

MAX E Duplex 11k
High-Frequency Solar Inverter
User Manual

Table of Contents

ABOUT THIS MANUAL	1
Purpose	1
Scope	1
SAFETY INSTRUCTIONS	1
INTRODUCTION	2
Features	2
Basic System Architecture	2
Product Overview	3
Unpacking and Inspection	4
Preparation	4
Mounting the Unit	4
Battery Connection	5
AC Input/Output Connection	6
PV Connection	8
Final Assembly	10
Remote Display Panel Installation	
Communication Connection	
Dry Contact Signal	
BMS Communication	13
OPERATION	14
Power ON/OFF	14
Inverter Turn-on	14
Operation and Display Panel	14
LCD Display Icons	15
LCD Setting	17
LCD Display	
Operating Mode Description	
Faults Reference Code	
Warning Indicator	40
BATTERY EQUALIZATION	41
SPECIFICATIONS	42
Table 1 Line Mode Specifications	42
Table 2 Inverter Mode Specifications	43
Table 3 Charge Mode Specifications	44
Table 4 General Specifications	45
TROUBLE SHOOTING	46
Appendix I: Parallel function	47
Appendix II: BMS Communication Installation	
Appendix III: The Wi-Fi Operation Guide in Remote Panel	65



ABOUT THIS MANUAL

Purpose

This manual describes the assembly, installation, operation and troubleshooting of this unit. Please read this manual carefully before installations and operations. Keep this manual for future reference.

Scope

This manual provides safety and installation guidelines as well as information on tools and wiring.

SAFETY INSTRUCTIONS

 \triangle WARNING: This chapter contains important safety and operating instructions. Read and keep this manual for future reference.

- 1. Before using the unit, read all instructions and cautionary markings on the unit, the batteries and all appropriate sections of this manual.
- 2. **CAUTION** --To reduce risk of injury, charge only deep-cycle lead acid type rechargeable batteries. Other types of batteries may burst, causing personal injury and damage.
- 3. Do not disassemble the unit. Take it to a qualified service center when service or repair is required. Incorrect re-assembly may result in a risk of electric shock or fire.
- 4. To reduce risk of electric shock, disconnect all wirings before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
- 5. **CAUTION** Only qualified personnel can install this device with battery.
- 6. **NEVER** charge a frozen battery.
- 7. For optimum operation of this inverter/charger, please follow required spec to select appropriate cable size. It's very important to correctly operate this inverter/charger.
- 8. Be very cautious when working with metal tools on or around batteries. A potential risk exists to drop a tool to spark or short circuit batteries or other electrical parts and could cause an explosion.
- 9. Please strictly follow installation procedure when you want to disconnect AC or DC terminals. Please refer to INSTALLATION section of this manual for the details.
- 10. Fuses are provided as over-current protection for the battery supply.
- 11. GROUNDING INSTRUCTIONS -This inverter/charger should be connected to a permanent grounded wiring system. Be sure to comply with local requirements and regulation to install this inverter.
- 12. NEVER cause AC output and DC input short circuited. Do NOT connect to the mains when DC input short circuits.
- 13. **Warning!!** Only qualified service persons are able to service this device. If errors still persist after following troubleshooting table, please send this inverter/charger back to local dealer or service center for maintenance.
- 14. WARNING: Because this inverter is non-isolated, only three types of PV modules are acceptable: single crystalline, poly crystalline 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 NO grounding.
- 15. **CAUTION:** It's required to use PV junction box with surge protection. Otherwise, it will cause damage on inverter when lightning occurs on PV modules.



INTRODUCTION

This is a multi-function inverter, combining functions of inverter, solar charger and battery charger to offer uninterruptible power support in a single package. The comprehensive LCD display offers user-configurable and easy-accessible button operations such as battery charging current, AC or solar charging priority, and acceptable input voltage based on different applications.

Features

- Pure sine wave inverter
- Configurable color with the built-in RGB LED bar
- Built-in Wi-Fi for mobile monitoring (APP is required)
- Supports USB On-the-Go function
- Built-in anti-dusk kit
- Detachable LCD control module with multiple communication ports for BMS (RS485, CAN-BUS, RS232)
- Configurable input voltage ranges for home appliances and personal computers via LCD control panel
- Configurable AC/PV output usage timer and prioritization
- Configurable AC/Solar charger priority via LCD control panel
- Configurable battery charging current based on applications via LCD control panel
- Compatible to utility mains or generator power
- Auto restart while AC is recovering
- Overload / Over temperature / short circuit protection
- Smart battery charger design for optimized battery performance
- Cold start function

Basic System Architecture

The following illustration shows basic application for this unit. It also required the following devices to have a complete running system:

- Generator or Utility mains.
- PV modules

Consult with your system integrator for other possible system architectures depending on your requirements.

This inverter can power various appliances in home or office environment, including motor-type appliances such as tube light, fan, refrigerator and air conditioners.

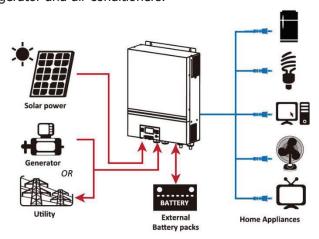
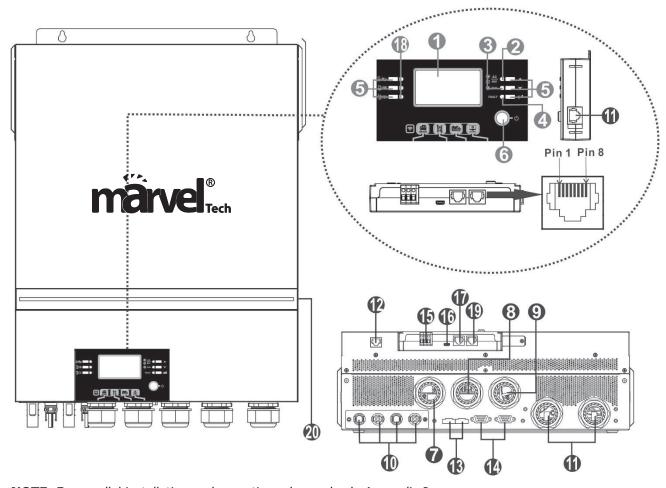


Figure 1 Basic hybrid PV System Overview



Product Overview



NOTE: For parallel installation and operation, please check *Appendix I*.

- 1. LCD display
- 2. Status indicator
- 3. Charging indicator
- 4. Fault indicator
- 5. Function buttons
- 6. Power on/off switch
- 7. Generator input connector
- 8. AC input connector
- 9. AC output connector (Load connection)
- 10. PV connectors
- 11. Battery connectors
- 12. Remote LCD module communication Port

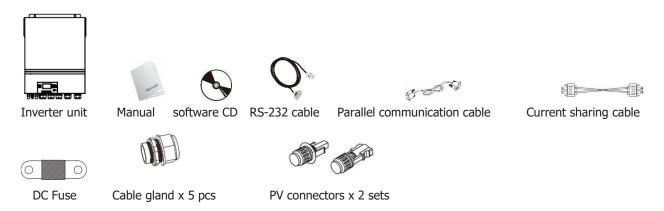
- 13. Current sharing port
- 14. Parallel communication port
- 15. Dry contact
- 16. USB port as USB communication port and USB function port
- 17. BMS communication port: CAN, RS-485 or RS-232
- Output source indicators (refer to OPERATION/operation and Display Panel section for details) and USB function setting reminder (refer to OPERATION/Function setting for the details)
- 19. RS-232 communication port
- 20 RGB LED bar (refer to LCD Setting section for the details)



INSTALLATION

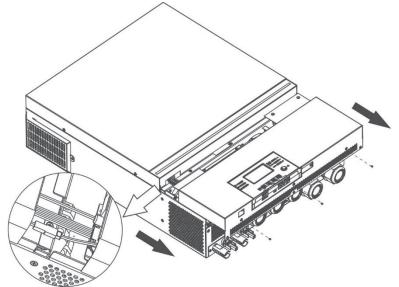
Unpacking and Inspection

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



Preparation

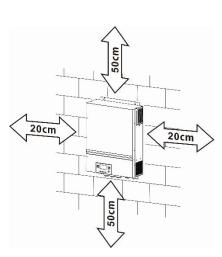
Before connecting all wirings, please take off bottom cover by removing five screws. When removing the bottom cover, be carefully to remove three cables as shown below.



Mounting the Unit

Consider the following points before selecting where to install:

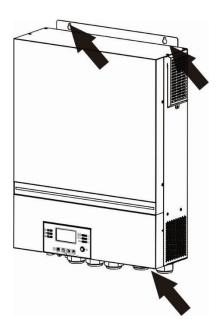
- Do not mount the inverter on flammable construction materials.
- Mount on a solid surface
- Install this inverter at eye level in order to allow the LCD display to be read at all times.
- The ambient temperature should be between 0°C and 55°C to ensure optimal operation.
- The recommended installation position is to be adhered to the wall vertically.
- Be sure to keep other objects and surfaces as shown in the right diagram to guarantee sufficient heat dissipation and to have enough space for removing wires.



⚠ SUITABLE FOR MOUNTING ON CONCRETE OR OTHER NON-COMBUSTIBLE SURFACE ONLY.



Install the unit by screwing four screws. It's recommended to use M4 or M5 screws.



Battery Connection

CAUTION: For safety operation and regulation compliance, it's requested to install a separate DC over-current protector or disconnect device between battery and inverter. It may not be requested to have a disconnect device in some applications, however, it's still requested to have over-current protection installed. Please refer to typical amperage in below table as required fuse or breaker size. **Ring terminal:**

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

WARNING! It's very important for system safety and efficient operation to use appropriate cable for battery connection. To reduce risk of injury, please use the proper recommended cable and terminal size as below.



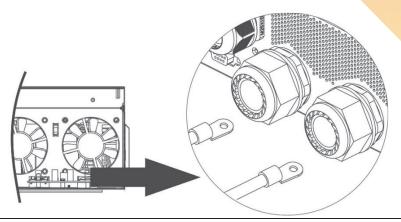
Recommended battery cable and terminal size:

	Typical	Patton		Cable	Ring Terminal		Torque
Model	Amperage	Battery capacity	Wire Size	mm ²	Dimen	sions	value
	Amperage	Capacity		mm-	D (mm)	L (mm)	value
11KW	228A	250AH	1*3/0AWG	85	8.4	54	5 Nm

Please follow below steps to implement battery connection:

- 1. Assemble battery ring terminal based on recommended battery cable and terminal size.
- 2. Fix two cable glands into positive and negative terminals.
- 3. Insert the ring terminal of battery cable flatly into battery connector of inverter and make sure the nuts are tightened with torque of 5 Nm. Make sure polarity at both the battery and the inverter/charge is correctly connected and ring terminals are tightly screwed to the battery terminals.





 \wedge

WARNING: Shock Hazard

Installation must be performed with care due to high battery voltage in series.



CAUTION!! Do not place anything between the flat part of the inverter terminal and the ring terminal. Otherwise, overheating may occur.

CAUTION!! Do not apply anti-oxidant substance on the terminals before terminals are connected tightly.

CAUTION!! Before making the final DC connection or closing DC breaker/disconnector, be sure positive (+) must be connected to positive (+) and negative (-) must be connected to negative (-).

AC Input/Output Connection

CAUTION!! Before connecting to AC input power source, please install a **separate** AC breaker between 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's 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 as below.

