

Hybrid Parallel Model Installation Guidance

2021-7-25

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PART1: Single Phase Parallel System Wiring

Lux power inverter support “Parallel Connection”, which means you can combine multiple inverters together to get bigger back-up power. As parallel model is different from standard one, please make it clear to the distributor if you want a parallel unit. This document is used to show how to set up a parallel system.

➤ Step1. Single unit installation

Install each single phase inverter as user manual. Before installation, please make sure the distance between each inverter meet the requirements of user manual.

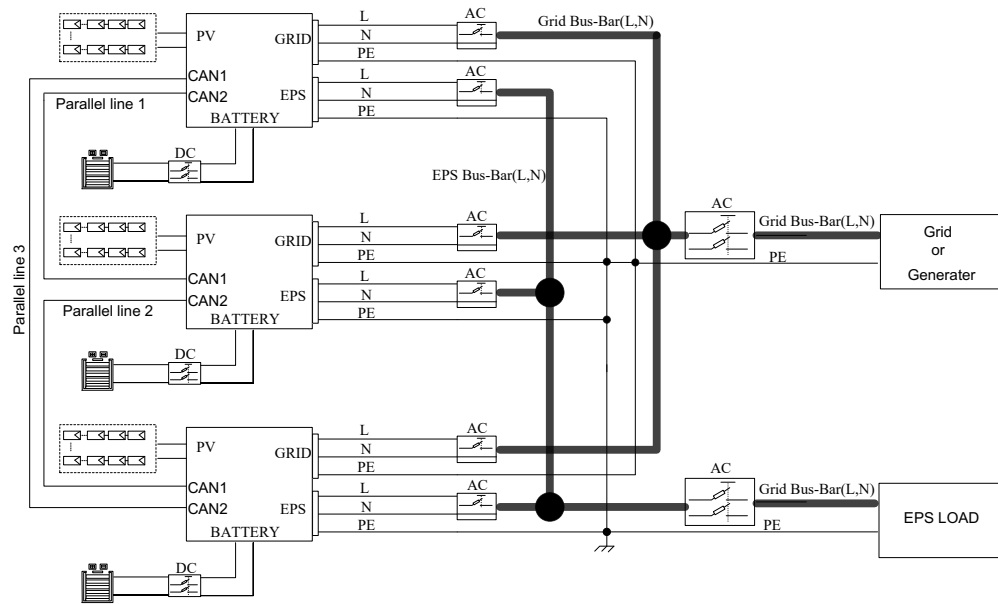
➤ Step2. Parallel system wiring

If you paralleling the system as single phase system, the most important thing is to make sure the L & N lines of each unit (AC port And EPS port) are correctly connected, please check with multi-meter to make sure L cable of each units are connected. Do not connect one inverter’s L cable to another inverter’s N cable.

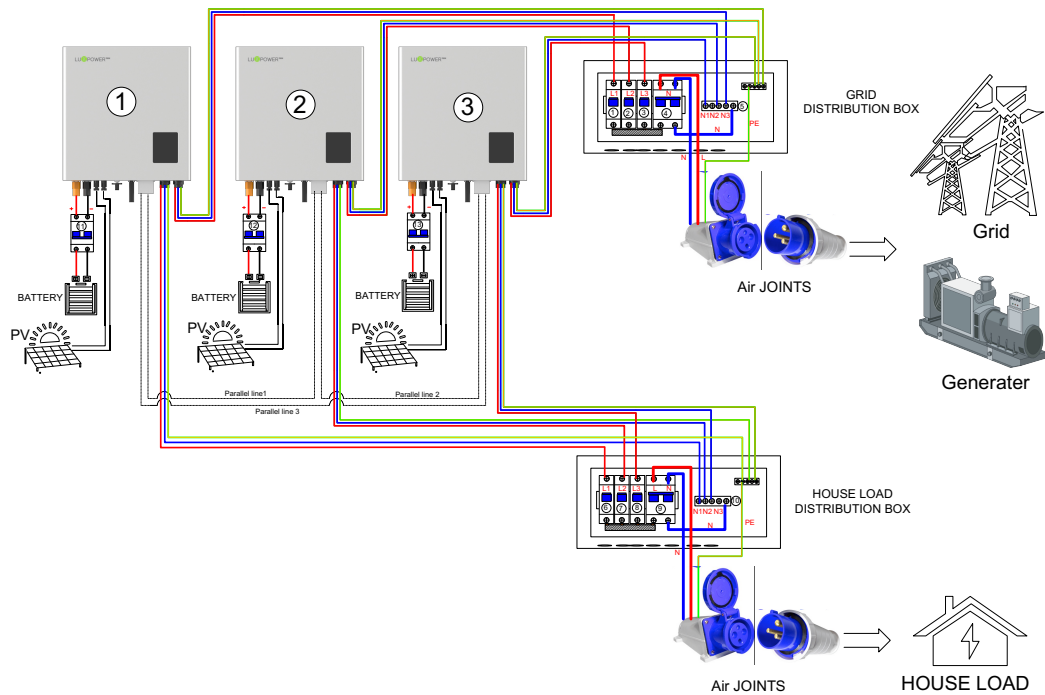
Wiring the parallel system as below suggestions for safety and cost reasons. Three single phase inverters in parallel diagram:

Note: For CT clamp, only need to install one CT clamp in a single phase paralleling system. You

can connect CT clamp RJ45 terminal to any inverters in the system.



The suggested wiring:



✓ **Cross Section of connection cable:**

Position	Cross Section (Length≤20m)	Note
AC Connector to Grid Distribution Box	$\geq 5.26 \text{ mm}^2$	Maximum Grid current is 25A
EPS Connector to EPS Load Distribution Box	$\geq 3.332 \text{ mm}^2$	Nominal EPS current is 16A
Grid Distribution Box to Air Joints	$\geq (5.26*3) \text{ mm}^2$	Maximum Grid current is 25A * 3 inverters output together
EPS Load Distribution Box to Air Joints	$\geq (3.332*3) \text{ mm}^2$	Nominal EPS current is 16A * 3 inverters output together
Battery lines	$\geq 20 \text{ mm}^2$	Maximum Battery current is 70A

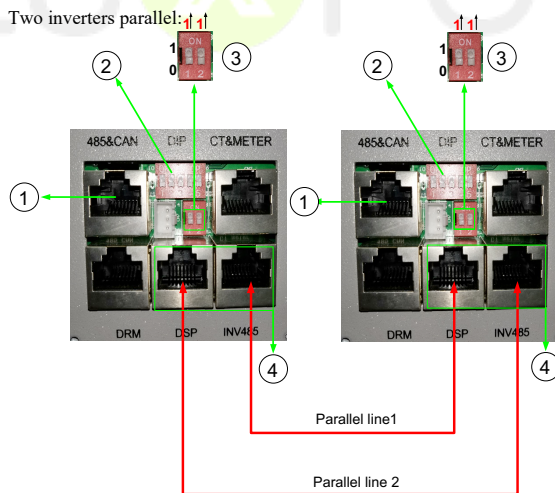
**1) Copper wire 1 mm^2 safe current carrying capacity is 5 amps (within 20 meters distance)

2) The PE line can be chosen between 6~10 mm^2

➤ **Step3. Set up the parallel CAN communication balance resistance.**

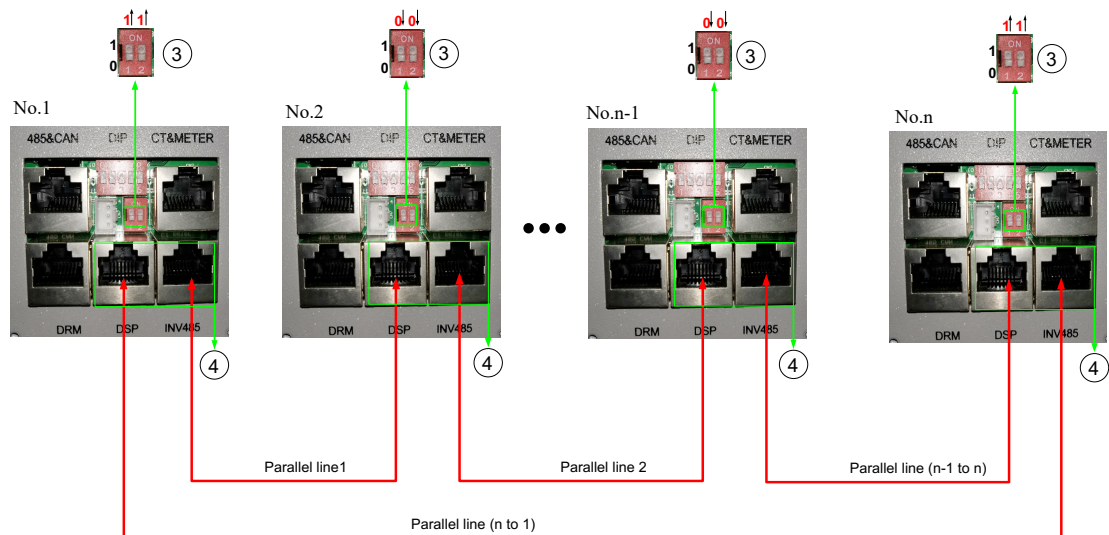
- Connect parallel communication cable. The port4 are used for parallel connection.
- Switch ③ are used for the parallel communication balance resistance.
- If there are only two inverters parallel in your system, all PINs of switch③ must be dialed

toward “on” position: $\uparrow \uparrow$.



