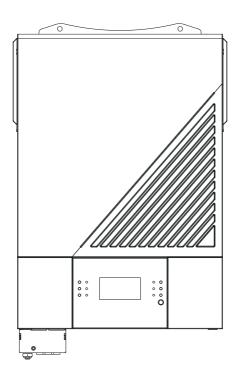
# **User Manual**

# 4.2KW/6.2KW SOLAR INVERTER / CHARGER



# **Table Of Contents**

ABOUT THIS MANUAL	1
Purpose	
SAFETY INSTRUCTIONS	1
INTRODUCTION	2
Features	2
Basic System Architecture	2
Product Overview	3
INSTALLATION	4
Unpacking and Inspection	4
Preparation	4
Mounting the Unit	4
Battery Connection	5
AC Input/Output Connection	7
PV Connection	8
Final Assembly	
Remote Display Panel Installation	11
Communication Options	12
BMS Communication	13
Dry Contact Signal	13
OPERATION	14
Power ON/OFF	14
Operation and Display Panel	14
LCD Display Icons	15
LCD Setting	18
Display Setting	31
Operating Mode Description	36
Battery Equalization Description	39
Fault Reference Code	40
Warning Indicator	41
SPECIFICATIONS	42
Table 1 Line Mode Specifications	42
Table 2 Inverter Mode Specifications	
Table 3 Charge Mode Specifications	
Table 4 General Specifications	
TROUBLE SHOOTING	45
Appendix I: BMS Communication Installation	46

#### **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



WARNING: All safety instructions in this document must be read, understood and followed. Failure to follow these instructions will result in death or serious injury.

- Before using the unit, read all instructions and cautionary markings on the unit, the batteries and all
  appropriate sections of this manual.
- CAUTION --The default setting of battery type is AGM battery .If charge other types of batteries, need set up according to the battery features, otherwise may cause 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.
- 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.
- 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. One piece of 150A fuse is 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.
- 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.
- CAUTION: It's requested 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 input voltage ranges for home appliances and personal computers via LCD control panel
- Configurable battery charging current based on applications via LCD control panel
- Configurable AC/Solar Charger priority 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
- · Removable LCD control module
- Multiple communication ports for BMS (RS485, CAN-BUS, RS232)
- Built-in WiFi for mobile monitoring (Requires App), OTG USB function, dusk filters
- Configurable AC/PV Output usage timer and prioritization

# **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.

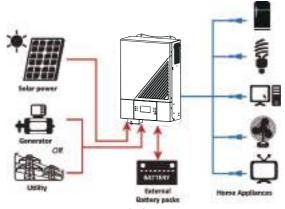
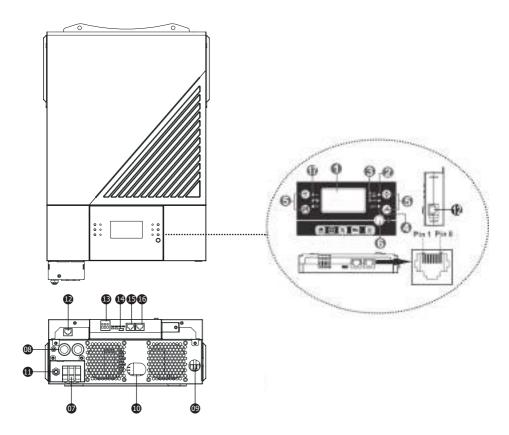


Figure 1 Hybrid Power System

# **Product Overview**



- 1. LCD display
- 2. Status indicator
- 3. Charging indicator
- 4. Fault indicator
- 5. Function buttons
- 6. Power on/off switch
- 7. AC input connectors
- 8. AC output connectors (Load connection)
- 9. PV input
- 10. Battery input
- 11. Circuit breaker
- 12. Remote LCD panel communication port
- 13. Dry contact
- 14. USB communication port
- 15. BMS communication port: CAN and RS232 or RS485
- 16. RS-232 communication port
- 17. Output source indicators (refer to OPERATION/Operation and Display Panel section for details) and USB function setting reminder (refer to OPERATION/Function Setting for the details)

#### **INSTALLATION**

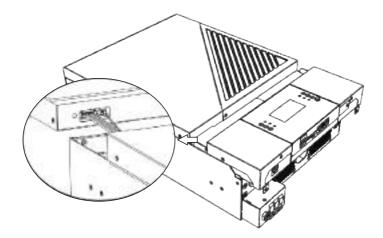
# **Unpacking and Inspection**

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

- · Inverter x 1
- User manual x 1
- RS232 Communication cable x 1

# **Preparation**

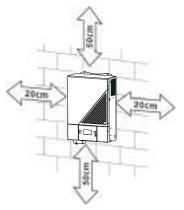
Before connecting all wirings, please take off the bottom cover by removing two screws as shown below. Detach the cables from the cover.



# **Mounting the Unit**

Consider the followings before selecting your placements:

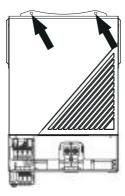
- Do not mount the inverter on flammable construction materials.
- Mount on a solid surface
- Install the inverter at eye level in order to allow easy LCD display readout.
- For proper air circulation and heat dissipation, allow a clearance of approx. 20 cm to the side and approx. 50 cm above and below the unit.
- The ambient temperature should be between 0°C and 55°C to ensure optimal operation.
- The recommended orientation is to adhered to the wall vertically.
   Be sure to keep other objects and surfaces as shown in the diagram to guarantee sufficient heat dissipation and to have enough space for wirings.





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

Install the unit by screwing two 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 disconnection device between battery and the inverter. It may not be necessary to have a disconnection device in some applications, however, it's still recommended to have over-current protection installed. Please refer to typical amperage as required.

**WARNING!** All wiring must be performed by a qualified electrical technician. **WARNING!** It's very important for system safety and efficient operation to use appropriate cables for battery connection. To reduce risk of injury, please use the proper recommended cable in the table below.

