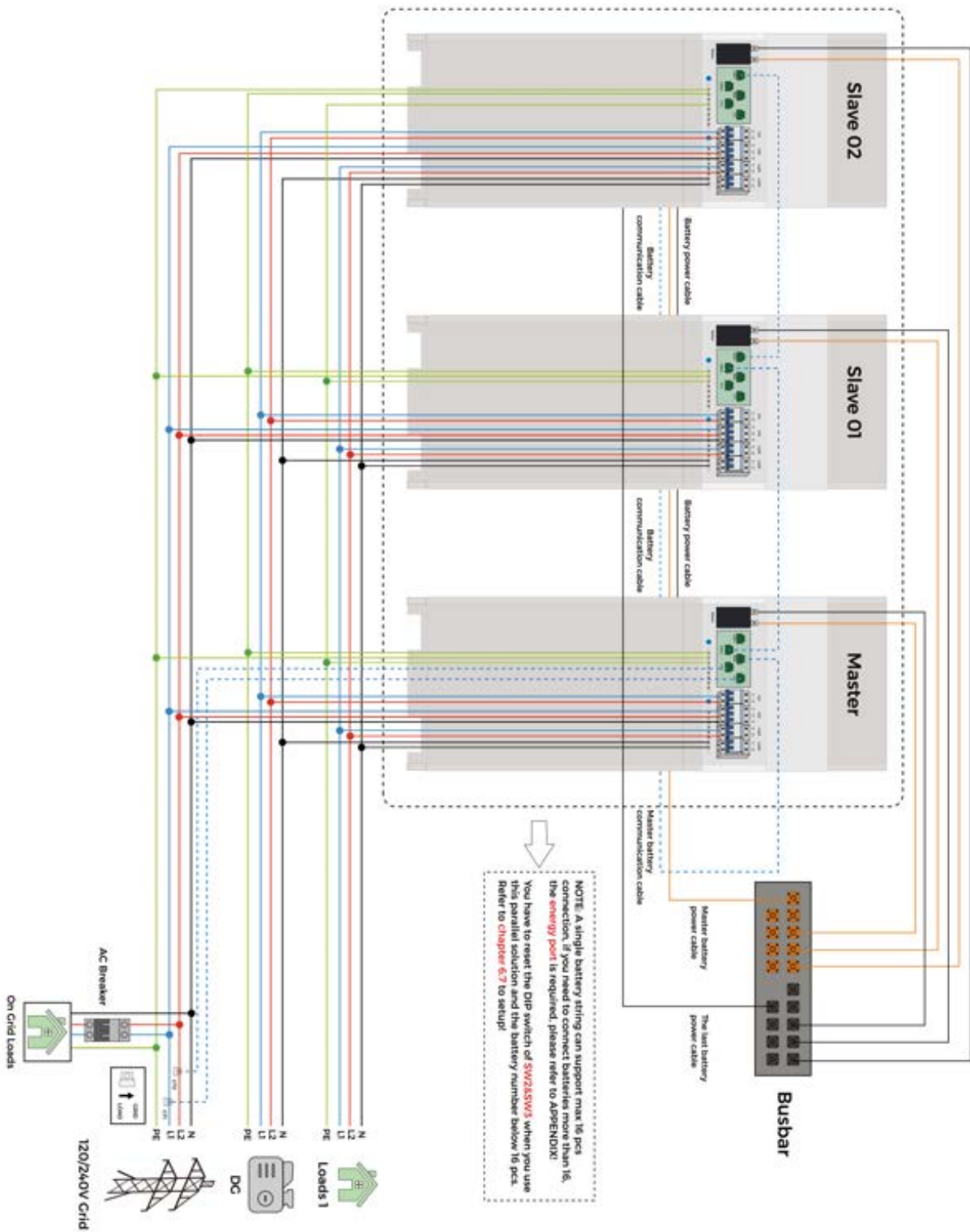
Make sure the CT Limiter sensor is installed properly. If the load is connected outside the inverter, user need to choose common ct and make sure the CT ratio is right(the default 90A ct ratio is 1:1000, no need to change). The common ct is only needed to be connected to the master inverter.

