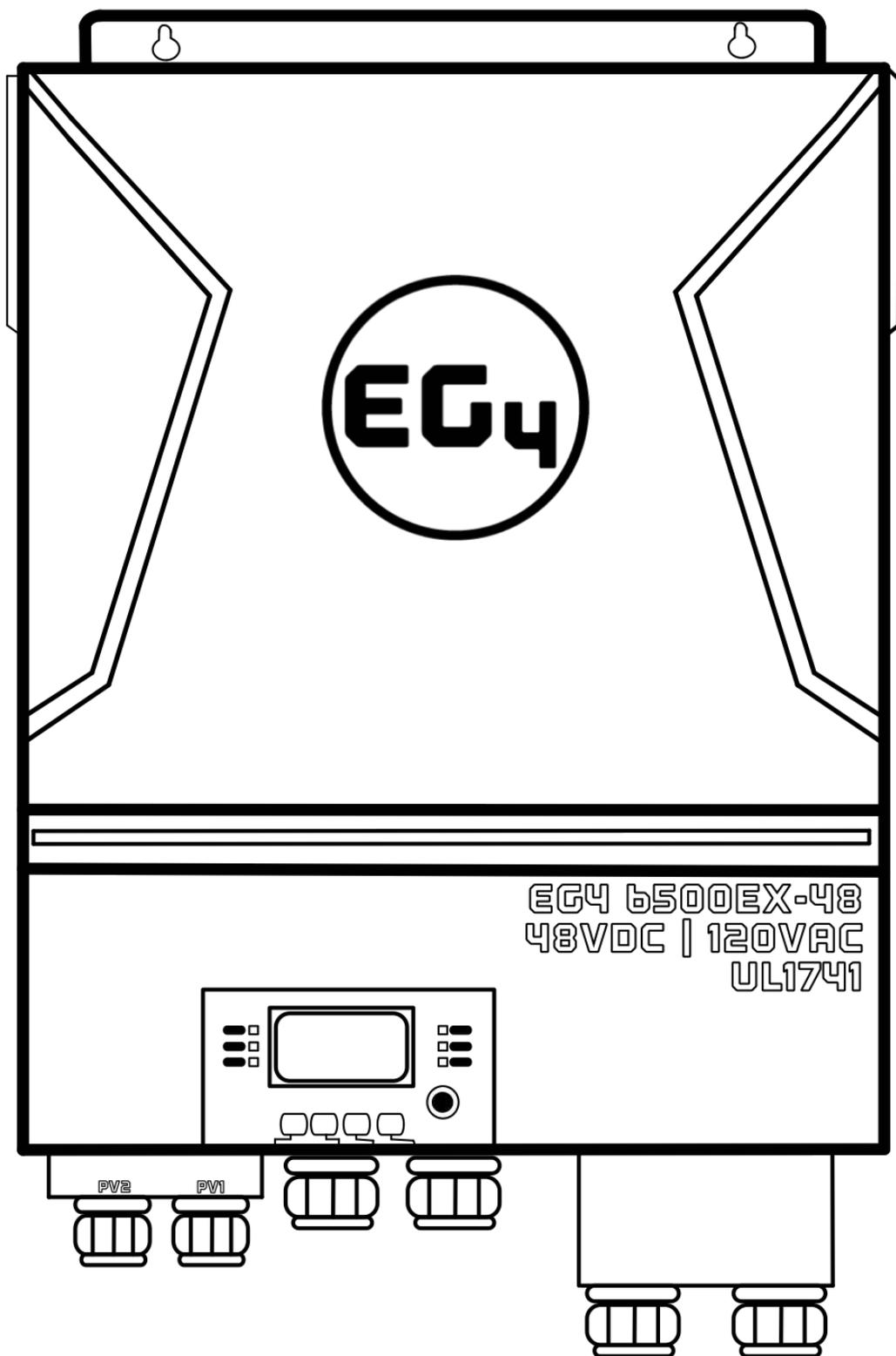
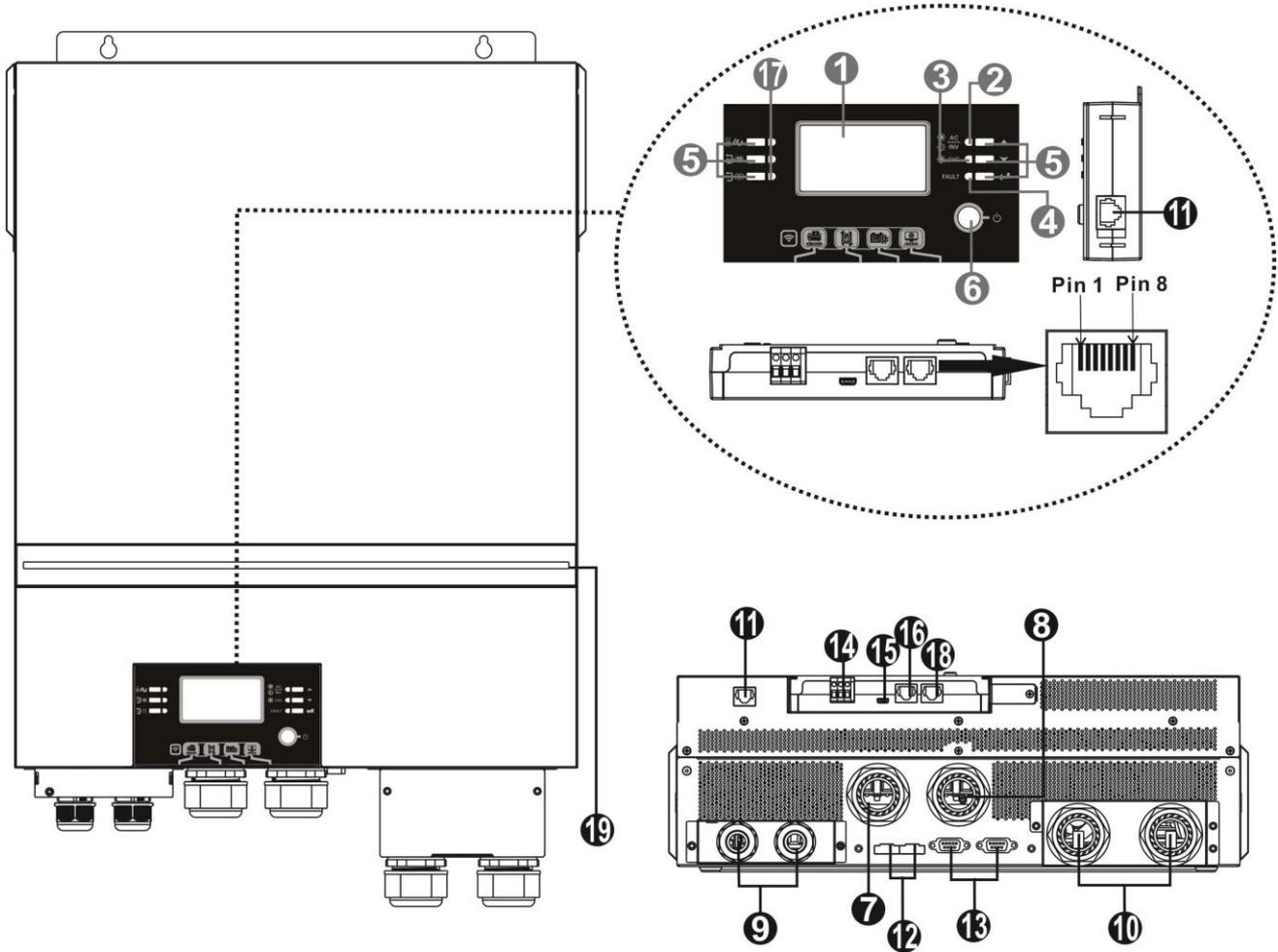


Quick Start Guide

EG4 6500 EX-48
SOLAR INVERTER/CHARGER
6.5KVA 120Vac



Product Overview



NOTE: 6.5KW is a parallel model. For parallel installation and operation, please check *Appendix I*.

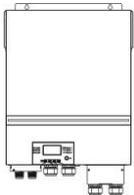
- | | |
|---|---|
| 1. LCD display | 12. Current sharing port |
| 2. Status indicator | 13. Parallel communication port |
| 3. Charging indicator | 14. Dry contact |
| 4. Fault indicator | 15. USB port as USB communication port and USB function port |
| 5. Function buttons | 16. BMS communication port: CAN, RS-485 or RS-232 |
| 6. Power on/off switch | 17. Output source indicators (refer to OPERATION/Operation and Display Panel section for details) and USB function setting reminder (refer to OPERATION/Function Setting for the details) |
| 7. AC input connectors | 18. RS-232 communication port |
| 8. AC output connectors (Load connection) | 19. RGB LED bar (refer to LCD Setting section for the details) |
| 9. PV terminal | |
| 10. Battery connectors | |
| 11. Remote LCD module communication Port | |

NOTE: For parallel model installation and operation, please check the parallel installation guide (pg. 47) for details.

INSTALLATION:

Unpacking and Inspection

Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. You should have received the following items:



Inverter unit



Manual



software CD



RS-232 cable



Parallel communication cable



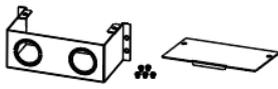
Current sharing cable



DC Fuse



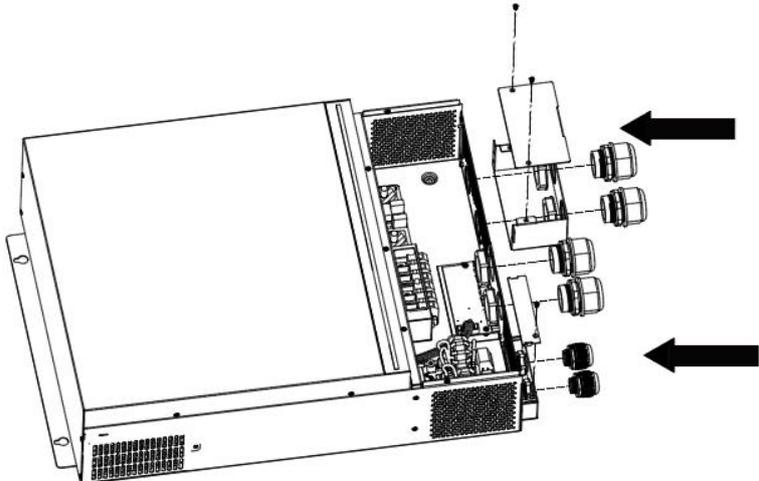
Cable gland x 4 pcs



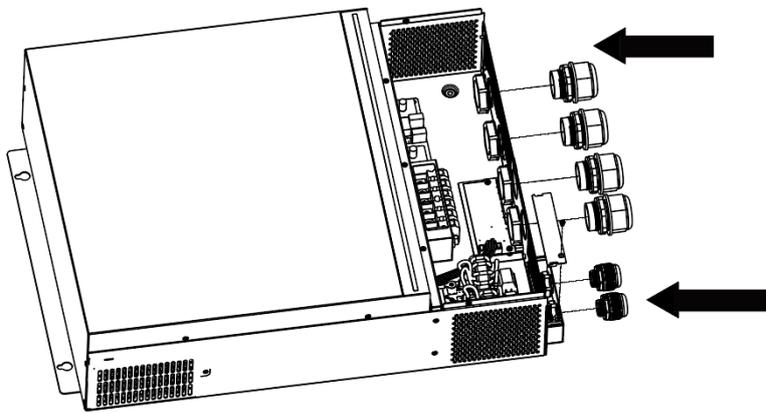
Extension Box Kit

Installation of Battery Wiring Extension Box and Cable Glands

Install two cable glands on the extension box, then fix the extension box on the rear panel of the inverter. *Note: Installation of the battery wiring extension box is necessary for UL conformity. If UL conformity is not required in your region, it is sufficient to only install the cable glands (Graphic 2) shown below.*



Graphic 1



Graphic 2

AC Input/Output Connection

CAUTION!! Before connecting to AC input power source, please install a **separate** AC breaker between the inverter and AC input power source. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current of AC input.

CAUTION!! There are two terminal blocks with "IN" and "OUT" markings. Please do NOT mis-connect input and output connectors.

WARNING! All wiring must be performed by a qualified personnel.

WARNING! It is very important for system safety and efficient operation to use appropriate cable for AC input connection. To reduce risk of injury, please use the proper recommended cable size below.

Suggested cable requirement for AC wires

Model	Gauge	Torque Value
6.5KW	4 AWG	1.4~ 1.6Nm

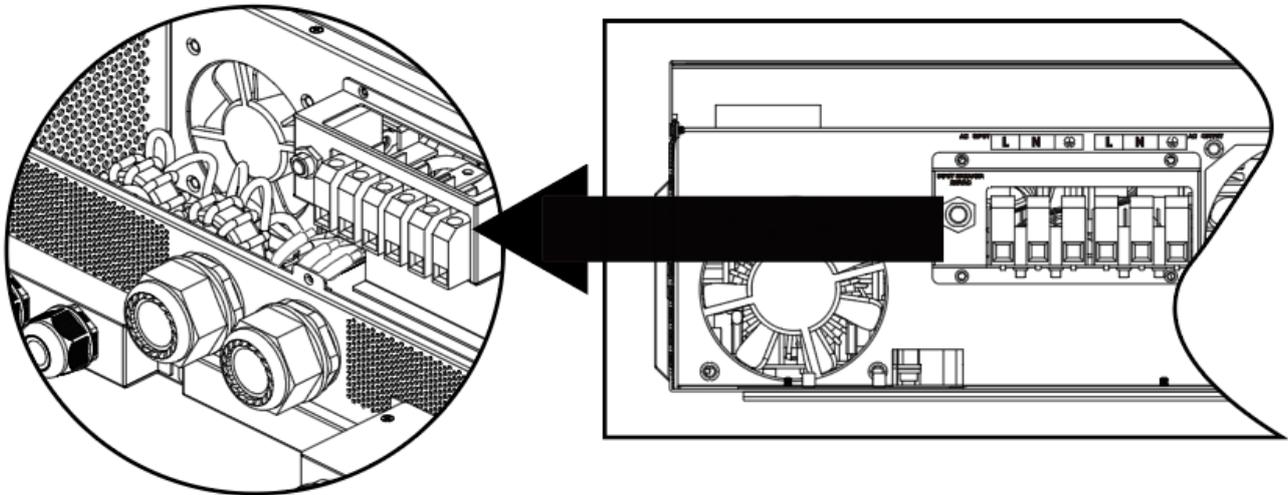
Please follow below steps to implement AC input/output connection:

1. Before making AC input/output connection, be sure to open DC protector or disconnecter first.
2. Remove insulation sleeve 10mm for six conductors. And shorten phase L and neutral conductor N 3 mm.
3. Fix two cable glands into input and output sides.
4. Insert AC input wires according to polarities indicated on terminal block and tighten the terminal screws. Be sure to connect PE protective conductor (⊕) first.