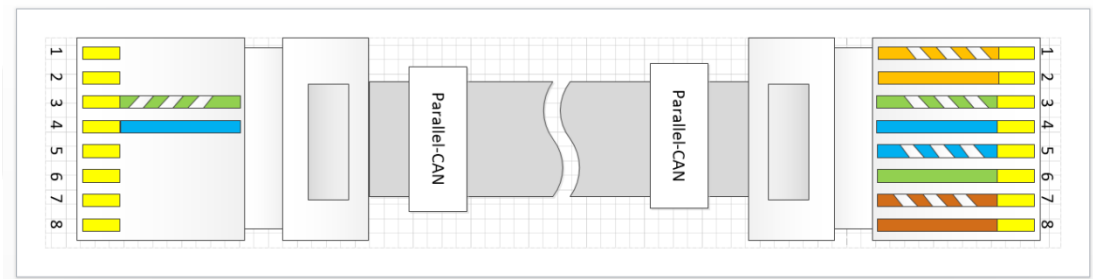
- If there are more than two inverters parallel in your system, only two of longest distance of

need to be dialed toward “on” position: $\uparrow \uparrow$, and others keep off: $\downarrow \downarrow$.



The maximum parallel quantity is 10, so $2 \leq n \leq 10$

- For other ports' definition, please refer to user manual.
- Please double check if the wirings are correct.
- If the cable is not long enough inside the carton, please make cable as the picture below:



➤ Step4. Set up the monitor system and do settings

- Power on the inverter and connect Wi-Fi dongle to internet.
- Please set one of them to '1 Phase Primary' via Web (<http://server.luxpowertek.com>) or App (Luxpowerview) and others as 'Subordinates'. when you run parallel model as stand-alone inverter, please set it to "1 Phase Primary".

Application Setting

Power Backup (?)
Enable
Disable

Micro-Grid
Enable
Disable

Feed-in Grid
Enable
Disable

Fast Zero Export
Enable
Disable

Set System Type (?)

1 Phase Primary
Subordinates
3 Phase Primary

Set

Set Composed Phase (?)

1 Phase Primary
Subordinates
3 Phase Primary

Set

Max. AC Input Power
Set

Seamless EPS switching
Enable
Disable

PV Grid Off (?)
Enable
Disable

Feed-in Grid Power(%)
100
Set

Normal / Standby
Normal
Standby

Battery Shared
Enable
Disable

Clear Detected Phases
Set

- Please enable “power backup” as below if required.

- Please combine the inverters as one group in the monitor system so that you can see the whole system running status easily. Please input the number from 1 to the number you have.

- If you want to explore more about settings, please refer to ‘LXP Hybrid Inverter Website Setting’.

➤ Step5. Running the system

- Turn on the primary Unit and sub Units to check if all EPS outputs are OK
- Turn on all breakers in the Grid Distribution Box and EPS Load Distribution Box

PART2: Three Phase System Wiring

➤ Step1. Install each single inverter as user manual

Lux power inverter support three phase system, which means 3 pcs or more inverters can be used to compose a three phase system. Please note that this model is different from the standard one, please make it clear to distributor to get parallel unit. This document is used to show you how to set up a three phase system.

