SP5000 Premium Parallel Installation Guide

1. Introduction

This inverter can be used in parallel with maximum 6 units. The supported maximum output power is 60KW/60KVA.

2. Parallel cable

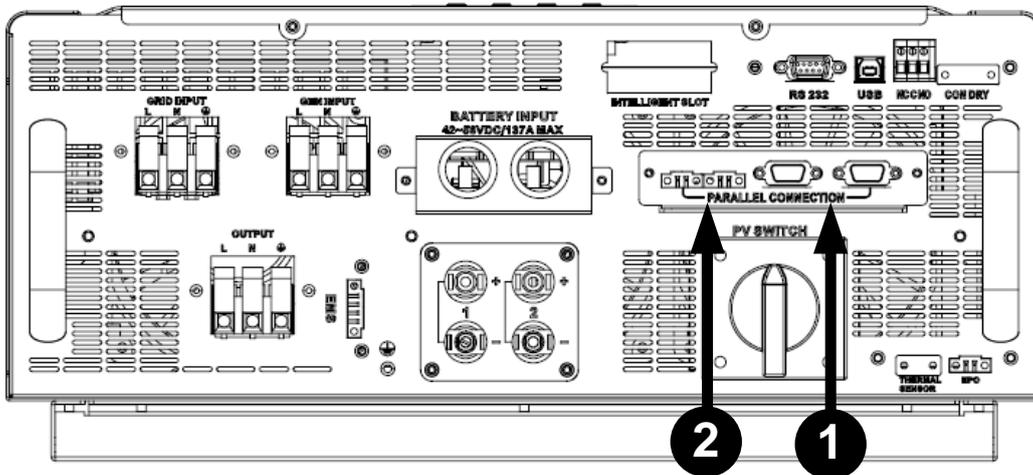You will find the following items in the package:

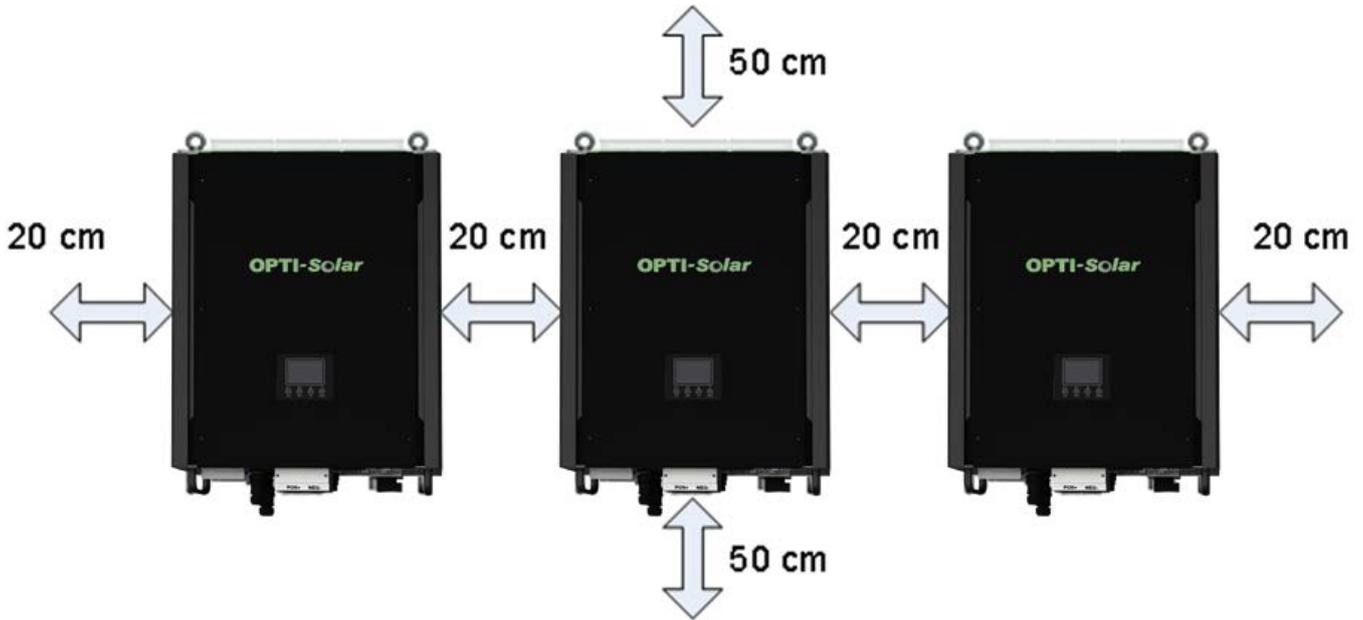Parallel communication cable   Current sharing cable