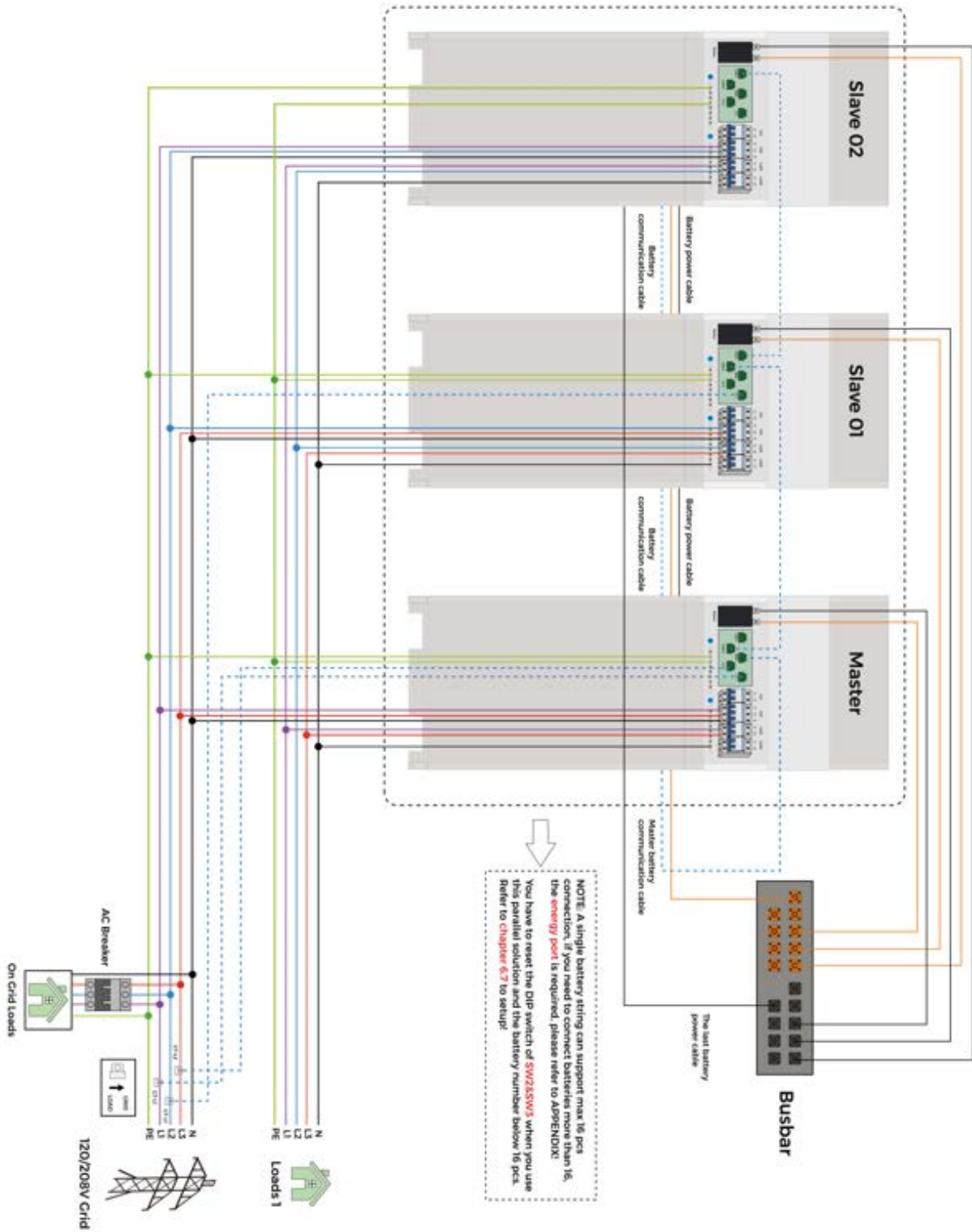
Please check the master and slaver's setting by APP and make sure all the setting are same.

