Eco-Hybrid Inverters Parallel Guidance

2021-7-9

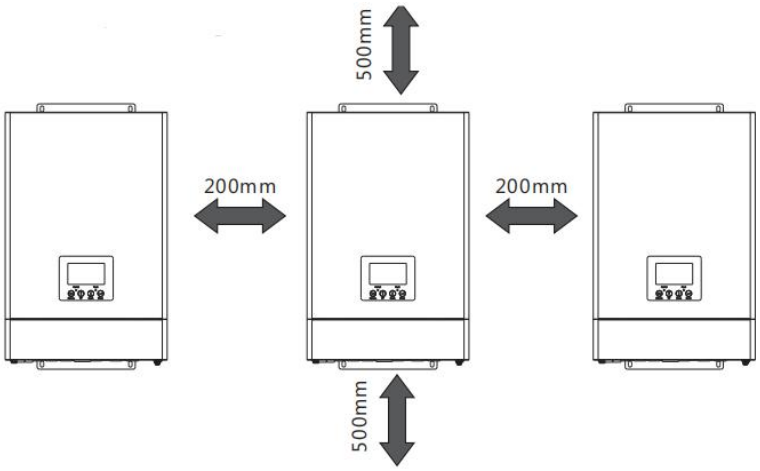
PART1: Single Phase Parallel System

Lux Power ECO-Hybrid inverter supports “Parallel Connection”, which means you can combine multiple inverters together to get bigger back-up power.

Installation and commissioning procedures are as below,

Step1. Installing each inverter

Install each inverter following the requirements in user manual. Please make sure the distance between each inverter meet the requirements below.