Suggested cable requirement for AC wires

Model	Gauge	Torque Value
11KW	8 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 disconnector first.
- 2. Remove insulation sleeve 10mm for six conductors. And shorten phase L and neutral conductor N 3 mm.
- 3. Fix three 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)**

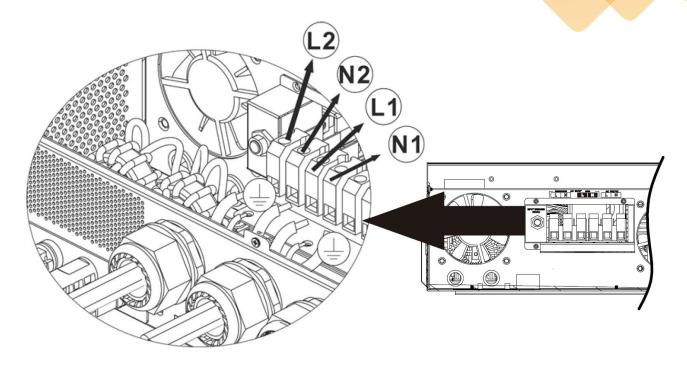
L1→**LINE** (brown or black)

N1→**Neutral** (blue)

L2→ **Generator** (brown or black)

N2→Neutral (blue)





WARNING:

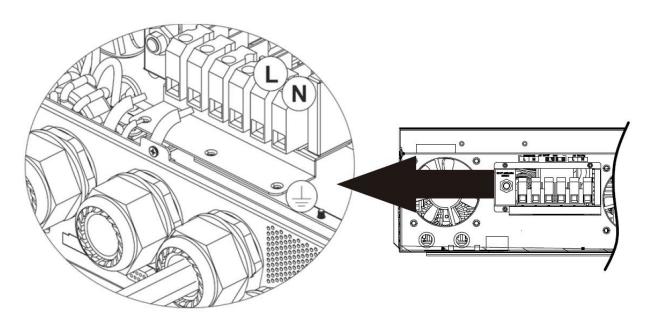
Be sure that AC power source is disconnected before attempting to hardwire it to the unit.

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 short-circuited when these inverters are worked in parallel operation.



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

PV Connection

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

NOTE1: Please use 600VDC/30A circuit breaker.

NOTE2: The overvoltage 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: single crystalline and poly crystalline 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 NO grounding.

CAUTION: It's required to use PV junction box with surge protection. Otherwise, it will cause damage on 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 27A.

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.

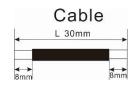
Step 3: Assemble provided PV connectors with PV modules by the following steps.

Components for PV connectors and Tools:

Components for PV connec	omponents for PV connectors and Tools:				
Female connector housing					
Female terminal					
Male connector housing					
Male terminal					
Crimping tool and spanner					

Prepare the cable and follow the connector assembly process:

Strip one cable 8 mm on both end sides and be careful NOT to nick conductors.



Insert striped cable into female terminal and crimp female terminal as shown below.



Insert assembled cable into female connector housing as shown below.



Insert striped cable into male terminal and crimp male terminal as shown below.





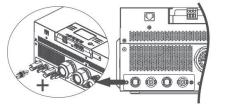
Insert assembled cable into male connector housing as shown below.

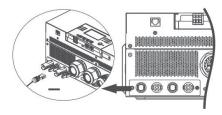


Then, use spanner to screw pressure dome tightly to female connector and male connector as shown below.



Step 4: 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.





WARNING! For safety and efficiency, it's very important to use appropriate cables for PV module connection. To reduce risk of injury, please use the proper cable size as recommended below.

To reduce hisk of injuly, piedse use the	te proper cable size as recommended below.
Conductor cross-section (mm ²)	AWG no.
4~6	10~12

CAUTION: Never directly touch the terminals of inverter. It might cause lethal electric shock.

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	11KW
Max. PV Array Power	11000W
Max. PV Array Open Circuit Voltage	500Vdc
PV Array MPPT Voltage Range	90Vdc~450Vdc
Start-up Voltage (Voc)	80Vdc

Recommended solar panel configuration:

Solar Panel Spec.	SOLAR INPUT 1	SOLAR INPUT 2	Oltres	Total Innut
(reference)	Min in series: 4pcs, per inpu	Q'ty of	Total Input Power	
- 250Wp	Max. in series: 12pcs, per in	put	panels	Power
- Vmp: 30.7Vdc	4pcs in series	Χ	4pcs	1000W
- Imp: 8.3A	X	4pcs in series	4pcs	1000W
- Voc: 37.7Vdc	12pcs in series	Х	12pcs	3000W
- Isc: 8.4A	X	12pcs in series	12pcs	3000W
- Cells: 60	6pcs in series	6pcs in series	12pcs	3000W
	6pcs in series, 2 strings	Χ	12pcs	3000W
	X	6pcs in series, 2 strings	12pcs	3000W
	8pcs in series, 2 strings	Х	16pcs	4000W



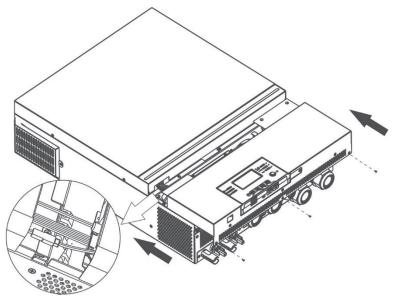
Х	8pcs in series, 2 strings	16pcs	4000W
11pcs in series, 2 strings	Х	22pcs	5500W
Х	11pcs in series, 2 strings	22pcs	5500W
9pcs in series, 1 string	9pcs in series, 1 string	18pcs	4500W
10pcs in series, 1 string	10pcs in series, 1 string	20pcs	5000W
12pcs in series, 1 string	12pcs in series, 1 string	24pcs	6000W
6pcs in series, 2 strings	6pcs in series, 2 strings	24pcs	6000W
7pcs in series, 2 strings	7pcs in series, 2 strings	28pcs	7000W
8pcs in series, 2 strings	8pcs in series, 2 strings	32pcs	8000W
9pcs in series, 2 strings	9pcs in series, 2 strings	36pcs	9000W
10pcs in series, 2 strings	10pcs in series, 2 strings	40pcs	10000W
11pcs in series, 2 strings	11pcs in series, 2 strings	44pcs	11000W

Take the 555Wp PV module as an example. After considering above two parameters, the recommended module configurations are listed in the table below.

Solar Panel Spec.	SOLAR INPUT 1	SOLAR INPUT 2	Oltre of	Total Innut
(reference) - 555Wp	Min in series: 3pcs, per inpu	Q'ty of	Total Input	
- Imp: 17.32A	Max. in series: 10pcs, per ir	nput	panels	Power
- Voc: 38.46Vdc	3pcs in series	х	3pcs	1665W
- Isc: 18.33A	X	3pcs in series	3pcs	1665W
- Cells: 110	7pcs in series	Х	7pcs	3885W
	X	7pcs in series	7pcs	3885W
	10pcs in series	X	10pcs	5550W
	X	10pcs in series	10pcs	5550W
	7pcs in series	7pcs in series	14pcs	7770W
	10pcs in series	10pcs in series	20pcs	11100W

Final Assembly

After connecting all wirings, re-connect three cables and then put bottom cover back by screwing five screws as shown below.

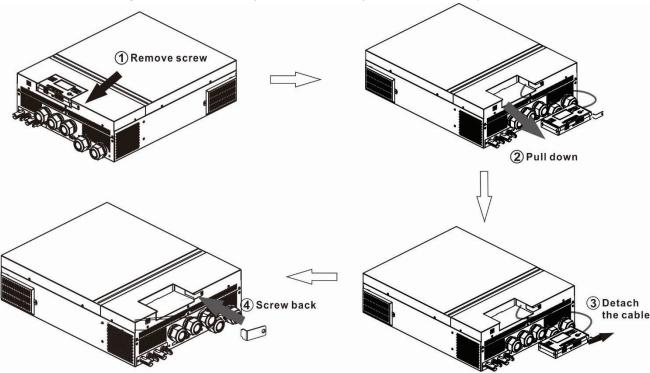




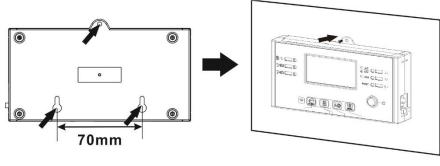
Remote Display Panel Installation

The LCD module can be removable and installed in a remote location with an optional communication cable. Please take the follow steps to implement this remote panel installation.

Step 1. Remove the screw on the bottom of LCD module and pull down the module from the case. Detach the cable from the original communication port. Be sure to replace the retention plate back to the inverter.



Step 2. Prepare your mounting holes in the marked locations as shown in the illustration below. The LCD module then can be securely mounted to your desired location.

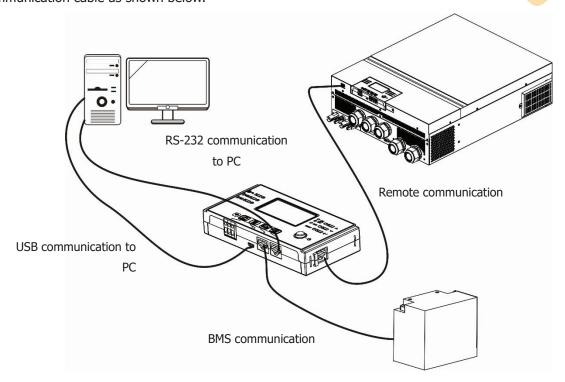


Note: Wall installation should be implemented with the proper screws to the right.





Step 3. After LCD module is installed, connect LCD module to the inverter with an optional RJ45 communication cable as shown below.



Communication Connection

Serial Connection

Please use the supplied serial cable to connect between the inverter and your PC. Install the monitoring software from the bundled CD and follow the on-screen instructions to complete your installation. For detailed software operation, refer to the software user manual on the bundled CD.

Wi-Fi Connection

This unit is equipped with a Wi-Fi transmitter. Wi-Fi transmitter can enable wireless communication between off-grid inverters and monitoring platform. Users can access and control the monitored inverter with downloaded APP. You may find "WatchPower" app from the Apple® Store or "WatchPower Wi-Fi" in Google® Play Store. All data loggers and parameters are saved in iCloud. For quick installation and operation, please check Appendix III.





Dry Contact Signal

There is one dry contact (3A/250VAC) available on the rear panel. It could be used to deliver signal to external device when battery voltage reaches warning level.

Unit Status		Condi	Dry contact	port: NC C NO	
				NC & C	NO & C
Power Off	Unit is off and	no output is pow	vered.	Close	Open
	Output is powered	Program 01 set as USB	Battery voltage < Low DC warning voltage	Open	Close
Power On	from Battery power or Solar energy.	(utility first) or SUB (solar first)	Battery voltage > Setting value in Program 13 or battery charging reaches floating stage	Close	Open
Power Off		Program 01 is set as SBU	Battery voltage < Setting value in Program 12	Open	Close
		(SBU priority)	Battery voltage > Setting value in Program 13 or battery charging reaches floating stage	Close	Open

BMS Communication

It is recommended to purchase a special communication cable if you are connecting to Lithium-Ion battery banks. Please refer to *Appendix II- BMS Communication Installation* for details.



OPERATION

Power ON/OFF

Once the unit has been properly installed and the batteries are connected well, simply press On/Off switch (located on the display panel) to turn on the unit.



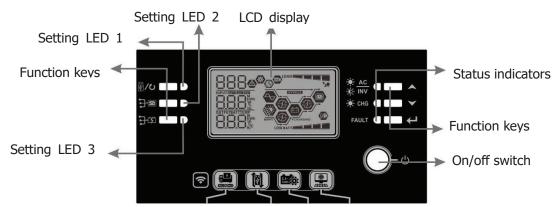
Inverter Turn-on

After this inverter is turned on, WELCOME light show will be started with RGB LED BAR. It will slowly cycle through entire spectrum of nine colors (Green, Sky blue, Royal blue, Violet, Pink, Red, Honey, Yellow, Lime yellow) about 10-15 seconds. After initialization, it will light up with default color.