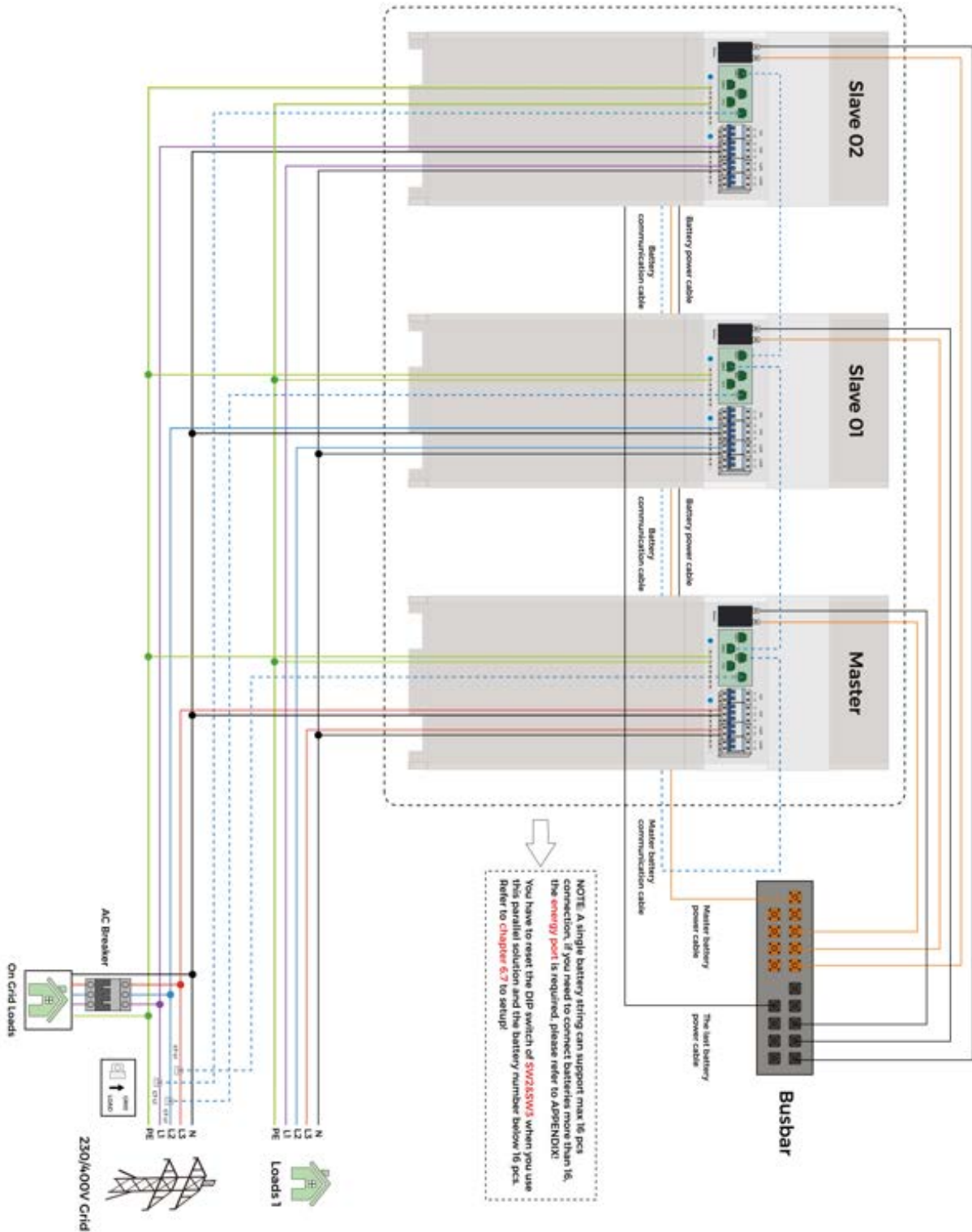
Note

Check out the attachment for more details.

9.1 Split Phase (120/240Vac) Parallel Connection







10. Operating of the All in one Device

10.1 Monitoring System

ATG monitoring platform support both APP and web monitoring, user can monitor detailed running information like generating capacity, system data, and send command, set parameters.