3. Overview

1. Parallel communication port
2. Current sharing port

4. Mounting the Unit

When installing multiple units, please follow below chart.
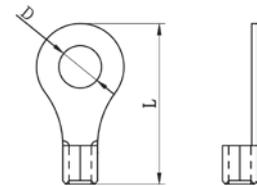

NOTE: For proper air circulation to dissipate heat, it's necessary to allow a clearance of approx. 20 cm to the side and approx. 50 cm above and below the unit. Be sure to install each unit in the same level.

5. Wiring Connection

The cable size of each inverter is shown as below:

Recommended battery cable and terminal size for each inverter:

Ring terminal:

| Model | Wire Size | Ring Terminal | | | Torque value |
| | | Cable mm^2 | Dimensions | | |
			D (mm)	L (mm)	
5KW	2	38	8.4	54.2	7~12 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.

Recommended AC input and output cable size for each inverter:

Model	AWG no.	Conductor cross-section	Torque
5KW	10~8 AWG	5.5~10 mm^2	1.4~1.6Nm

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 cable size of AC input and output, please also follow the same principle.

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

Recommended breaker specification of battery for each inverter:

Model	One unit*
5KW	150A/60VDC

*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 one unit. "X" indicates the number of inverters connected in parallel.

Recommended battery capacity

Inverter parallel numbers	2	3	4	5	6
Battery Capacity	400AH	600AH	800AH	1000AH	1200AH

CAUTION! Please follow the battery charging current and voltage from battery spec to choose the suitable battery. The wrong charging parameters will reduce the battery lifecycle sharply.

Approximate back-up time table

Load (W)	Backup Time @ 48Vdc 800Ah (min)	Backup Time @ 48Vdc 1200Ah (min)
5,000	240	360
10,000	112	168
15,000	60	90
20,000	40	60
25,000	20	30
30,000	13	20

PV Connection

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

CAUTION: Each inverter should connect to PV modules separately.