# Ring terminal:

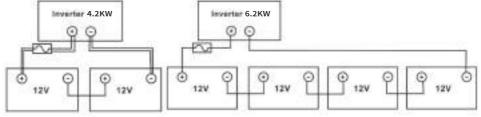


# Recommended battery cable size:

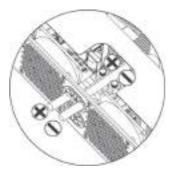
Model	Typical	Wire Size	Cable mm <sup>2</sup>	Ring '	Terminal	Torque
	Amperage		(each)	Dim	ensions	Value
				D (mm)	L (mm)	
4.2KW	165A	2*4AWG	25	8.4	33.2	
6.2KW	1244	1*2AWG	38	8.4	39.2	5 Nm
0.2800	124A	2*4AWG	25	8.4	33.2	

Please follow below steps to implement battery connection:

4.2KW model supports 24VDC system and 6.2KW model supports 48VDC system. Connect all battery
packs as below chart. It is recommend to connect minimum of 100Ah capacity battery for 4.2KW
model and 200Ah capacity battery for 6.2KW model.



Prepare four battery wires for 4.2KW model and two or four battery wires for 6.2KW model depending on cable size (refer to recommended cable size table). Apply ring terminals to your battery wires and secure it to the battery terminal block with the bolts properly tightened. Refer to battery cable size for torque value. Make sure polarity at both the battery and the inverter is correctly connected and ring terminals are secured to the battery terminals.





#### **WARNING: Shock Hazard**

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



**CAUTION!!** Do not place anything between inverter terminals and the ring terminals. Otherwise, overheating may occur.

**CAUTION!!** Do not apply anti-oxidant substance on the terminals before terminals are securely tightened.

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

# **AC Input/Output Connection**

**CAUTION!!** Before connecting to AC input power source, please install a **separate** AC breaker between the inverter and the AC input power source. This will ensure that the inverter can be safely disconnected during maintenance and fully protected from over-current. The recommended spec of AC breaker is 32A

**CAUTION!!** There are two power terminal blocks with "IN" (Input) and "OUT" (Output) markings. DO NOT mistakenly connect to the wrong connectors.

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

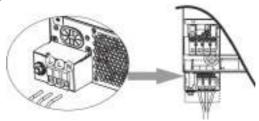
**WARNING!** It's very important for system safety and efficient operation to use appropriate cable size for AC input connection. To reduce risk of injury, please use the proper recommended cable size as below.

#### Suggested cable requirement for AC wires

Model	Gauge	Cable (mm²)	Torque Value
4.2KW	12 AWG	4	1.2 Nm
6.2KW	10 AWG	6	1.2 Nm

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

- 1. Before making AC input/output connection, be sure to enable DC protector or disconnector first.
- 2. Remove insulation sleeves for about 10mm for the five screw terminals.
- 3. Insert AC input wires according to polarities indicated on terminal block and tighten the terminal screws. Be sure to connect the grounding wire ( ) first.
  - ⊕→Ground (yellow-green)
  - L→LINE (brown or black)
  - N→Neutral (blue)





#### WARNING:

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

4. This inverter is equipped with dual-output. There are four terminals (L1/N1, L2/N2) available on output port. It's set up through LCD program or monitoring software to turn on and off the second output. Refer to "LCD setting" section for the details.

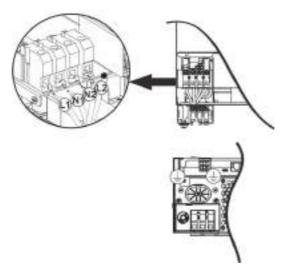
Insert AC output wires according to polarities indicated on terminal block and tighten terminal screws. Be sure to connect PE protective conductor ( ) first.

L1→LINE (brown or black)

N1→Neutral (blue)

L2→LINE (brown or black)

N2→Neutral (blue)



5. Make sure the wires are securely connected.

**CAUTION:** Appliances such as air conditioner required at least 2~3 minutes to spool up because it needs to have enough time to balance refrigerant gas inside of circuits. If a power shortage occurs and recovers in a short period of time, it may cause damage to your connected appliances. To prevent this from happening, please check with manufacturer of air conditioner if it has time-delay function before installation. Otherwise, this inverter will trigger overload fault and cut off output to protect your appliance but sometimes it may still causes damage to the air conditioner.

#### **PV Connection**

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

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

Model	Wire Size	Cable (mm <sup>2</sup> )	Torque value (max)
4.2KW/6.2KW	1 x 12AWG	4	1.2 Nm

**WARNING:** Because this inverter is non-isolated, are accepted: single crystalline, poly crystalline with class A-rated and CIGS modules. To avoid any malfunctions, 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 connection.

**CAUTION:** It's requested to use PV junction box with surge protection. Otherwise, it will cause damage on inverter when lightning occurs on PV modules.

#### **PV Module Selection:**

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

 Open circuit Voltage (Voc) of PV modules not to exceeds 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	4.2KW	6.2KW
Max. PV Array Power	5000W	6000W
Max. PV Array Open Circuit Voltage	ge 500Vdc	
PV Array MPPT Voltage Range	60Vdc~450Vdc	
Start-up Voltage	60Vdc +/- 10Vdc	
Max. PV Current	27A	

Take the 250Wp 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	Olta a fara a a la	Total input
(reference) - 250Wp	Min in series: 2 pcs, max. in series: 12 pcs.	Q'ty of panels	power
- Vmp: 30.1Vdc	2pcs in series	2 pcs	500W
- Imp: 8.3A	4pcs in series	4 pcs	1000W
- Voc: 37.7Vdc	6 pcs in series	6 pcs	1500W
- Isc: 8.4A	8 pcs in series	8 pcs	2000W
- Cells: 60	12 pcs in series	12 pcs	3000W
	8 pieces in series and 2 sets in parallel	16 pcs	4000W
	10 pieces in series and 2 sets in parallel	20 pcs	5000W
	11 pieces in series and 2 sets in parallel (only for 6KVA model)	22 pcs	5500W
	12 pieces in series and 2 sets in parallel (only for 6KVA model)	24 pcs	6000W

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

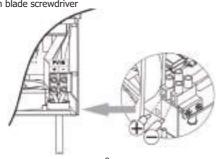
oddie configurations are listed in the table below.					
Solar Panel Spec.	SOLAR INPUT	Q'ty of panels	Total input		
(reference) - 555Wp	Min in series: 2 pcs, max. in series: 11 pcs.	Q ty or pariers	power		
- Imp: 17.32A	2pcs in series	2 pcs	1110W		
- Voc: 38.46Vdc	4pcs in series	4 pcs	2220W		
- Isc: 18.33A - Cells: 110	6 pcs in series	6 pcs	3330W		
300. 110	8 pcs in series	8 pcs	4440W		
	10 pcs in series (only for 6KVA model)	10 pcs	5550W		
	11 pcs in series (only for 6KVA model)	11 pcs	6000W		