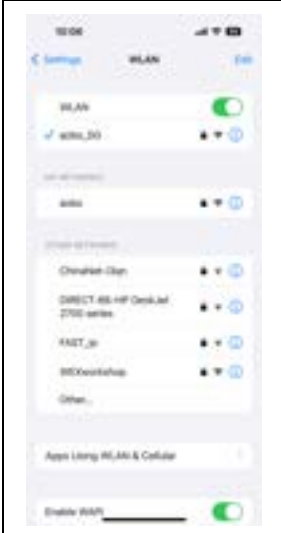


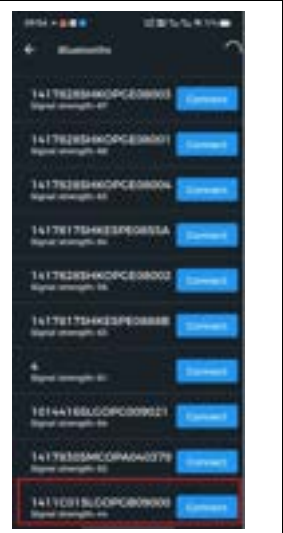
10.1.1 Software Download

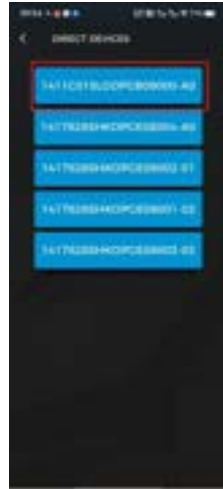
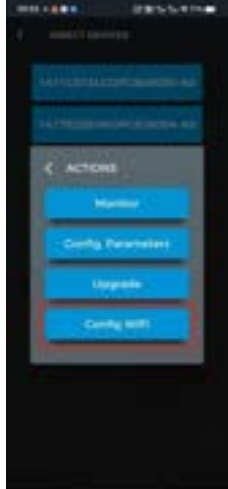

APP: Download APP by searching "ATG" in Google Play or Apple App Store

Web: www.atgepower.com








10.2 WIFI Configuration

			
<p>1. Connect your phone to local 4G WIFI</p>	<p>2. Open APP-Direct Conn</p>	<p>3. Click ESP Ble</p>	<p>4. Click corresponding SN and connect</p>

			
<p>5. Click corresponding SN</p>	<p>6. Click Config WIFI</p>	<p>7. Enter password of local 4G WIFI. Select Broadcast and click start BLE Config</p>	



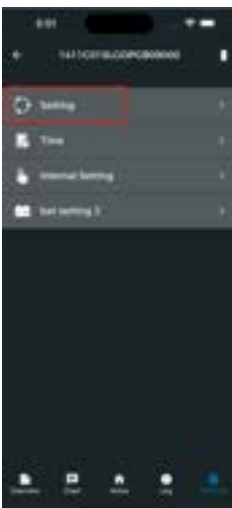

10.3 Mode Setting








			
<p>1. Login your account, click inverter</p>	<p>2. Enter your device SN and click in</p>	<p>3. Setting</p>	<p>4. Setting Section</p>

			
5. Set the work mode			

10.4 Generator Setting



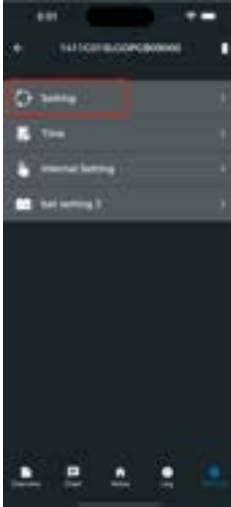
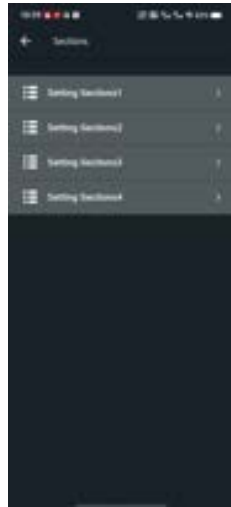


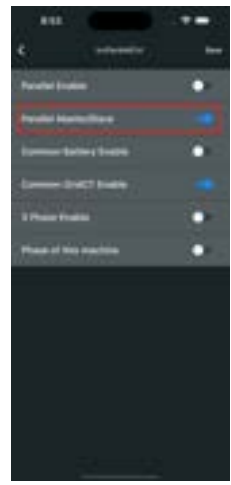

Note
<ol style="list-style-type: none"> 1. The two wires start signal DRYO_1A and DRYO_1B of the Generator is used to automatically control the start and stop of the Generator. 2. Make sure the inverter units software version support Generator function. 3. When the generator is used in inverter parallel situation, the two wires start signal is only needed to be connected to the master unit. The wiring and the setting of the Generator should be exactly same. 4. Please check the diagram above(6.3).