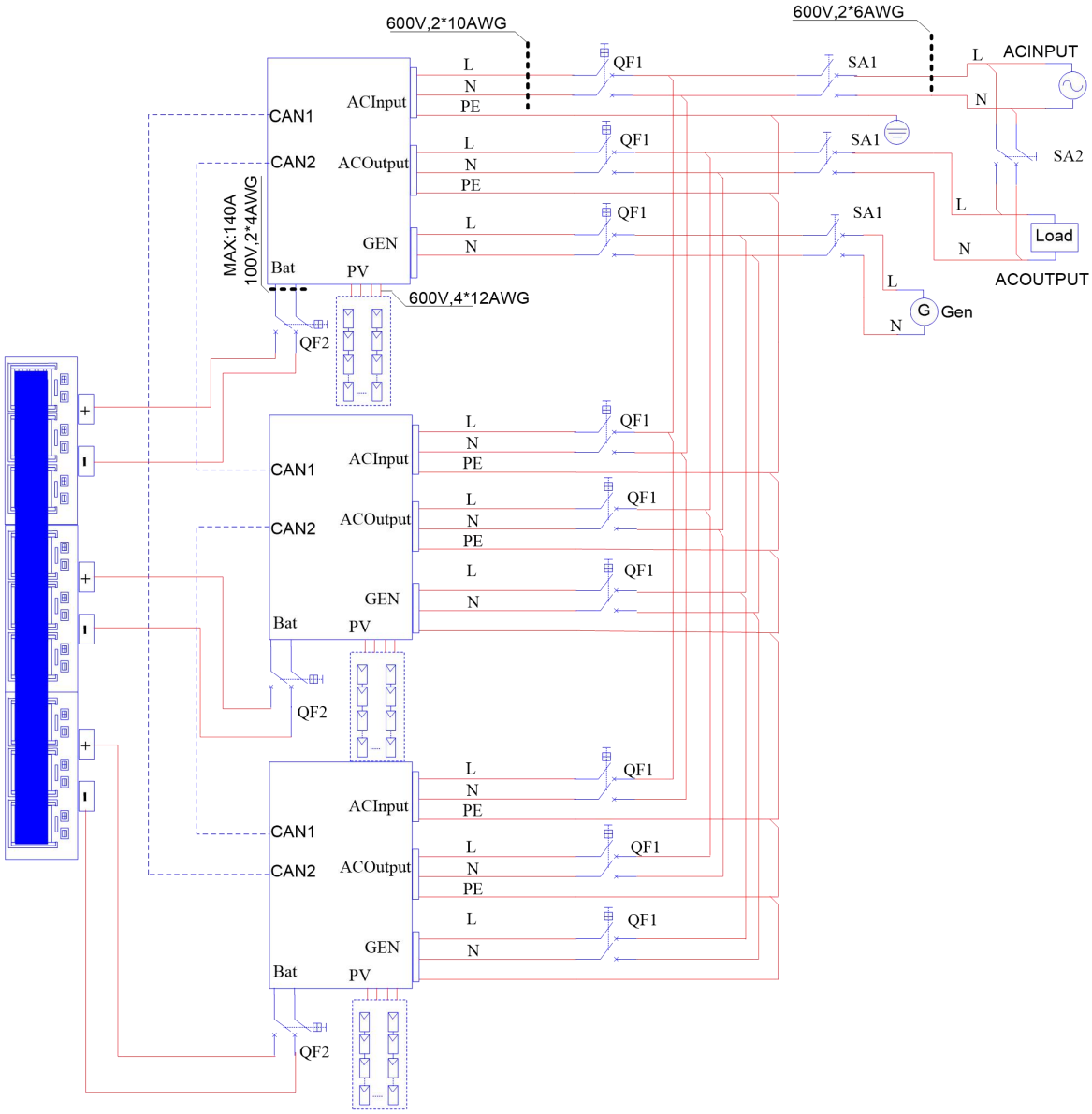


Step2. Wiring of power cables

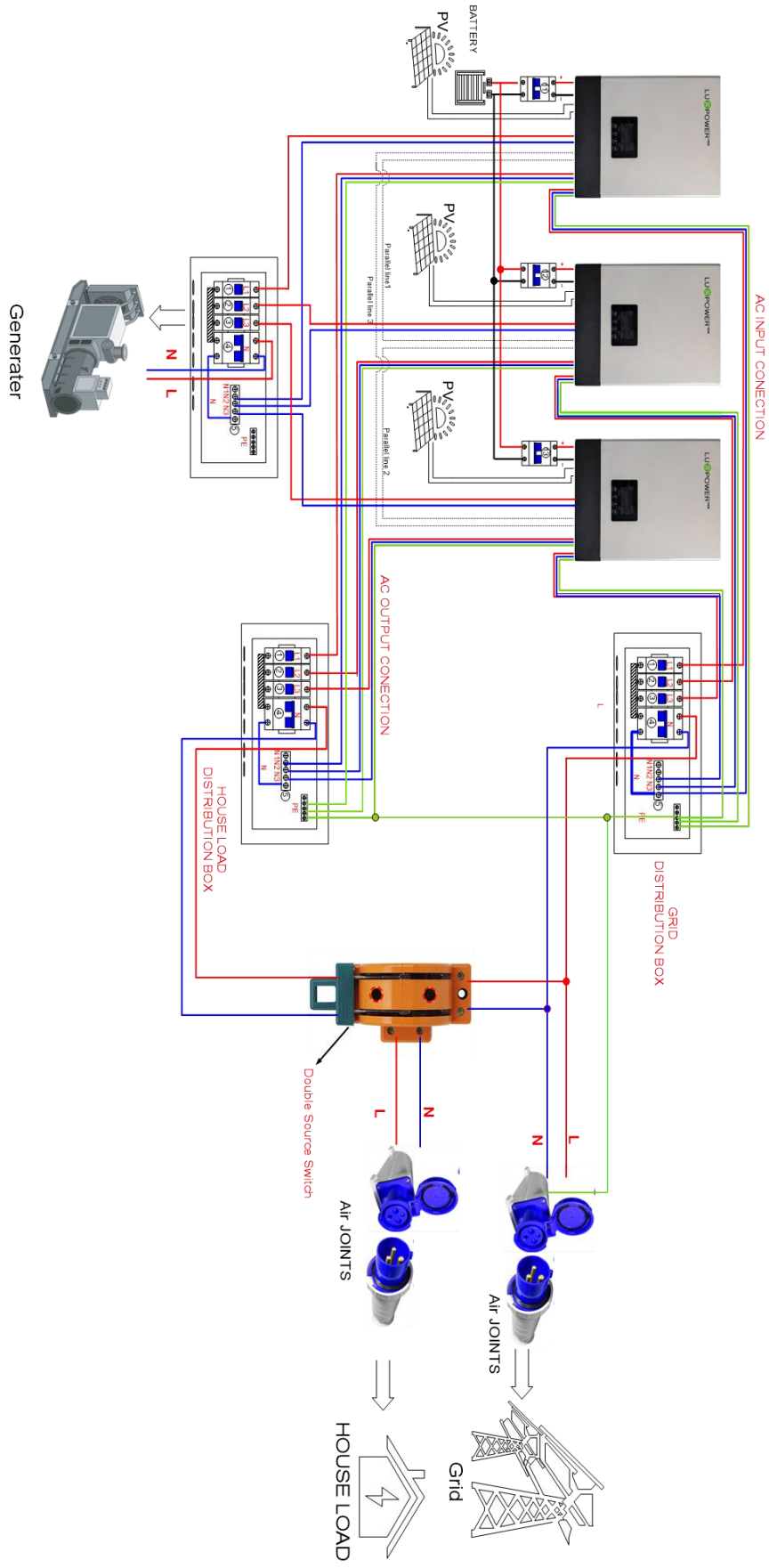
Connect the AC input ports, AC output ports and Gen ports(If generator is connected) of the inverters together according to the diagram below, It should be L to L, N to N, and PE to PE.