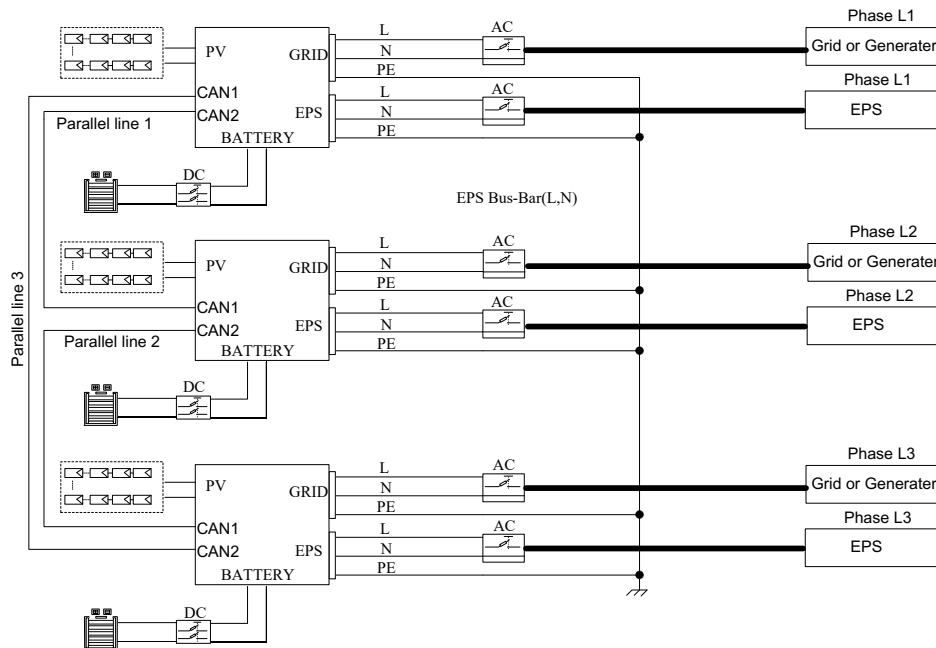
➤ Step2. Parallel connection

Wiring the parallel system as below suggestions for safety and cost reasons.

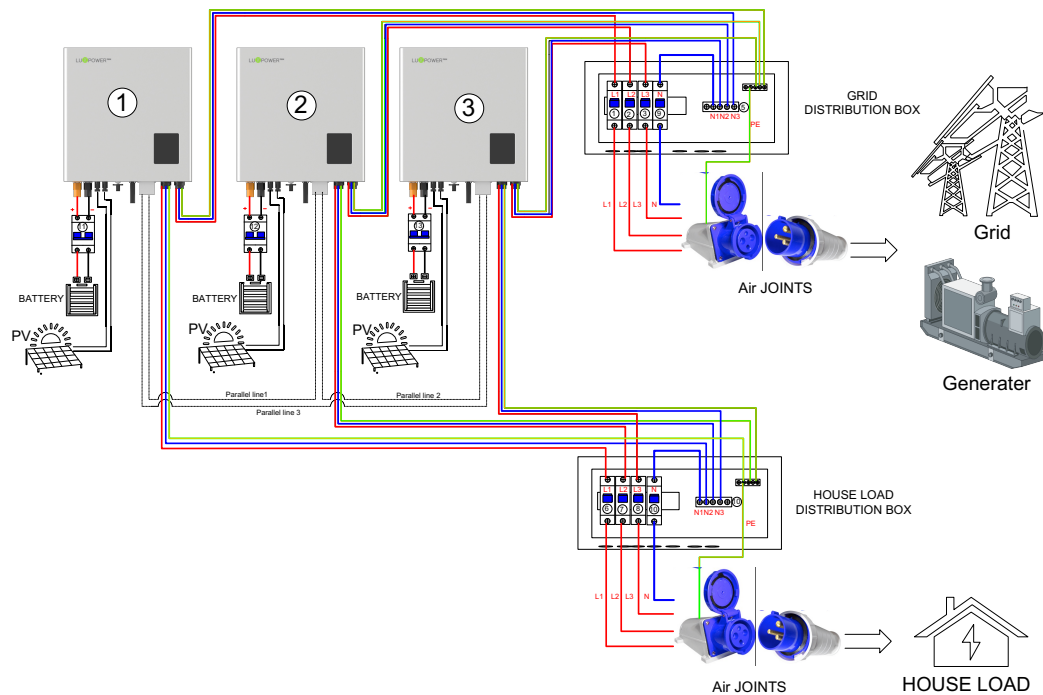
When paralleling the system as three phase system, make sure there is at least one inverter in each phase. **DO NOT connect** EPS terminals all together when used in 3 phase system, otherwise you will short the grid/utility.

For three phase system, we need to install 3 CT clamps in each phase to measure the power of each phase, and the RJ45 terminal of CT clamp need to be connected to the inverter which is in the same phase. For example, one CT is used to measure the current of R phase, so its RS45 terminal need to connect to the inverter which is in R phase.