6. Inverters Configuration

No matter how many pieces of inverters installed in parallel, please connect L, N, G terminals of AC input and AC output from each inverter together separately. Connect all battery terminals of each inverter together. Please refer to the following example of 3 units.
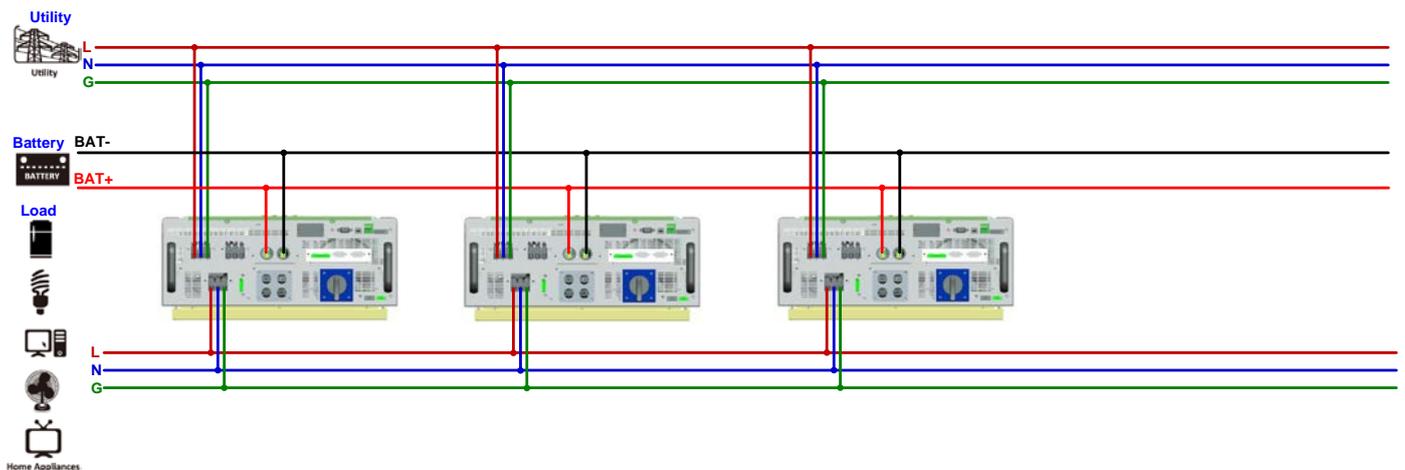
Two inverters in parallel:
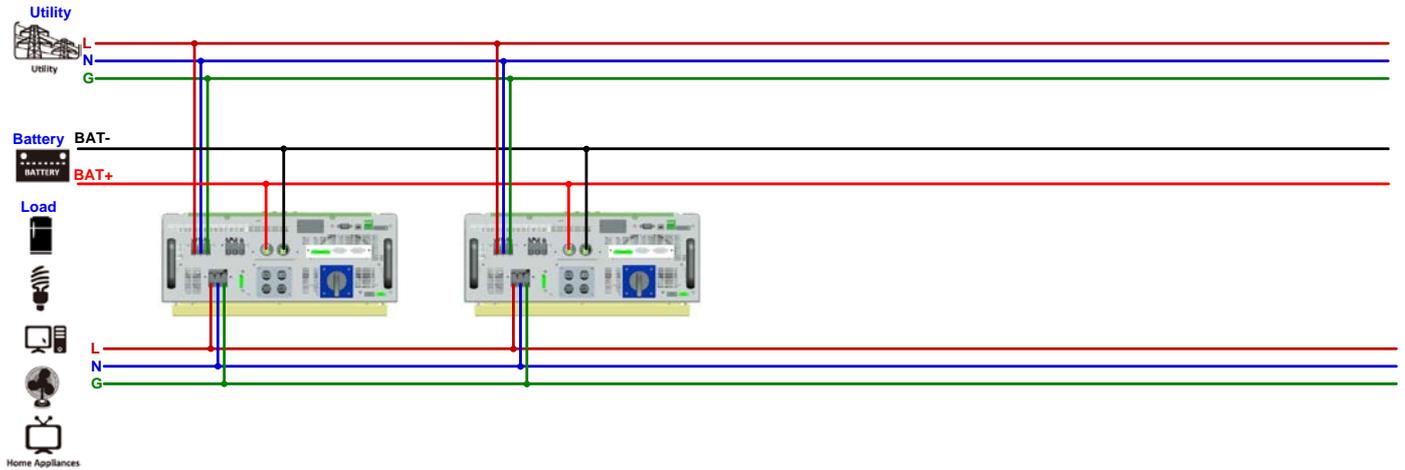
Power Connection