Connect batteries to the inverters, each inverter can have separate batteries, or you can also parallel the batteries and then connect the battery bank to each inverter.

Please check with a multi-meter after the wiring is done.



Power cable wiring diagram


BATTERY
PV
Generater
N
L
AC INPUT CONECTION
AC OUTPUT CONECTION
HOUSE LOAD
DISTRIBUTION BOX
GRID
DISTRIBUTION BOX
Double Source Switch
Air JOINTS
Air JOINTS
HOUSE LOAD
Grid

✓ **Recommended Battery Capacity:**

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

***At least 200AH per unit**

✓ **Recommended Cable Size:**

Cables	**Cross-sectional area (Length≤20m)**	**Note**
AC Input to QF1	≥8mm²	Maximum Grid current is 40A
AC Output to QF1	≥6mm²	Nominal current is25A
GEN Port to QF1	≥6mm²	Maximum current is 25A
QF1 Port to SA1	≥6mm²	Maximum current is 25A
SA1 to AC	≥6mm²*3	Maximum current is 40A*n
SA1 to AC	≥6mm²*3	Maximum current is 25A*n
SA1 to AC	≥6mm²*3	Maximum current is 25A*n

**** 1) The PE line can be chosen between 6~10mm²**

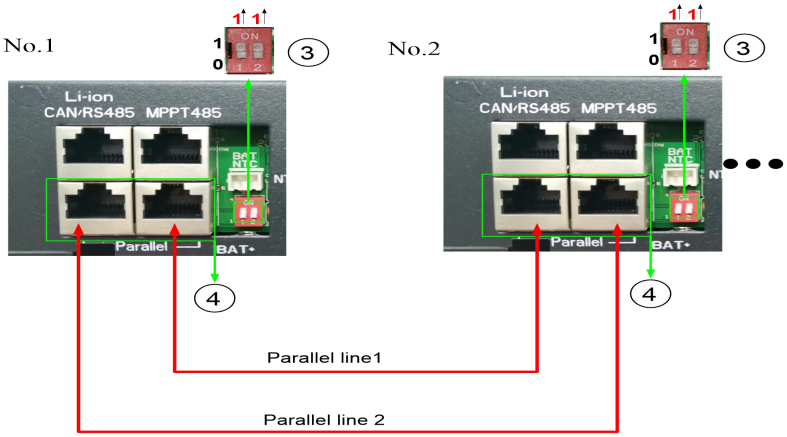
2) n is the number of parallel inverters

Step3. Connection of parallel communication cables

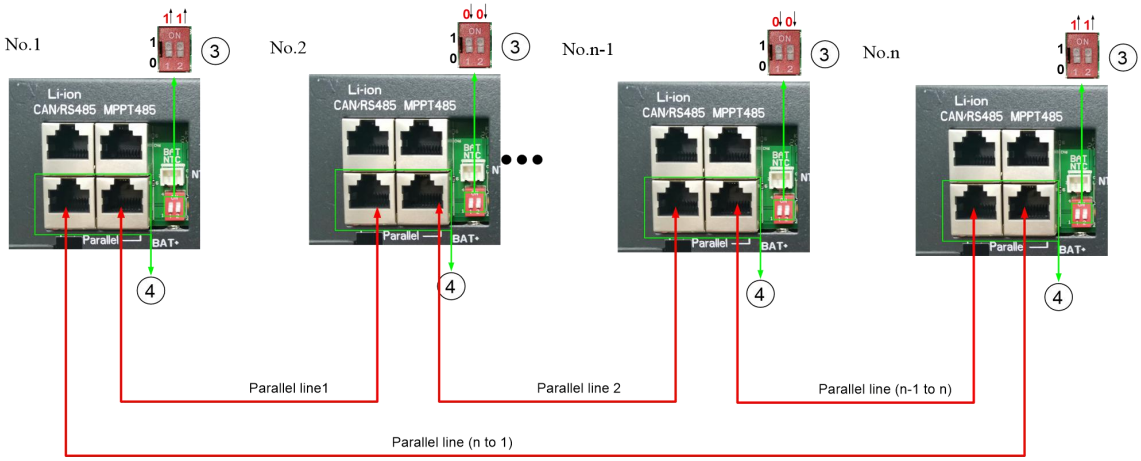
First, prepare parallel communication cables. The commonly used Ethernet cables(Cat 5e) can be used for parallel communication.