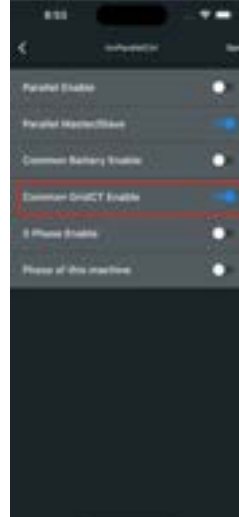


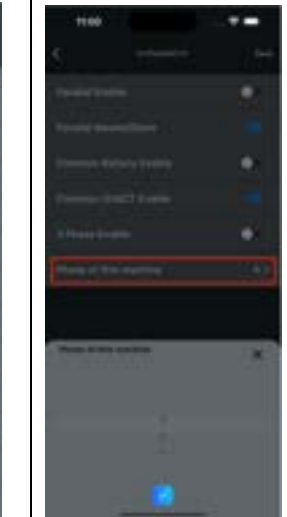



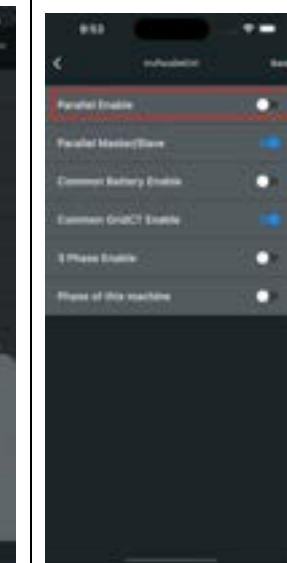
			
1. Login your account, click inverter	2. Enter your device SN and click in	3. Setting	4. Setting Section

			
<p>5. Set the minimum battery capacity when the generator starts and the maximum battery capacity when it stops</p>	<p>6. It indicates the maximum current that the inverter charges the battery from Generator</p>	<p>7. The maximum time the generator can run in a day, when the time is up, the generator will be shut down</p>	<p>8. It indicates the waiting time of the Generator to restart after it has reached the running time</p>
			
<p>9. Rated power of Generator</p>	<ol style="list-style-type: none"> 1. Enable control of the Generator function 2. Generator Charge Enable control 3. If this function is enabled, the dry contact of the generator automatically open and closes when the SOC of the battery reaches the SOC setting value of the generator startup, thus controlling the automatic startup of the generator. If this function is disabled, manually start the generator 4. Reservation 5. When enabled, the generator can be manually started 6. Connect the diesel Generator to the grid input port 		

10.5 Parallel Inverters Operation Setting

Note
Make sure all the units in parallel are with the same software version.
A parallel warning maybe occur because of the following reasons: 1. Wrong setup of the parallel number. 2. Wrong inter-unit parallel communication cable. 3. Wrong setup of the unit address.

			
1. Login your account, click inverter	2. Enter your device SN and click in	3. Setting	4. Setting Section
			
5. Select the number of parallel machines	6. This interface is used for parallel, and the inverter is selected as the master or slave. 0: Master 1: Slave		7. Set the master and slave address one by one, the master inverter is 1

			
<p>8. Enable or disable CT sharing.</p>	<p>9. Enable or disable group 3 phase enable when you apply your system in three phase environment</p>	<p>10. Set the dis/charge current of battery</p>	<p>11. This interface is used to select the output phase of the device when three phases are used. (Reserved function).</p>
			
<p>12. If you have battery connected, activate this feature.</p>	<p>13. Grid Standard</p>	<p>14. Power Grid Settings</p>	<p>15. Parallel enable</p>

Note




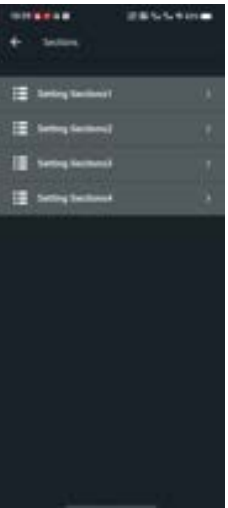

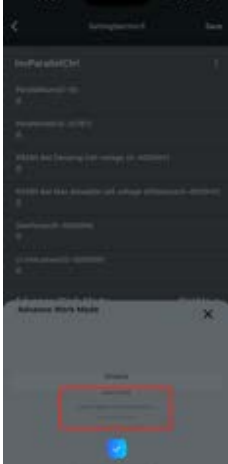
If you need to assemble the split phase inverter into three phases system (120V/208V), please make the following settings:

1. 3 PHASE EN; 2. PARALLEL EN; 3. PHASE Selection; 4. Grid Standard (United States); 5. Power Grid Settings(US 208V); 6. Master/slave selection; 7. Number of parallel machines; 8. ADDRESS.