RGB LED BAR can light up in different color and light effects based on the setting of energy priority to display the operation mode, energy source, battery capacity and load level. These parameters such as color, effects, brightness, speed and so on can be configured through the LCD panel. Please refer to LCD settings for the details.

Operation and Display Panel

The operation and the LCD module, shown in the chart below, includes six indicators, six function keys, on/off switch and a LCD display to indicate the operating status and input/output power information.



Indicators

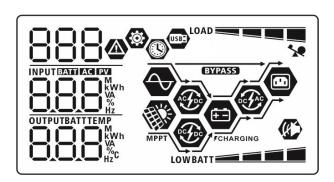
LED Ind	LED Indicator		Solid/Flashing	Messages
Setting	Setting LED 1		Solid On	Output powered by utility
Setting	LED 2	Green	Solid On	Output powered by PV
Setting	LED 3	Green	Solid On	Output powered by battery
	rs ÷ CHG	Green	Solid On	Output is available in line mode
			Flashing	Output is powered by battery in battery mode
Status		Green	Solid On	Battery is fully charged
indicators			Flashing	Battery is charging.
		Dod	Solid On	Fault mode
		Red	Flashing	Warning mode



Function Keys

Function	Key	Description
₩/ ७	ESC	Exit the setting
(F)	USB function setting	Select USB OTG functions
	Timer setting for the Output source priority	Setup the timer for prioritizing the output source
]	Timer setting for the Charger source priority	Setup the timer for prioritizing the charger source
+] \$	Press these two keys at the time to switch RGB LED bar for output source priority and battery discharge/charge status
A	Up	To last selection
^	Down	To next selection
←	Enter	To confirm/enter the selection in setting mode

LCD Display Icons



Icon	Function description	
Input Source Information		
AC	Indicates the AC input.	
PV	Indicates the PV input	
INPUT BATH FACE FAVE	Indicate input voltage, input frequency, PV voltage, charger current,	
	charger power, battery voltage.	
Configuration Program and I	Fault Information	
®		
888	Indicates the setting programs.	
	Indicates the warning and fault codes.	
888 @	Warning: Alashing with warning code.	
	Fault: FBB lighting with fault code	
Output Information		
OUTPUTBATTTEMP M KWh	Indicate output voltage, output frequency, load percent, load in VA,	
	load in Watt and discharging current.	
Battery Information		
	Indicates battery level by 0-24%, 25-49%, 50-74% and 75-100% in	
BATT	battery mode and charging status in line mode.	
When battery is charging, it will present battery charging status.		



Status	Battery voltag	oltage LCD D		LCD Display	
	<2V/cell		4 bars will flash in turns.		
Constant 2 ~ 2.083V/ce		ell will flash in tur			
Current mode / Constant	2.083 ~ 2.163	7V/cell	Bottom two bars will flas	bars will be on and the other two h in turns.	
Voltage mode	> 2.167 V/cel	II	Bottom three will flash.	e bars will be on and the top bar	
Floating mode. I	 Batteries are ful	lly charged	4 bars will be	2.00	
In battery mode,			4 Dats Will De	e 011.	
Load Percentage	· · · · · · · · · · · · · · · · · · ·	Battery Voltage		LCD Display	
Load Percentage	<u> </u>	< 1.85V/cell		HIND-TOTAL TOTAL CONTINUES OF THE STATE OF T	
			33\//coll	LOWBATT	
Load >50%		1.85V/cell ~ 1.933V/cell 1.933V/cell ~ 2.017V/cell		BATT	
				BATT	
		> 2.017V/cell		BATT	
		< 1.892V/cell		LOWBATT	
Load < 50%		1.892V/cell ~ 1.975V/cell		BATT	
		1.975V/cell ~ 2.058V/cell		BATT	
		> 2.058V/cell		BATT SALE	
Load Information	on				
	*	Indicates overloa	ad.		
.0AD ======		Indicates the loa	s the load level by 0-24%, 25-49%, 50-74% and 75-1		
0%~2 LOAD 50%~7		0%~2	24%	25%~49%	
		LOAD		LOAD	
		50%~	74%	75%~100%	
			LOAD		
Mode Operation Information					
lack		Indicates unit co	nnects to the	mains.	

MPPT	Indicates unit connects to the PV panel.
BYPASS	Indicates load is supplied by utility power.
P	Indicates the utility charger circuit is working.
	Indicates the solar charger circuit is working.
P	Indicates the DC/AC inverter circuit is working.
	Indicates unit alarm is disabled.
USB	Indicates USB disk is connected.
	Indicates timer setting or time display



LCD Setting

General Setting

After pressing and holding "←" button for 3 seconds, the unit will enter the Setup Mode. Press "♠" or "▼" button to select setting programs. Press "←" button to confirm you selection or "[♣]/♥" button to exit.

Setting Programs:

Program	Description	Selectable option		
		Escape		
00	Exit setting mode			
		850		
		Utility first (default)	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.	
01	Output source priority: To configure load power source priority	Solar first	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	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	
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)	Setting range is from 10A to 150A. Increment of each click is 10A.	



	1	1	
		Appliances (default)	If selected, acceptable AC input voltage range will be within 90-280VAC.
03	AC input voltage range	APL	
		UPS	If selected, acceptable AC input voltage range will be within 170-280VAC.
		UPS	
		AGM (default)	Flooded
		86-	FLd
		User-Defined	If "User-Defined" is selected, battery charge voltage and low DC cut-off voltage can be set up in program 26, 27 and 29.
		USE	
		Pylontech battery G	If selected, programs of 02, 26, 27 and 29 will be automatically set up. No need for further setting.
		PYL	
05	Battery type	WECO battery	If selected, programs of 02, 12, 26, 27 and 29 will be auto-configured per battery supplier recommended. No need for
		υEC	further adjustment.
		Soltaro battery	If selected, programs of 02, 26, 27 and 29 will be automatically set up. No need for further setting.
		SOL	
		LIb-protocol compatible battery	Select "LIb" if using Lithium battery compatible to Lib protocol. If selected, programs of 02, 26, 27 and 29 will be automatically set up. No need for
		UБ	further setting.



		3 rd party Lithium battery	Select "LIC" if using Lithium
		<u>ης</u> 🐵	battery not listed above. If
		l ij 💆	selected, programs of 02, 26, 27
			and 29 will be automatically set
		LI [up. No need for further setting.
		L' L	Please contact the battery
			supplier for installation
			procedure.
		Restart disable (default)	Restart enable
	Auto restart when overload	85 👁	C5 🚳
06	OCCURS		
	occurs		
		LHd	LHE
		Restart disable (default)	Restart enable
			<u> </u>
07	Auto restart when over	0'	• •
07	temperature occurs		
			l
		ԷԻ Ძ	
		50Hz (default)	60Hz
		[] 9 🐵	89 🔮
09	Output frequency		
		50 _{Hz}	60 _{Hz}
		220V	230V (default)
		iii 📽	iii 📽
		220,	
10	Output voltage		<u></u>
		240V	
		🚳	
		24 <u>0</u> ,	
	Maximum utility and	<u> </u>	Littlibe about to a comment 200
	Maximum utility and generator charging current	Utility charging current: 2A	Utility charging current: 30A
	ganalata. Charging carrent	🚳	(default)
	Note: If setting value in		🕲
11	program 02 is smaller than	6H8	
	that in program in 11, the		1648
	inverter will apply charging current from program 02	C '^	
	for utility charger.		∃∐^
L	1	<u> </u>	



11	Maximum utility and generator charging current 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.	Generator charging current: 2A Control Contro	Generator charging current: 30A (default) Generator charging current: 30A (default) Generator charging current: 30A (default)
12	Setting voltage point or SOC percentage back to utility source when selecting "SBU" (SBU priority) in program 01.	46V (default) LEATT SOC 10% (default for Lithium) BATT BATT BATT W	Setting range is from 44V to 56V. Increment of each click is 1V. 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%.
13	Setting voltage point or SOC percentage back to battery mode when selecting "SBU" (SBU priority) in program 01.	Battery fully charged BATT Setting range is from 48V to 6 SOC 30% (default for Lithium) BATT BATT %	54V (default) 52V. Increment of each click is 1V. If any types of lithium battery is selected in program 05, setting value will change to SOC automatically. Setting range is 10% to 100%.
16	Charger source priority: To configure charger source priority	If this inverter/charger is work mode, charger source can be Solar first	,



16	Charger source priority: To configure charger source priority	energy can charge battery. So	Solar energy and utility will charge battery at the same time. Solar energy will be the only charger source no matter utility is available or not. king in Battery mode, only solar lar energy will charge battery if it's
18	Alarm control	available and sufficient. Alarm on (default)	Alarm off
19	Auto return to default display screen	Return to default display screen (default) 19 ESP Stay at latest screen 19 FEP	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. If selected, the display screen will stay at latest screen user finally switches.
20	Backlight control	Backlight on (default)	Backlight off



		1			
22	Beeps while primary source	Alarm on (de	•	Alarm off	
22	is interrupted	800		80F	
		Bypass disat	ole (default)	Bypass enable	e
23	Overload bypass: When enabled, the unit will transfer to line mode if overload occurs in battery	23	⊗	23	©
	mode.	649		64E	
		Record enab	le (default)	Record disabl	e
		25		25	②
25	Record Fault code				
		FEN		FdS	
		default: 56.4	1V		
		56	©		
	Bulk charging voltage	["			
26	(C.V voltage)	BATT			
		up. Setting r	range is from 48.0	-	program can be set acrement of each
		click is 0.1V. default: 54.0			
		27	◎		
		Բլս			
27	Floating charging voltage	S HINV			
				-	program can be set rement of each click
		is 0.1V.	inverter is used	Darallol, Thic	inverter is operated
	AC output mode		ase application.	in parallel sys	tem.
28	*This setting is only available when the inverter is in standby mode (Switch	28 '	©	- 58 @)
	off).	SI G		PAL	



		When the inverter is operated inverter to be operated in specific	in 3-phase app <mark>lication, set up</mark>
		L1 phase:	L2 phase:
		JQ @	DO 0
	Charger source priority:		
16	To configure charger	32 !	392
	source priority	L3 phase:	
		28 @	
		-0	
		202	
		323	
		default: 44.0V	If self-defined is selected in
	Low DC cut-off voltage or Low SOC:	2 0 0	program 5, this program can be set up. Setting range is from
			42.0V to 48.0V. Increment of
	 If battery power is only power source available, 	C D L	each click is 0.1V. Low DC cut-off
	inverter will shut down.	│ └┤└ ┤∁ _╵	voltage will be fixed to setting
	 If PV energy and battery power are 		value no matter what percentage of load is connected.
29	available, inverter will charge battery without	SOC 0% (default for	If any types of lithium battery is
	AC output. • If PV energy, battery	Lithium)	selected in program 05, setting
	power and utility are all	29 🚳	value will change to SOC automatically. Adjustable range
	available, inverter will transfer to line mode	SOC	is 0% to 90%. Increment of each
	and provide output power to loads.	BATT	click is 5%.
	power to louds.	\ %	
		Battery equalization	Battery equalization disable
			(default)
		30 🚳	30 0
30	Battery equalization		
		EEN	E8S
			' is selected in program 05, this
		program can be set up.	is sciected in program us, tills
		default: 58.4V	Setting range is from 48.0V to
		3 @	62.0V. Increment of each click is
31	Battery equalization voltage	Ęυ	0.1V.
		BATT	
		ָדֹעָם' ·	