The 2x RJ45 ports with “Parallel” marking are for parallel connection. Although one communication cable is okay for parallel communication, it is suggested to use 2 cables for more secure and reliable communication(for 2 inverters in parallel).

The 2-bit DIP switch adjacent to the parallel ports is used to connect or disconnect balance resistor of the parallel communication.



If there are more than two inverters in parallel operation, only the 2 inverters on the ends of the daisy chain connection, which have the longest distance between them, need to set the 2-bit DIP to ON position. The 2-bit DIP of other inverters should be at OFF position.



The maximum parallel quantity is 16PCS

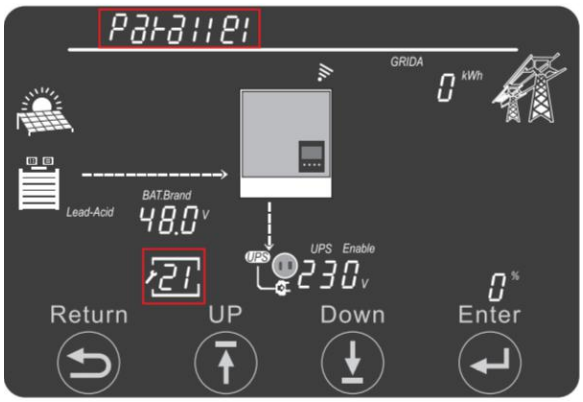
Step4. Connection of battery communication cable

Connect communication cable to any of the parallel inverters, and the master battery module. The DIP switches on battery modules need to be set correctly.

Step5. Setting parameters related to parallel operation

Power on the inverter, set parameters as below,

1. Press the “Enter” button for over 10 seconds, the LCD will enter parameter-setting status, a wrench icon will appear alongside the parameter number. Press UP/Down button to switch to parameter 21, as in the image below,

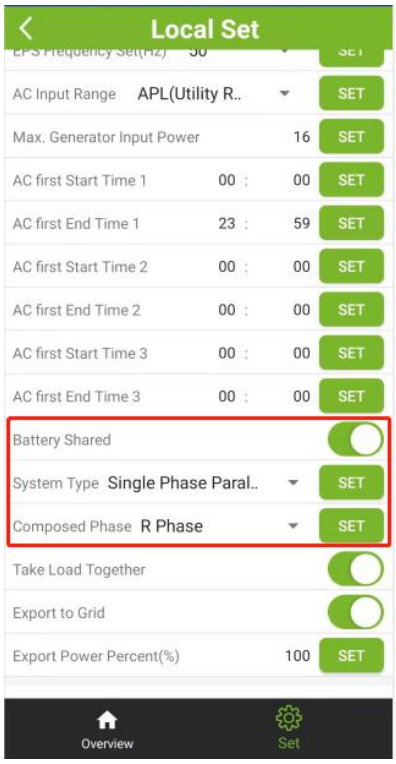


2. The “Parallel” wording will be flashing on the top left of the screen, click “Enter” to set parallel type. There are 3 options to choose - NoPL(no parallel), 1PH(1-ph parallel), 3PH(3-phase parallel). Please select “1PH” for single phase parallel inverters. Then click “Enter”.