2. If you need to use a single phase assemble a three-phase (230V/240V), please make the following settings:

1. 3PHASE EN;
2. PHASE Selection;
3. Grid standard(South Africa);
4. Power Grid Settings(Split Phase);
5. Master/slave selection;
6. Number of parallel machines;
7. ADDRESS.(Do not PARALLEL Enable and COMMON CT Enable)

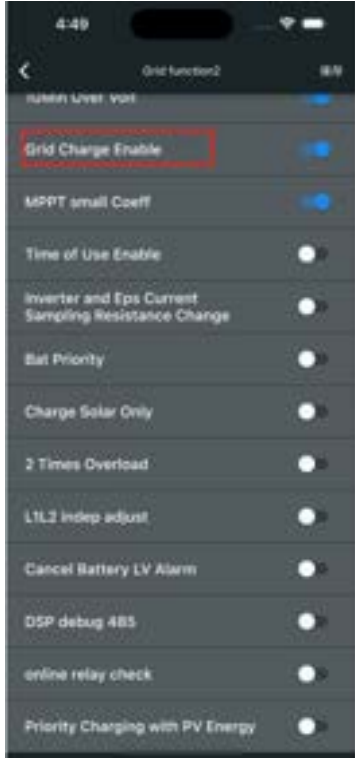

10.6 Advanced Mode

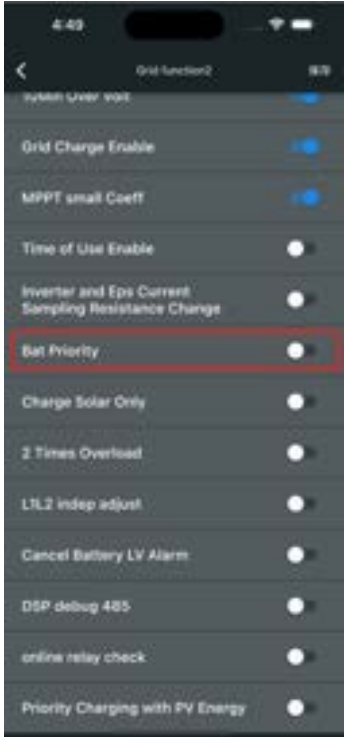
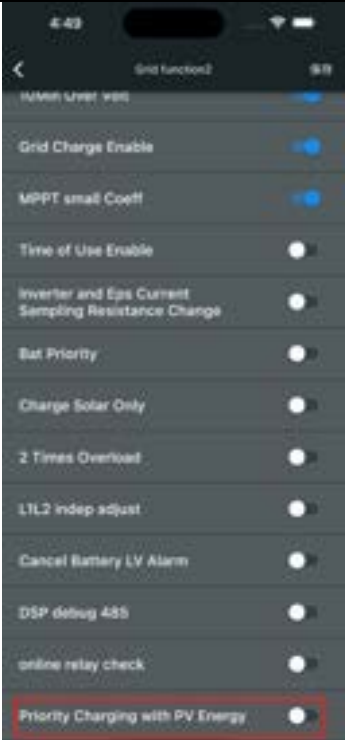
			
<p>1. Login your account, click inverter</p>	<p>2. Enter your device SN and click in</p>	<p>3. Setting</p>	<p>4. Setting Section</p>
			
<p>5. Select advanced work mode</p>	<p>6. Set the mode as you want</p>		


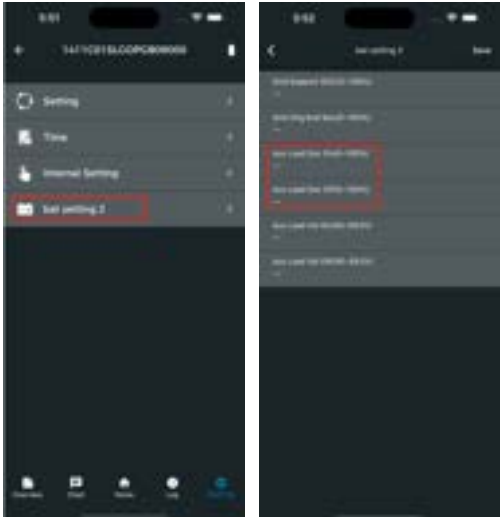
There are three advanced modes available: **sell first/limit grid consumption/zero export.**