Three phase system composed by three inverters diagram:



The suggested wiring:



✓ **Cross Section of L1,L2,L3&N lines:**

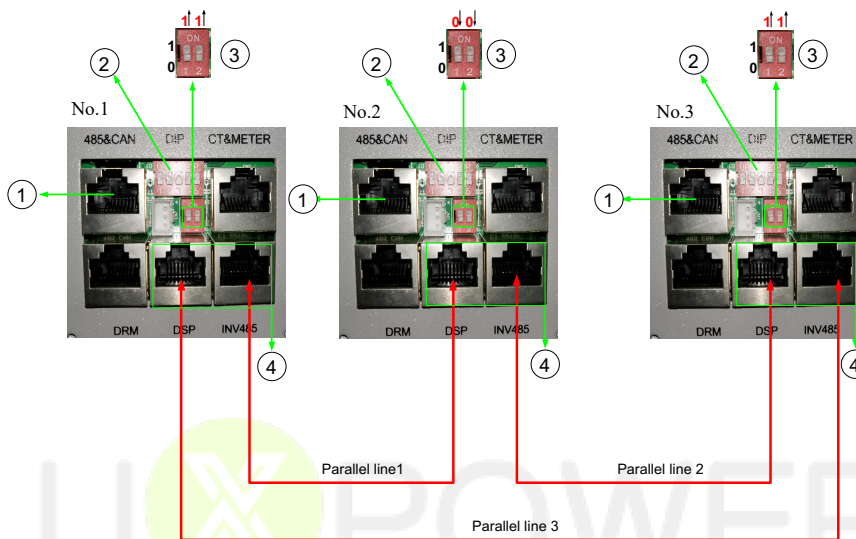
Position	Cross Section (Length ≤ 20m)	Note
AC Connector(L1,L2,L3&N) to Grid Distribution Box	$\geq 5.26 \text{ mm}^2$	Maximum Grid current is 25A
EPS Connector(L1,L2,L3&N) to EPS Load Distribution Box	$\geq 3.332 \text{ mm}^2$	Nominal EPS current is 16A
Grid Distribution Box (L1,L2,L3) to Air Joints	$\geq 5.26 \text{ mm}^2$	Maximum Grid current is 25A
Grid Distribution Box (N) to Air Joints	$\geq 20 \text{ mm}^2$	Maximum Grid current is 25A * 3 inverters output together
EPS Load Distribution Box(L1,L2,L3) to Air Joints	$\geq 3.332 \text{ mm}^2$	Nominal EPS current is 16A
EPS Load Distribution Box(N) to Air Joints	$\geq (3.332 * 3) \text{ mm}^2$	Nominal EPS current is 16A * 3 inverters output together
Battery lines	$\geq 20 \text{ mm}^2$	Maximum Battery current is 70A

**1) Copper wire 1 mm^2 safe current carrying capacity is 5 amps (within 20 meters distance) for AC and EPS lines.

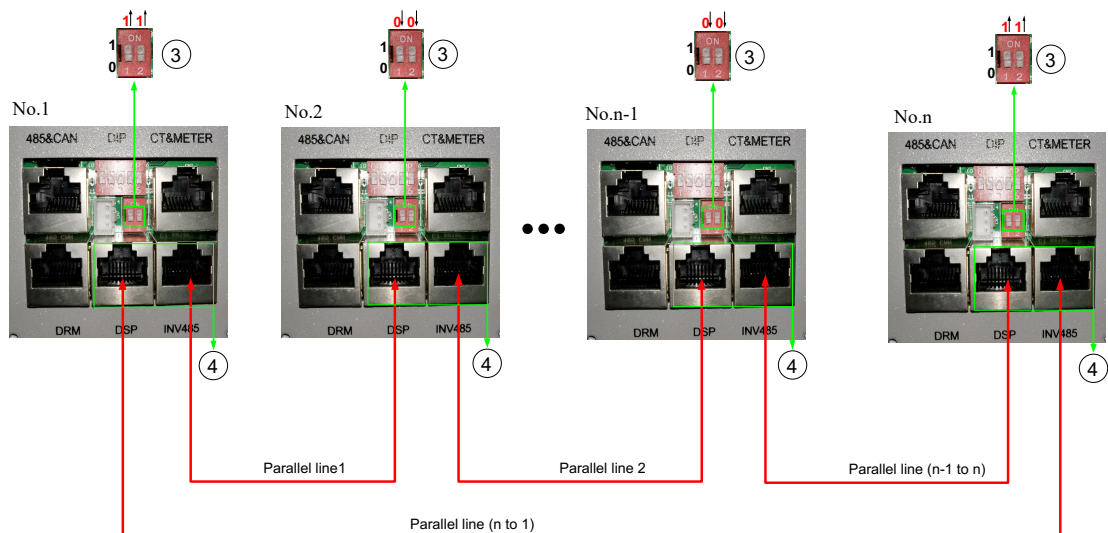
2) The PE line can be chosen between 6~10 mm^2

➤ Step3. Set up the parallel CAN communication balance resistance.