⊕ → **Ground (yellow-green)**

L → **LINE (brown or black)**

N → **Neutral (blue)**

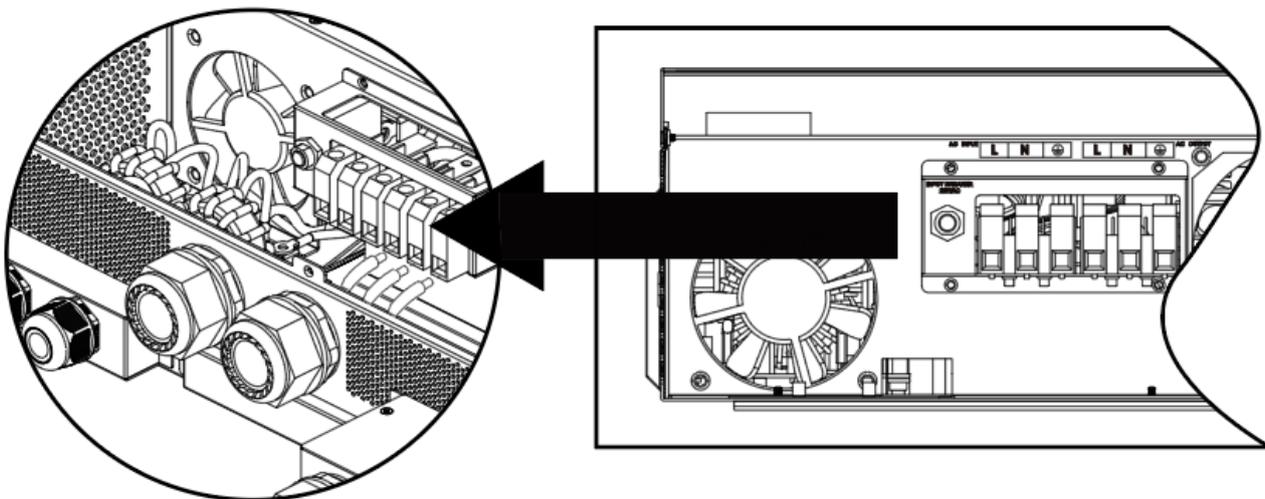


WARNING:

Be sure that the AC power source is disconnected before attempting to hardwire it to the unit.

5. Then, insert AC output wires according to polarities indicated on terminal block and tighten terminal screws.
Be sure to connect PE protective conductor (⊕) first.

⊕ → **Ground (yellow-green)**
L → **LINE (brown or black)**
N → **Neutral (blue)**



6. Make sure the wires are securely connected.

CAUTION: Important

Be sure to connect AC wires with correct polarity. If L and N wires are connected reversely, it may cause utility to short-circuit when these inverters are in parallel operation.

CAUTION: Appliances such as air conditioners require at least 2~3 minutes to restart because it's necessary to have enough time to balance refrigerant gasses inside of circuits. If a power outage occurs and recovers in a short time, it will cause damage to your connected appliance. To prevent this kind of damage, please check with the manufacturer of the air conditioner to see if it is equipped with time-delay function before installation. Otherwise, this inverter/charger will trigger an overload fault and shut off output to protect your appliance however sometimes it still causes internal damage to the air conditioner.

PV Connection

CAUTION: Before connecting to PV modules, please install **separate** DC circuit breakers between inverter and PV modules.

*NOTE: Please use 600VDC/30A circuit breaker. The over voltage category of the PV input is II.
Please follow the steps below to implement PV module connection*

WARNING: Because this inverter is non-isolated, only three types of PV modules are acceptable: monocrystalline and polycrystalline with class A-rated and CIGS modules.
To avoid any malfunction, do not connect any PV modules with possible current leakage to the inverter. For example, grounded PV modules will cause current leakage to the inverter. When using CIGS modules, please be sure NOT to ground.

CAUTION: It is required to use PV junction box with surge protection. Otherwise, it will cause damage to the inverter when lightning occurs on PV modules.

Step 1: Check the input voltage of PV array modules. This system is applied with two strings of PV array. Please make sure that the maximum current load of each PV input connector is 18A.

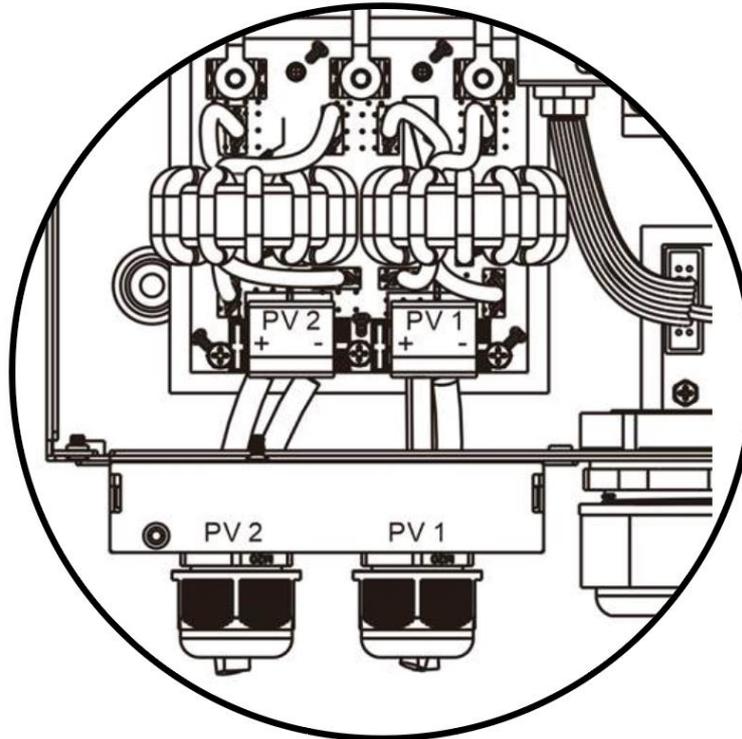
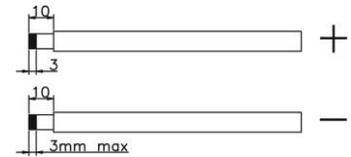
CAUTION: Exceeding the maximum input voltage can destroy the unit!! Check the system before wire connection.

Step 2: Disconnect the circuit breaker and switch off the DC switch.

Step 3: Assemble PV terminals with PV modules by the following steps.

Please follow below steps to implement PV module connection:

1. Remove insulation sleeve 10 mm for positive and negative conductors.
2. Check correct polarity of connection cable from PV modules and PV input connectors. Then, connect positive pole (+) of connection cable to positive pole (+) of PV input connector. Connect negative pole (-) of connection cable to negative pole (-) of PV input connector.



3. Make sure the wires are securely connected.

Recommended Panel Configuration

When selecting proper PV modules, please be sure to consider the following parameters:

1. Open circuit Voltage (Voc) of PV modules not to exceed maximum PV array open circuit voltage of the inverter.
2. Open circuit Voltage (Voc) of PV modules should be higher than the start-up voltage.

INVERTER MODEL	6.5KW
Max. PV Array Power	8000W
Max. PV Array Open Circuit Voltage	500Vdc
PV Array MPPT Voltage Range	90Vdc~450Vdc
Start-up Voltage (Voc)	80Vdc

Example solar panel configuration for 6.5KW model:

Solar Panel Spec. (reference)	SOLAR INPUT 1	SOLAR INPUT 2	Q'ty of panels	Total Input Power
	Min in series: 3pcs, per input Max. in series: 12pcs, per input			
- 330Wp	3pcs in series	x	3pcs	990W
- Vmp: 33.7Vdc	x	3pcs in series	3pcs	990W
- Imp: 9.79A	6pcs in series	x	6pcs	1980W
- Voc: 39.61Vdc	x	6pcs in series	6pcs	1980W
- Isc: 10.4A	12pcs in series	x	12pcs	3960W
- Cells: 60	x	12pcs in series	12pcs	3960W
	6pcs in series	6pcs in series	12pcs	3960W
	6pcs in series, 2 strings	x	12pcs	3960W
	x	6pcs in series, 2 strings	12pcs	3960W
	6pcs in series, 2 strings	6pcs in series, 2 strings	24pcs	7920W

Appendix I: Parallel Function

1. Introduction

This inverter can be used in parallel with three different operation modes.

1. Parallel operation in single phase is with up to 6 units. The supported maximum output power is 39KW/39KVA.
2. Maximum six units work together to support split-phase equipment. 5 units support one phase maximum. The supported maximum output power is 39KW/39KVA and one phase can be up to 32.5KW/32.5KVA.

2. Mounting the Unit

When installing multiple units, please follow below chart.

NOTE: For proper air circulation to dissipate heat, allow a clearance of approx. 28in to the side and approx. 20in above and below the unit. Be sure to install each unit in the same level.

3. Wiring Connection

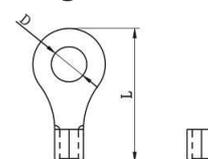
WARNING: It's REQUIRED to connect battery for parallel operation.

The cable size of each inverter is shown as below:

Recommended battery cable and terminal size for each inverter:

Model	Wire Size	Cable mm ²	Ring Terminal		Torque value
			Dimensions		
			D (mm)	L (mm)	
6.5KW	1*2/0AWG	67	8.4	47	5 Nm

Ring terminal:



WARNING: Be sure the length of all battery cables are the same. Otherwise, there will be voltage differences between inverter and battery causing paralleled inverters to not work.

Recommended AC input and output cable size for each inverter:

Model	AWG no.	Torque
6.5KW	4 AWG	1.4~ 1.6 Nm

You need to connect the cables of each inverter together. Take the battery cables for example: You need to use a connector or bus-bar as a joint to connect the battery cables together, and then connect to the battery terminal. The cable size used from joint to battery should be X times cable size in the tables above. ("X" indicates the number of inverters connected in parallel.)

Regarding AC input and output, please also follow the same principle.

CAUTION!! Please install the breaker at the battery and AC input side. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current of battery or AC input.

Recommended breaker specification of battery for each inverter:

Model	1 unit*
6.5KW	125A

* Recommended breaker size between batteries & inverter is 125A regardless of system size.

Recommended breaker specification of AC input with single phase:

Model	2 units	3 units	4-6 units
6.5KW	120A/120VAC	180A/120VAC	250A/120VAC

Note 1: Also, you can use 60A breaker for 6.5KW models with only 1 unit and install one breaker at its AC input in each inverter.

Note 2: Regarding three-phase system, you can use 4-pole breaker directly and the rating of the breaker should be compatible with the phase current limitation from the phase with maximum units

Recommended battery capacity

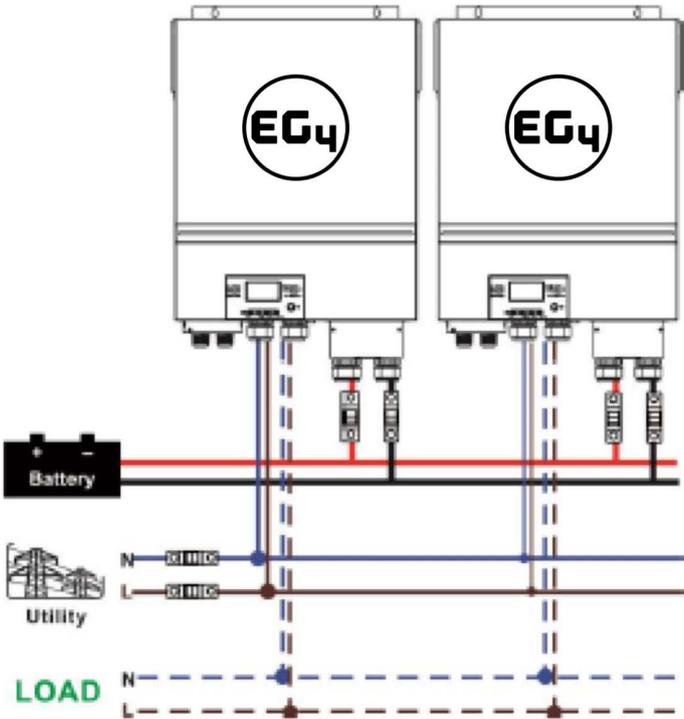
Inverter parallel numbers	2	3	4	5	6
Battery Capacity	200AH	400AH	400AH	600AH	600AH

WARNING! Be sure that all inverters will share the same battery bank. Otherwise, the inverters will transfer to fault mode.

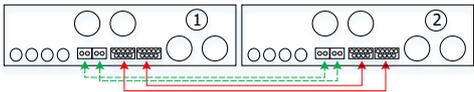
4-1. Parallel Operation in Single phase

Two inverters in parallel:

Power Connection

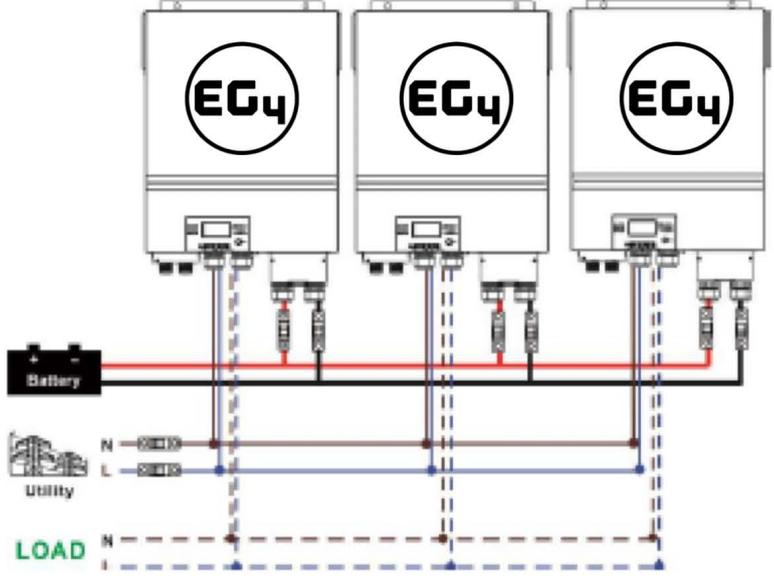


Communication Connection

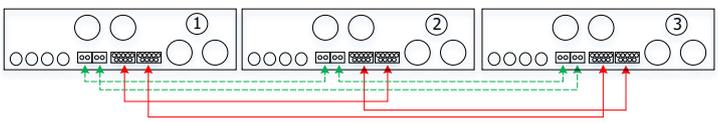


Three inverters in parallel:

Power Connection

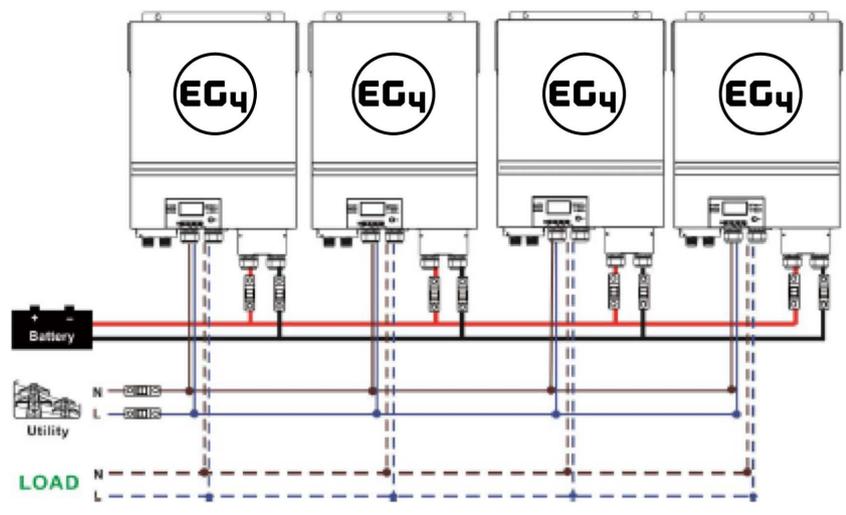


Communication Connection

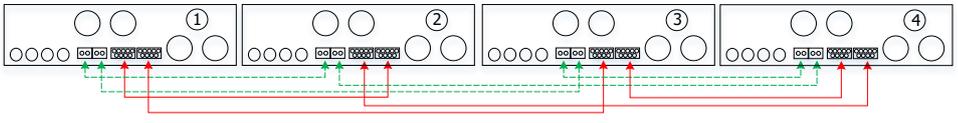


Four inverters in parallel:

Power Connection

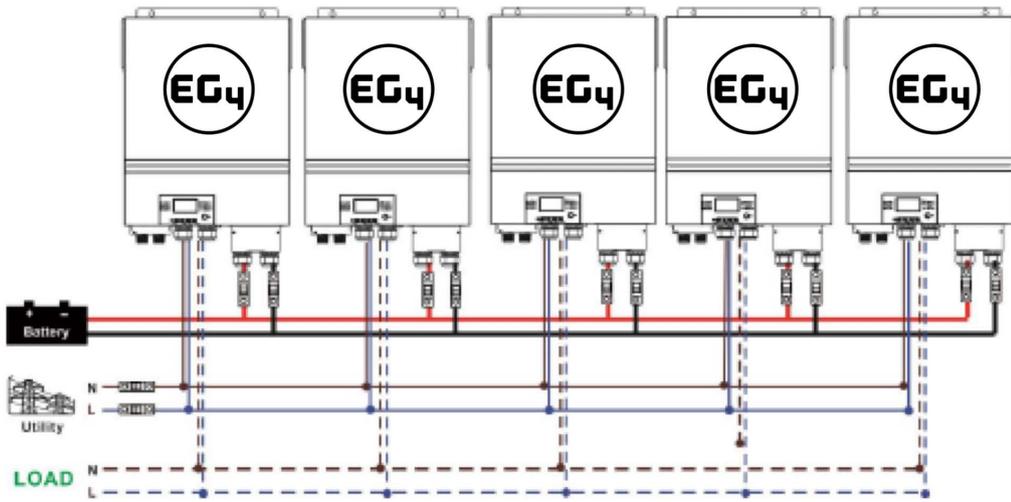


Communication Connection

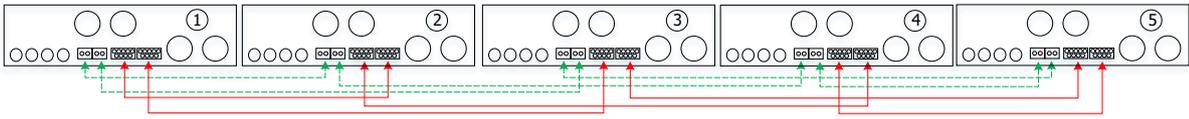


Five inverters in parallel:

Power Connection

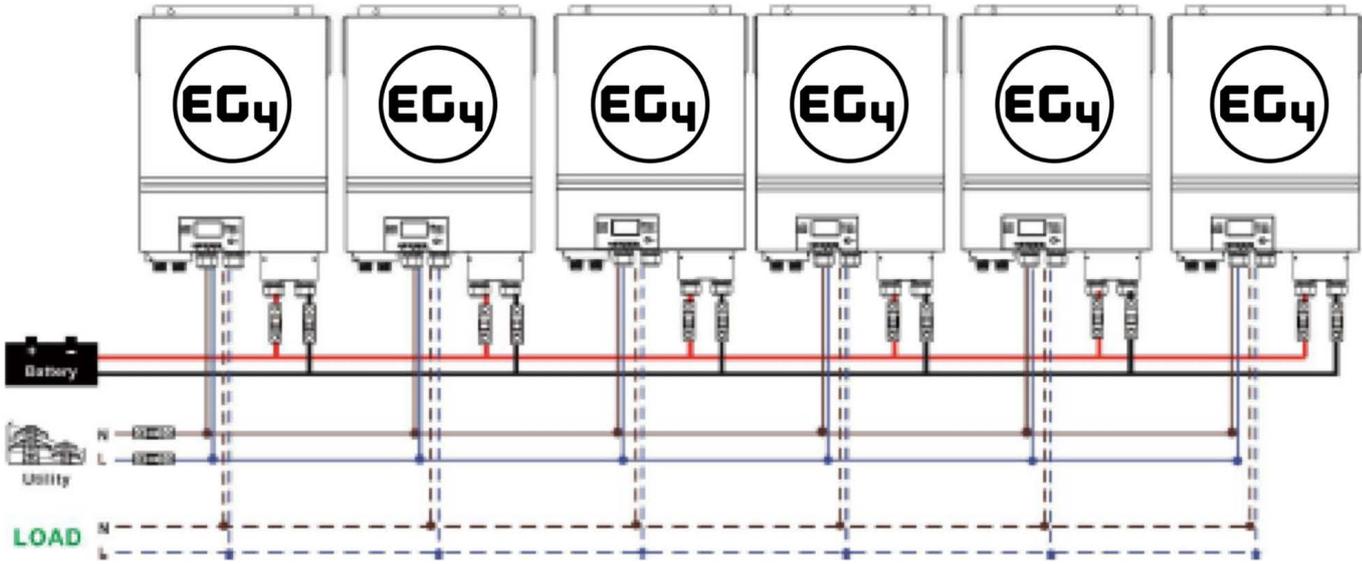


Communication Connection

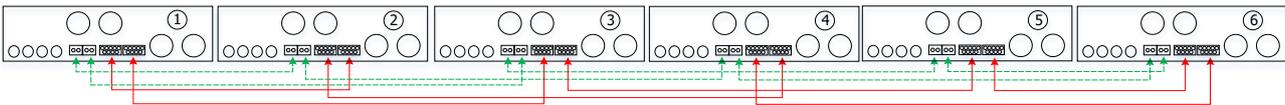


Six inverters in parallel:

Power Connection



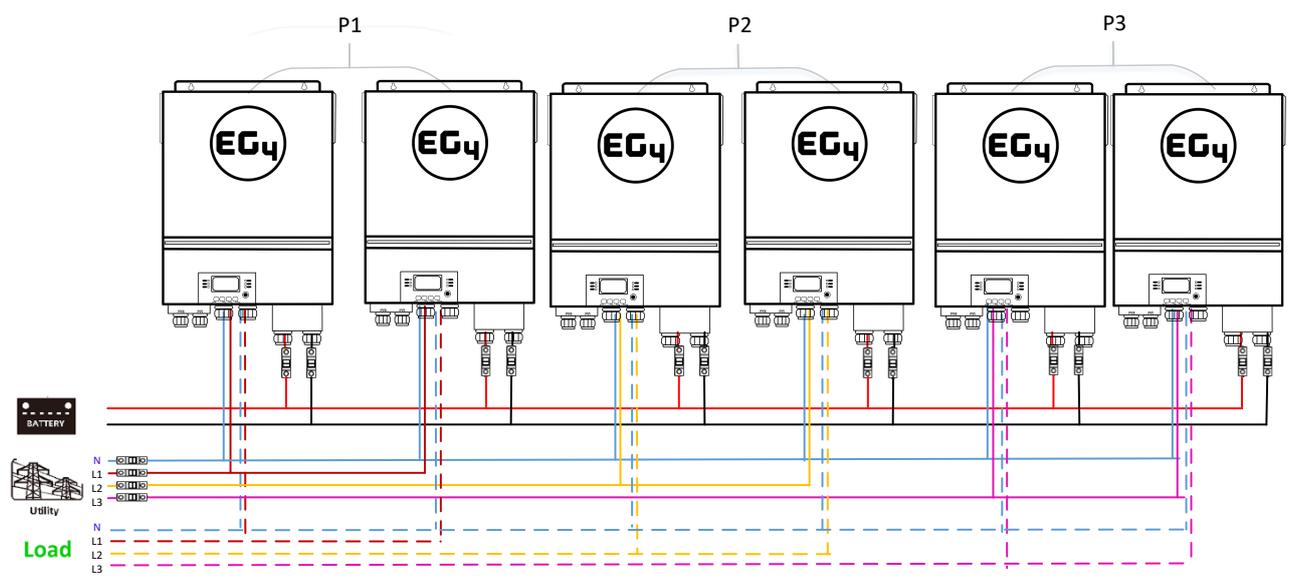
Communication Connection



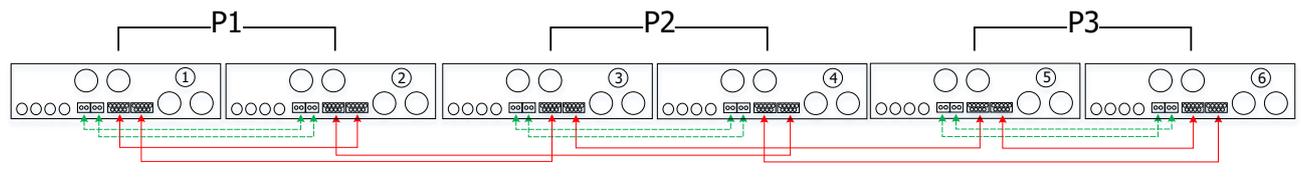
4-2. Support 3-phase equipment

Two inverters in each phase:

Power Connection

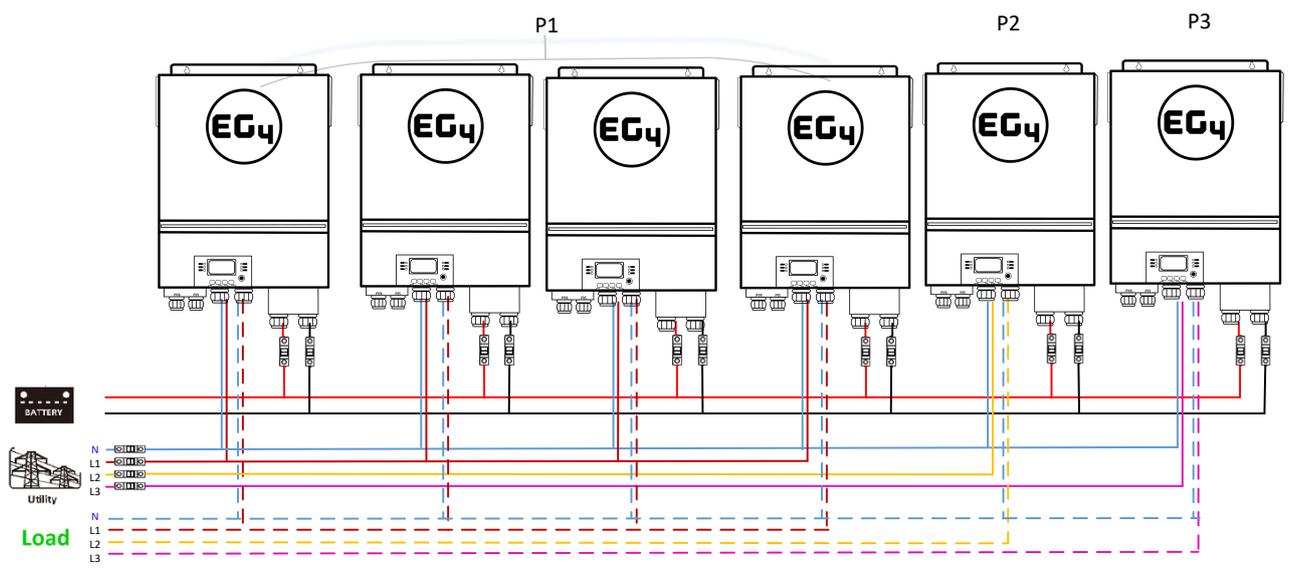


Communication Connection

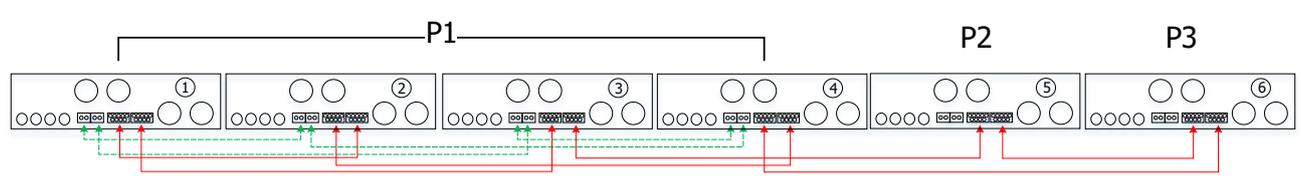


Four inverters in one phase and one inverter for the other two phases:

Power Connection

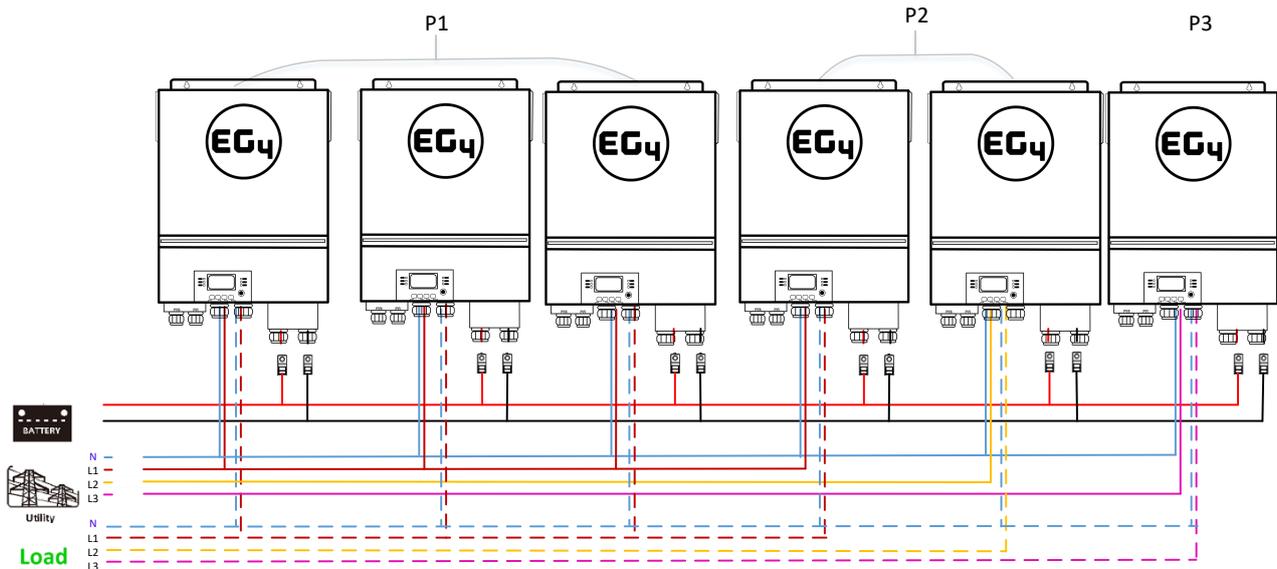


Communication Connection

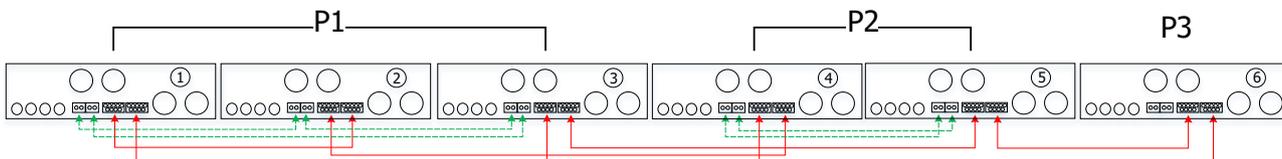


Three inverters in one phase, two inverters in second phase and one inverter for the third phase:

Power Connection

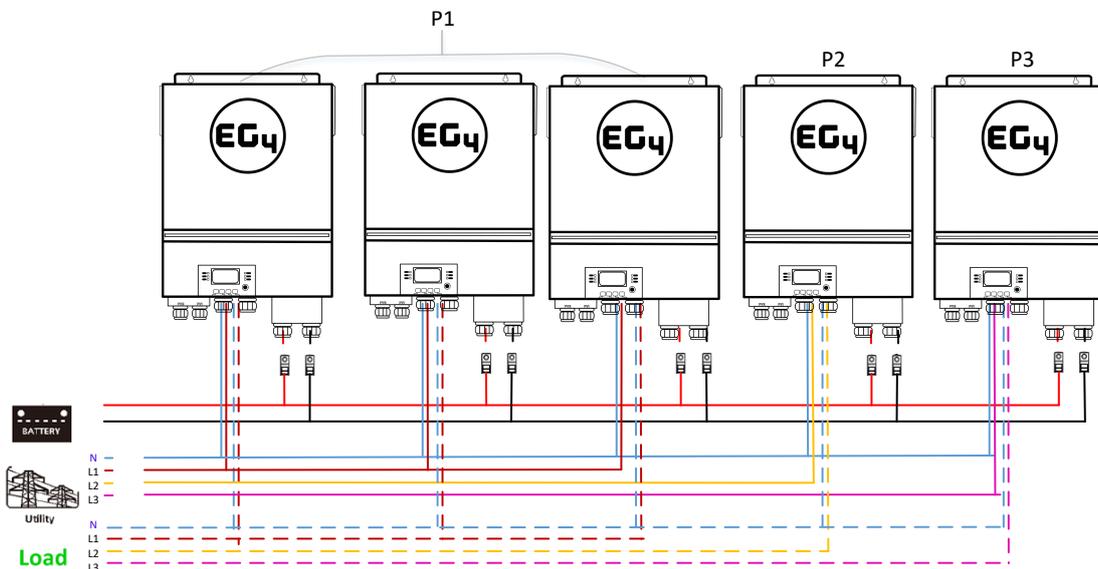


Communication Connection

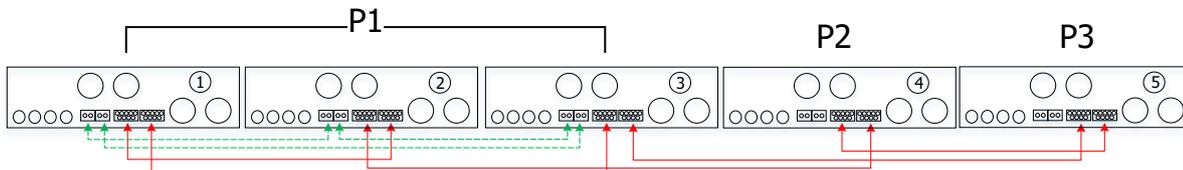


Three inverters in one phase and only one inverter for the remaining two phases:

Power Connection

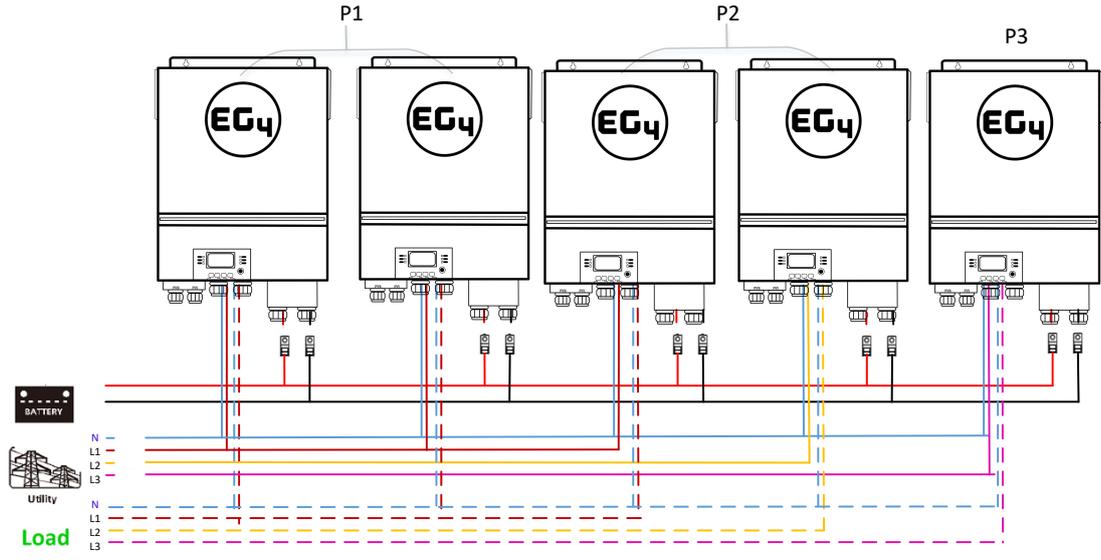


Communication Connection

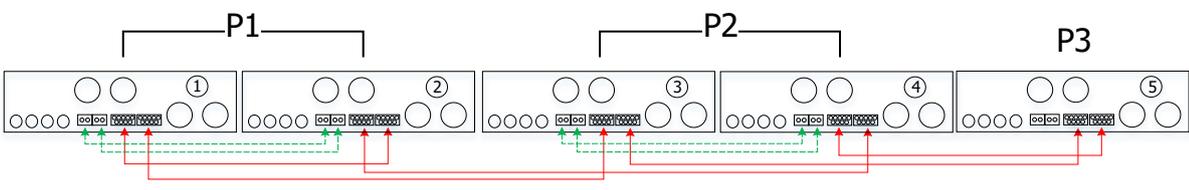


Two inverters in two phases and only one inverter for the remaining phase:

Power Connection

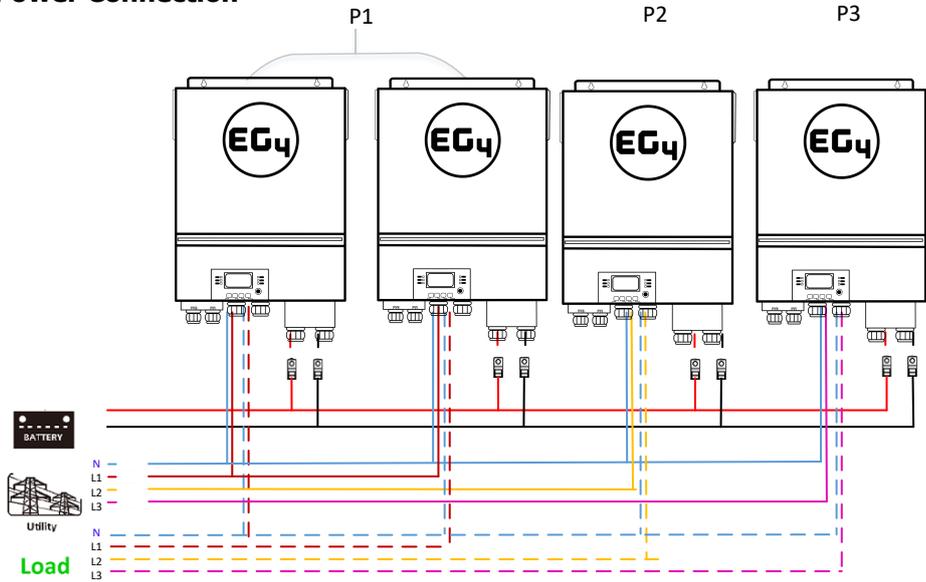


Communication Connection

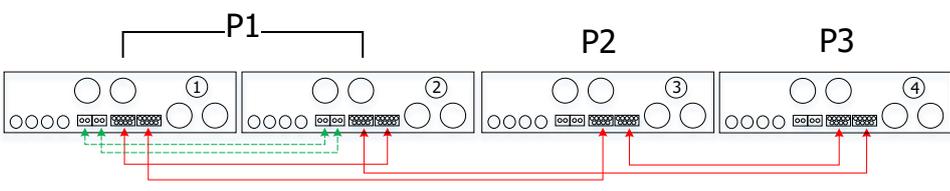


Two inverters in one phase and only one inverter for the remaining phases:

Power Connection

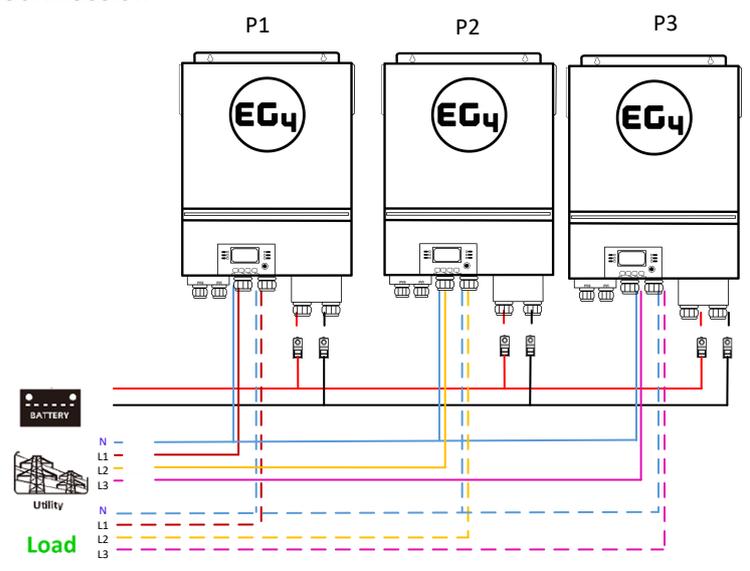


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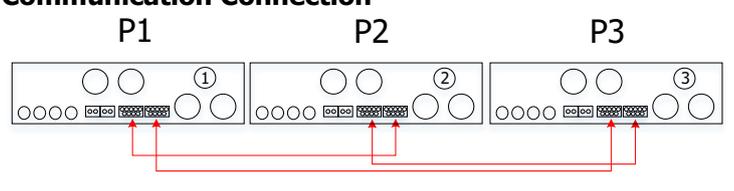


One inverter in each phase:

Power Connection



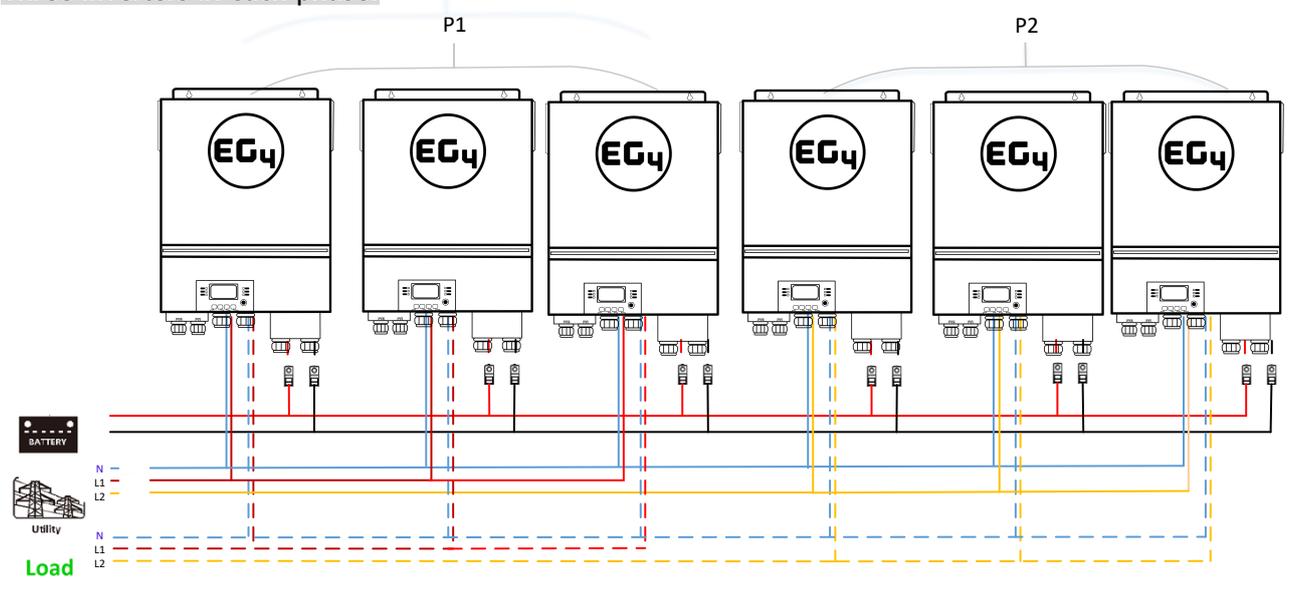
Communication Connection



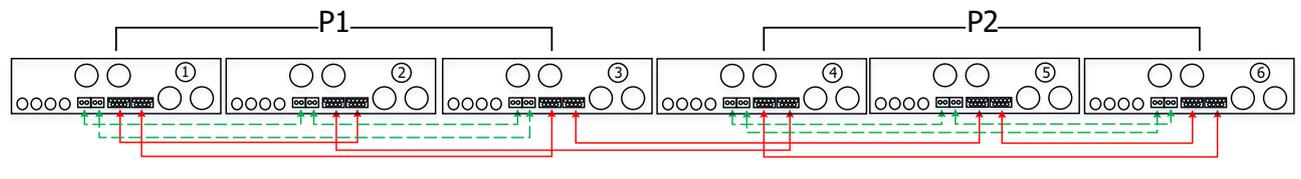
WARNING: Do not connect the current sharing cable between inverters which are in different phases. Otherwise, it may damage the inverters.

4-3. Support split-phase equipment

Three inverters in each phase:

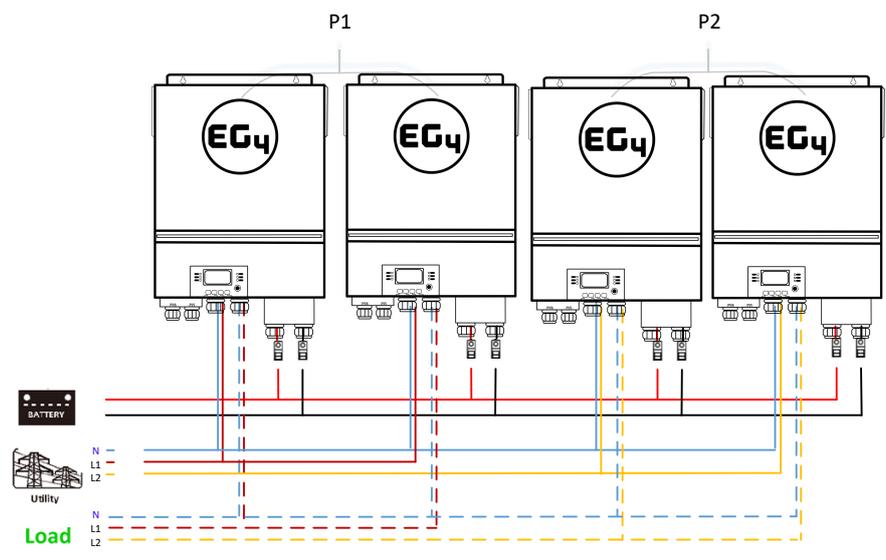


Communication Connection

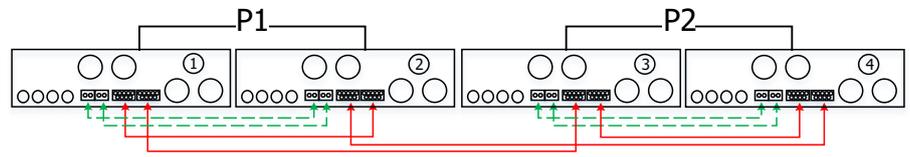


Two inverters in each phase:

Power Connection

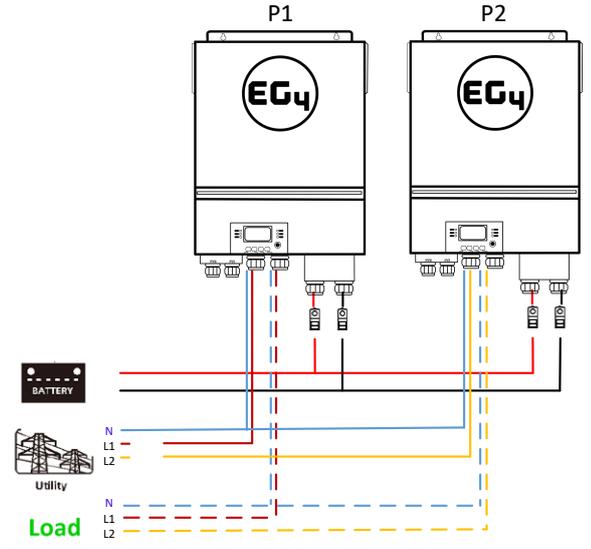


Communication Connection

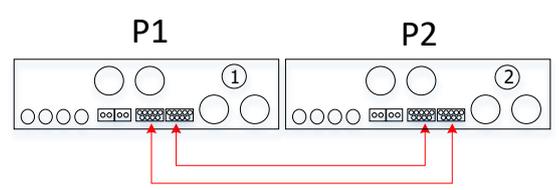


One inverter in each phase:

Power Connection



Communication Connection



5. PV Connection

Please refer to user manual of single unit for PV Connection.