#### **PV Module Wire Connection**

Please take the following to implement PV module connection:

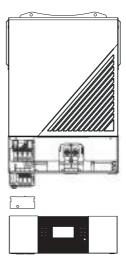
- Remove insulation sleeve for about 7 mm on your positive and negative wires.
- 2. We recommend using bootlace ferrules on the wires for optimal performance.
- Check polarities of wire connections from PV modules to PV input screw terminals. Connect your wires as illustrated below. Recommended tool: 4mm blade screwdriver





# **Final Assembly**

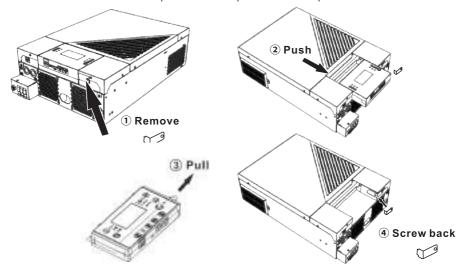
After connecting all wirings, replace the bottom cover as shown below.



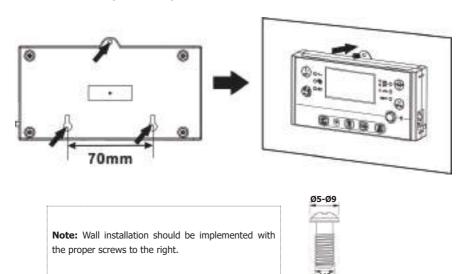
# **Remote Display Panel Installation**

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.

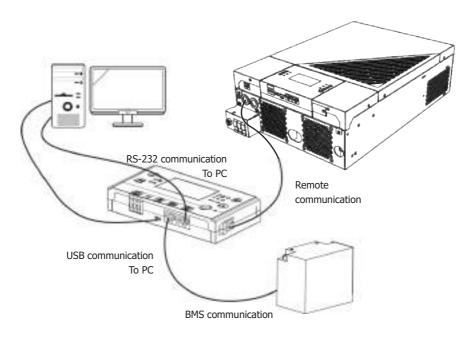
**Step 1.** Remove the screw on the bottom of LCD panel and pull down the module from the case. Detach the cable from the remote communication port. Be sure to replace the retention plate back to the inverter.



**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.



Step 3. Connect LCD module to the inverter with an optional RJ45 communication cable as shown below.



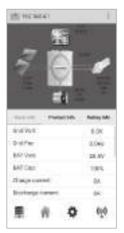
# **Communication Options**

#### **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.

#### Wi-Fi Connection

This series is built in Wifi technology. It allows wireless communication up to 6~7m in an open space.



## **BMS Communication**

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

# **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 Program 0 powered set as USB		Battery voltage < Low DC warning voltage	Open	Close
Power On	from Battery power or Solar energy.	(utility first)	Battery voltage > Setting value in Program 13 or battery charging reaches floating stage	Close	Open
Power On		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

#### **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.



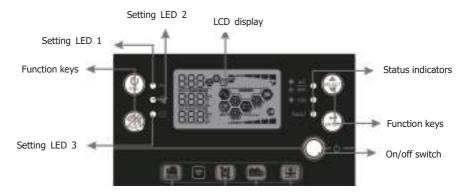
#### **Inverter Turn-on**

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, indicating the operating status and input/output power information.



#### **Indicators**

LED Ir	dicator	Color	Solid/Flashing	Messages	
Settin	Setting LED 1 Green		Solid On	Output powered by utility	
Settin	g LED 2	Green	Solid On	Output powered by PV	
Settin	g LED 3	Green	Solid On	Output powered by battery	
<u>₩</u> AC	Green	Solid On	Output is available in line mode		
₩ ĪNV		Green	Flashing	Output is powered by battery in battery mode	
Status indicators		Green	Solid On	Battery is fully charged	
		Green	Flashing	Battery is charging.	
	EALILT	Red	Solid On	Fault mode	
	FAULT		Flashing	Warning mode	

# **Function Keys**

Func	ction Key	Description
ESC	ESC	Exit the setting
	USB function setting	Select USB OTG functions
(4.0)	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
SELECT	Select	To next selection
ENTER	Enter	To confirm/enter the selection in setting mode
SELECT + ENTER		Press these two keys at the time to switch RGB LED bar for output source priority and battery discharge/charge status

# **LCD Display Icons**



Icon	Function description	
Input Source Information		
WE.	Indicates the AC input.	
E-2	Indicates the PV input	
0005	Indicate input voltage, input frequency, PV voltage, charger current,	
0.0.03	charger power, battery voltage.	

Configuration P	rogram and F	ault Informatio	n			
0	0					
888		Indicates the setting programs.				
		Indicates the wa	Indicates the warning and fault codes.			
8880				vith warning code.		
		Fault: F88	lighting with f	fault code		
Output Informa	tion					
000-				ıt frequency, load percent, load in VA,		
30,00		load in Watt and				
OUTPUT			-	te the unit with AC output and setting		
		Programs 60, 63	1 or 62 differer	nt to default setting.		
Battery Informa	ition	l				
		Indicates batter	y level by 0-24	1%, 25-49%, 50-74% and 75-100% in		
BATT				atus in line mode.		
M/h on lootton, in al			auaina atatus			
When battery is ch	Battery voltage					
Status	<2V/cell	e LCD Display 4 bars will flash in turns.		ach in turne		
Constant		The right har will be on and the other three				
Current mode /	2 ~ 2.083V/ce	bars will flash in turns.				
Constant	2.083 ~ 2.167	The right two bars will be on and the other two bars will flash in turns.				
Voltage mode	> 2.167 V/cell	The right three bars will be on and the left bar				
Floating mode. B	atteries are full					
In battery mode, i		-				
Load Percentage		Battery Voltage	LCD Display			
3		< 1.85V/cell		LOWBATT		
		1.85V/cell ~ 1.9	33V/cell	BATT		
Load >50%		1.933V/cell ~ 2.	017V/cell	BATT		
		> 2.017V/cell		BATT		
		< 1.892V/cell		LOWBATT		
		1.892V/cell ~ 1.	975V/cell	BATT		
Load < 50%		1.975V/cell ~ 2.	058V/cell	BATT		
		> 2.058V/cell		BATT		
Load Information						
	76	Indicates overlo	ad.			
		Indicates the loa	ad level by 0-2			
LOAD	9 90	0%~	24%	25%~49%		
5/0				LOAD		
4		50%	~74%	75%~100%		

LOAD

LOAD

Mode Operation Information		
◆	Indicates unit connects to the mains.	
	Indicates unit connects to the PV panel.	
(BYPASS)	Indicates load is supplied by utility power.	
<b>(4)</b>	Indicates the utility charger circuit is working.	
<b>®</b>	Indicates the solar charger circuit is working.	
<b>®</b>	Indicates the DC/AC inverter circuit is working.	
<b>©</b>	Indicates unit alarm is disabled.	
<b></b>	Indicates USB disk is connected.	
<b>©</b>	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 button to select setting programs. Press button to confirm you selection or button to exit.