Communication Connection
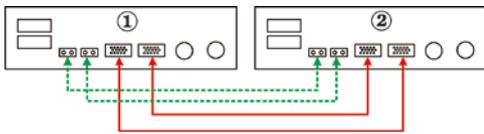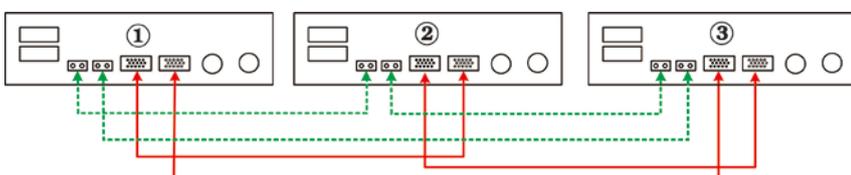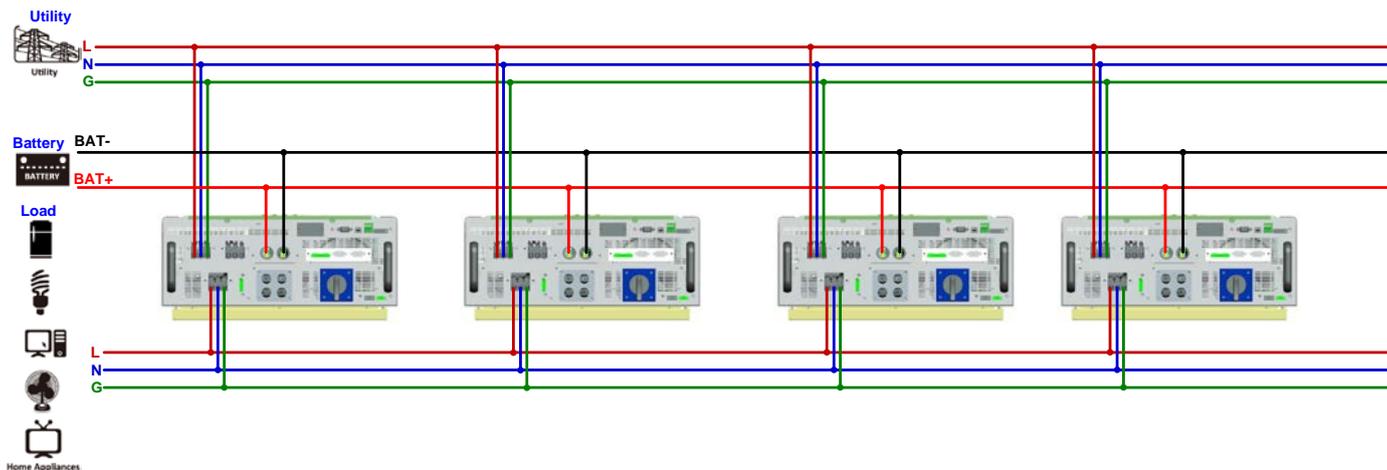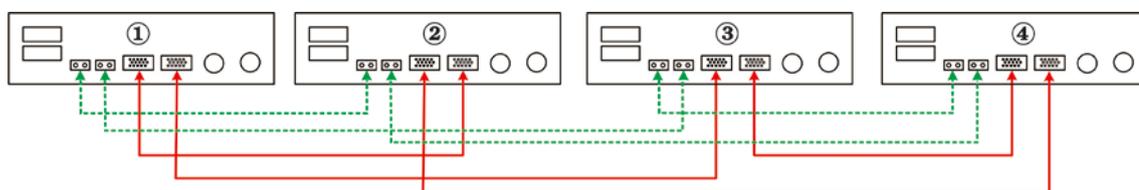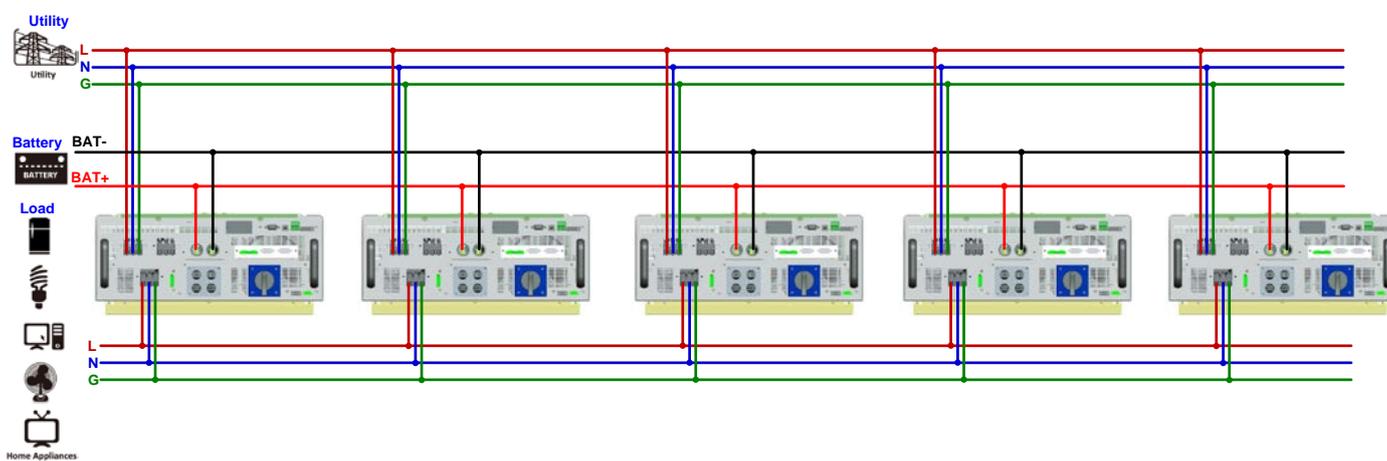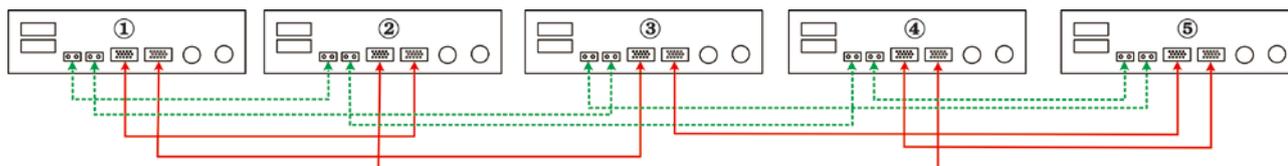