CAUTION: Each inverter should connect to PV modules separately.

Appendix II: BMS Communication Installation

1. Introduction

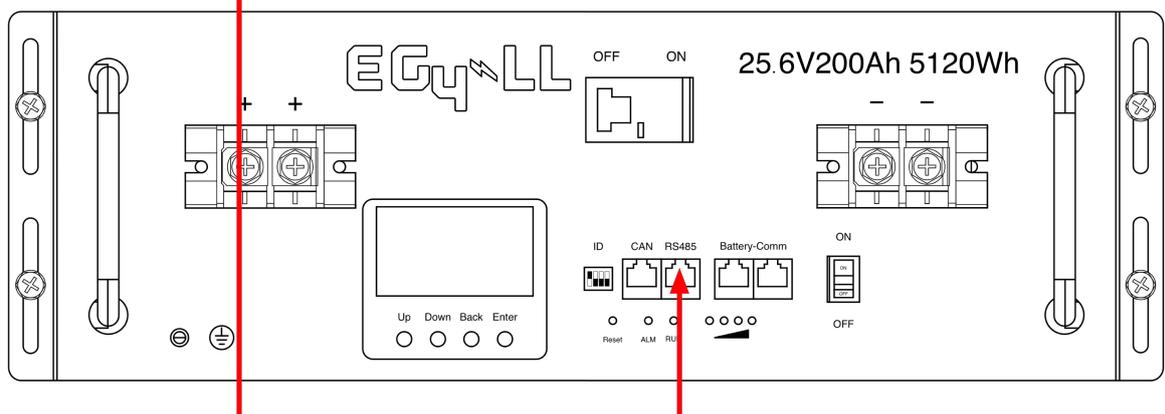
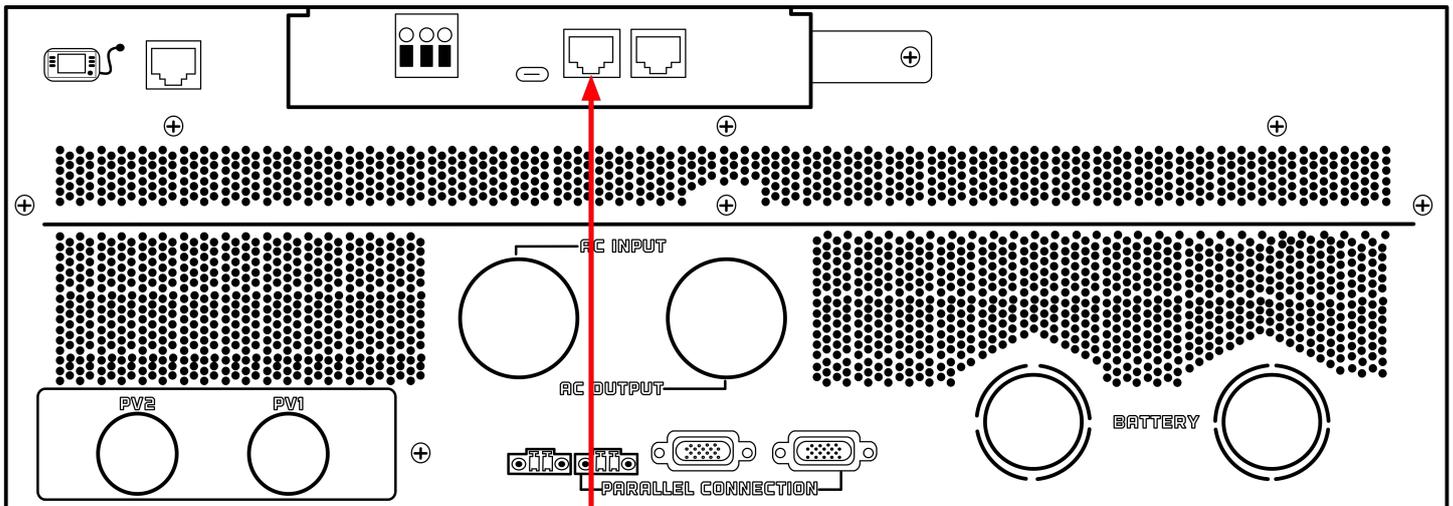
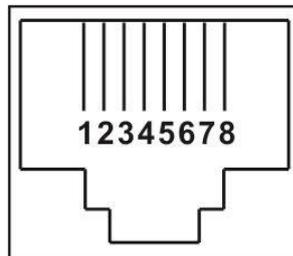
When connecting to lithium battery, it is recommended to purchase a custom-made RJ45 communication cable. Please check with your dealer or integrator for details.

This custom-made RJ45 communication cable delivers information and signal between lithium battery and the inverter. The information is listed below:

- Re-configure charging voltage, charging current and battery discharge cut-off voltage according to the lithium battery parameters.
- Starting and stopping of charging is based on the batteries SOC (State Of Charge)

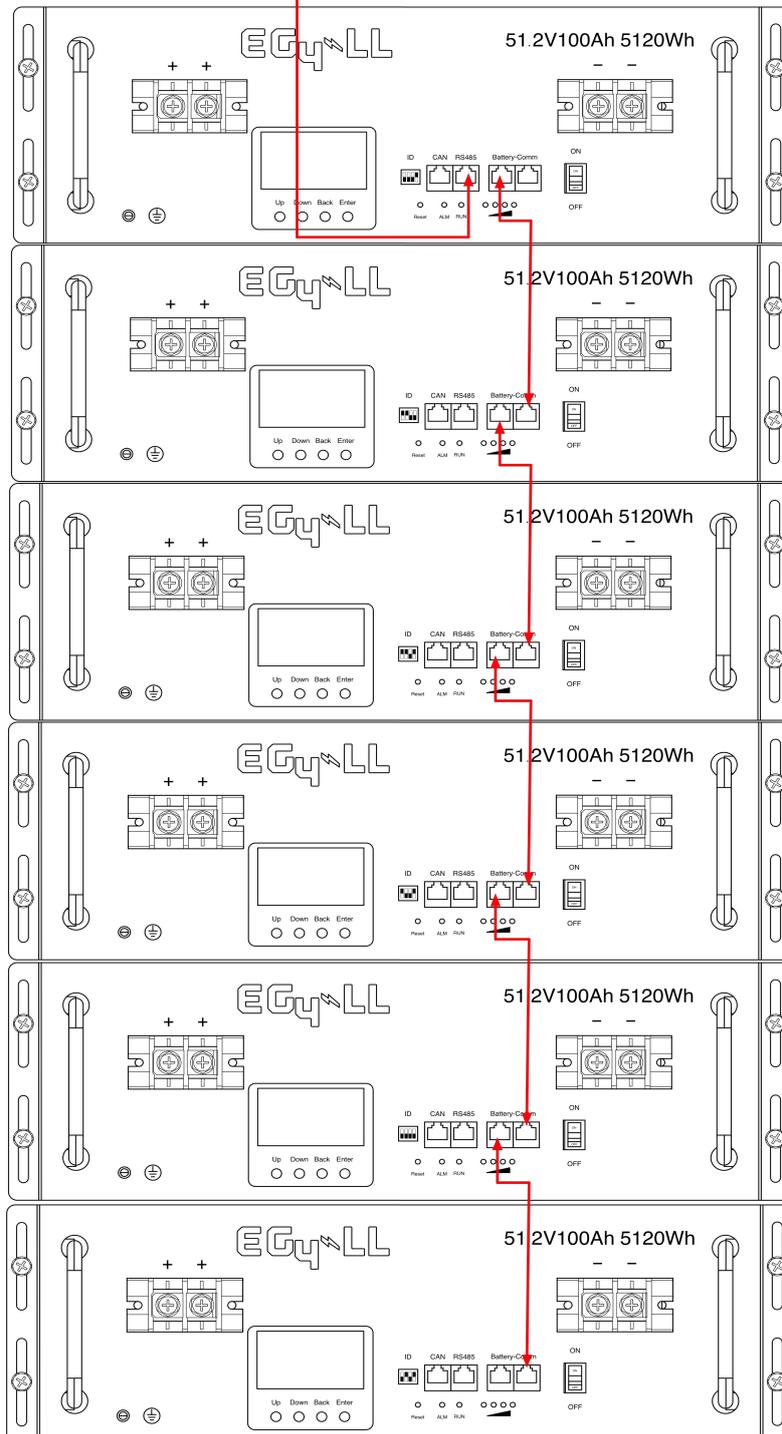
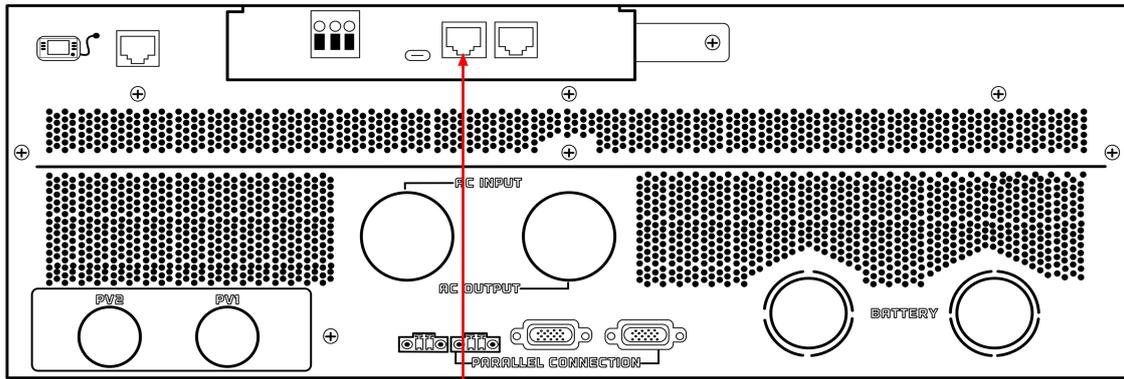
2. Pin Assignment for BMS Communication Port

	Definition
PIN 1	RS232TX
PIN 2	RS232RX
PIN 3	RS485B
PIN 4	NC
PIN 5	RS485A
PIN 6	CANH
PIN 7	CANL
PIN 8	GND



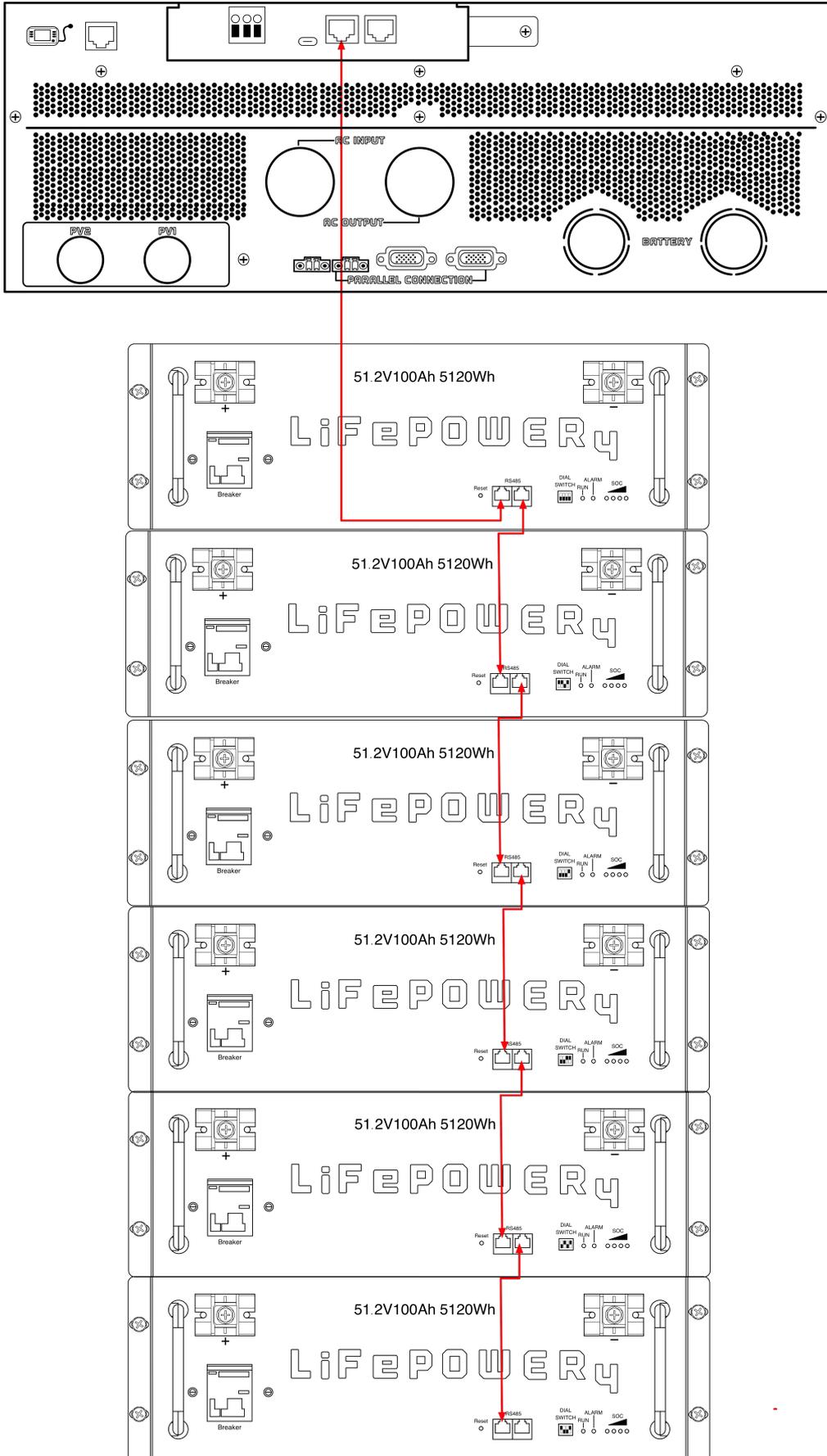
Battery Networking- EG4-LL

Using the 1ft RS485 cable interconnect your batteries as illustrated in the diagram below.



Battery Networking-LiFePower4

Using the 1ft RS485 cable interconnect your batteries as illustrated in the diagram below.

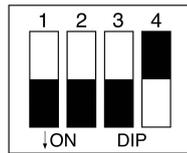


Settings for EG4 Lithium Batteries

1). Dip Switch: There are 4 Dip Switches which set different baud rates and battery group addresses. If switch position is turned to the "OFF" position, it means "0". If switch position is turned to the "ON" position, it means "1".