# **Setting Programs:**

Program	Description	Selectable option	
00	Exit setting mode	Escape   O  O	
		ESC	
		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.
		SbU	Utility provides power to the loads only when battery voltage drops to either low-level warning voltage or the setting point in program 12.
02	Maximum charging current: To configure total charging current for solar and utility chargers. (Max. charging current = utility charging current + solar charging current)	60A (default)	Setting range is from 10A to 120A. Increment of each click is 10A.

		Appliances (default)	If selected, acceptable AC input
		03 ⊗	voltage range will be within 90-280VAC.
03	AC input voltage range	RPL	To all the decrease below AC front
		UPS <b>⊙</b>	If selected, acceptable AC input voltage range will be within 170-280VAC.
		UPS	
		AGM (default)	Flooded
		U5 ®	05 °
		860	FLd
		User-Defined	If "User-Defined" is selected,
		NS 0	battery charge voltage and low DC
		0.5	cut-off voltage can be set up in program 26, 27 and 29.
	USE		
		Pylontech battery	If selected, programs of 02, 26, 27
		05 👦	and 29 will be automatically set up. No need for further setting.
05	Battery type	PYL	
		WECO battery (only for 48V	If selected, programs of 02, 12,
		model)	26, 27 and 29 will be auto-configured per battery
		85 🛮	supplier recommended. No need
			for further adjustment.
		υEC	
		Soltaro battery (only for	If selected, programs of 02, 26, 27
		48V model)	and 29 will be automatically set up. No need for further setting.
		05 -	
		COL	
		JUL	

		LTh protocol compatible	Coloct "I Th" if using Lithium
		LIb-protocol compatible	Select "LIb" if using Lithium
		battery	battery compatible to Lib protocol.
		<u>N</u> S ⊗	If selected, programs of 02, 26, 27
			and 29 will be automatically set
			up. No need for further setting.
		UЬ	
		3 <sup>rd</sup> party Lithium battery	Select "LIC" if using Lithium
		<u> </u>	battery not listed above. If
		- 60	selected, programs of 02, 26, 27
			and 29 will be automatically set
			up. No need for further setting.
		LI C	Please contact the battery supplier
			for installation procedure.
		Restart disable (default)	Restart enable
		00	nc ø
0.5	Auto restart when overload	00 -	00 0
06	occurs		
		200 20	
		LFd	LFE
		Restart disable (default)	Restart enable
		റാ ര	0.0
07	Auto restart when over	010	01-
07	temperature occurs		
		F 8 F	115
		554	FFE
		50Hz (default)	60Hz
		00 0	89 o
09	Output fraguancy	03	05 -
09	Output frequency		
		CO	CO
		50.	60.
		220V	230V (default)
		10.0	10.0
		0.959-800	0653700
		220.	230-
10	Output voltage	240V	0.30
		10 0	
		DUN.	
	Maximum utility charging	CTU'	
	current	30A (default)	
	Note: If setting value in	110	Setting range is 2A, then from 10A
11	program 02 is smaller than	1.11	to 100A. Increment of each click is
	that in program in 11, the inverter will apply charging	UEI	10A.
	current from program 02 for	20.	
	utility charger.	DO.	

		23V (default for 24V model)	Setting range is from 22V to 25.5V.  Increment of each click is 0.5V.
		23D-	
Setting voltage or SOC percentage back to utility source when selecting	46V (default for 48V model)	Setting range is from 44V to 55V.  Increment of each click is 1V.	
	"SBU" (SBU priority) in program 01.	46D	
		SOC 10% (default for Lithium)	If any types of lithium battery is selected in program 05, setting value will change to SOC automatically. Adjustable range is
		SOC 10.	5% to 95%.
		Available options for 24V mod 24V to 29V. Increment of eac	del: Setting range is FUL and from h click is 1V.
		Battery fully charged	27V (default)
		FÜL	عتق
	Setting voltage or SOC	Available options for 48V mod 48V to 58V. Increment of eac	del: Setting range is FUL and from h click is 1V.
13	percentage back to battery mode when selecting "SBU" (SBU priority) in program 01.	Battery fully charged	54V (default)
		FIII	ς̈́q.
		SOC 30% (default for Lithium)	If any types of lithium battery is selected in program 05, setting value will change to SOC
		13 ♥ 500 30.	automatically. Adjustable range is 10% to 100%. Increment of each click is 5%.
		30-	

		If this inverter/charger is wor	king in Line, Standby or Fault mode,
		charger source can be progra	= :
		Solar first	Solar energy will charge battery as
		15 0	first priority.
		.0	Utility will charge battery only
			when solar energy is not available.
		CSO	
		Solar and Utility (default)	Solar energy and utility will charge
	Charger source priority:	16 <b>o</b>	battery at the same time.
16	To configure charger source		
	priority	- O	
		SiliU	
		Only Solar	Solar energy will be the only
		15 ®	charger source no matter utility is
		0.00	available or not.
		00075930	
		050	
		If this inverter/charger is wor	king in Battery mode, only solar
		_	olar energy will charge battery if it's
		available and sufficient.	
		Alarm on (default)	Alarm off
		19 0	10 0
18	Alarm control	10	10
10	Auditi conta of		
		P0U	60F
		0011	001
		Return to default display	If selected, no matter how users
		screen (default)	switch display screen, it will
		19 0	automatically return to default display screen (Input voltage
		13	/output voltage) after no button is
			pressed for 1 minute.
		cco	
19	Auto return to default display screen	CDF	
		Stay at latest screen	If selected, the display screen will
		19 0	stay at latest screen user finally
		15 -	switches.
		100 TO TRANSPORTED	
		FEB	
		13.00 m S.C.	