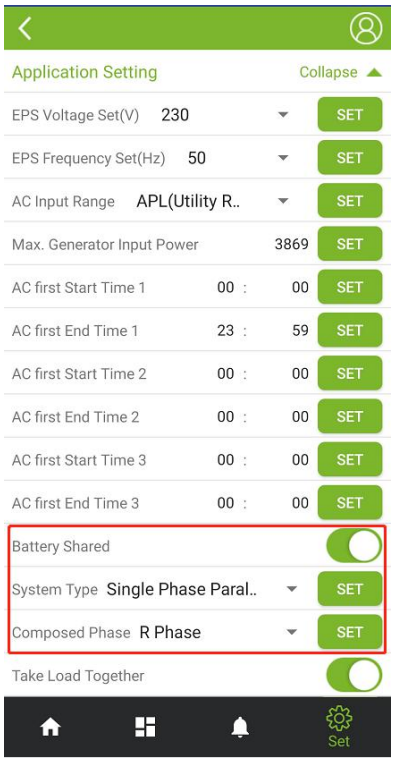
3. Select the phase on which you want the inverter to be. There are 3 options - P1 for phase R, P2 for phase S, P3 for phase T. For single phase parallel, only P1 can be selected, just click “Enter”.

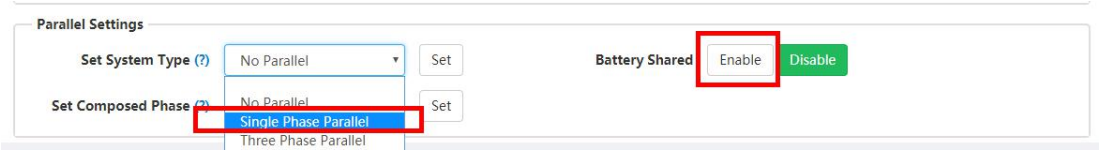
4. Set if you are using shared battery bank for the parallel inverters. If the inverters all connect to the same battery bank, select “Enable”, otherwise choose “Disable”. Then click “Enter”. The inverter will then restart and the settings will take effect.

The settings can also be done on the LuxPowerView APP via Direct Connect method,



Or done remotely on LuxPowerView APP or on the monitoring platform if the inverters are connected to our server.





Step6. Running the system

■ Check and make sure all connection is correct.

■ Turn on all breakers.