- Connect parallel communication cable. The port4 are used for parallel connection.
- Switch ③ are used for the parallel communication balance resistance,
- If there are only three inverters parallel in this three-phase system, Switch ③ of No.1 and No.3 need to be dialed toward “on” position: $1 \uparrow 1 \uparrow$, and No.2 keeps off: $0 \downarrow 0 \downarrow$



- If there are more than three inverters parallel in this three-phase system, only two of the longest distance need to be dialed toward “on” position: $1 \uparrow 1 \uparrow$, and others keep off: $0 \downarrow 0 \downarrow$



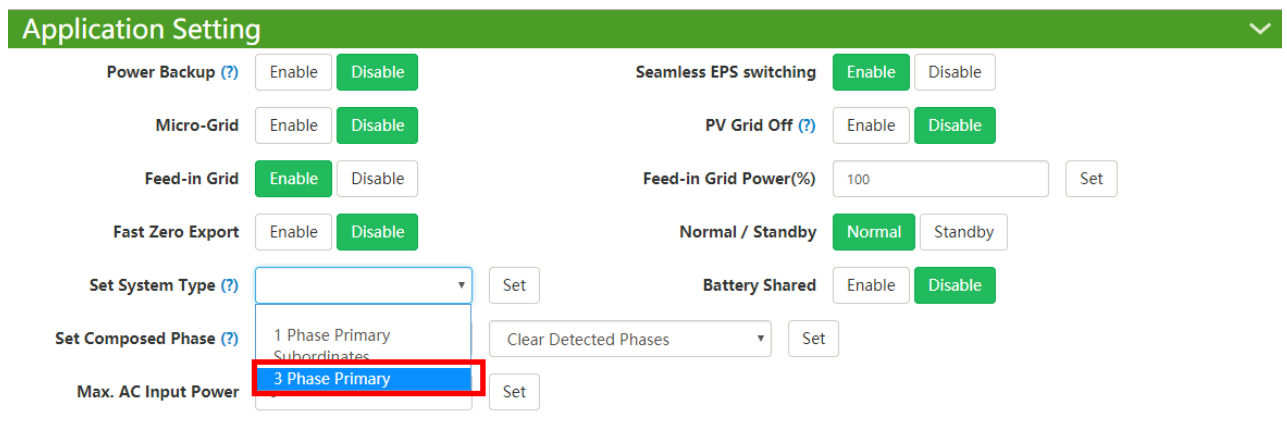
The maximum parallel quantity is 10, so $3 \leq n \leq 10$

- For other ports' definition, please refer to user manual.

- Please double check if the wirings are correct.

➤ Step4. Set up the monitor system and do settings

- Power on the inverter and connect Wi-Fi dongle to internet.
- The inverters are set as 'sub' by default. Please set one of them to 'Phase 3 primary' via Web (<http://server.luxpowertek.com>) or App (Luxpowerview).

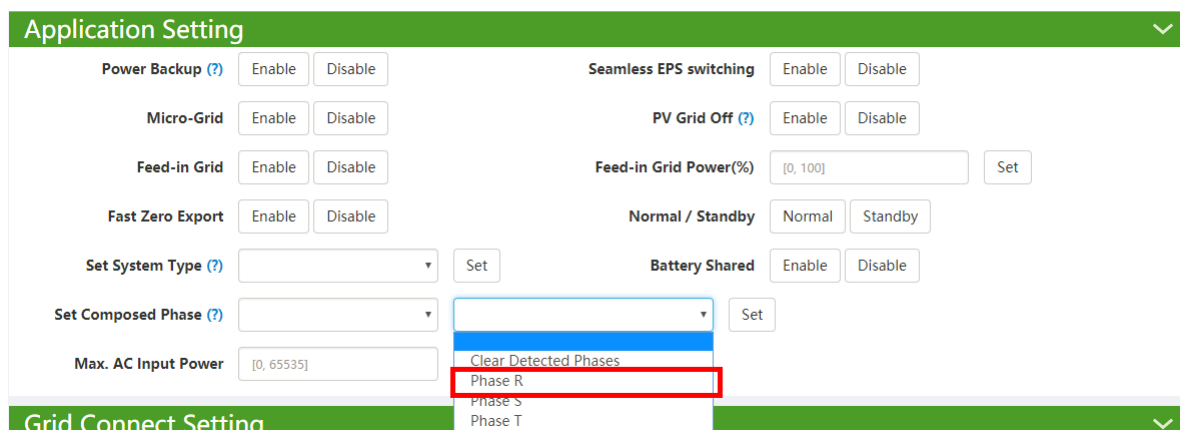


Application Setting

Power Backup (?)	Enable	Disable	Seamless EPS switching	Enable	Disable
Micro-Grid	Enable	Disable	PV Grid Off (?)	Enable	Disable
Feed-in Grid	Enable	Disable	Feed-in Grid Power(%)	100	Set
Fast Zero Export	Enable	Disable	Normal / Standby	Normal	Standby
Set System Type (?)	▼		Battery Shared	Enable	Disable
Set Composed Phase (?)	1 Phase Primary Subordinates 3 Phase Primary		Clear Detected Phases	▼	Set
Max. AC Input Power	▼				Set