	I	T	
33	Battery equalized time	60min (default)	Setting range is from 5min to 900min. Increment of each click is 5min.
		60	
34	Battery equalized timeout	120min (default)	Setting range is from 5min to 900 min. Increment of each click is 5 min.
35	Equalization interval	30days (default) 35	Setting range is from 0 to 90 days. Increment of each click is 1 day
36	Equalization activated immediately	Enable If equalization function is enal can be set up. If "Enable" is sactivate battery equalization in show "E". If "Disable" is set function until next activated e	Disable (default) Disable (default)
37	Reset all stored data for PV generated power and output load energy	Not reset(Default) ∃	Reset 37 FSE
38	Solar energy feeds to the grid (It's requested to enter password)	Solar feeds to the grid disable(default)	Solar feeds to the grid enable



		Disable (Default)	If selected, battery discharge protection is disabled.
		dd5	The setting range is from 30 A to
41	Maximum battery discharging current	└┤ 	200 A. Increment of each click is 10A. If discharging current is higher than setting value, battery will stop discharging. At this time, if the utility is available, the
		30	inverter will operate in bypass mode. If no utility is available, the inverter will shut down after 5-minute operation in battery mode.
51	On/Off control for RGB LED *It's necessary to enable this setting to activate RGB LED lighting function.	Enabled (default)	Disable
		LEN	LdS
		Low	Normal (default)
		52 🛭	52 🕲
52	D: 11 (DCD 15D	LO	
32	Brightness of RGB LED	High	
		52 🚳	
		H I	
		Low	Normal (default)
53	Lighting speed of RGB LED	53 🔮	53 🚳
		LO	NOH



53	Lighting speed of RGB LED	High	
54	RGB LED effects	Scrolling Scrolling Scrolling	Breathing 54
55	Color combination of RGB LED to show energy source and battery charge/discharge status: Grid-PV-Battery Battery charge/discharge status	C01: (Default) Violet-White-Sky blue Pink-Honey	C02: White-Yellow-Green Royal blue-Lime yellow
93	Erase all data log	Not reset (Default)	Reset 93 🌣
94	Data log recorded interval *The maximum data log number is 1440. If it's over 1440, it will re-write the first log.	3 minutes 3 minutes 10 minutes (default)	5 minutes 94 © 20 minutes 94 ©



94	Data log recorded interval *The maximum data log number is 1440. If it's over 1440, it will re-write the first log.	30 minutes SH	60 minutes
95	Time setting – Minute	For minute setting, the ran	nge is from 0 to 59.
96	Time setting – Hour	For hour setting, the range	e is from 0 to 23.
97	Time setting– Day	For day setting, the range	is from 1 to 31.
98	Time setting- Month	For month setting, the ran	ge is from 1 to 12.
99	Time setting – Year	For year setting, the range	e is from 17 to 99.



Function Setting

There are three function keys on the display panel to implement special functions such as USB OTG, Timer setting for output source priority and timer setting for charger source priority.

1. USB Function Setting

Insert an OTG USB disk into the USB port (). Press and hold " button for 3 seconds to enter USB Setup Mode. These functions including inverter firmware upgrade, data log export and internal parameters rewrite from the USB disk.

Procedure	LCD Screen
Step 1: Press and hold " button for 3 seconds to enter USB function setting mode.	
Step 2: Press ** ** ** ** ** ** ** ** ** ** ** ** *	UPG ® ● SEL LOG

Step 3: Please select setting program by following the procedure.

Program#	Operation Procedure	LCD Screen	
∰/℧ _:	This function is to upgrade inverter firmware. If firmware upgrade is needed, please check with		
Upgrade	your dealer or installer for detail instructions.		
firmware			
] • • • • • • • • • • • • • • • • • • •	This function is to over-write all parameter settings (TEXT file) with settings in t	the On-The-Go	
- □:	USB disk from a previous setup or to duplicate inverter settings. Please check	with your	
Re-write	dealer or installer for detail instructions.		
internal			
parameters			
	By pressing " button to export data log from the inverter to USB disk. If	[86 🖷	
	the selected function is ready, LCD will display "ーロゴ". Press "鬱/ひ" button		
	to confirm the selection again.	F88	
] \$1:	Press "Dutton to select "Yes", LED 1 will flash once every second	L85 👁 📾	
Export data	during the process. It will only display LOG and all LEDs will be on	465	
log	after this action is complete. Then, press " button to return to main screen.	no .	
	Or press " "button to select "No" to return to main screen. "" "" "" "" "" "" "" "" ""		

If no button is pressed for 1 minute, it will automatically return to main screen.

Error message for USB On-the-Go functions:

Error Code	Messages
UO I	No USB disk is detected.
U02	USB disk is protected from copy.
U03	Document inside the USB disk with wrong format.

If any error occurs, error code will only show 3 seconds. After three seconds, it will automatically return



2. Timer Setting for Output Source Priority

This timer setting is to set up the output source priority per day.

Procedure		
Step 1: Press and hold "button for 3 seconds to enter Timer Setup Mode for output source priority.		
Step 2: Press "***/**/** or "・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・		
descriptions in Step 3).	500	

Step 3: Please select setting program by following each procedure.

Program#	Operation Procedure	LCD Scree	en
∰/ ひ	Press "☐/O" button to set up Utility First Timer. Press "☐" button to select staring time. Press "▲" or "▼" button to adjust values and press "←" to confirm. Press "☐" button to select end time. Press "▲" or "▼" button to adjust values, press "←" button to confirm. The setting values are from 00 to 23, with 1-hour increment.	USB * 00 23	
	Press "→" button to set up Solar First Timer. Press "→" button to select staring time. Press "→" or "▼" button to adjust values and press "←" to confirm. Press "→" button to select end time. Press "→" or "▼" button to adjust values, press "←" button to confirm. The setting values are from 00 to 23, with 1-hour increment.	SUb (00 23	
] \$	Press "J'" button to set up SBU Priority Timer. Press "J'" button to select staring time. Press "\" or "\" button to adjust values and press "\" to confirm. Press "\" button to select end time. Press "\" or "\" button to adjust values, press "\" button to confirm. The setting values are from 00 to 23, with 1-hour increment.	S6U (00 23	

Press " button to exit the Setup Mode.

3. Timer Setting for the Charger Source Priority

This timer setting is to set up the charger source priority per day.

This time setting is to set up the charger source priority per day.	
Procedure	LCD Screen
Step 1: Press and hold "button for 3 seconds to enter Timer Setup Mode for charging source priority.	CSO ♥ SNU
Step 2: Press "例/ひ", "予動" or "予算" button to enter the selectable programs (detail	050
descriptions in Step 3).	

Step 3: Please select setting program by following each procedure.

Program#	Operation Procedure	LCD Screen
∰/ゼ	Press "button to set up Solar First Timer. Press button to select staring time. Press "a" or "v" button to adjust values and press "d" to confirm. Press button to select end time. Press "a" or "v" button to adjust values, press "d" button to confirm. The setting values are from 00 to 23, with 1-hour increment.	CSO ♥ 00 23



] •••	Press "button to set up Solar & Utility Timer. Press "button to select staring time. Press "A" or "V" button to adjust values and press "U" to confirm. Press "B" button to select end time. Press "A" or "V" button to adjust values, press "U" button to confirm. The setting values are from 00 to 23, with 1-hour increment.	SAU 00 23	®
] #	Press ""button to set up Solar Only Timer. Press "button to select staring time. Press " or " button to adjust values and press " to confirm. Press " button to select end time. Press " or " v" button to adjust values, press " button to confirm. The setting values are from 00 to 23, with 1-hour increment.	050 00 23	

Press ""/" button to exit the Setup Mode.



LCD Display

The LCD display information will be switched in turn by pressing the "UP" or "DOWN" button. The selectable information is switched as the following table in order.

Selectable information	LCD display
	Grid input voltage=230V, output voltage=230V
Input voltage/Output voltage	INPUT AG OUTPUT V OUTPUT V MPPT DECEMBRING LOW BATT
(Default Display Screen)	Generator input voltage=230V, output voltage=230V
	OUTPUT V OUTPUT V OUTPUT V MPPT OUTPUT LOW BATT
	Grid input frequency=50Hz
	OUTPUT WIPPT OUTPUT LOAD BYPASS OUTPUT MPPT OF DOT SCHARGING LOW BATT
Input frequency	Generator input frequency=50Hz
	OUTPUT V BYPASS OUTPUT WPPT OCOUPTION LOW BATT
PV voltage	PV1 voltage=260V INPUT OUTPUT WPPT MPPT BATT



	PV2 voltage=260V
	INPUT PY OUTPUT V MPPT SCHARGING BATT
	PV1 current = 2.5A
PV current	INPUT EV BYPASS OUTPUT WARPT WARPT WARPT BATT
T V Carrette	PV2 current = 2.5A
	INPUT EXT A OUTPUT WITH A MINING BATT
	PV1 power = 500W
PV power	OUTPUT W OUTPUT W PV2 power = 500W LOAD
	INPUT DV W OUTPUT W MPPT MPPT BYPASS D FCHARGING BATT



	AC and PV charging current=50A
	OUTPUT OUTPUT PV charging current=50A LOAD
Charging current	OUTPUT OUTPUT AC charging current=50A LOAD
	OUTPUT OUTPUT CHARGING BATT FORM FORM
	AC and PV charging power=500W
	OUTPUT W OUTPUT W PV charging power=500W LOAD
Charging power	OUTPUT OUTPUT WARPPT BATT
	Battery voltage=25.5V, output voltage=230V
Battery voltage and output voltage	OUTPUT PCHARGING BATT



Output frequency Output frequ
Load percentage Load percentage Unity of the property of th
Load percentage Load percent=70% Load percentage Load perc
Load percentage When connected load is lower than 1kVA, load in VA will present xxxVA like below chart. Load in VA When load is larger than 1kVA (≥1kVA), load in VA will present x.xkVA like below chart. Load in VA
Load percentage When connected load is lower than 1kVA, load in VA will present xxxVA like below chart. Load in VA When load is larger than 1kVA (≥1kVA), load in VA will present x.xkVA like below chart. Load in VA
When connected load is lower than 1kVA, load in VA will present xxxVA like below chart. Load in VA When load is larger than 1kVA (≥1kVA), load in VA will present x.xkVA like below chart. Load in VA When load is larger than 1kVA (≥1kVA), load in VA will present x.xkVA like below chart. LOAD When load is larger than 1kVA (≥1kVA), load in VA will present x.xkVA like below chart.
Will present xxxVA like below chart. LOAD OUTPUT WHEN I ARRING WHEN I ARRING OUTPUT OUT
Load in VA When load is larger than 1kVA (≥1KVA), load in VA will present x.xkVA like below chart. LOAD OUTPUT VA When load is larger than 1kVA (≥1KVA), load in VA will present x.xkVA like below chart. LOAD OUTPUT VA NEPT FCHARGING BATT NEPT FCHARGING BATT AND FCHARGING BATT AND FCHARGING BATT NEPT NEPT STATE AND FCHARGING BATT NEPT STATE AND FCHARGING BATT STATE BATT BATT STATE BATT BAT
Load in VA When load is larger than 1kVA (≥1KVA), load in VA will present x.xkVA like below chart. LOAD OUTPUT WA When load is larger than 1kVA (≥1KVA), load in VA will present x.xkVA like below chart. BATT OUTPUT OUTPUT BATT BAT
When load is larger than 1kVA (≥1KVA), load in VA will present x.xkVA like below chart. LOAD OUTPUT WARRING BATT
OUTPUT WA MPPT BATT BYPASS BYPASS BATT BA
K MPPT COPPS FCHARGING
When load is lower than 1kW, load in W will present xxxW like below chart.
LOAD
OUTPUT OUTPUT
Load in Watt When load is larger than 1kW (≥1KW), load in W will
present x.xkW like below chart.
DEATH C. STATE OF THE PARTY OF
OUTPUT KW MPPT CHARGING
Battery voltage=25.5V, discharging current=1A
Battery voltage/DC discharging current
BATT BATT



PV energy generated today and Load output energy today	This PV Today energy = 3.88kWh, Load Today energy = 9.88kWh. LOAD OUTPUT kWh MPPT BATT
PV energy generated this month and Load output energy this month.	This PV month energy = 388kWh, Load month energy = 988kWh. LOAD LOAD LOAD AVERAGING MPPT M
PV energy generated this year and Load output energy this year.	This PV year energy = 3.88MWh, Load year energy = 9.88MWh. LOAD LOAD OUTPUT MWh MPPT MPPT MPPT MARGING BATT
PV energy generated totally and Load output total energy.	PV Total energy = 38.8MWh, Load Output Total energy = 98.8MWh. LOAD OUTPUT MWh MIPPT MIP
Real date.	Real date Nov 28, 2020. LOAD BYPASS MPPT CHARGING BATT
Real time.	Real time 13:20.