PART2: Three Phase System Wiring

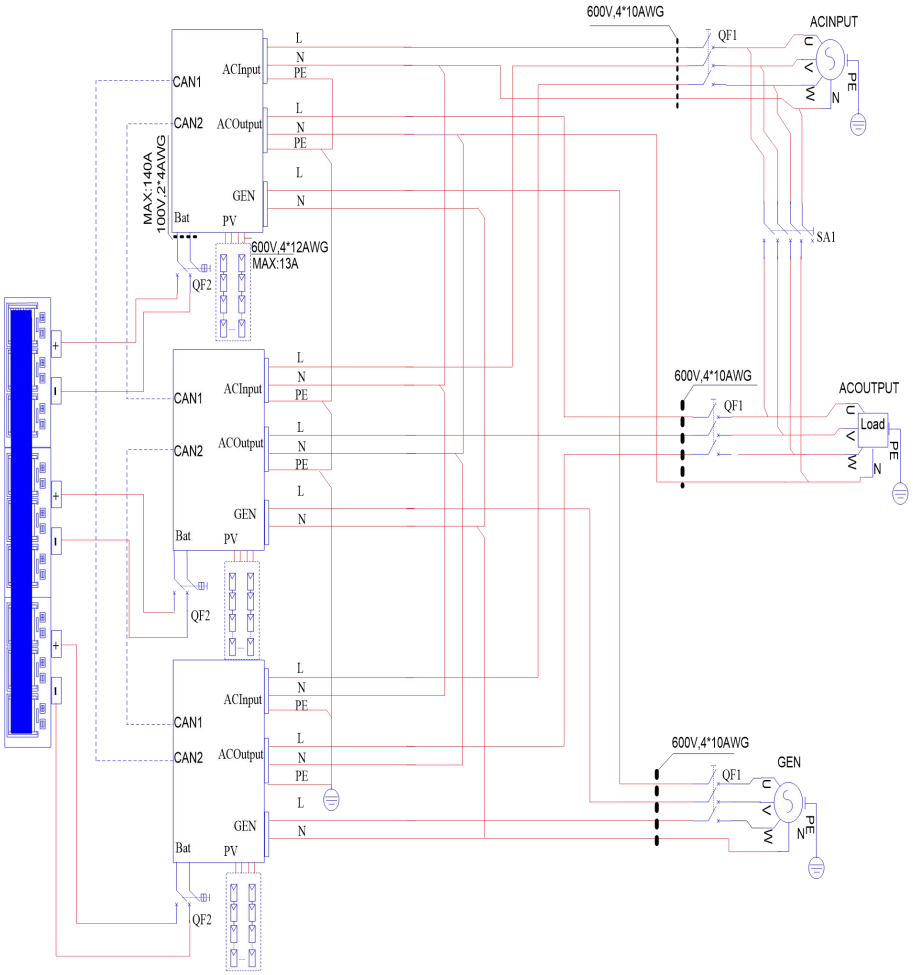
Step1. Installing each inverter

Lux Power Eco-Hybrid inverters can be used to form a three-phase system. This part will show you how to set up a three phase system with the Eco-Hybrid series inverters.

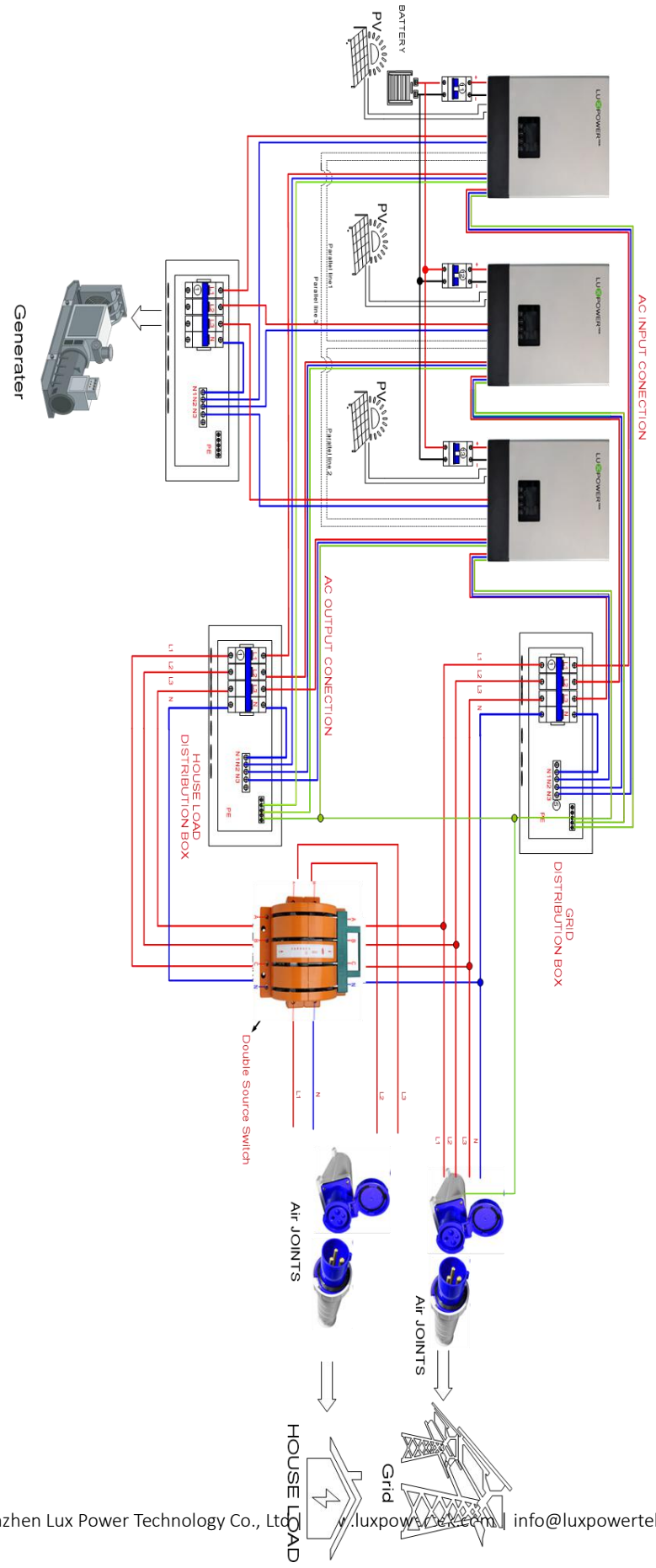
Step2. Wiring of power cables

Wiring the 3-phase parallel system as below,

When using the inverters to form a 3-phase system, make sure there is at least one inverter on each phase. The live(L) terminal of each inverter should be connected to its correct phase terminal(R/S/T) on the breakers, only the neutral(N) terminal of each inverter can be connected together. If the live(L) terminals of the inverters on different phase are connected to the same point, you'll cause short circuit to the grid and generator.