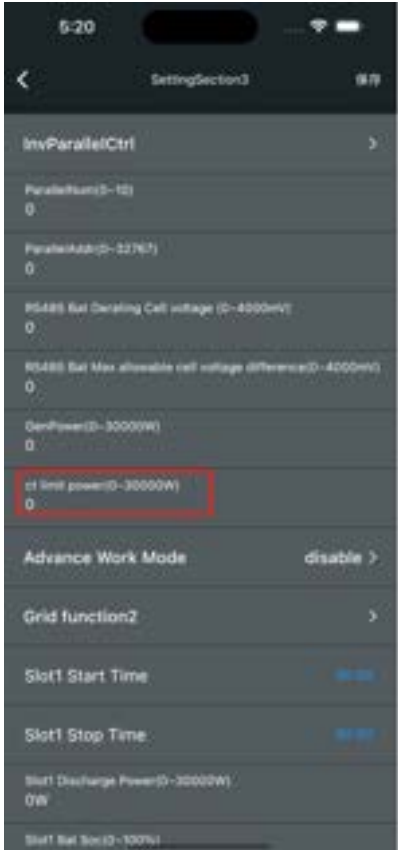
	Mode	Description
	Sell First	<p>Auto start. The battery power can be sold out to the grid under TOU control.</p> <p>When TOU is enable: Within the time period: charge and discharge the grid according to the specified time and specific power, regardless of power consumption. Outside the time slot. The grid cannot charge the battery, only the photovoltaic is allowed to charge the battery.</p> <p>When TOU is disable: Always charge the battery first, whether it is photovoltaic or grid. The battery will not discharge under on grid mode.</p>
	Limit Grid Consumption	<p>When the TOU is enabled: During the day: Photovoltaic power generation is given priority to the loads, and the remaining power is fed to the grid (the grid can be sold) or limited photovoltaic power generation (the grid cannot be sold). Outside the time slot. The grid cannot charge the battery, only the photovoltaic is allowed to charge the battery.</p> <p>During the night: When the battery capacity is available, the battery is discharged the power to loads. In areas with tiered tariffs, users can set quotas by set CT limit power and use part of the grid's electricity first.</p> <p>When TOU is disabled: Always charge the battery first, whether it comes from the grid or not. The battery does not discharge under on grid mode.</p>
	Zero Export	<p>Auto disabled.</p> <p>When the TOU is enabled: During the day: PV gives priority to the loads and battery power, automatically limiting the remaining power. The grid can be charged regularly. Outside the time period: the grid cannot charge the battery, only the photovoltaic is</p>

		<p>allowed to charge the battery.</p> <p>During the night: When the battery capacity is available, the battery is discharged the power to loads. You can set the work time slots of grid.</p> <p>When the TOU is enabled: Always charge the battery first, whether it is photovoltaic or grid. The battery will not discharge under on grid mode.</p>
--	--	---

Attributes	Description
	<p>It is an advanced control attribute enabled for grid charging. If the TOU function is disabled, this property is used to determine whether to charge the battery according to the grid. If TOU function is enabled, the battery can be charged on the grid only during the time period.</p>
	<p>If at any time the user does not want to use the grid to charge the battery, enable this property</p>

	<p>In the event of a storm or other emergency, users can use this property to adjust power distribution priorities. If this property is disabled, the PV is powered to the load first by default.</p>
	<p>The photovoltaic energy is provided preferentially to the battery, and the excess is provided to the load. When the energy of photovoltaic is insufficient, it is supplemented by the grid. This priority is the highest.</p>

	<p>There are 6 slots are available. If grid /generator charge is enable, the grid is used to power the load and charge the battery to target SOC at specific bat power up to a specified SOC value.</p>
	<p>Set the SOC value of the LOAD 2 startup; Set the SOC value of the LOAD 2 stop.</p>

	<p>Set limited power from grid under limit grid consumption.</p>
--	--

11. Fault Diagnosis and Solutions

Content	Codes	Explanation	Solutions
discharge over current	00	Battery discharge over current. When the battery is loaded, the load is too large.	<ul style="list-style-type: none"> (1) Nothing needs to do, wait one minute for the inverter to restart. (2) Check whether the load is in compliance with the specification. (3) Cut off all the power and shut down all the machines; disconnect the load and plug in to restart machines, then check.
over load	01	The load power is greater than other power(PV,BAT).	<ul style="list-style-type: none"> (1) Check whether the load is in compliance with the maximum power of the machine. (2) Cut off all the power and shut down all the machines; disconnect the load and plug in to restart machines, then check