Main CPU version checking.	Main CPU version 00014.04.
Secondary CPU version checking.	Secondary CPU version 00012.03. LOAD BYPASS MEPT PO CHARGING BATT
Wi-Fi version checking	Wi-Fi version 00000.24. LOAD BYPASS MPPT CHARGING BATT
The third CPU version checking	The third CPU version 00058.01. LOAD BYPASS MPPT CHARGING BATT



Operating Mode Description

Operation mode	Description	LCD display
Standby mode Note: *Standby mode: The inverter is not turned on yet but at this time, the inverter can charge battery without AC output.	No output is supplied by the unit but it still can charge batteries.	Charging by utility. Charging by utility. Charging by PV energy. Charging by PV energy. No charging.
Fault mode Note: *Fault mode: Errors are caused by inside circuit error or external reasons such as over temperature, output short circuited and so on.	No charging at all no matter if grid or PV power is available.	No charging.
Line Mode	The unit will provide output power from the mains. It will also charge the battery at line mode.	Charging by utility and PV energy. BYPASS Charging by utility. BYPASS CHARGING



Operation mode	Description	LCD display
Line Mode	The unit will provide output power from the mains. It will also charge the battery at line mode.	If "SUB" (solar first) is selected as output source priority and solar energy is not sufficient to provide the load, solar energy and the utility will provide the loads and charge the battery at the same time. BYPASS BYP
Battery Mode	The unit will provide output power from battery and/or PV power.	Power from battery and PV energy. PV energy will supply power to the loads and charge battery at the same time. No utility is available. Power from battery only.



Operation mode	Description	LCD display
		Power from PV energy only.
Battery Mode	The unit will provide output power from battery and/or PV power.	MPPT MPPT

Faults Reference Code

Fault Code	Fault Event	Icon on
01	Fan is locked when inverter is off.	F:: }
02	Over temperature	F82
03	Battery voltage is too high	F83
04	Battery voltage is too low	F:::::::::::::::::::::::::::::::::::::
05	Output short circuited.	F8S
06	Output voltage is too high.	F88
07	Overload time out	F87
08	Bus voltage is too high	F88
09	Bus soft start failed	F88
10	PV over current	F 18
11	PV over voltage	F } }
12	DCDC over current	F 12
13	Battery discharge over current	F 13
51	Over current	FS
52	Bus voltage is too low	852
53	Inverter soft start failed	F <u>53</u>
55	Over DC voltage in AC output	F <u>55</u>
57	Current sensor failed	F57
58	Output voltage is too low	F58



Warning Indicator

Warning Code	Warning Event	Audible Alarm	Icon flashing
01	Fan is locked when inverter is on.	Beep three times every second	
02	Over temperature	None	02 &
03	Battery is over-charged	Beep once every second	□ 3
04	Low battery	Beep once every second	
07	Overload	Beep once every 0.5 second	LOAD
10	Output power derating	Beep twice every 3 seconds	[<u> </u>
15	PV energy is low.	Beep twice every 3 seconds	
16	High AC input (>280VAC) during BUS soft start	None	164
30	Communication lost between DSP and INPUT MCU	None	30∞
32	Communication failure between inverter and remote display panel	None	32@
E9	Battery equalization	None	
ЬР	Battery is not connected	None	6P@_



BATTERY EQUALIZATION

Equalization function is added into charge controller. It reverses the buildup of negative chemical effects like stratification, a condition where acid concentration is greater at the bottom of the battery than at the top. Equalization also helps to remove sulfate crystals that might have built up on the plates. If left unchecked, this condition, called sulfation, will reduce the overall capacity of the battery. Therefore, it's recommended to equalize battery periodically.

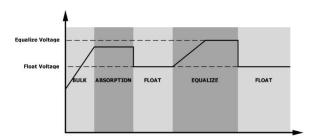
How to Apply Equalization Function

You must enable battery equalization function in monitoring LCD setting program 33 first. Then, you may apply this function in device by either one of following methods:

- 1. Setting equalization interval in program 37.
- 2. Active equalization immediately in program 39.

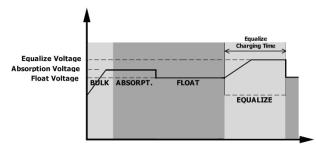
When to Equalize

In float stage, when the setting equalization interval (battery equalization cycle) is arrived, or equalization is active immediately, the controller will start to enter Equalize stage.

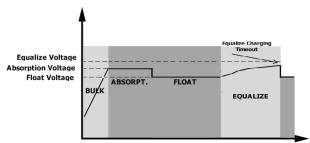


Equalize charging time and timeout

In Equalize stage, the controller will supply power to charge battery as much as possible until battery voltage raises to battery equalization voltage. Then, constant-voltage regulation is applied to maintain battery voltage at the battery equalization voltage. The battery will remain in the Equalize stage until setting battery equalized time is arrived.



However, in Equalize stage, when battery equalized time is expired and battery voltage doesn't rise to battery equalization voltage point, the charge controller will extend the battery equalized time until battery voltage achieves battery equalization voltage. If battery voltage is still lower than battery equalization voltage when battery equalized timeout setting is over, the charge controller will stop equalization and return to float stage.





SPECIFICATIONS

Table 1 Line Mode Specifications

MODEL	11KW	
Input Voltage Waveform	Sinusoidal (utility or generator)	
Nominal Input Voltage	230Vac	
Low Loss Voltage	170Vac±7V (UPS) 90Vac±7V (Appliances)	
Low Loss Return Voltage	180Vac±7V (UPS); 100Vac±7V (Appliances)	
High Loss Voltage	280Vac±7V	
High Loss Return Voltage	270Vac±7V	
Max AC Input Voltage	300Vac	
Max AC Input Current	60A	
Max 2nd Input Current	60A	
Nominal Input Frequency	50Hz / 60Hz (Auto detection)	
Low Loss Frequency	40±1Hz	
Low Loss Return Frequency	42±1Hz	
High Loss Frequency	65±1Hz	
High Loss Return Frequency	63±1Hz	
Output Short Circuit Protection	Line mode: Circuit Breaker (70A) Battery mode: Electronic Circuits	
Efficiency (Line Mode)	>95% (Rated R load, battery full charged)	
Transfer Time	10ms typical (UPS); 20ms typical (Appliances)	
Output power de-rating: When AC input voltage under 170V the output power will be de-rated.	Output Power Rated Power 50% Power 90V 170V 280V Input Voltage	



Table 2 Inverter Mode Specifications

Table 2 Inverter Mode Specificat	.10113	
MODEL	11KW	
Rated Output Power	11000W	
Output Voltage Waveform	Pure Sine Wave	
Output Voltage Regulation	230Vac±5%	
Output Frequency	60Hz or 50Hz	
Peak Efficiency	93%	
Overload Protection	100ms@≥180% load;5s@≥120% load; 10s@105%~120% load	
Surge Capacity	2* rated power for 5 seconds	
Low DC Warning Voltage		
@ load < 20%	46.0Vdc	
@ 20% ≤ load < 50%	42.8Vdc	
@ load ≥ 50%	40.4Vdc	
Low DC Warning Return Voltage		
@ load < 20%	48.0Vdc	
@ 20% ≤ load < 50%	44.8Vdc	
@ load ≥ 50%	42.4Vdc	
Low DC Cut-off Voltage		
@ load < 20%	44.0Vdc	
@ 20% ≤ load < 50%	40.8Vdc	
@ load ≥ 50%	38.4Vdc	
High DC Recovery Voltage	61Vdc	
High DC Cut-off Voltage	63Vdc	
DC Voltage Accuracy	+/-0.3V@ no load	
THDV	<5% for linear load,<10% for non-linear load @ nominal voltage	
DC Offset	≦100mV	
Power Limitation When battery voltage is lower than 55Vdc, output power will be derated. If connected load is higher than this	Output Load Rate Power	
derated power, the AC output voltage will decrease until the output power reduces to this derated power. The minimum AC output voltage is output voltage setting – 10V.	Rate Power *0.725 Battery Voltage 42V 55Vdc	



Table 3 Charge Mode Specifications

Utility Charging N	Mode Specifica Mode		
MODEL	1000	11KW	
Charging Current	: (UPS)		
@ Nominal Input Vo		150A	
Flooded			
Bulk Charging	Battery	58.4Vdc	
Voltage	AGM / Gel	FC 4)/4-	
	Battery	56.4Vdc	
Floating Charging	g Voltage	54Vdc	
Overcharge Prote	ection	63Vdc	
Charging Algorith	nm	3-Step	
Charging Curve		Battery Voltage, per cell Charging Current, % Voltage 100% T1 minimum 10mins, maximum 8hrs Current Bulk (Constant Current) Absorption (Constant Voltage) Time	
MODEL		11KW	
Rated Power		11000W	
Max. PV Array Op Voltage	en Circuit	500Vdc	
PV Array MPPT V	oltage Range	90Vdc~450Vdc	
Max. Input Curre	nt	27A x 2 (MAX 40A)	
Max. Charging Cu	ırrent	150A	
Start-up Voltage		80V +/- 5Vdc	
Power Limitation		27A 13.5A 75° 80° MPPT temperature	



Table 4 General Specifications

MODEL	11KW
Safety Certification	CE
Operating Temperature Range	-10°C to 50°C
Storage temperature	-15°C∼ 60°C
Humidity	5% to 95% Relative Humidity (Non-condensing)
Dimension (D*W*H), mm	147.4x 432.5 x 553.6
Net Weight, kg	18.4

Table 5 Parallel Specifications

Max parallel numbers	6	
Circulation Current under No Load Condition	Max 2A	
Power Unbalance Ratio	<5% @ 100% Load	
Parallel communication	CAN	
Transfer time in parallel mode	Max 50ms	
Parallel Kit	YES	

Note: Parallel feature will be disabled when only PV power is available.