3-phase system consisting of 3xEco-Hybrid inverters


BATTERY
PV
PV
PV
Generater
AC INPUT CONECTION
AC OUTPUT CONECTION
HOUSE LOAD
DISTRIBUTION BOX
GRID
DISTRIBUTION BOX
Double Source Switch
Air JOINTS
Air JOINTS
HOUSE LOAD
Grid

Each inverter can have separate batteries, or you can also parallel the batteries and then connect the battery bank to each inverter.

✓ **Recommended battery capacity:**

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

*At least 200AH per unit

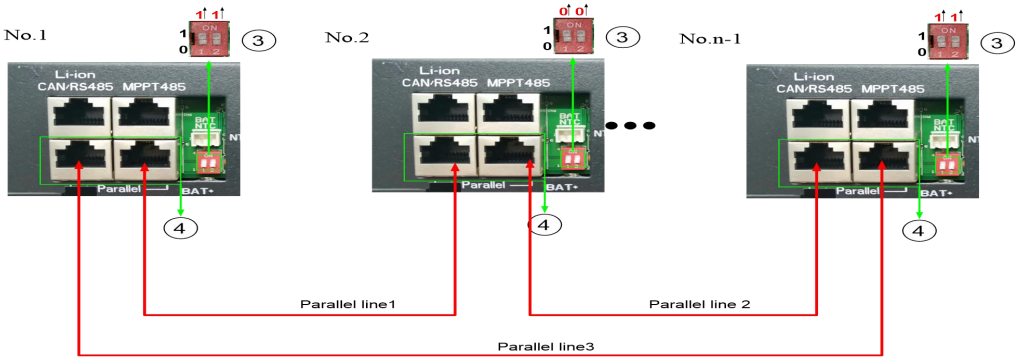
✓ **Recommended cable size:**

Cables	**Cross Section (Length≤20m)**	**Note**
AC Input (L1,L2,L3&N) to QF1	≥8mm²	Maximum Grid current is 40A
AC Output (L1,L2,L3&N) to QF1	≥6mm²	Nominal current is25A
GEN (L1,L2,L3) to QF1	≥8mm²	Maximum current is 25A
BATTERY to QF2	≥20mm²	Maximum current is 25A

Step3. Connection of parallel communication cables

First, prepare parallel communication cables. The commonly used Ethernet cables can be used for parallel communication.

The 2x RJ45 ports with “Parallel” marking are for parallel connection. Connect parallel communication cables according to the diagram below,



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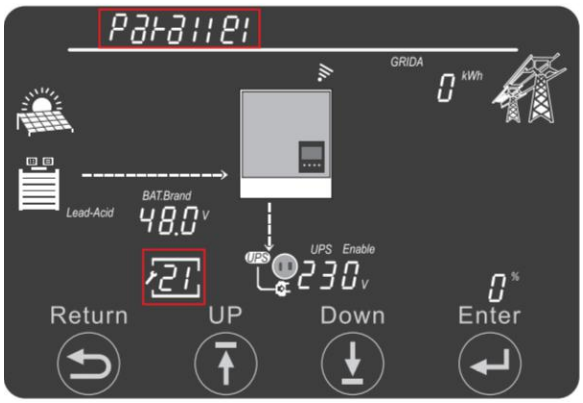
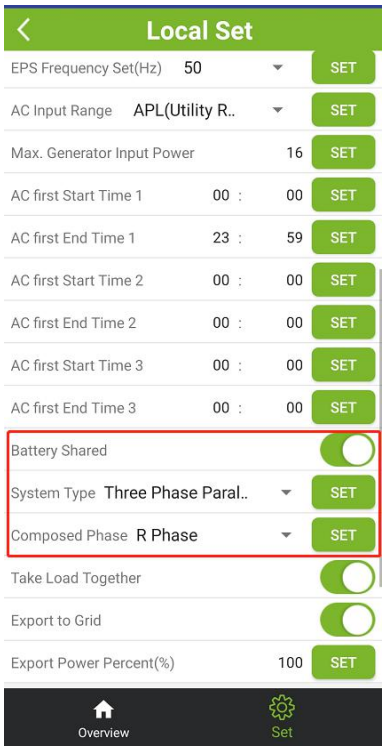


2. The “Parallel” wording will be flashing on the top left of the screen, click “Enter” to set parallel type. There are 3 options to choose - NoPL(no parallel), 1PH(1-ph parallel), 3PH(3-phase parallel). Please select “3PH” for each inverter in the 3 phase system. Then click “Enter”.