Three inverters in parallel:

Power Connection

Communication Connection

Four inverters in parallel:

Power Connection

Communication Connection

Five inverters in parallel:

Power Connection

Communication Connection

Six inverters in parallel:
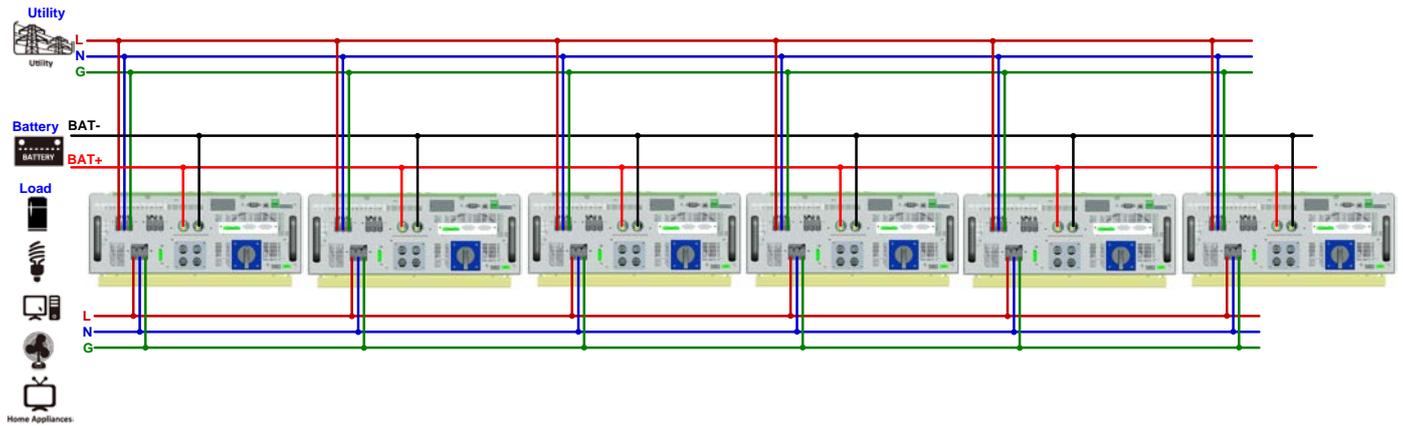
Power Connection

Communication Connection
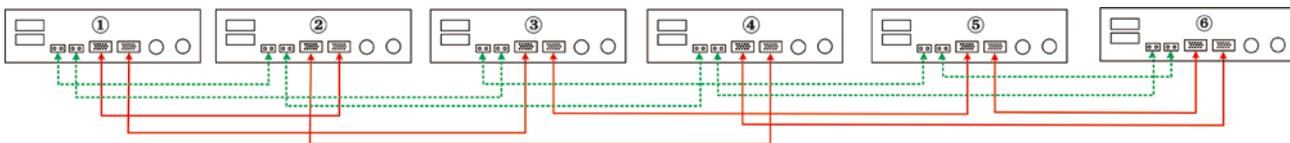
7. Setting and LCD Display

Setting Program:

The parallel function setting is only available by Solarpower or Solarpower Pro. Please install the software in your PC first.

For setting, you can set the inverter one by one through RS232 or USB port.

Note: When using serial port (USB or RS-232) for communication, you only can monitor the inverter connected with serial port directly. The other inverters will not be listed in Solarpower software. However, some settings can be applied to all with serial port connection. These kinds of settings are listed as below:

But we suggest you use the SNMP card or Modbus card to combine the system as a centralized monitoring. So you can use "SYNC" option to set all the inverter at the same time.