TROUBLE SHOOTING

		T	
Problem	LCD/LED/Buzzer	Explanation / Possible cause	What to do
Unit shuts down automatically during startup process.	LCD/LEDs and buzzer will be active for 3 seconds and then complete off.	The battery voltage is too low (<1.91V/Cell)	Re-charge battery. Replace battery.
No response after power on.	No indication.	 The battery voltage is far too low. (<1.4V/Cell) Battery polarity is connected reversed. 	 Check if batteries and the wiring are connected well. Re-charge battery. Replace battery.
	Input voltage is displayed as 0 on the LCD and green LED is flashing.	Input protector is tripped	Check if AC breaker is tripped and AC wiring is connected well.
Mains exist but the unit works in battery mode.	Green LED is flashing.	Insufficient quality of AC power. (Shore or Generator)	 Check if AC wires are too thin and/or too long. Check if generator (if applied) is working well or if input voltage range setting is correct. (UPS→Appliance)
	Green LED is flashing.	Set "Solar First" as the priority of output source.	Change output source priority to Utility first.
When the unit is turned on, internal relay is switched on and off repeatedly.	LCD display and LEDs are flashing	Battery is disconnected.	Check if battery wires are connected well.
	Fault code 07	Overload error. The inverter is overload 110% and time is up.	Reduce the connected load by switching off some equipment.
	Fault code 05	Output short circuited.	Check if wiring is connected well and remove abnormal load.
		Temperature of internal converter component is over 120°C. (Only available for 1-3KVA models.)	Check whether the air flow of the unit is blocked or
	Fault code 02	Internal temperature of inverter component is over 100°C.	whether the ambient temperature is too high.
Buzzer beeps		Battery is over-charged.	Return to repair center.
continuously and red LED is on.	Fault code 03	The battery voltage is too high.	Check if spec and quantity of batteries are meet requirements.
	Fault code 01	Fan fault	Replace the fan.
	Fault code 06/58	Output abnormal (Inverter voltage below than 190Vac or is higher than 260Vac)	Reduce the connected load. Return to repair center
	Fault code 08/09/53/57	Internal components failed.	Return to repair center.
	Fault code 51	Over current or surge.	Restart the unit, if the error
	Fault code 52	Bus voltage is too low.	happens again, please return
	Fault code 55	Output voltage is unbalanced.	to repair center.



Appendix I: Parallel function

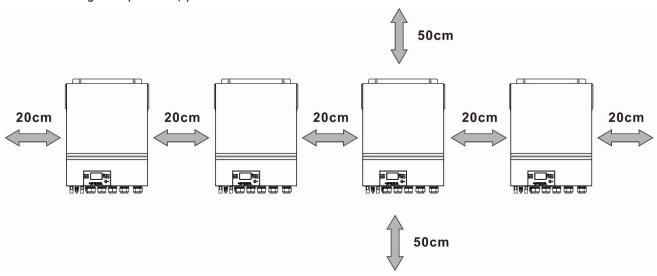
1. Introduction

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

- 1. Parallel operation in single phase is with up to 6 units. The supported maximum output power is 66KW/66KVA.
- 2. Maximum six units work together to support three-phase equipment. Maximum four units support one phase.

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. 20 cm to the side and approx. 50 cm 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.

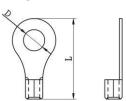
The cable size of each inverter is shown as below:

Recommended battery cable and terminal size for each inverter:

			Ring Te	erminal	Towarra
Model	Wire Size	Cable mm ²	Dimer	nsions	Torque value
			D (mm)	L (mm)	value
11KW	1*3/0AWG	85	8.4	54	5 Nm

WARNING: Be sure the length of all battery cables is the same. Otherwise, there will be voltage difference between inverter and battery to cause parallel inverters not working.

Ring terminal:



Recommended AC input and output cable size for each inverter:

Model	AWG no.	Torque
11KW	6 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*
11KW	250A/70VDC

^{*}If you want to use only one breaker at the battery side for the whole system, the rating of the breaker should be X times current of 1 unit. "X" indicates the number of inverters connected in parallel.

Recommended breaker specification of AC input with single phase:

Model	2 units	3 units	4 units	5 units	6 units
11KW	120A/230VAC	180A/230VAC	240A/230VAC	300A/230VAC	360A/230VAC

Note 1: Also, you can use 60A breaker 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

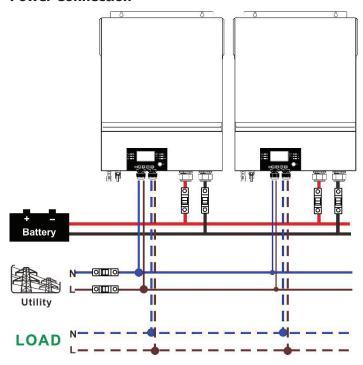
Inverter parallel numbers	2	3	4	5	6
Battery Capacity	200AH	400AH	400AH	600AH	600AH

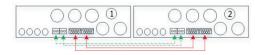
WARNING! Be sure that all inverters will share the same battery bank. Otherwise, the inverters will transfer to fault mode.

4-1. Parallel Operation in Single phase

Two inverters in parallel:

Power Connection



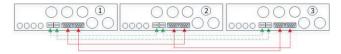




Three inverters in parallel:

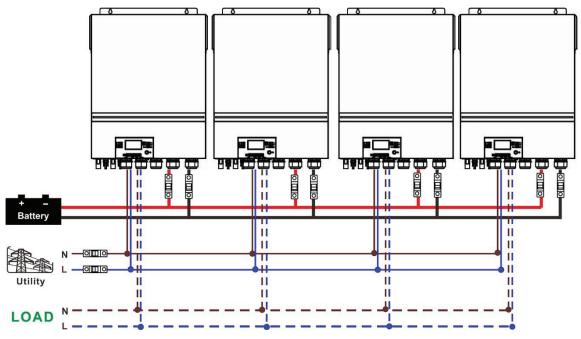
Power Connection Battery LOAD N LOA

Communication Connection



Four inverters in parallel:

Power Connection

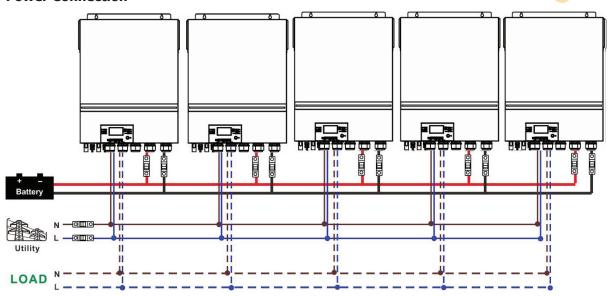






Five inverters in parallel:

Power Connection

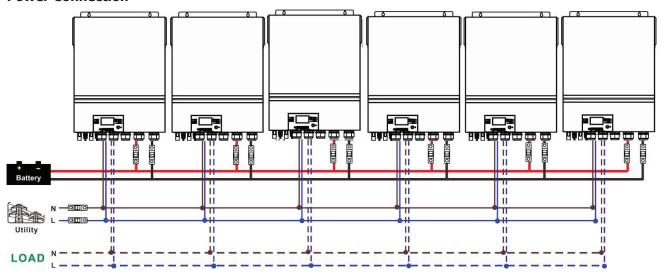


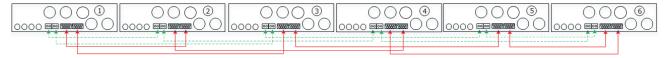
Communication Connection



Six inverters in parallel:

Power Connection





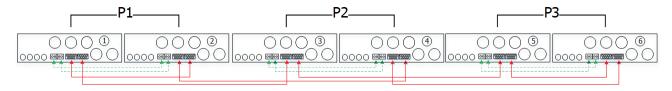


4-2. Support 3-phase equipment

Two inverters in each phase:

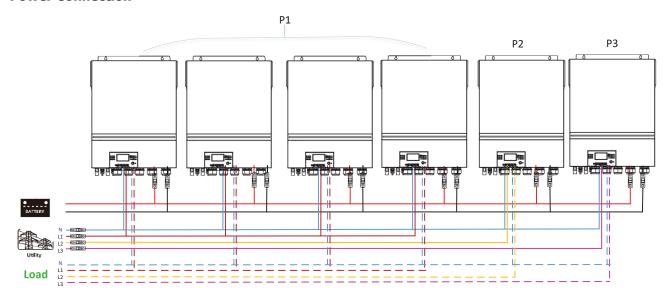
Power Connection

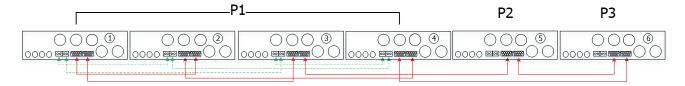
Communication Connection



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

Power Connection

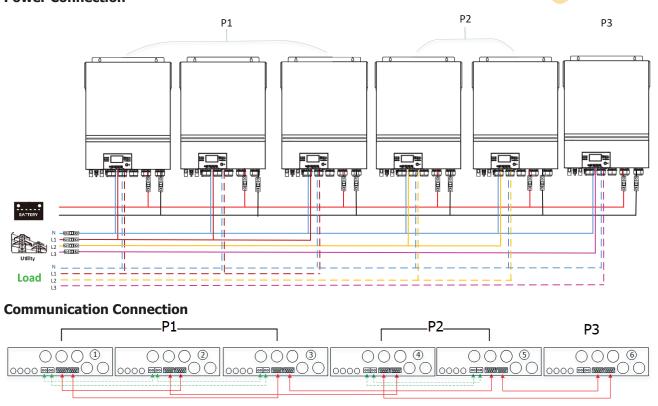






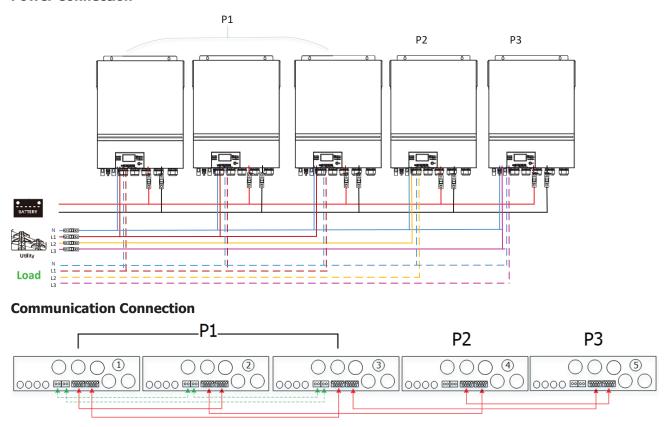
Three inverters in one phase, two inverters in second phase and one inverter for the third phase:

Power Connection



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

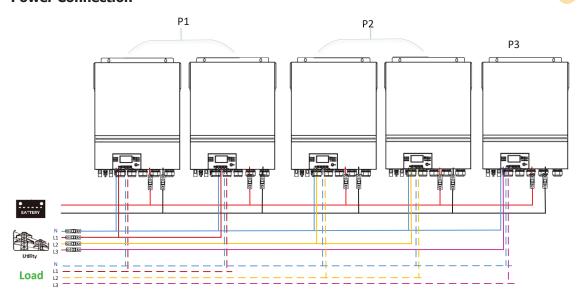
Power Connection



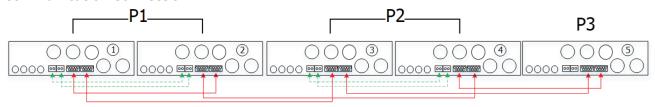


Two inverters in two phases and only one inverter for the remaining phase:

Power Connection

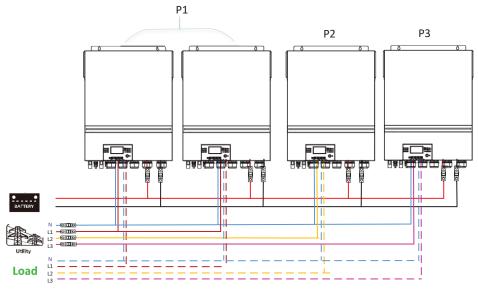


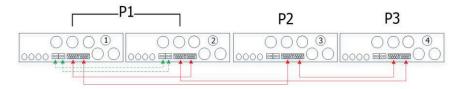
Communication Connection



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

Power Connection

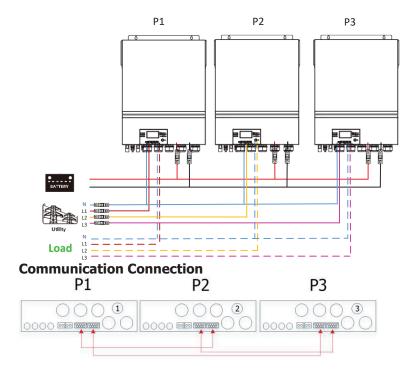






One inverter in each phase:

Power Connection



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

5. PV Connection

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

CAUTION: Each inverter should connect to PV modules separately.