3. Select the phase on which you want the inverter to be. There are 3 options - P1 for phase R, P2 for phase S, P3 for phase T. Select the correct phase for each inverter in the 3 phase system, just click “Enter”.

4. Set if you are using shared battery bank for the parallel inverters. If the inverters all connect to the same battery bank, select “Enable”, otherwise choose “Disable”. Then click “Enter”. The inverter will then restart and the settings will take effect.

The settings can also be done on the LuxPowerView APP via Direct Connect method,



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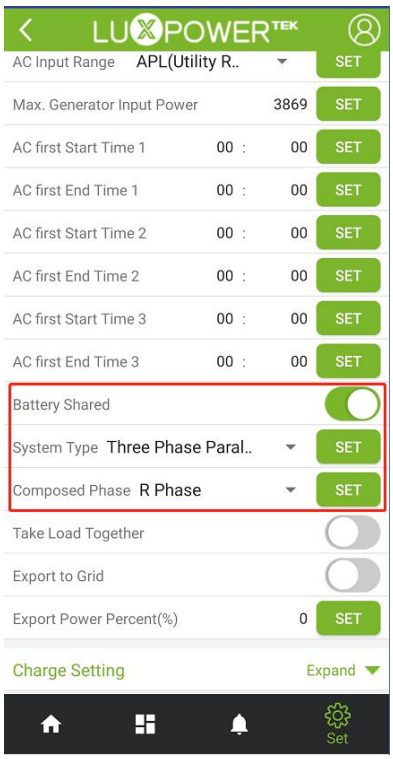

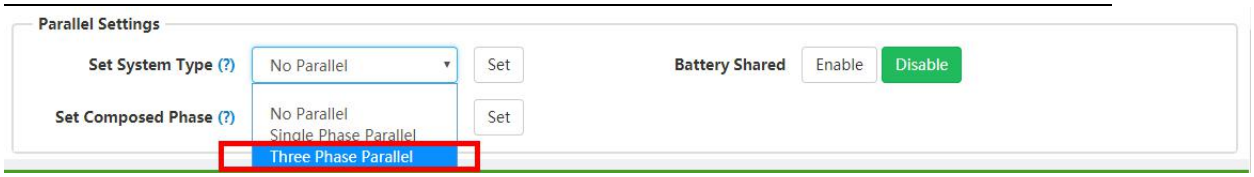

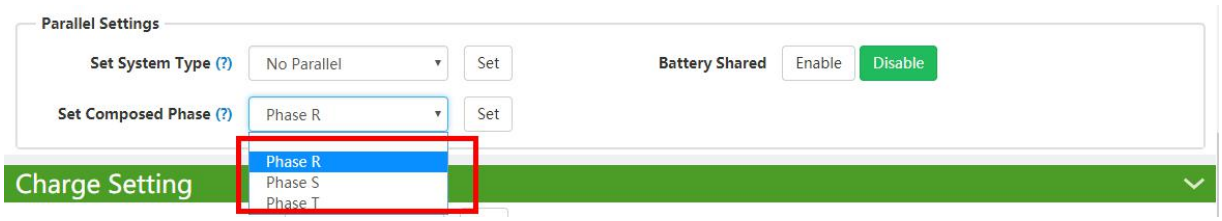

Step6. Running the system

■Check and make sure all connection is correct.

■Turn on all breakers.

Related Fault

Fault	Description	Countermeasures
E008	CAN communication error in Parallel System	1. Please check if you have connect parallel communication cable 2. Check if the communication cables are connected to the right COM port 3. Check if you are using the right cables 4. Check if the 2-bit DIP switch is set correctly 5. If have multiple units on the same site but run them separately, do not do parallel parameter setting
E011	AC inconsistent in parallel system	Check if AC input, AC output, Gen input connection is correct for each inverter. Always connect the L, N, earth wires according to the markings on terminal block
E015	Phase Error in three phase parallel system	Check the phase setting is right, if you set single phase system, then each inverter should be R phase; If you set three phase system, then there should be R phase inverter, S phase inverter and T phase inverter