● Use SNMP card to synchronize the parameters:

Each inverter should have one SNMP card. Make sure all of the SNMP cards are connected to the router as a LAN.
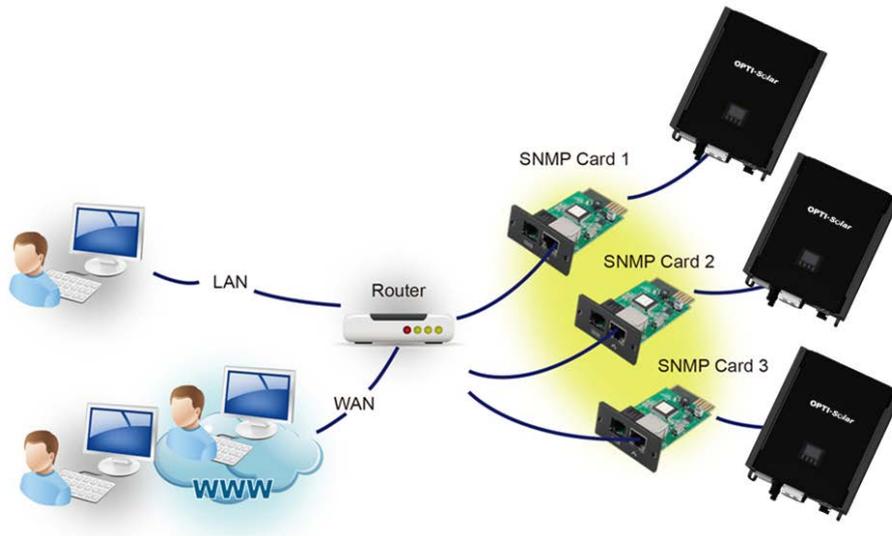
● Use Modbus card to synchronize the parameters:

Each inverter should have one Modbus card. Make sure all of the Modbus cards are connected each other and one of the Modbus cards is connected to the computer by RS-485/RS232 converter.
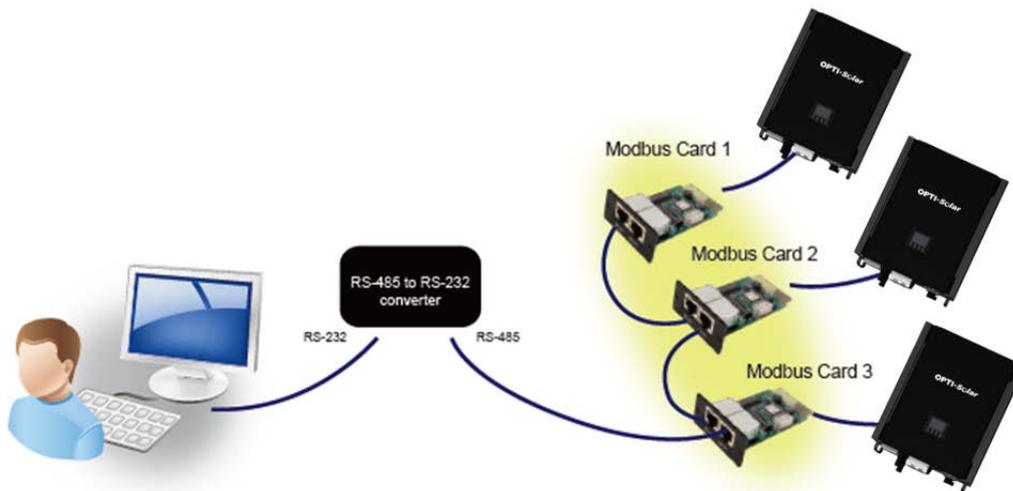
Launch SolarPowerPro in computer and select Device Control >> Parameter Setting >> Parallel output. Two options: Enable or Disable.

If you want to use parallel function, please choose "Enable" and press " [Apply] " button. Then, " [✓ Sync] " button will be shown is the screen. Please be sure to click " [✓ Sync] " button before clicking " [Apply] " button.

There is a "Sync" button in each parameter setting. When "Sync" is clicked and "Apply" is pressed, this new setting will be applied to all inverters. If not, this setting is only effected in current inverter you choose.

Note: Without centralized monitoring system, "Sync" function is not effective. Then, you have to set up the inverter one by one through serial communication port.

Parallel for output: Enable

Parallel for output: Disable

Fault code display:

Fault Code	Fault Event	Icon on
60	Power feedback protection	60 ⚠ ERROR
61	Relay board driver loss	61 ⚠ ERROR
62	Relay board communication loss	62 ⚠ ERROR
71	Firmware version inconsistent	71 ⚠ ERROR
72	Current sharing fault	72 ⚠ ERROR
80	CAN fault	80 ⚠ ERROR
81	Host loss	81 ⚠ ERROR
82	Synchronization loss	82 ⚠ ERROR

8. Commissioning

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 "enable parallel for output" on Solarpower or SolarPower Pro. And then shut down all units.