			<p>whether the load is short circuited if the fault has been eliminated.</p> <p>(3) Contact customer service if error warning continues.</p>
bat disconnect	02	Battery Disconnect.(Battery voltage not identified)	<p>(1) Check whether the battery is connected.</p> <p>(2) Check if battery wiring port is open circuited.</p> <p>(3) Contact customer service if error warning continues.</p>
bat under vol	03	Battery voltage is lower than normal range.	<p>(1) Checking System Settings, If so, power off and restart.</p> <p>(2) Check if the grid power down. If so, waiting for the grid power up, the inverter will automatically charge.</p> <p>(3) Contact customer service if error warning continues.</p>
bat low capacity	04	Bat Low capacity	(1)Battery is Lower than setting capacity.(SOC<100%-DOD)
bat over vol	05	The battery voltage is greater than the Inverter maximum voltage.	<p>(1) Checking System Settings, If so, power off and restart.</p> <p>(2) Contact customer service if error warning continues.</p>
grid low vol	06	Grid voltage is abnormal.	(1) Check if the grid is abnormal.
grid over vol	07		<p>(2) Restart the inverter and wait until it functions normally.</p> <p>(3) Contact customer service if error warning continues.</p>
grid low freq	08	Grid Frequency is abnormal.	(1) Check if the grid is abnormal.
grid over freq	09		<p>(2) Restart the inverter and wait until it functions normally.</p> <p>(3) Contact customer service if error warning continues.</p>
gfcı over	10	Inverter GFCI exceeds standard.	<p>(1) Check PV string for direct or indirect grounding phenomenon.</p> <p>(2) Check peripherals of machine for current leakage.</p> <p>(3) Contact the local inverter</p>

			customer service if fault remains unremoved.
bus under vol	13	BUS voltage is lower than normal.	(1) Check the input mode setting is correct. (2) Restart the inverter and wait until it functions normally (3) Contact customer service if error warning continues.
Bus over vol	14	BUS voltage is over maximum value.	(1) Check the input mode setting is correct. (2) Restart the inverter and wait until it functions normally.
Inv over cur	15	The inverter current exceeds the normal value.	(1)Restart the inverter and wait until it functions normally.
Chg over cur	16	Battery charge current over than the inverter maximum voltage.	(1)Restart the inverter and wait until it functions normally.
Bus vol osc	17	Bus voltage instability.	(1) Check the input and output mode setting is correct. (2) Restart the inverter and wait until it functions normally.
Inv under vol	18	Inv voltage is abnormal	(1) Check if the Inv voltage is abnormal. (2) Restart the inverter and wait until it functions normally. (3) Contact customer service if error warning continues.
Inv over vol	19		
Inv Freq Abnor	20	Inv frequency is abnormal	(1) Check if the inv frequency is abnormal. (2) Restart the inverter and wait until it functions normally. (3) Contact customer service if error warning continues.
Igbt temp high	21	The inverter temperature is higher than the allowed value.	(1)Cut off all the power of the machine and wait one hour, then turn on the power of the machine.
Bat over temp	23	Battery temperature is higher than the allowed value.	(1)Disconnect the battery and reconnect it after an hour.
Bat under temp	24	Battery temperature is lower than the allowed value.	(1)Check the ambient temperature near the battery to see if it meets the

			specifications.
BMS comm fail	27	Communication between lithium battery and inverter is abnormal.	(1) Check the cable, crystal, line sequence. (2) Checking the Battery switch.
Fan fail	28	Fan fails.	(1) Check whether the inverter temperature is abnormal. (2) Check whether the fan runs properly.(If you can see it)
Grid Phase err	30	The grid fault phase.	(1)Check power grid wiring.
Arc Fault	31	PV Arc Fault	(1) Check Photovoltaic panels,PV wire. (2) Contact customer service if error warning continues.
Bus soft fail	32	The inverter may be damaged.	(1) Restart the inverter and wait until it functions normally. (2) Contact customer service if error warning continues.
Inv soft fail	33		
Bus short	34		
Inv short	35		
Fan fault	36	Fan fault.	(1) Check whether the inverter temperature is abnormal. (2) Check whether the fan runs properly.(If you can see it)
Pv iso low	37	PV iso low	(1) Check if the PE line is connected to the inverter and is connected to the ground. (2) Contact customer service if error warning continues.
Bus relay fault	38	The inverter may be damaged.	(1) Restart the inverter and wait until it functions normally. (2) Contact customer service if error warning continues.
Grid relay fault	39		
Eps rly fault	40		
Gfci fault	41		
Selftest fail	44		
System fault	45		
Current DCover	46		
Voltage DCover	47		



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