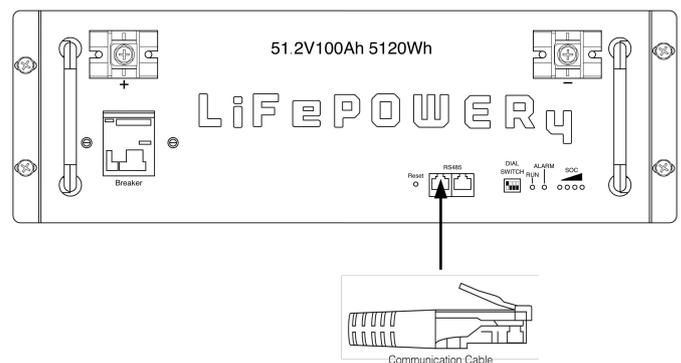
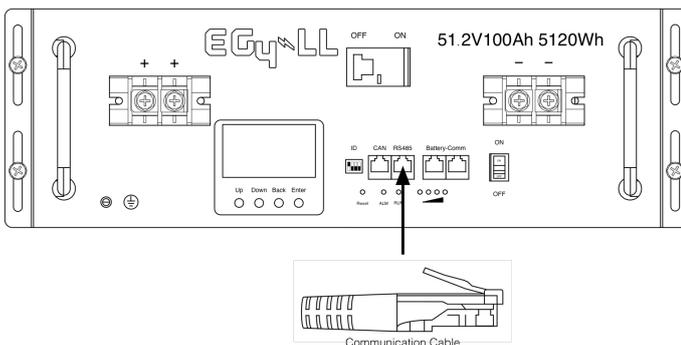
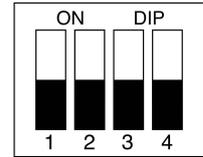
EG4-LL Battery

- Dip 1, 2, and 3 are in the "ON" position *on = down
- Dip 4 is in the "OFF" position *off = up
- The 1-3 "ON" & 4 "OFF" configuration is to indicate Master battery status and is reserved for communications with the inverter.
- A Max of 16 batteries can communicate in a single battery bank



EG4-LifePower4 Battery

- Dip 1, 2, 3, and 4 are in the "OFF" position *off = down
- The ALL "OFF" position is to indicate the Master battery status and is reserved for communications with the inverter
- A Max of 16 batteries can communicate in a single battery bank.

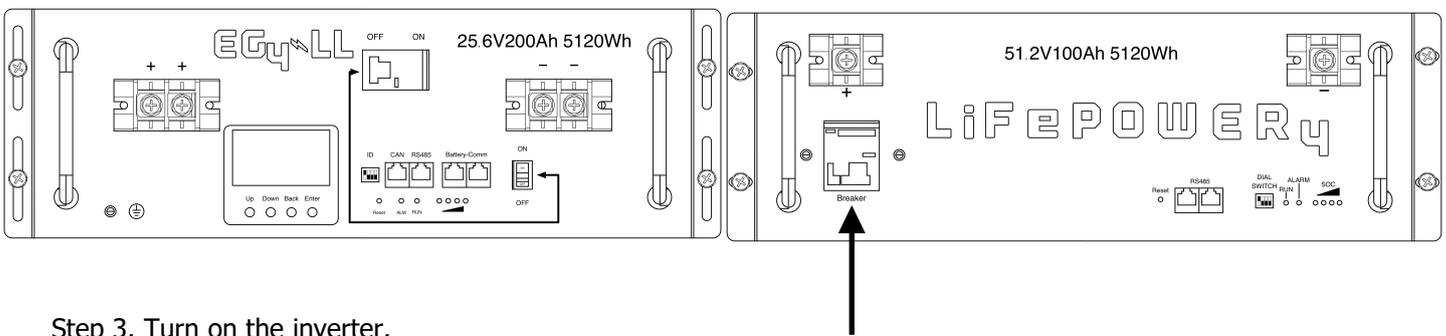


Please Note: If you change the dipswitches, you must power cycle the batteries for the BMS to recognize the new dipswitch address.

2). Process of install

Step 1. Use the RS485 cable to connect inverter and Lithium battery as Fig 1.

Step 2. Switch on Lithium battery.



Step 3. Turn on the inverter.

Step 4. Be sure to select battery type as "EG4" in LCD program 5.

If communication between the inverter and battery is successful, the battery icon  on LCD display will flash

NOTE: For EG4-LL Ensure to turn on the red power switch as well as the breaker.

NOTE: Despite EG4 batteries having built-in breakers. It is still recommended to have a 125A in line breaker.

6. LCD Setting and Display

Setting Program:

Program	Description	Selectable option	
28	AC output mode *This setting is able to set up only when the inverter is in standby mode. Be sure that on/off switch is in "OFF" status.	Single 28  SIG	When the unit is operated alone, please select "SIG" in program 28.
		Parallel 28  PAL	When the units are used in parallel for single phase application, please select "PAL" in program 28. Please refer to 4-1 for detailed information.
		L1 phase: 28  3P1	When the units are operated in 3-phase application, please choose "3PX" to define each inverter. It is required to have at least 3 inverters or maximum 6 inverters to support three-phase equipment. It's required to have at least one inverter in each phase or it's up to four inverters in one phase. Please refer to fig.4-2 for detailed information. Please select "3P1" in program 28 for the inverters connected to L1 phase, "3P2" in program 28 for the inverters connected to L2 phase and "3P3" in program 28 for the inverters connected to L3 phase.
		L2 phase: 28  3P2	
		L3 phase: 28  3P3	
		Be sure to connect share current cable to units which are on the same phase. Do NOT connect share current cable between units on different phases.	
		L1 for split phase: 28  2P1	When the units are operated in split phase application, please choose "2PX" to define each inverter. It is required to have at least 2 inverters or maximum 6 inverters to support split-phase equipment. It's required to have at least one inverter in each phase or it's up to three inverters in one phase. Please refer to fig.4-2 for detailed information. Please select "2P1" in program 28 for the inverters connected to L1 phase, "2P2" in program 28 for the inverters connected to L2 phase. And it can choose 120° or 180° phase difference for "2P2".
		L2 for split phase: (120° phase difference) 28  120 2P2	
		L2 for split phase: (180° phase difference) 28  180 2P2	

Fault code display:

Fault Code	Fault Event	Icon on
60	Power feedback protection	F60
71	Firmware version inconsistent	F71
72	Current sharing fault	F72
80	CAN fault	F80
81	Host loss	F81
82	Synchronization loss	F82
83	Battery voltage detected different	F83
84	AC input voltage and frequency detected different	F84
85	AC output current unbalance	F85
86	AC output mode setting is different	F86

Code Reference:

Code	Description	Icon on
NE	Unidentified unit master or slave	NE
HS	Master unit	HS
SL	Slave unit	SL

7. Commissioning**Parallel in single phase**

Step 1: Check the following requirements before commissioning:

- Ensure all wire connections are correct.
- Ensure all breakers in Line wires of load side are open and each Neutral wires of each unit are connected together.

Step 2: Turn on each unit and set "PAL" in LCD setting program 28 of each unit. And then shut down all units.

Note: It's necessary to turn the switch into the off position when setting the LCD program. Otherwise, the setting cannot be programmed.

Step 3: Turn on each unit.

LCD display in Master unit	LCD display in Slave unit
<p>The LCD display in the Master unit shows 'HS' at the top, 'INPUT 0V' in the middle, and 'OUTPUT 120V' at the bottom. To the right, there are two battery level indicators: 'LOAD' and 'BATT', both showing a full charge. A small icon of a battery and a plug is also visible.</p>	<p>The LCD display in the Slave unit shows 'SL' at the top, 'INPUT 0V' in the middle, and 'OUTPUT 120V' at the bottom. To the right, there are two battery level indicators: 'LOAD' and 'BATT', both showing a full charge. A small icon of a battery and a plug is also visible.</p>

NOTE: Master and slave units are randomly defined if units are powered on together. To define a host unit start the unit you wish to be the host first.

LCD Setting

General Setting

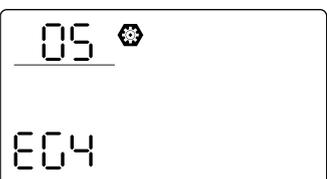
After pressing and holding  button for 3 seconds, the unit will enter the Settings Menu.

Press  " or  " button to select setting programs.

Press  " button to confirm you selection or  /  " button to exit.

Setting Programs:

Program	Description	Selectable option	
00	Exit setting mode	Escape 00  ESC	
01	Output source priority: To configure load power source priority	Utility first (default) 01  USb	Utility will provide power to the loads as first priority. Solar and battery energy will provide power to the loads only when utility power is not available.
		Solar first 01  Sub	Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, Utility energy will supply power to the loads at the same time.
		SBU priority 01  SbU	Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, battery energy will supply power to the loads at the same time. Utility provides power to the loads only when battery voltage drops to either low-level warning voltage or the setting point in program 12.
02	Maximum charging current: To configure total charging current for solar and utility chargers. (Max. charging current = utility charging current + solar charging current)	60A (default) 02  60 ^A	Setting range is from 10A to 120A. Increment of each click is 10A.

03	AC input voltage range	Appliances (default) 03  APL	If selected, acceptable AC input voltage range will be within 80-140VAC.
		UPS 03  UPS	If selected, acceptable AC input voltage range will be within 90-140VAC.
05	Battery type	AGM (default) 05  AGM	Flooded 05  FLD
		User-Defined 05  USE	If "User-Defined" is selected, battery charge voltage and low DC cut-off voltage can be set up in program 26, 27 and 29.
		 EG4	If using EG4 batteries you will use this battery type for BMS communications. If this battery type is selected settings 2,26, 27 will be configured by the BMS.
		LiB-protocol compatible battery 05  LiB	
		3 rd party Lithium battery 05  LiC	

06	Auto restart when overload occurs	Restart disable (default) 06  L F d	Restart enable 06  L F E
07	Auto restart when over temperature occurs	Restart disable (default) 07  L F d	Restart enable 07  L F E
09	Output frequency	50Hz 09  50 _{Hz}	60Hz (default) 09  60 _{Hz}
10	Output voltage	110V 10  110 _v	120V (default) 10  120 _v
		127V 10  127 _v	

<p>11</p>	<p>Maximum utility charging current</p> <p>Note: If setting value in program 02 is smaller than that in program in 11, the inverter will apply charging current from program 02 for utility charger.</p>	<p>30A (default)</p> <p>11 </p> <p>UET</p> <p>30^A</p>	<p>Setting range is 2A, then from 10A to 120A. Increment of each click is 10A.</p>
<p>12</p>	<p>Setting voltage point back to utility source when selecting "SBU" (SBU priority) in program 01.</p>	<p>46V (default)</p> <p>12 </p> <p>BATT</p> <p>46^v</p>	<p>Setting range is from 44V to 51V. Increment of each click is 1V.</p>
<p>12</p>	<p>Setting voltage point back to utility source when selecting "SBU" (SBU priority) in program 01.</p>	<p>SOC 10% (default for Lithium)</p> <p>12 </p> <p>SOC</p> <p>BATT</p> <p>10%</p>	<p>If the battery type (#05) set as Lithium, this setting will change to SOC automatically. Adjustable range is 5% to 95%. Increment of each click is 5%.</p>
<p>13</p>	<p>Setting voltage point back to battery mode when selecting "SBU" (SBU priority) in program 01.</p>	<p>Battery fully charged</p> <p>13 </p> <p>BATT</p> <p>FUL^v</p>	<p>54V (default)</p> <p>13 </p> <p>BATT</p> <p>54^v</p>
<p>13</p>	<p>Setting voltage point back to battery mode when selecting "SBU" (SBU priority) in program 01.</p>	<p>SOC 30% (default for Lithium)</p> <p>13 </p> <p>SOC</p> <p>BATT</p> <p>30%</p>	<p>Setting range is from 48V to 61V. Increment of each click is 1V.</p> <p>If any types of lithium battery is selected in program 05, setting value will change to SOC automatically. Setting range is 10% to 100%.</p>
<p>16</p>	<p>Charger source priority: To configure charger source priority</p>	<p>If this inverter/charger is working in Line, Standby or Fault mode, charger source can be programmed as below:</p> <p>Solar first</p> <p>16 </p> <p>C50</p>	<p>Solar energy will charge battery as first priority. Utility will charge battery only when solar energy is not available.</p>

16	Charger source priority: To configure charger source priority	Solar and Utility (default) 16  SNU	Solar energy and utility will charge battery at the same time.
		Only Solar 16  050	Solar energy will be the only charger source no matter utility is available or not.
		If this inverter/charger is working in Battery mode, only solar energy can charge battery. Solar energy will charge battery if it's available and sufficient.	
18	Alarm control	Alarm on (default) 18  60N	Alarm off 18  60F
19	Auto return to default display screen	Return to default display screen (default) 19  ESP	If selected, no matter how users switch display screen, it will automatically return to default display screen (Input voltage /output voltage) after no button is pressed for 1 minute.
		Stay at latest screen 19  HEP	If selected, the display screen will stay at latest screen user finally switches.
20	Backlight control	Backlight on (default) 20  LON	Backlight off 20  LOF

22	Beeps while primary source is interrupted	Alarm on (default) 22  RON	Alarm off 22  ROF
23	Overload bypass: When enabled, the unit will transfer to line mode if overload occurs in battery mode.	Bypass disable (default) 23  byd	Bypass enable 23  byE
25	Record Fault code	Record enable (default) 25  FEN	Record disable 25  FdS
26	Bulk charging voltage (C.V voltage)	default: 56.4V 26  CV BATT 56.4 _v	If self-defined is selected in program 5, this program can be set up. Setting range is from 48.0V to 61.0V. Increment of each click is 0.1V.
27	Floating charging voltage	default: 54.0V 27  FLV BATT 54.0 _v	If self-defined is selected in program 5, this program can be set up. Setting range is from 48.0V to 61.0V. Increment of each click is 0.1V.
28	AC output mode <i>*This setting is only available when the inverter is in standby mode (Switch off).</i>	Single: This inverter is used in single phase application. 28  S10	Parallel: This inverter is operated in parallel system. 28  PAR When the inverter is operation in split phase application, set up inverter to be operated in specific phase.