		Backlight on (default)	Backlight off
		5U @	SU ⊚
20	Backlight control		
		LON	LOC
			LUC
		Alarm on (default)	Alarm off
22	Beeps while primary source is interrupted	55 ⊚	55 🍖
		RON	ROF
		Bypass disable (default)	Bypass enable
23	Overload bypass: When enabled, the unit will transfer to line mode if overload occurs in battery	53 @	53 💩
	mode.	929	69E
		Record enable (default)	Record disable
		25 0	25 ø
25	Record Fault code	1/70/7/	VS-860
		FEN	FdS
		Available options for 24V m	
		28.2V (default)	If user-defined is selected in program 5, this program can be set
		5P @	up. Setting range is from 25.0V to
		Lo	31.5V. Increment of each click is 0.1V.
Bulk charging voltage		ວດ້ວ.	0.1v.
	COC 101		
	(C.V voltage)	Available options for 48V m 56.4V (default)	If user-defined is selected in
		JC 6	program 5, this program can be set
			up. Setting range is from 48.0V to 61.0V. Increment of each click is
		[	0.1V.
	56.4		

		Available options for 24V mo	del:
	27V (default)  27   FL   2	If user-defined is selected in program 5, this program can be set up. Setting range is from 25.0V to 31.5V. Increment of each click is 0.1V.	
27	Floating charging voltage	Available options for 48V mo	del:
		54V (default)	If user-defined is selected in program 5, this program can be set up. Setting range is from 48.0V to 61.0V. Increment of each click is 0.1V.
		Available options for 24V mo	dal.
Low DC cut-off voltage or SOC percentage:	21.0V (default)	If user-defined is selected in program 5, this program can be set up. Setting range is from 21.0V to 24.0V. Increment of each click is 0.1V. Low DC cut-off voltage will be fixed to setting value no matter what percentage of load is connected.	
	<ul> <li>If battery power is only power source available,</li> </ul>	Available options for 48V mo	
inverter will shut down.  If PV energy and battery power are available, inverter will charge battery without AC output.  If PV energy, battery power and utility are all available, inverter will transfer to line mode	42.0V (default)  28  COP 420	If user-defined is selected in program 5, this program can be set up. Setting range is from 42.0V to 48.0V. Increment of each click is 0.1V. Low DC cut-off voltage will be fixed to setting value no matter what percentage of load is connected.	
		SOC 0% (default) 28  SOC 0.	If Lithium battery is selected in program 5, setting value will change to SOC automatically. Setting range is from 0% to 90%.

		Battery equalization	Battery equalization disable
			(default)
		30.0	30 o
30	Battery equalization		
		EEN	CUC
			" is selected in program 05, this
		program can be set up.	i is selected in program 05, this
		Available options for 24V mod	del:
		29.2V (default)	Setting range is from 25.0V to
		310	31.5V. Increment of each click is
		Çυ	0.1V.
		202	
31	Battery equalization voltage	535	
31	battery equalization voltage	Available options for 48V mod	T. C.
		58.4V (default)	Setting range is from 48.0V to
		3   0	61.0V. Increment of each click is 0.1V.
		Çυ	0.1v.
		COL.	
		284	
		60min (default)	Setting range is from 5min to
		33 °	900min. Increment of each click is 5min.
33	Battery equalized time		3111111
		CO	
		120min (defeath)	Catting and a in form Faring to 000
		120min (default)	Setting range is from 5min to 900 min. Increment of each click is 5
24	Pattern and the different	34 0	min.
34	Battery equalized timeout		
		120	
		30days (default)	Setting range is from 0 to 90 days.
		35.0	Increment of each click is 1 day
35	Equalization interval	22	
35	.1	940001000	
		309	
		Enable	Disable (default)
		36 ◎	36 <b>o</b>
36	Equalization activated	30	20
	immediately	2012/200	E 102
		REN	Ras

		be set up. If "Enable" is selected battery equalization immediat " "," If "Disable" is selected until next activated equalization."	bled in program 30, this program can ted in this program, it's to activate tely and LCD main page will shows d, it will cancel equalization function on time arrives based on program 35 will not be shown in LCD main page.
37	Reset all stored data for PV generated power and output load energy	37 <b>o</b>	37 <b>©</b>
60	Low DC cut off voltage or SOC percentage on second output	24V default setting: 21.0V  48V default setting: 42.0V	If "User-defined" is selected in program 05, this setting range is from 21.0V to 31.5V for 24V model. Increment of each click is 0.1V.  If "User-defined" is selected in program 05, this setting range is from 42.0V to 61.0V for 48V model. Increment of each click is 0.1V.
		SOC 0% (default for Lithium)  SOC 0% (default for Lithium)	If any type of lithium battery is selected in program 05, this parameter value will be displayed in percentage and value setting is based on battery capacity percentage. Setting range is from 0% to 95%. Increment of each click is 5%.
61	Setting discharge time on the second output (L2)	Disable (Default)  6 1   dd5	Setting range is disable and then from 0 min to 990 min. Increment of each click is 5 min. *If the battery discharge time achieves the setting time in program 61 and the program 60 function is not triggered, the output will be turned off.

62	Setting time interval to turn on second output (L2)	00~23 (Default. Second output is always on)	Setting range is from 00 to 23.  Increment of each click is 1 hour.  If setting range is from 00 to 08, the second output will be turned on until 09:00. During this period, it will be turned off if any setting value in program 60 or 61 is reached.
93	Erase all data log	Not reset(Default)	Reset  93   FSE
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  3 minutes  3 minutes  4 minutes (default)  5 minutes  6 minutes  7	5 minutes 20 minutes 60 minutes
95	Time setting – Minute	For minute setting, the range	e is from 0 to 59.
96	Time setting – Hour	For hour setting, the range is 96 HOU	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 range is from 1 to 12.
99	Time setting – Year	For year setting, the range is from 17 to 99.

# **Functional Setting**

There are three function settings: USB OTG, timer setting for output source priority and timer setting for charger source priority.

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 re-write from the USB disk.