6. LCD Setting and Display

Setting Program:

Program	Description	Selectable opti	on
		Single	When the unit is operated alone, please select "SIG" in program 28.
		SHG	
		Parallel 💮	When the units are used in parallel for single phase application, please select "PAL" in program 28. Please
		PAL	refer to 5-1 for detailed information.
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.	L1 phase:	When the units are operated in 3- phase application, please choose "3PX" to define each inverter. It is required to have at least 3
		3P I	inverters or maximum 6 inverters to support three-phase equipment. It's required to have at least one
		L2 phase:	inverter in each phase or it's up to four inverters in one phase. Please refers to 4-2 for detailed information.
		385	Please select "3P1" in program 28 for the inverters connected to L1
		L3 phase:	phase, "3P2" in program 28 for the inverters connected to L2 phase and "3P3" in program 28 for the inverters connected to L3 phase.
		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.



Fault code display:

Fault Code	Fault Event	Icon on
60	Power feedback protection	F60
71	Firmware version inconsistent	[
72	Current sharing fault	[6]5
80	CAN fault	F88
81	Host loss	F8
82	Synchronization loss	F82
83	Battery voltage detected different	F83
84	AC input voltage and frequency detected different	F84
85	AC output current unbalance	F8S
86	AC output mode setting is different	F86

Code Reference:

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

7. Commissioning

Parallel in single phase

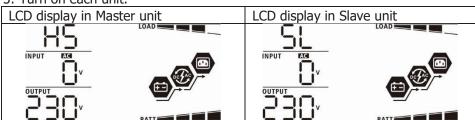
Step 1: Check the following requirements before commissioning:

- Correct wire connection
- 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.

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

Step 3: Turn on each unit.

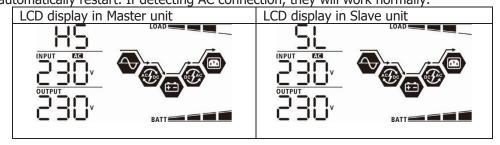


NOTE: Master and slave units are randomly defined.

Step 4: Switch on all AC breakers of Line wires in AC input. It's better to have all inverters connect to utility at



the same time. If not, it will display fault 82 in following-order inverters. However, these inverters will automatically restart. If detecting AC connection, they will work normally.



Step 5: If there is no more fault alarm, the parallel system is completely installed.

Step 6: Please switch on all breakers of Line wires in load side. This system will start to provide power to the load.

Support three-phase equipment

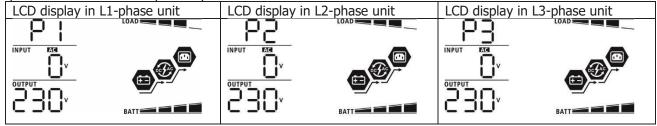
Step 1: Check the following requirements before commissioning:

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

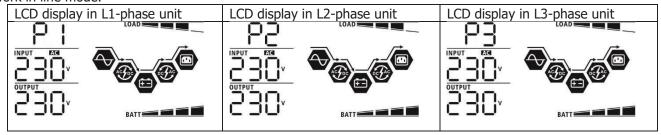
Step 2: Turn on all units and configure LCD program 28 as P1, P2 and P3 sequentially. And then shut down all units.

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

Step 3: Turn on all units sequentially.



Step 4: Switch on all AC breakers of Line wires in AC input. If AC connection is detected and three phases are matched with unit setting, they will work normally. Otherwise, the AC icon will flash and they will not work in line mode.



Step 5: If there is no more fault alarm, the system to support 3-phase equipment is completely installed.

Step 6: Please switch on all breakers of Line wires in load side. This system will start to provide power to the load.

Note 1: To avoid overload occurring, before turning on breakers in load side, it's better to have whole system in operation first.

Note 2: Transfer time for this operation exists. Power interruption may happen to critical devices, which cannot bear transfer time.



<u>8. Tro</u>	uble shooting	
	Situation	
Fault Code	Fault Event Description	Solution
60	Current feedback into the inverter is detected.	 Restart the inverter. Check if L/N cables are not connected reversely in all inverters. For parallel system in single phase, make sure the sharing are connected in all inverters. For supporting three-phase system, make sure the sharing cables are connected in the inverters in the same phase, and disconnected in the inverters in different phases. If the problem remains, please contact your installer.
71	The firmware version of each inverter is not the same.	 Update all inverter firmware to the same version. Check the version of each inverter via LCD setting and make sure the CPU versions are same. If not, please contact your instraller to provide the firmware to update. After updating, if the problem still remains, please contact your installer.
72	The output current of each inverter is different.	 Check if sharing cables are connected well and restart the inverter. If the problem remains, please contact your installer.
80	CAN data loss	Check if communication cables are connected well and restart the
81	Host data loss	inverter.
82	Synchronization data loss	2. If the problem remains, please contact your installer.
83	The battery voltage of each inverter is not the same.	 Make sure all inverters share same groups of batteries together. Remove all loads and disconnect AC input and PV input. Then, check battery voltage of all inverters. If the values from all inverters are close, please check if all battery cables are the same length and same material type. Otherwise, please contact your installer to provide SOP to calibrate battery voltage of each inverter. If the problem still remains, please contact your installer.
84	AC input voltage and frequency are detected different.	 Check the utility wiring connection and restart the inverter. Make sure utility starts up at same time. If there are breakers installed between utility and inverters, please be sure all breakers can be turned on AC input at same time. If the problem remains, please contact your installer.
85	AC output current unbalance	 Restart the inverter. Remove some excessive loads and re-check load information from LCD of inverters. If the values are different, please check if AC input and output cables are in the same length and material type. If the problem remains, please contact your installer.
86	AC output mode setting is different.	 Switch off the inverter and check LCD setting #28. For parallel system in single phase, make sure no 3P1, 3P2 or 3P3 is set on #28. For upporting three-phase system, make sure no "PAL" is set on #28. If the problem remains, please contact your installer.



Appendix II: BMS Communication Installation

1. Introduction

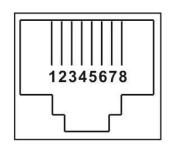
If connecting to lithium battery, it is recommended to purchase a custom-made RJ45 communication cable. Please check with your dealer or integrator for details.

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

- Re-configure charging voltage, charging current and battery discharge cut-off voltage according to the lithium battery parameters.
- Have the inverter start or stop charging according to the status of lithium battery.

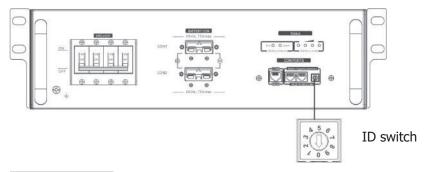
2. Pin Assignment for BMS Communication Port

	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

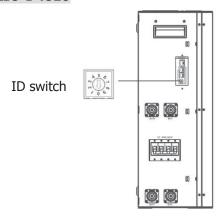


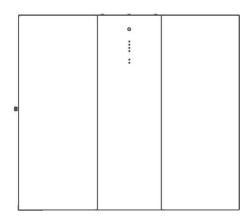
3. Lithium Battery Communication Configuration

LIO-4810-150A



ESS LIO-I 4810

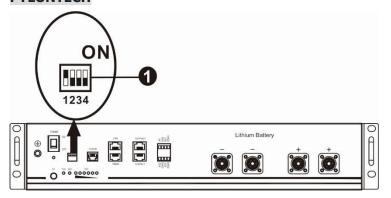




ID Switch indicates the unique ID code for each battery module. It's required to assign a unique ID to each battery module for normal operation. We can set up the ID code for each battery module by rotating the PIN number on the ID switch. From number 0 to 9, the number can be random; no particular order. Maximum 10 battery modules can be operated in parallel.



PYLONTECH



①Dip Switch: There are 4 Dip Switches that sets different baud rate and battery group address. If switch position is turned to the "OFF" position, it means "0". If switch position is turned to the "ON" position, it means "1".

Dip 1 is "ON" to represent the baud rate 9600.

Dip 2, 3 and 4 are reserved for battery group address.

Dip switch 2, 3 and 4 on master battery (first battery) are to set up or change the group address.

NOTE: "1" is upper position and "0" is bottom position.

Dip 1	Dip 2	Dip 3	Dip 4	Group address
	0	0	0	Single group only. It's required to set up master battery with this setting and slave batteries are unrestricted.
1: RS485	1	0	0	Multiple group condition. It's required to set up master battery on the first group with this setting and slave batteries are unrestricted.
baud rate=9600	0	1	0	Multiple group condition. It's required to set up master battery on the second group with this setting and slave batteries are unrestricted.
Restart to	1	1	0	Multiple group condition. It's required to set up master battery on the third group with this setting and slave batteries are unrestricted.
take effect	0	0	1	Multiple group condition. It's required to set up master battery on the fourth group with this setting and slave batteries are unrestricted.
	1	0	1	Multiple group condition. It's required to set up master battery on the fifth group with this setting and slave batteries are unrestricted.

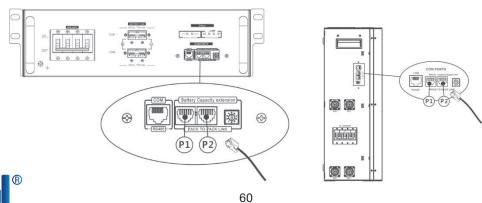
NOTE: The maximum groups of lithium battery is 5 and for maximum number for each group, please check with battery manufacturer.

4. Installation and Operation

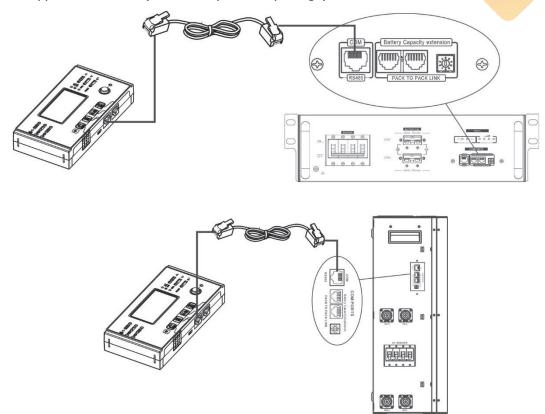
LIO-4810-150A/ESS LIO-I 4810

After ID no. is assigned for each battery module, please set up LCD panel in inverter and install the wiring connection as following steps.

Step 1: Use supplied RJ11 signal cable to connect into the extension port (P1 or P2).



Step 2: Use supplied RJ45 cable (from battery module package) to connect inverter and Lithium battery.



* For multiple battery connection, please check battery manual for the details.