<p>28</p>	<p>AC output mode</p> <p><i>*This setting is only available when the inverter is in standby mode (Switch off).</i></p>	<p>L1 phase: 28 </p> <p>3P 1</p>	<p>L2 phase: 28 </p> <p>3P 2</p>
		<p>L3 phase: 28 </p> <p>3P 3</p>	
		<p>L1 for split phase: 28 </p> <p>2P 1</p>	<p>L2 for split phase: (120° phase difference) 28 </p> <p>120</p> <p>2P 2</p>
<p>29</p>	<p>Low DC cut-off voltage:</p> <ul style="list-style-type: none"> ● If battery power is only power source available, inverter will shut down. ● If PV energy and battery power are available, inverter will charge battery without AC output. ● If PV energy, battery power and utility are all available, inverter will transfer to line mode and provide output power to loads. 	<p>default: 44.0V</p> <p>29 </p> <p>40.0 BATT</p> <p>44.0V</p>	<p>If self-defined is selected in program 5, this program can be set up. Setting range is from 42.0V to 48.0V. Increment of each click is 0.1V. Low DC cut-off voltage will be fixed to setting value no matter what percentage of load is connected.</p>
		<p>SOC 0% (default for Lithium)</p> <p>29 </p> <p>50C BATT</p> <p>0%</p>	<p>If any types of lithium battery is selected in program 05, setting value will change to SOC automatically. Adjustable range is 0% to 90%. Increment of each click is 5%.</p>
<p>30</p>	<p>Battery equalization</p>	<p>Battery equalization</p> <p>30 </p> <p>EEN</p>	<p>Battery equalization disable (default)</p> <p>30 </p> <p>Ed5</p>

		If "Flooded" or "User-Defined" is selected in program 05, this program can be set up.	
31	Battery equalization voltage	default: 58.4V 31  EV BATT 58.4V	Setting range is from 48.0V to 62.0V. Increment of each click is 0.1V.
33	Battery equalized time	60min (default) 33  60	Setting range is from 5min to 900min. Increment of each click is 5min.
34	Battery equalized timeout	120min (default) 34  120	Setting range is from 5min to 900 min. Increment of each click is 5 min.
35	Equalization interval	30days (default) 35  30d	Setting range is from 0 to 90 days. Increment of each click is 1 day
36	Equalization activated immediately	Enable 36  REN	Disable (default) 36  ADS
		If equalization function is enabled in program 30, this program can be set up. If "Enable" is selected in this program, it's to activate battery equalization immediately and LCD main page will show "EQ". If "Disable" is selected, it will cancel equalization function until next activated equalization time arrives based on program 35 setting. At this time, "EQ" will not be shown in LCD main page.	
37	Reset all stored data for PV generated power and output load energy	Not reset(Default) 37  NRE	Reset 37  RSE

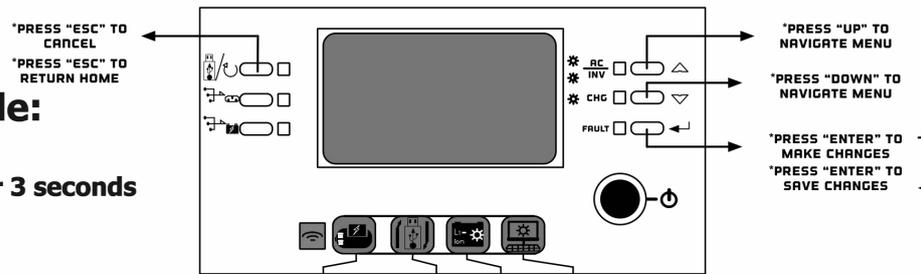
<p>41</p>	<p>Maximum discharging current</p>	<p>Disable (Default)</p> <p>41 </p> <p>dd5</p>	<p>If selected, battery discharge protection is disabled.</p>
		<p>30A</p> <p>41 </p> <p>30</p>	<p>The setting range is from 30 A to 150 A. Increment of each click is 10A.</p> <p>If discharging current is higher than setting value, battery will stop discharging. At this time, if the utility is available, the inverter will operate in bypass mode. If no utility is available, the inverter will shut down after 5-minute operation in battery mode.</p>
		<p>150A</p> <p>41 </p> <p>150</p>	
<p>51</p>	<p>On/Off control for RGB LED *This setting must be enable to activate RGB LED lighting function.</p>	<p>Enabled (default)</p> <p>51 </p> <p>LEN</p>	<p>Disable</p> <p>51 </p> <p>Ld5</p>
<p>52</p>	<p>Brightness of RGB LED</p>	<p>Low</p> <p>52 </p> <p>LO</p>	<p>Normal (default)</p> <p>52 </p> <p>no4</p>
		<p>High</p> <p>52 </p> <p>H1</p>	
<p>53</p>	<p>Lighting speed of RGB LED</p>	<p>Low</p> <p>53 </p> <p>LO</p>	<p>Normal (default)</p> <p>53 </p> <p>no4</p>

		High 53  HI	
54	RGB LED effects	Scrolling 54  50F	Breathing 54  bFE
		Solid on (Default) 54  50L	
55	Color combination of RGB LED to show energy source and battery charge/discharge status: <ul style="list-style-type: none"> ● Grid-PV-Battery ● Battery charge/discharge status 	C01: (Default) <ul style="list-style-type: none"> ● Violet-White-Sky blue ● Pink-Honey 55  C01	C02: <ul style="list-style-type: none"> ● White-Yellow-Green ● Royal blue-Lime yellow 55  C02
93	Erase all data log	Not reset (Default) 93  nFE	Reset 93  rSE
94	Data log recorded interval <i>*The maximum data log number is 1440. If it's over 1440, it will re-write the first log.</i>	3 minutes 94  3	5 minutes 94  5
		10 minutes (default) 94  10	20 minutes 94  20

<p>94</p>	<p>Data log recorded interval <i>*The maximum data log number is 1440. If it's over 1440, it will re-write the first log.</i></p>	<p>30 minutes 94  30</p>	<p>60 minutes 94  60</p>
<p>95</p>	<p>Time setting – Minute</p>	<p>For minute setting, the range is from 0 to 59. 95   mi n 0</p>	
<p>96</p>	<p>Time setting – Hour</p>	<p>For hour setting, the range is from 0 to 23. 96   HOU 0</p>	
<p>97</p>	<p>Time setting– Day</p>	<p>For day setting, the range is from 1 to 31. 97   day 1</p>	
<p>98</p>	<p>Time setting– Month</p>	<p>For month setting, the range is from 1 to 12. 98   mon 1</p>	
<p>99</p>	<p>Time setting – Year</p>	<p>For year setting, the range is from 17 to 99. 99   YEA 19</p>	

EG4 Inverter Set Up Guide:

To enter Menu - Press and ENTER for 3 seconds



- **Program Setting 0**
 - Exit Setting Mode
- **Program Setting 1**
 - Output Source Priority – Determined by specific use case.
 - Most will use SBU (Solar, Battery, Utility)
- **Program Setting 2**
 - Maximum Charging Amperage – Determine the max charging amperage of the batteries being used and input that here.
 - This setting works in unison with Program Setting 11 if AC Input is supplied.
 - *For EG4 Batteries = 80A*
- **Program Setting 3**
 - AC Input Voltage Range
 - Use APL here
- **Program Setting 4**
 - Power Saving Mode – If enabled, the inverter will go into standby mode when the load is insufficient and will stay there until a more sizable load is requested.
 - Most will use SDS (disabled)
- **Program Setting 5**
 - Battery Type – Determine the battery chemistry of the batteries being used and input that here
 - *For EG4 Batteries = EG4, for all other batteries use User Defined Settings.*
- **Program Setting 6**
 - Overload restart option – If enabled, the unit will restart itself when the load requested exceeds 120% of inverter capacity.
 - Most will use Lfd (disabled)
- **Program Setting 7**
 - Overtemp Restart Option – The unit will shut down when the maximum operating temperature is reached to avoid damage or fire. It will also automatically restart itself once the internal temperature has dropped below the maximum value
 - Most will use eFD (disabled)
- **Program Setting 9**
 - Output Frequency
 - If you live in America you will use 60Hz
- **Program Setting 10**
 - Output Voltage
 - Use this menu to set the inverter to 110vac or 120vac
- **Program Setting 11**
 - Maximum Charging Current – This is the maximum amount of charging current that can be used from the utility input
 - This number is a factor of the total maximum amperage inputted in Program Setting 2.
 - Most will use the default 30A

- **Program Setting 12**
 - Low Battery Voltage Level – Determine the lowest point you would like to discharge your batteries to before passing the load / charging responsibility to the AC input. Input that here.
 - Most will use 48.0V
- **Program Setting 13**
 - Charged Battery Voltage – Determine for how long you would like to be using the AC input from your Utility (Power Grid / Generator). Once your batteries reach the specified voltage the unit will switch from the Utility input and back into battery mode
 - Most will use 51.0V
- **Program Setting 16**
 - Charging Source Priority – Determine if you want the utility input to be able to charge the batteries, or if you want ONLY solar to charge the batteries.
 - Most will use SNU here (Solar and Utility)
- **Program Setting 18**
 - Alarm Control – Determine if you want an alarm or buzzer active, and if so, choose the preferred alarm sound.
 - Most will use ND4 (no alarm)
- **Program Setting 19**
 - Auto Return to Home Screen – This option will allow the user to make the unit stay on the last selected screen instead of the unit timing out and switching back to the default home screen after 1 min of inactivity.
 - Most will use fEP (stays on screen)
- **Program Setting 20**
 - Back Light – Controls the backlight function of the screen.
 - Most will use LON (enabled)
- **Program Setting 22**
 - Beep when primary source interrupted.
default is AON (enabled)
- **Program Setting 23**
 - Battery Bypass Mode – If enabled, a unit in Battery Mode will bypass into Line Mode when an overload occurs.
 - Most will use bYE (enabled)
- **Program Setting 25**
 - Record Fault Code.
 - Most will use FEN (record fault code)
- **Program Setting 26**
 - Bulk Charging – This is the manual setting for bulk charging. Check the manufacturer's specs for the recommended bulk charge of your specific battery.
 - *For EG4 Batteries = 57.5V*
- **Program Setting 27**
 - Float Charge – Check the manufacturer's specs for the recommended float charge of your specific battery.
 - *For EG4 Batteries = 56.5V*
- **Program Setting 28**
 - AC Output Mode – This is the mode for Single, Parallel, or 3 Phase.
 - If you are using a single unit for 120V ONLY, you will use SIG
 - If you are using 2 inverters in split phase operations, one inverter will be 2P1 and the second will be 2P2.
- **Program Setting 29**
 - Low DC Cutoff – Determines at what point the inverter will stop requesting power from the batteries if AC Input is not available.
 - Most will use 46.0V

- **Program Setting 30-36**
 - Battery Equalization settings
When using EG4 you will not need these settings. If using flooded lead acid or AGM batteries consult your batteries user manual for recommended Equalization settings.
- **Program Setting 37**
 - Rest all stored data for PV generated power and output load energy
- **Program Setting 41**
 - Maximum Discharging Current
Use this to set maximum battery discharging current
range is 30A to 150A
unit of change is in 10A increments
 - *Note: For EG4 batteries maximum discharge is 100A*
- **Program Setting 51**
 - RGB LED ON/OFF Control
- **Program Setting 52**
 - RGB Brightness Control
- **Program Setting 53**
 - Effect Speed of RGB lighting
- **Program Setting 54**
 - RGB Lighting Effects Menu
- **Program Setting 55**
 - RGB Lighting Color Menu
- **Program Setting 93**
 - Erase All Data Logged
- **Program Setting 94**
 - Data Log Recorded Interval
Use this menu to determine the interval time (in minutes) that data is logged
- **Program Settings 95- 99**
 - Data and Time Settings

Appendix III: The Wi-Fi Operation Guide in Remote Panel

1. Introduction

Wi-Fi module can enable wireless communication between off-grid inverters and monitoring platform. Users have complete and remote monitoring and controlling experience for inverters when combining Wi-Fi module with WatchPower APP, available for both iOS and Android based device. All data loggers and parameters are saved in iCloud.

The major functions of this APP:

- Delivers device status during normal operation.
- Allows user to configure device setting after installation.
- Notifies users when a warning or alarm occurs.
- Allows users to query inverter history data.



2. WatchPower App

2-1. Download and install APP

Operating system requirement for your smart phone:

🍏 iOS system supports iOS 9.0 and above

🤖 Android system supports Android 5.0 and above

Please scan the following QR code with your smart phone and download WatchPower App.



Android System



iOS System



Or you may find "WatchPower" app on the Apple® Store or "WatchPower Wi-Fi" in the Google® Play Store.

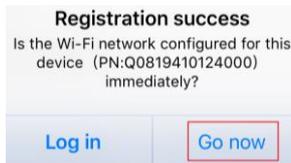
2-2. Initial Setup

Step 1: Registration at first time

After the installation, please tap the shortcut icon  to access this APP on your mobile screen. In the screen, tap "Register" to access "User Registration" page. Fill in all required information and scan the remote box PN by tapping  icon. Or you can simply enter PN directly. Then, tap "Register" button.

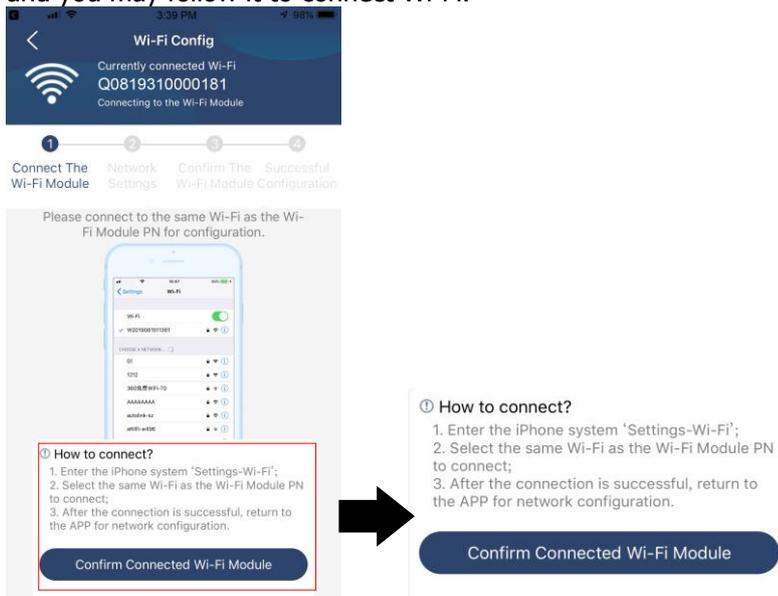


Then, a "Registration success" window will pop up. Tap "Go now" to continue setting local Wi-Fi network connection.

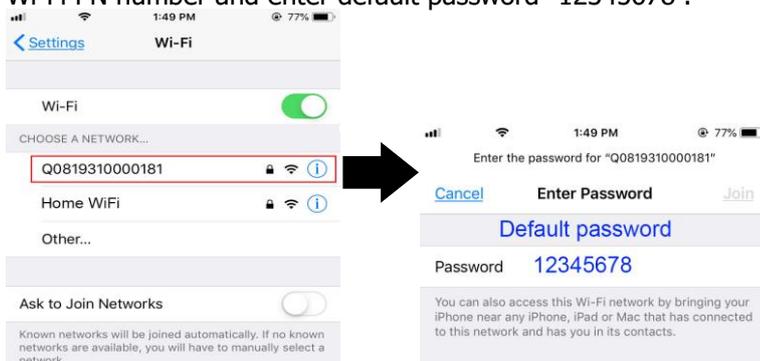


Step 2: Local Wi-Fi Module Configuration

Now, you are in "Wi-Fi Config" page. There are detailed setup procedure listed in "How to connect?" section and you may follow it to connect Wi-Fi.



Enter the "Settings→Wi-Fi" and select connected Wi-Fi name. The connected Wi-Fi name is the same to your Wi-Fi PN number and enter default password "12345678".



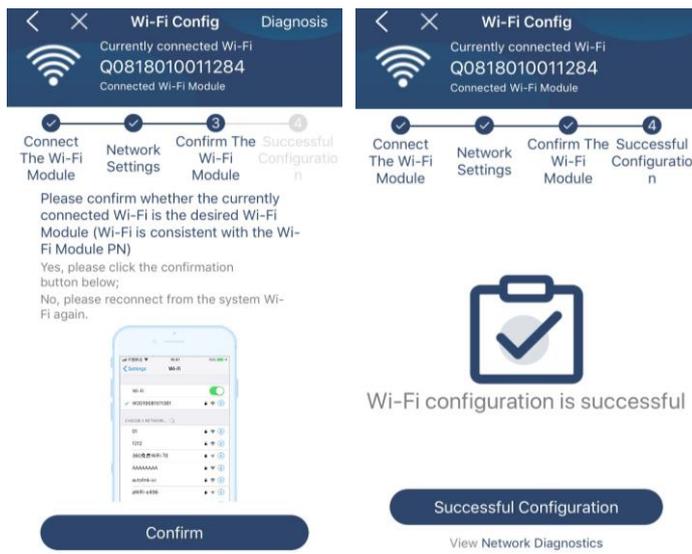
Then, return to WatchPower APP and tap "Confirm Connected Wi-Fi Module" button when Wi-Fi module is connected successfully.