Step 3: Turn on each unit.

LCD display in Master unit	LCD display in Slave unit
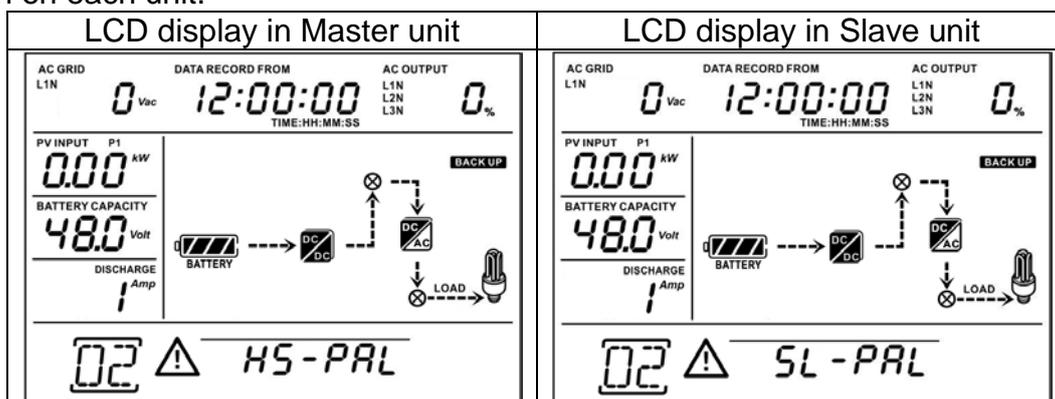
NOTE: Master and slave units are randomly defined. Warning 02 is AC GRID voltage low.

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.

LCD display in Master unit	LCD display in Slave unit
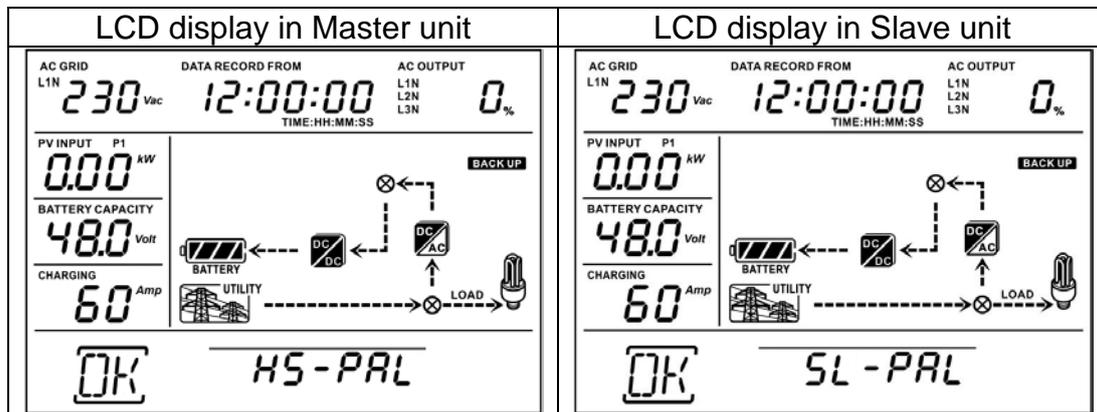
Step 5: If there is no more fault alarm, the parallel system is completely installed.
Step 6: Please switch on all breakers of Line wires in load side. This system will start to provide power to the load.

9. Trouble shooting

Situation		Solution
Fault Code	Fault Event Description	
60	Current feedback into the inverter is detected.	1. Restart the inverter. 2. Check if L1/L2/L3/N cables are not connected with wrong sequence in all inverters. 3. Make sure the sharing cables are connected in all inverters. 4. If the problem remains, please contact your installer.
61	Relay board driver loss	1. Disconnect all of power source. 2. Only connect AC input, and press Enter key to let it working in bypass mode. 3. Check if the problem happens again or not, and feed back the result to your installer.
62	Relay board communication loss	
71	The firmware version of each inverter is not the same.	1. Update all inverter firmware to the same version. 2. After updating, if the problem still remains, please contact your installer.
72	The output current of each inverter is different.	1. Check if sharing cables are connected well and restart the inverter. 2. If the problem remains, please contact your installer.
80	CAN data loss	1. Check if communication cables are connected well and restart the inverter. 2. If the problem remains, please contact your installer.
81	Host data loss	
82	Synchronization data loss	