Note for parallel system:

- 1. Only support common battery installation.
- 2. Use custom-made RJ45 cable to connect any inverter (no need to connect to a specific inverter) and Lithium battery. Simply set this inverter battery type to "LIB" in LCD program 5. Others should be "USE".

Step 3: Turn the breaker switch "ON". Now, the battery module is ready for DC output.



Step 4: Press Power on/off button on battery module for 5 secs, the battery module will start up.
*If the manual button cannot be approached, just simply turn on the inverter module. The battery module will be automatically turned on.

Step 5: Turn on the inverter.





Step 6. Be sure to select battery type as "LIB" in LCD program 5.

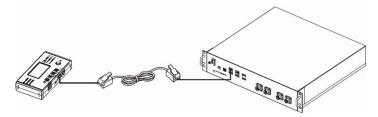


416

If communication between the inverter and battery is successful, the battery icon on LCD display will flash. Generally speaking, it will take longer than 1 minute to establish communication.

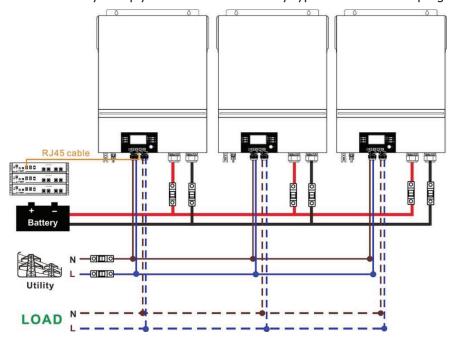
PYLONTECH

After configuration, please install LCD panel with inverter and Lithium battery with the following steps. Step 1. Use custom-made RJ45 cable to connect inverter and Lithium battery.

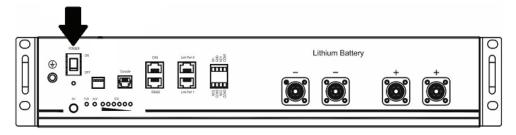


Note for parallel system:

- 1. Only support common battery installation.
- 2. Use custom-made RJ45 cable to connect any inverter (no need to connect to a specific inverter) and Lithium battery. Simply set this inverter battery type to "PYL" in LCD program 5. Others should be "USE".

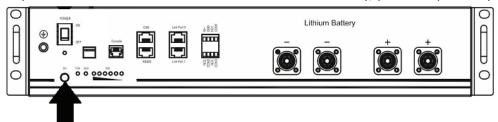


Step 2. Switch on Lithium battery.





Step 3. Press more than three seconds to start Lithium battery, power output ready.



Step 4. Turn on the inverter.



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





If communication between the inverter and battery is successful, the battery icon on LCD display will flash. Generally speaking, it will take longer than 1 minute to establish communication.

Active Function

This function is to activate lithium battery automatically while commissioning. After battery wiring and commissioning is successfully, if battery is not detected, the inverter will automatically activate battery if the inverter is powered on.

5. LCD Display Information

Press "\rightar" or "\rightar" button to switch LCD display information. It will show battery pack and battery group number before "Main CPU version checking" as shown below.

Selectable information	LCD display
Battery pack numbers & Battery group numbers	Battery pack numbers = 3, battery group numbers = 1



6. Code Reference

Related information code will be displayed on LCD screen. Please check inverter LCD screen for the operation.

Code	Description	Action
Code	If battery status is not allowed to charge and	ACTION
	discharge after the communication between the	
	inverter and battery is successful, it will show	
	code 60 to stop charging and discharging	
	battery.	
	Communication lost (only available when the	
	battery type is setting as any type of lithium-ion	
	battery.)	
	After battery is connected, communication	
	signal is not detected for 3 minutes, buzzer	
	will beep. After 10 minutes, inverter will	
	stop charging and discharging to lithium	
	battery.	
	Communication lost occurs after the	
	inverter and battery is connected	
	successfully, buzzer beeps immediately.	
	Battery number is changed. It probably is	Press "UP" or "DOWN" key to switch LCD
	because of communication lost between	display until below screen shows. It will
	battery packs.	have battery number re-checked and 62
	, , , , , , , , , , , , , , , , , , , ,	warning code will be clear.
		LOAD
		BATT
		BATT
	If battery status is not allowed to charge after	
	the communication between the inverter and	
	battery is successful, it will show code 69 to	
	stop charging battery.	
	If battery status must to be charged after the	
	communication between the inverter and	
	battery is successful, it will show code 70 to	
	charge battery.	
	If battery status is not allowed to discharge	
	after the communication between the inverter	
	and battery is successful, it will show code 71	
	to stop discharging battery.	



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 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 from the Apple® Store or "WatchPower Wi-Fi" in 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.



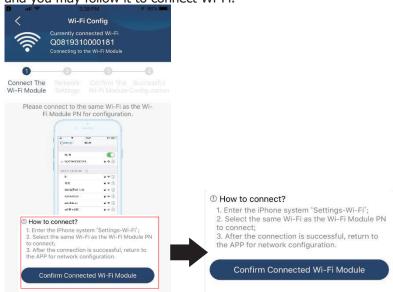


Then, a "Registration success" window will pop up. Tap "Go now" to continue setting local Wi-Fi network connection.

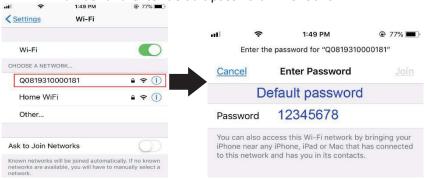


Step 2: Local Wi-Fi Module Configuration

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.



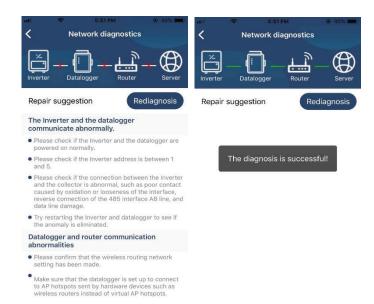
If the connection fails, please repeat Step 2 and 3.



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.



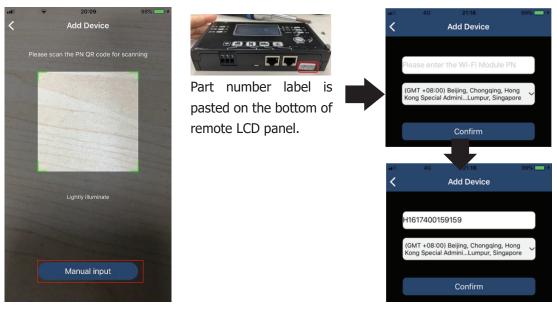


Devices

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



Tap 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.

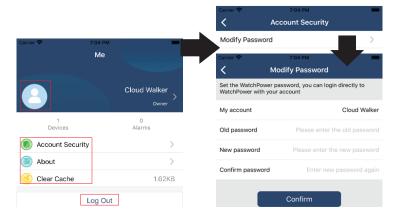


For more information about Device List, please refer to the section 2.4.

ME

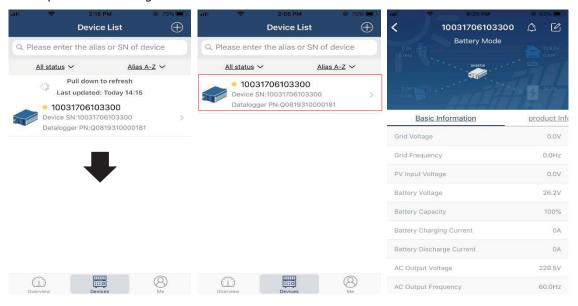
In ME page, users can modify "My information", including [User's Photo], [Account security], [Modify password], [Clear cache], and [Log-out], shown as below diagrams.





2-4. Device List

In 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.





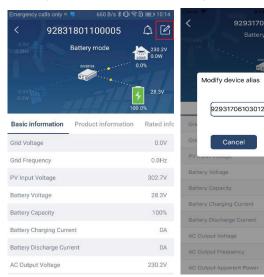
(Battery Mode) Inverter will power the load from the batter with or without PV charging. Only PV source can charge battery.





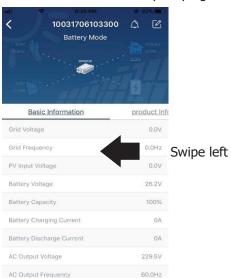
Device Alarm and Name Modification

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 of Wi-Fi Module PN, status and firmware version.

Parameter Setting

This page is to activate some features and set up parameters for inverters. Please be noted that the listing in "Parameter Setting" page in below diagram may differ from the models of monitored inverter. Here will briefly highlight some of it, <code>[Output Setting]</code>, <code>[Battery Parameter Setting]</code>, <code>[Enable/ Disable items]</code>, <code>[Restore to the defaults]</code> to illustrate.



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

- a) Listing options to change values by tapping one of it.
- b) Activate/Shut down functions by clicking "Enable" or "Disable" button.
- c) 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	To set output voltage.
	Output	To set output frequency.
	frequency	
Battery	Battery type:	To set connected battery type.
parameter	Battery cut-off	To set the battery stop discharging voltage or SOC.
setting	voltage/SOC	Please see product manual for the recommended voltage or SOC
		range based on connected battery type.
	Back to grid	When "SBU" or "SOL" is set as output source priority and battery
	voltage/SOC	voltage is lower than this setting voltage or SOC, unit will transfer to
		line mode and the grid will provide power to load.
	Back to	When "SBU" or "SOL" is set as output source priority and battery
	discharge	voltage is higher than this setting voltage or SOC, battery will be
	voltage/SOC	allowed to discharge.



	Charger source priority:	To configure charger source priority.	
1	Max. charging		
l	current		
l	Max. AC		
l	charging current:	It's to set up battery charging parameters. The selectable values in	
l	Max. Generator	different inverter model may vary.	
l	charging current	Please see product manual for the details.	
l	Float charging		
l	voltage		
l	Bulk charging	It's to set up battery charging parameters. The selectable values in	
l	voltage	different inverter model may vary. Please see product manual for the details.	
l	Battery	Enable or disable battery equalization function.	
l	equalization		
l	Real-time	It's real-time action to activate battery equalization.	
l	Activate Battery		
l	Equalization		
	Equalized Time Out	To set up the duration time for battery equalization.	
l	Equalized Time	To set up the extended time to continue battery equalization.	
l	Equalization	To set up the frequency for battery equalization.	
l	Period		
	Equalization	To set up the battery equalization voltage.	
l	Voltage		
Enable/Disable	LCD Auto-return	If enable, LCD screen will return to its main screen after one minute	
Functions	to Main screen	automatically.	
l	Fault Code	If enabled, fault code will be recorded in the inverter when any fault	
l	Record	happens.	
l	Backlight	If disabled, LCD backlight will be off when panel button is not operated for 1 minute.	
l	Bypass Function	If enabled, unit will transfer to line mode when overload happened in battery mode.	
l	Beeps while	If enabled, buzzer will alarm when primary source is abnormal.	
1	primary source	, , , , , , , , , , , , , , , , , , , ,	
l	interrupt		
l	Over	If disabled, the unit won't be restarted after over-temperature fault is	
1	Temperature	solved.	
1	Auto Restart		
1	Overload Auto	If disabled, the unit won't be restarted after overload occurs.	
1	Restart	22.22.2.	
RGB LED Setting	Buzzer	If disabled, buzzer won't be on when alarm/fault occurred.	
	Enable/disable	Turn on or off RGB LEDs	
	Brightness	Adjust the lighting brightness	
	Speed	Adjust the lighting speed	
	<u> </u>	Change the light effects	
	l Effects		
	Effects Color selection	Adjust color combination to show energy source an battery status	