■ Two ways for composed phase setting:

- Composed phase will be automatically set according to the grid once connected with grid successfully, and it will store it in the system memory.
- If there is no grid input ever, composed phase need to be set manually as below. For primary inverter, the composed phase should be "Phase R".



Application Setting

Power Backup (?)	Enable	Disable	Seamless EPS switching	Enable	Disable
Micro-Grid	Enable	Disable	PV Grid Off (?)	Enable	Disable
Feed-in Grid	Enable	Disable	Feed-in Grid Power(%)	[0, 100]	Set
Fast Zero Export	Enable	Disable	Normal / Standby	Normal	Standby
Set System Type (?)	▼		Battery Shared	Enable	Disable
Set Composed Phase (?)	▼ Clear Detected Phases Phase R Phase S Phase T		Set		
Max. AC Input Power	[0, 65535]				

Grid Connect Setting

- If there is a phase inconsistency problem, please check if there is any phase without inverter connected.
- If the wiring is correct, please clear the phase detection as below.

Power Backup Enable (?)

Fast Zero Export Enable

PV Grid Off Enable (?)

Seamless EPS switching

Feed-in Grid

Feed-in Grid Power Percent(%)

Set Master or Slave (?)

Set Composed Phase (?)

Micro-Grid Enable

Neutral Detect Enable

Anti Island Enable

ISO Enable

Clear Detected Phases
Phase R
Phase S
Phase T

- Please enable “power backup” as below if required.

Application Setting

Power Backup (?)

Seamless EPS switching

Micro-Grid

PV Grid Off (?)

Feed-in Grid

Feed-in Grid Power(%)

Fast Zero Export

Normal / Standby

Set System Type (?)

Battery Shared

Set Composed Phase (?)

Max. AC Input Power

Clear Detected Phases

- Please combine the inverters as one group in the monitor system so that you can see the whole system running status easily. Please input the number from 1 to the number you have.

LUPOWERTEK Monitor Data Configuration Overview Maintain ParaTest User Center Logout

Station Overview ParaTest2 3 All Status Order by parallel

Device Overview

Serial number Status

1 0010014001 Offline

2 0022014007 Offline

3 0022014012 Offline

4 0102004050 Offline

5 0252016029 Offline

6 0252016030 Offline

7 0252016033 Offline

8 0252016034 Offline

9 0252016035 Offline

10 0252016037 Offline

11 0252016038 Offline

12 0252016039 Offline

13 0460022009 Normal 6 kW 5 kW 0 W 5 W 3.8 kWh 0 kWh 0.5 kWh -0.5 kWh ParaTest2 Parallel

14 1214324353 Offline 0 W 0 W 0 W 0 W 0 kWh 188 kWh 0.2 kWh 162.4 kWh ParaTest2 Parallel

15 2323232323 Offline 0 W 0 W 0 W 0 W 0.9 kWh 62.9 kWh 23.6 kWh 241.8 kWh ParaTest2 Parallel

16 6767676767 Offline 0 W 0 W 0 W 0 W 15.5 kWh 89.4 kWh 48.9 kWh 255.8 kWh ParaTest2 Parallel

Parallel

Serial number 0010014001

* Parallel Group A

* Parallel Index Parallel Index: [1-100] 5

Save Clear Cancel

If you want to explore more about settings, please refer to 《LXP Hybrid Inverter Website Setting》