## 1. USB Function Setting

Procedure	LCD Screen
Step 1: Press and hold " button for 3 seconds to enter Function Setting mode.	UPC @ @
Step 2: Press " Esc "," or " button to enter the selectable setting programs	SEF FOC

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

Program#	Operation Procedure	LCD Screen
T) ESC :	This function is to upgrade inverter firmware. If firmware upgrade is needed, please check with your dealer or installer for detail instructions.	
Upgrade		
firmware		
	This function is to over-write all parameter settings (TEXT file) with settings in the On-The-Go USB disk from a previous setup or to duplicate inverter settings. Please check with your dealer or	
Re-write	installer for detail instructions.	ar your acarer or
internal parameters		
SELECT :	Press " button to export data log from USB disk to inverter. If the	FOC 00
Export data log	selected function is ready, LCD will display " " ". Press " button to confirm the selection again.	F63

•	Press "button to select "Yes", LED 1 will flash once every second during the process. It will only display LOG and all LEDs will be on after this action is complete. Then, press "button to return to main	106 985 00	00
•	Screen.  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:

<b>Error Code</b>	Messages
UO 1	No USB disk is detected.
00S	USB disk is protected from copying.
003	Document inside the USB disk contains the wrong format.

If any error occurs, error code will only show for 3 seconds. After 3 seconds, it will automatically return to the main screen.

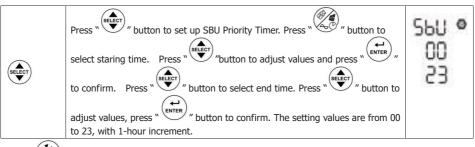
# 2. Timer Setting for Output Source Priority

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

Procedure	LCD Screen
<b>Step 1:</b> Press and hold "button for 3 seconds to enter Function Setting Mode for output source priority.	USB ©
Step 2: Press " Esc "," or " button to enter the selectable setting programs (detail descriptions in Step 3).	SbU

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

Program#	Operation Procedure	LCD Screen		
(U)	Press "button to set up Utility First Timer. Press "button to select staring time. Press "button to adjust values and press "to confirm. Press "button again to select end time. Press "button to adjust values, press "button to confirm. The setting values are from 00 to 23, with 1-hour increment.	20 00 050 ● 950		
	ress "button to set up Solar First Timer. Press "button to select staring time. Press "button to adjust values and press "button to confirm. Press "button to select end time. Press "button to adjust values, press "button to confirm. The setting values are from 00 to 23, with 1-hour increment.			



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.

Procedure	LCD Screen
Step 1: Press and hold " button for 3 seconds to enter Timer Setup Mode for charging	CSO •
Step 2: Press "  Step 7: Press "  Step 7	050
descriptions in Step 3).	

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

Program#	Operation Procedure	LCD Screen		
(t)	Press "button to set up Solar First Timer. Press "button to select staring time. Press "button to adjust values and press "button to select end time. Press "button to adjust values are from 00 to 23, with 1-hour increment.  Press "button to set up Solar & Utility Timer. Press "button to select staring time. Press "button to adjust values and press "button to adjust values are from 00 to 23, with 1-hour increment."  button to select end time. Press "button to adjust values are from 00 to 23, with 1-hour increment.			
SELECT	Press "button to set up Solar Only Timer. Press "button to select staring time. Press "button to adjust values and press "to confirm. Press "button to select end time. Press "button to adjust values, press "button to confirm. The setting values are from 00 to 23, with 1-hour increment.	050 <b>o</b> 00 23		

Press "  $\begin{picture}(0,0) \put(0,0){\line(0,0){100}} \put(0,0){\line(0$ 

# **Display Setting**

The LCD display information will be switched in turn by pressing the "button. The selective information is switched as the following table in order:

Selectable information	LCD display
	Input Voltage=230V, output voltage=230V
Input voltage/Output voltage (Default Display Screen)	530. <b>5</b>
	Input frequency=50Hz
Input frequency	230
	PV voltage=260V
PV voltage	280
	PV current = 2.5A
PV current	230. <b>23</b> 0.
	PV power = 500W
PV power	230. <b>200 2</b>

	AC and PV charging current=50A
	230 PV charging current=50A
Charging current	AC charging current=50A
	AC and PV charging power=500W
	SOO PV charging power=500W
Charging power	S00 230 AC charging power=500W
	Battery voltage=25.5V, output voltage=230V
Battery voltage and output voltage	Battery voltage=25.5V, output voltage=230V

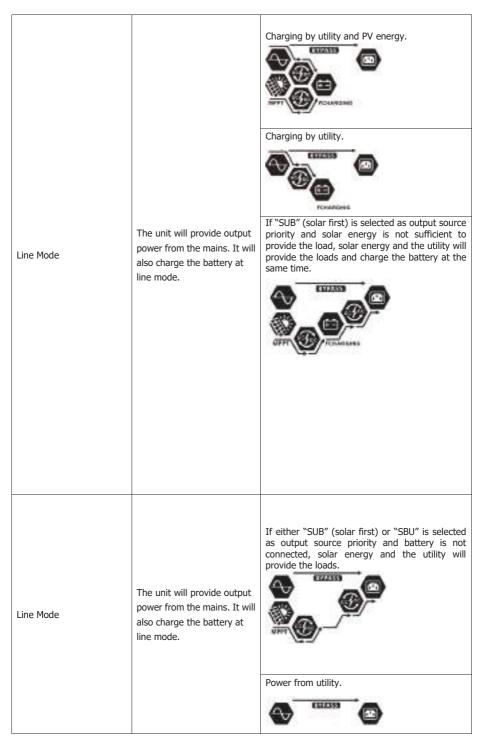
	Output frequency=50Hz
Output frequency	255. <b>S</b>
Load percentage	Load percent=70%
	When connected load is lower than 1kVA, load in VA will present xxxVA like below chart.
Load in VA	When load is larger than 1kVA (≥1KVA), load in VA will present x.xkVA like below chart.
	When load is lower than 1kW, load in W will
	present xxxW like below chart.
Load in Watt	When load is larger than 1kW (≥1KW), load in W will present x.xkW like below chart.
	255

L2 output voltage	Second output is off and L2 output voltage is 0V.  Second output is on and L2 output voltage is 230V.
Battery voltage/DC discharging current	Battery voltage=25.5V, discharging current=1A
PV energy generated today and Load output energy today	PV energy generation today = 3.88kWh, Today load output energy= 9.88kWh.
PV energy generated this month and Load output energy this month.	PV energy generation this month = 388kWh, Load output energy this month = 988kWh.
PV energy generated this year and Load output energy this year.	PV energy generation this year = 3.88MWh, Load output energy this year = 9.88MWh.