Step 3: Wi-Fi Network settings

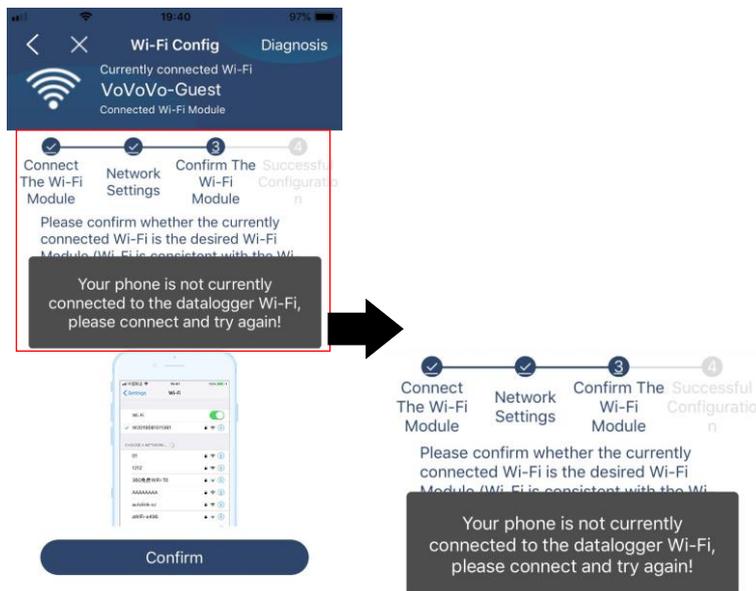
Tap  icon to select your local Wi-Fi router name (to access the internet) and enter password.



Step 4: Tap "Confirm" to complete the Wi-Fi configuration between the Wi-Fi module and the Internet.

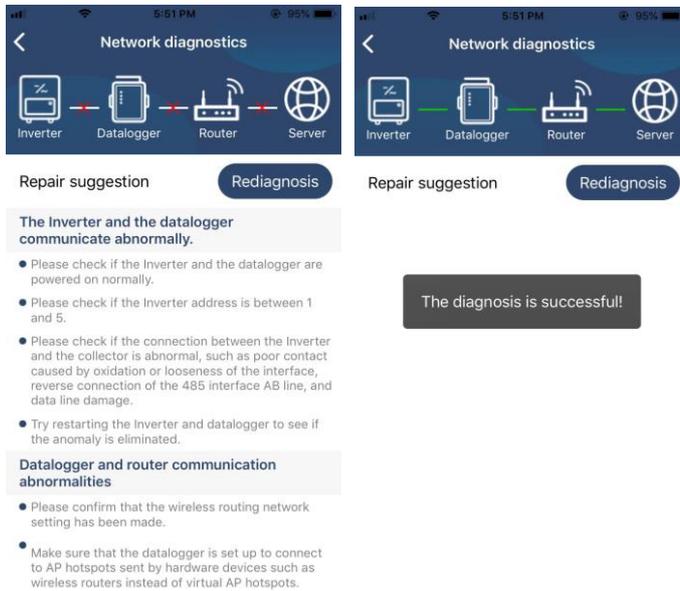


If the connection fails, please repeat Step 2 and 3.



Diagnose Function

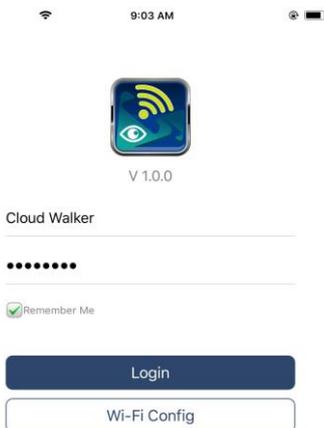
If the module is not monitoring properly, please tap "Diagnosis" on the top right corner of the screen for further details. It will show repair suggestion. Please follow it to fix the problem. Then, repeat the steps in the chapter 4.2 to re-set network setting. After all setting, tap "Rediagnosis" to re-connect again.



2-3. Login and APP Main Function

After finishing the registration and local Wi-Fi configuration, enter registered name and password to login.

Note: Tick "Remember Me" for your login convenience afterwards.



Overview

After login is successfully, you can access "Overview" page to have overview of your monitoring devices, including overall operation situation and Energy information for Current power and Today power as below diagram.



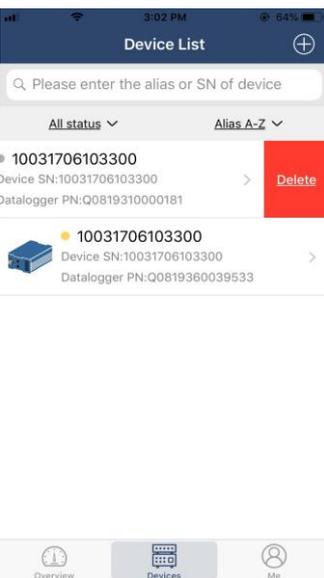
Devices

Tap the  icon (located on the bottom) to enter Device List page. You can review all devices here by adding or deleting Wi-Fi Modules in this page.

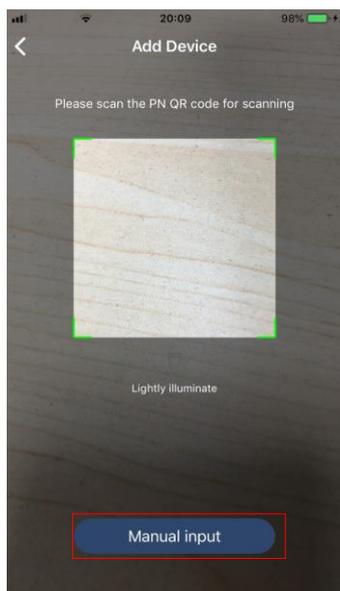
Add device



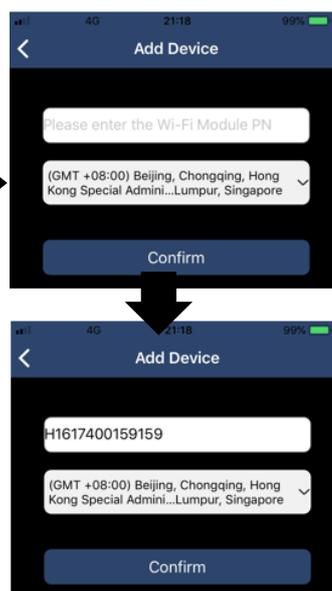
Delete device



Tap the  icon on the top right corner and manually enter part number to add device. This part number label is pasted on the bottom of remote LCD panel. After entering part number, tap "Confirm" to add this device in the Device list.



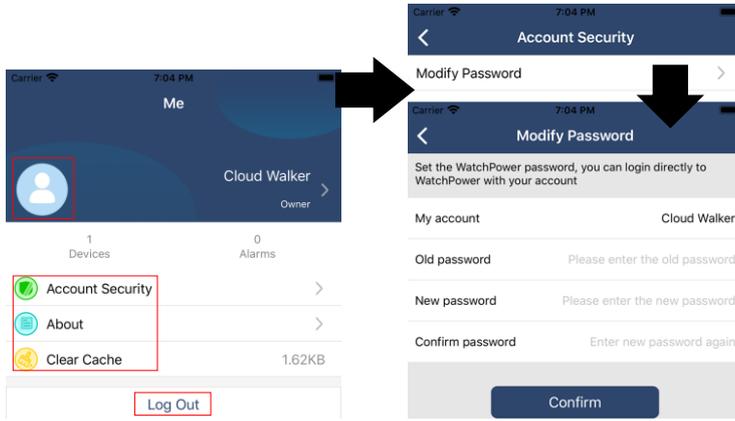
Part number label is pasted on the bottom of remote LCD panel.



For more information about Device List, please refer to the section 2.4.

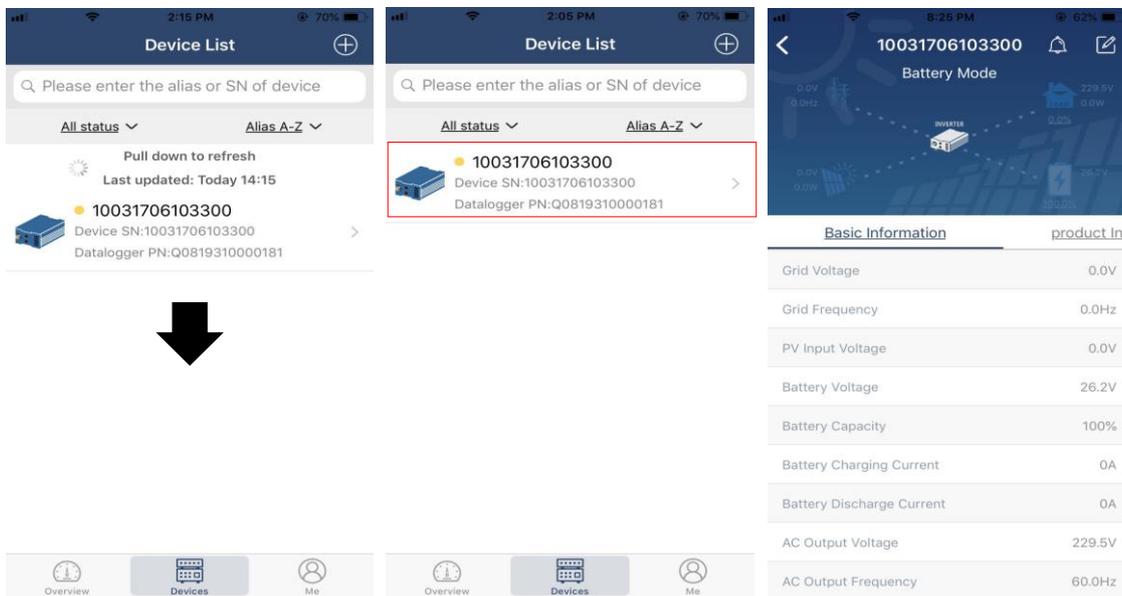
ME

In ME page, users can modify "My information", including **【User's Photo】** , **【Account security】** , **【Modify password】** , **【Clear cache】** ,and **【Log-out】** , shown as below diagrams.



2-4. Device List

In the Device List page, you can pull down to refresh the device information and then tap any device you want to check up for its real-time status and related information as well as to change parameter settings. Please refer to the parameter setting list.



Device Mode

On the top of screen, there is a dynamic power flow chart to show live operation. It contains five icons to present PV power, inverter, load, utility and battery. Based on your inverter model status, there will be **【Standby Mode】** , **【Line Mode】** , **【Battery Mode】** .

【Standby Mode】 Inverter will not power the load until "ON" switch is pressed. Qualified utility or PV source can charge battery in standby mode.



【Line Mode】 Inverter will power the load from the utility with or without PV charging. Qualified utility or PV source can charge battery.

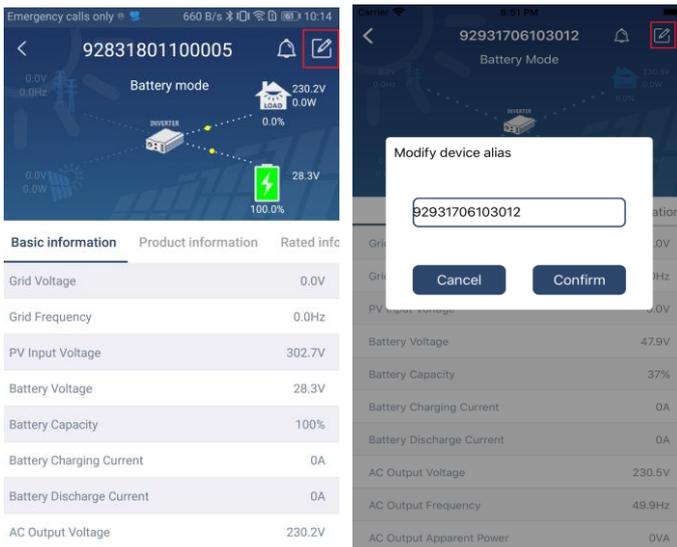


[Battery Mode] Inverter will power the load from the battery with or without PV charging. Only PV source can charge battery.



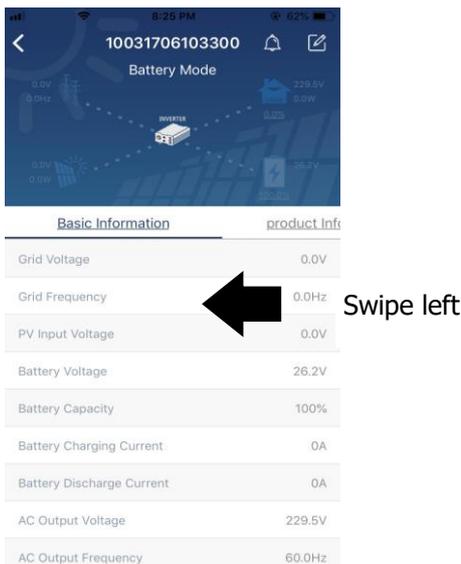
Device Alarm and Name Modification

In this page, tap the  icon on the top right corner to enter the device alarm page. Then, you can review alarm history and detailed information. Tap the  icon on the top right corner, a blank input box will pop out. Then, you can edit the name for your device and tap "Confirm" to complete name modification.



Device Information Data

Users can check up **[Basic Information]** , **[Product Information]** , **[Rated information]** , **[History]** , and **[Wi-Fi Module Information]** by swiping left.



[Basic Information] displays basic information of the inverter, including AC voltage, AC frequency, PV input voltage, Battery voltage, Battery capacity, Charging current, Output voltage, Output frequency, Output apparent power, Output active power and Load percent. Please slide up to see more basic information.

[Production Information] displays Model type (Inverter type), Main CPU version, Bluetooth CPU version and secondary CPU version.

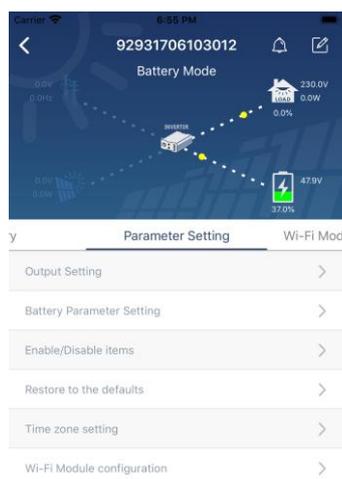
【Rated Information】 displays information of Nominal AC voltage, Nominal AC current, Rated battery voltage, Nominal output voltage, Nominal output frequency, Nominal output current, Nominal output apparent power and Nominal output active power. Please slide up to see more rated information.

【History】 displays the record of unit information and setting timely.

【Wi-Fi Module Information】 displays the Wi-Fi Module PN, status and firmware version.

Parameter Setting

This page is to activate some features and set up parameters for inverters. Please note that the listing in "Parameter Setting" page in below diagram may differ from the models of monitored inverter. Here we will briefly highlight some of it, **【Output Setting】**, **【Battery Parameter Setting】**, **【Enable/ Disable items】**, **【Restore to the defaults】** to illustrate.



There are three ways to modify setting and they vary according to each parameter.

- Listing options to change values by tapping one of it.
- Activate/Shut down functions by clicking the "Enable" or "Disable" button.
- Changing values by clicking arrows or entering the numbers directly in the column. Each function setting is saved by clicking "Set" button.

Please refer to below parameter setting list for an overall description and be noted that the available parameters may vary depending on different models. Please always see the original product manual for detailed setting instructions.

Parameter setting list:

Item		Description
Output setting	Output source priority	To configure load power source priority.
	AC input range	When selecting "UPS", it's allowed to connect personal computer. Please check product manual for details.
		When selecting "Appliance", it's allowed to connect home appliances.
	Output voltage	Set the output voltage.
	Output frequency	Set the output frequency.
Battery parameter setting	Battery type:	Set the connected battery type.
	Battery cut-off voltage	Sets the voltage at which the battery stops. Please see product manual for the recommended voltage range based on connected battery type.
	Back to grid voltage	When "SBU" or "SOL" is set as output source priority and battery voltage is lower than this setting voltage, unit will transfer to line mode and the grid will provide power to load.
	Back to discharge voltage	When "SBU" or "SOL" is set as output source priority and battery voltage is higher than this setting voltage, battery will be allowed to