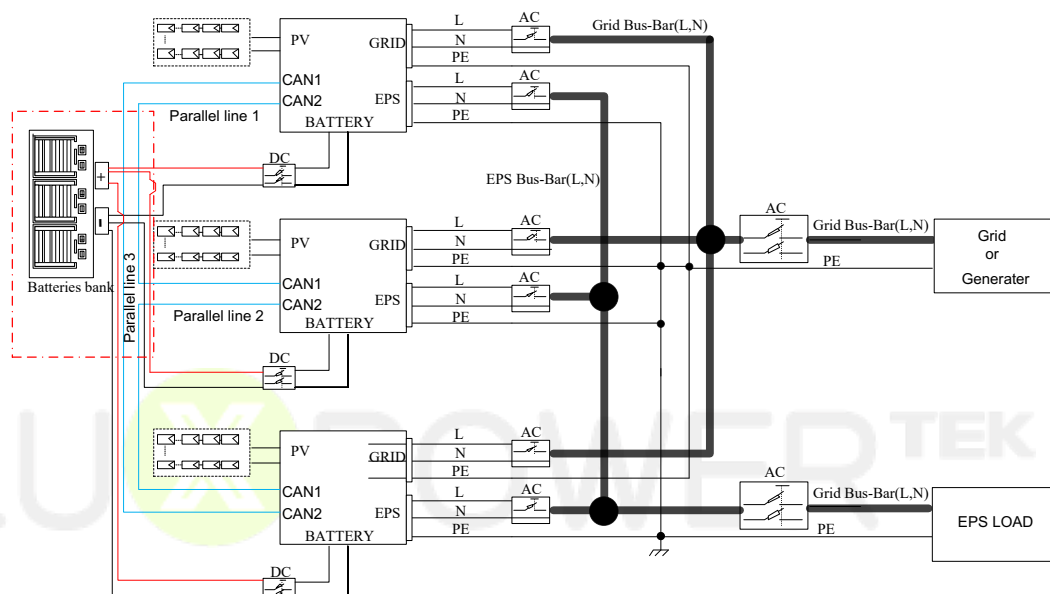
➤ Step5. Running the system

- Turn ON the primary Unit and sub Units and Check the all EPS output is OK
- Turn on all breakers in the Grid Distribution Box and EPS Load Distribution Box

PART3: Battery Connection in Parallel System

For parallel system battery connection, we support 2 ways to connect, you can either connect all inverters to one battery bank or connect each inverter to separate battery group. For above system in this document, it is connected as each inverter connect to separate battery.

- If you want all inverters share the battery, please connect the system as below. For the communication with BMS, please connect communication cable between the primary unit and the battery. Parallel diagram as below:



- If you connect one battery bank shared by multiple inverters as the diagram above, please enable “Battery shared” .

Application Setting

Power Backup (?)	Enable	Disable	Seamless EPS switching	Enable	Disable
Micro-Grid	Enable	Disable	PV Grid Off (?)	Enable	Disable
Feed-in Grid	Enable	Disable	Feed-in Grid Power(%)	100	Set
Fast Zero Export	Enable	Disable	Normal / Standby	Normal	Standby
Set System Type (?)		Set	Battery Shared	Enable	Disable
Set Composed Phase (?)		Clear Detected Phases			Set
Max. AC Input Power	0	Set			

PART4: Troubleshooting

LCD Display	Description	Troubleshooting
Error Code:008 Error: 100	CAN communication Fault in Parallel System	1. Please check if the parallel communication cables are firmly connected. 2. Please check if the 2-PIN DIP switches are well configured. 3. Please check the white label on the cables , marking with“Parallel-CAN” is the correct cable for parallel connection. 4. Please make sure the PINs are correct if you extend or redo the cable.
Error Code:009 Error: 200	Primary Inverter Lost in Parallel System	1. Please check if you have set one of units as 1-phase or 3-phase primary inverter, one primary inverter and others should be sub inverters. 2. Please check if the cable to the primary is well connected.
Error Code:008,009 Error: 300	Compound error codes	Please follow the guidance above
Error Code:010 Error: 400	Muti Primary unit in Parallel System	There are more than one primary inverter in this parallel system,please find out the unexpected inverters and reset them to be subordinates.
Error Code:011 Error: 800	AC input Inconsistent in Parallel System	Please check if the AC input voltage between the inverters are not synchronous . For example , some of them are 230Vac and some of them are 0Vac.
Error Code:012 Error: 1000	UPS output short circuit	Please check if the UPS output are shorted with multi-meter , you can turn off the inverter and check the resistance of the UPS output , L-N, and L-PE.
Error Code:013 Error: 2000	UPS output current reversed	Please check if the L,N cables are correctly installed , if you reverse the LN connection of one of them, there will have reversed current among the inverters. Thus please make sure the LN connections are correct.
Error Code:015 Error: 8000	Phase Error in 3 Phase System	1. Please check if you have configured 1-phase primary inverter for 3-phase parallel connection. 2. Please check if LN connection in one phase is reversed. 3. Please check the detected phase via APP or Webpage if the physical connections are correct . Select “clear detected phase” and click set if the detected phase is wrong. 4. Please reset the primary inverter if the error is still there after step3 .