	Total PV energy generation = 38.8MWh, Total load output energy = 98.8MWh.
	load output energy = 50.0FWH.
Total PV energy generation and total load output	EUL
energy.	200°- <b>6</b>
	200 200
	988
	Real date Nov 28, 2020.
	20 @
Real date.	
real date.	11 502
	2g <b>***</b>
	Real time 13:20.
	1640
Real time.	13 96 9
	70
	CU
	Main CPU version 00014.04.
	U 1
Main CPU version checking.	id @ P
	04
	Secondary CPU version 00003.03.
	UC O
Secondary CPU version checking.	
	UJ T
	Wi-Fi version 00000.24.
	U3
Wi-Fi version checking.	
	-311 <b>3</b> 20
	CH

# **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 and PV energy.  Charging by utility.  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.	Grid and PV power are available.  Grid is available.  PV power is available.  No charging.



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. The unit will provide output **Battery Mode** power from battery and/or PV power. Power from battery only. Power from PV energy only.

## **Battery Equalization Description**

Battery equalization function is built into the charge controller. It reverses the buildup of negative chemical effects such as 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 may 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 the battery periodically.

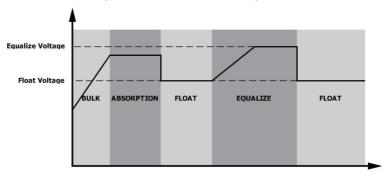
#### • How to Activate Equalization Function

You must enable battery equalization function in LCD setting Program 30 first. You can then apply this function by either one of the following methods:

- 1. Setting equalization interval in Program 35.
- 2. Activate equalization immediately in Program 36.

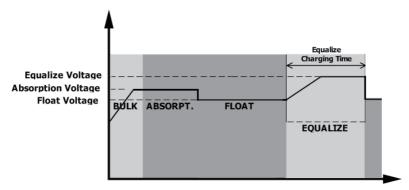
#### When to Equalize

In floating charge stage, when setting the equalization interval (battery equalization cycle) is reached, or equalization is activated immediately, the controller will start to enter Equalize Mode.

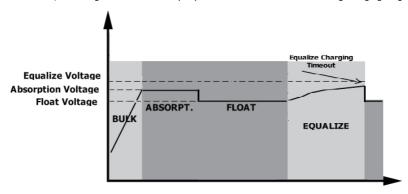


#### Equalize Charging and Timeout

In Equalize Mode, the controller will supply power to charge battery as much as possible until battery voltage reach the equalization voltage. Then, constant-voltage regulation is applied to maintain battery voltage at the equalization level. The battery will remain in the Equalize Mode until the equalization timer runs out.



However, in Equalize Mode, if the battery equalization timer runs out and the battery voltage doesn't recover to the battery equalization voltage point, the charge controller will extend the battery equalized time until battery voltage achieves equalization voltage. If the battery voltage is still lower than equalization voltage when the extension runs out, the charge controller will stop equalization and return to the floating charging stage.



### **Fault Reference Code**

Fault Code	Fault Event	Icon on
01	Fan is locked when inverter is off.	F0 :
02	Over temperature	F02
03	Battery voltage is too high	F03
04	Battery voltage is too low	F84
05	Output short circuited or over temperature is detected by internal converter components.	FOS
06	Output voltage is too high.	F08
07	Overload time out	F87
08	Bus voltage is too high	F08
09	Bus soft start failed	F09
51	Over current or surge	F5 I
52	Bus voltage is too low	FS2
53	Inverter soft start failed	FS3
55	Over DC voltage in AC output	FSS
57	Current sensor failed	FS7
58	Output voltage is too low	FS8
59	PV voltage is over limitation	F <b>5</b> 9

# **Warning Indicator**

Warning Code	Warning Event	Audible Alarm	Icon flashing
01	Fan is locked when inverter is on.	Beep three times every second	0 lø
02	Over temperature	None	05@
03	Battery is over-charged	Beep once every second	030
04	Low battery	Beep once every second	CHa
07	Overload	Beep once every 0.5 second	0.9
10	Output power derating	Beep twice every 3 seconds	ICo
15	PV energy is low.	Beep twice every 3 seconds	150
16	High AC input (>280VAC) during BUS soft start	None	160
32	Communication failure between inverter and remote display panel	None	350
E 9	Battery equalization	None	E9@
6P	Battery is not connected	None	6P@

## **SPECIFICATIONS**

Table 1 Line Mode Specifications

INVERTER MODEL	4.2KW 6.2KW			
Input Voltage Waveform	Sinusoidal (utility or generator)			
Nominal Input Voltage	230Vac			
Low Loss Voltage	170Vac±7V (UPS);			
Low Loss Voltage	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			
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	Circuit Breaker			
Efficiency (Line Mode)	>95% ( Rated R load, battery full charged )			
Transfer Time	10ms typical (UPS); 20ms typical (Appliances)			
Output power derating: When AC input voltage drops to 170V, the output power will be derated.	Output Power  Rated Power  50% Power  90V 170V 280V Input Voltage			

Table 2 Inverter Mode Specifications

INVERTER MODEL	4.2KW	6.2KW	
Rated Output Power	4.2KVA/4.2KW	6.2KVA/6.2KW	
Output Voltage Waveform	Pure S	line Wave	
Output Voltage Regulation	230Va	ac±10%	
Output Frequency	50Hz		
Peak Efficiency	9	93%	
Overload Protection	5s@≥110% load; 1	0s@105%~110% load	
Surge Capacity	2* rated pow	er for 5 seconds	
Max. AC Output Current	30Amp	40Amp	
Nominal DC Input Voltage	24Vdc	48Vdc	
Cold Start Voltage	23.0Vdc	46.0Vdc	
Low DC Warning Voltage			
@ load < 50%	23.0Vdc	46.0Vdc	
@ load ≥ 50%	22.0Vdc	44.0Vdc	
Low DC Warning Return Voltage			
@ load < 50%	23.5Vdc	47.0Vdc	
@ load ≥ 50%	23.0Vdc	46.0Vdc	
Low DC Cut-off Voltage			
@ load < 50%	21.5Vdc	43.0Vdc	
@ load ≥ 50%	21.0Vdc	42.0Vdc	
High DC Recovery Voltage	32Vdc	62Vdc	
High DC Cut-off Voltage	33Vdc	63Vdc	
No Load Power Consumption	<40W	<55W	

Table 3 Charge Mode Specifications

able 5 charge i	vioue Specifications		
<b>Utility Chargin</b>	g Mode		
INVERTER MODEL		4.2KW	6.2KW
Charging Algor	rithm	3-St	ер
AC Charging C	urrent (Max)	100Ar (@V <sub>I/P</sub> =23	•
<b>Bulk Charging</b>	Flooded Battery	29.2Vdc	58.4
Voltage	AGM / Gel Battery	28.2Vdc	56.4
Floating Charg	ing Voltage	27Vdc	54Vdc
Charging Curve		Bulk (Constant Current) (Constant Voltage	100%  50%  Maintenance (Floating)
MPPT Solar Cha			
INVERTER MOI		4.2KW	6.2KW
Max. PV Array		5000W 6000W	
Max. PV Currer		27A	
Nominal PV Vo		320Vdc 360Vdc	
Start-up Voltag	·	60Vdc +/- 10Vdc	
	Voltage Range	60Vdc~450Vdc	
•	Open Circuit Voltage	500Vdc	
Max Charging ( (AC charger plu	Current us solar charger)	120Amp	

## Table 4 General Specifications

INVERTER MODEL	4.2KW	6.2KW
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	130 x 300 x 466	
Net Weight, kg	9.4 10.4	

## **TROUBLE SHOOTING**

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)     Internal fuse tripped.	Contact repair center for replacing the fuse.     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)	<ol> <li>Check if AC wires are too thin and/or too long.</li> <li>Check if generator (if applied) is working well or if input voltage range setting is correct. (UPS→Appliance)</li> </ol>	
	Green LED is flashing.	Set "SUB" (solar first) as the priority of output source.	Change output source priority to "USB" (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.	
		Overload error. The inverter is overload 110% and time is up.	Reduce the connected load by switching off some equipment.	
	Fault code 07	If PV input voltage is higher than specification, the output power will be derated. At this time, if connected loads is higher than derated output power, it will cause overload.	Reduce the number of PV modules in series or the connected load.	
	Fault code 05	Output short circuited.	Check if wiring is connected well and remove abnormal load.	
Buzzer beeps	Fault code 02	Temperature of internal converter component is over 120°C.  Internal temperature of inverter component is over 100°C.	Check whether the air flow of the unit is blocked or whether the ambient temperature is too high.	
continuously and		Battery is over-charged.	Return to repair center.	
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 to repair center.	
	Fault code 55	Output voltage is unbalanced.	•	
	Fault code 59	PV input voltage is beyond the specification. Reduce the n modules in se		

## **Appendix I: BMS Communication Installation**

#### 1. Introduction

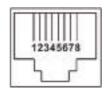
If connecting to lithium battery, it is recommended to purchase a custom-made RJ45 communication cable. Please check with your dealer or integrator for details.

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

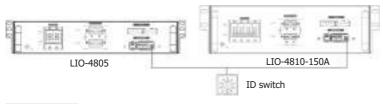
- Re-configure charging voltage, charging current and battery discharge cut-off voltage according to the lithium battery parameters.
- Have the inverter start or stop charging according to the status of lithium battery.

#### 2. Pin Assignment for BMS Communication Port

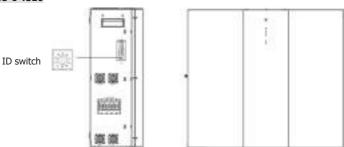
	Definition
PIN 1	RS232TX
PIN 2	RS232RX
PIN 3	RS485B
PIN 4	NC
PIN 5	RS485A
PIN 6	CANH
PIN 7	CANL
PIN 8	GND



# 3. Lithium Battery Communication Configuration LIO-4805/LIO-4810-150A



#### ESS LIO-I 4810



ID Switch indicates the unique ID code for each battery module. It's required to assign an identical 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.

# 

☑ Dip 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	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.
1: RS485 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 take	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.
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.

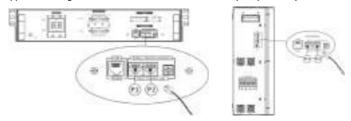
**NOTE:** The maximum groups of lithium battery is 5 and for maximum number for each group, please check with battery manufacturer.

#### 4. Installation and Operation

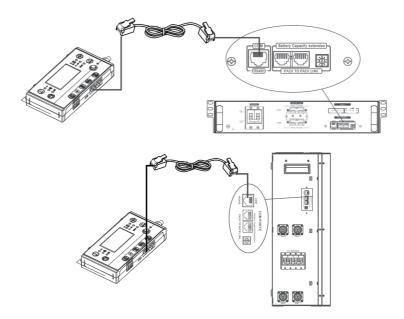
#### LIO-4805/LIO-4810-150A/ESS LIO-I 4810

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.



#### Note for parallel system:

- 1. Only support common battery installation.
- 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.



LI b

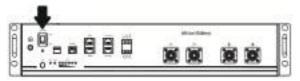
If communication between the inverter and battery is successful, the battery icon on LCD display will flash. Generally speaking, it will take longer than 1 minute to establish communication.

#### **PYLONTECH**

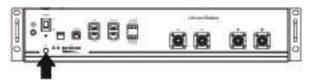
After configuration, please install LCD panel with inverter and Lithium battery with the following steps. Step 1. Use custom-made RJ45 cable to connect inverter and Lithium battery.



Step 2. Switch on Lithium battery.



Step 3. Press more than three seconds to start Lithium battery. Output power is 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.

#### **WECO**

Step 1. Use a custom-made RJ45 cable to connect inverter and Lithium battery.



Step 2. Switch on Lithium battery.



Step 3. Turn on the inverter.



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

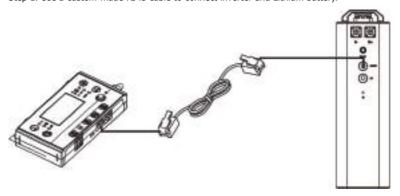


## ......

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.

#### **SOLTARO**

Step 1. Use a custom-made RJ45 cable to connect inverter and Lithium battery.



Step 2. Open DC isolator and switch on Lithium battery.



Step 3. Turn on the inverter.



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



# SOL

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

#### 5. LCD Display Information

Press "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	Battery pack numbers = 3, battery group numbers = 1
group numbers	<u>60</u> 3 <b>60</b> 1

#### 5. Code Reference

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

Code	Description	Action
80 <b>ø</b>	If battery status is not allowed to charge and discharge after the communication between the inverter and battery is successful, it will show code 60 to stop charging and discharging battery.	
8 lø	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.	
62ø	Battery number is changed. It probably is because of communication lost between battery packs.	Press "UP" or "DOWN" key to switch LCD display until below screen shows. It will have battery number re-checked and 62 warning code will be clear.
69 <b>ø</b>	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.	
70@	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.	
7 10	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.	