Parallel Model Installation Guidance V1.01

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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.

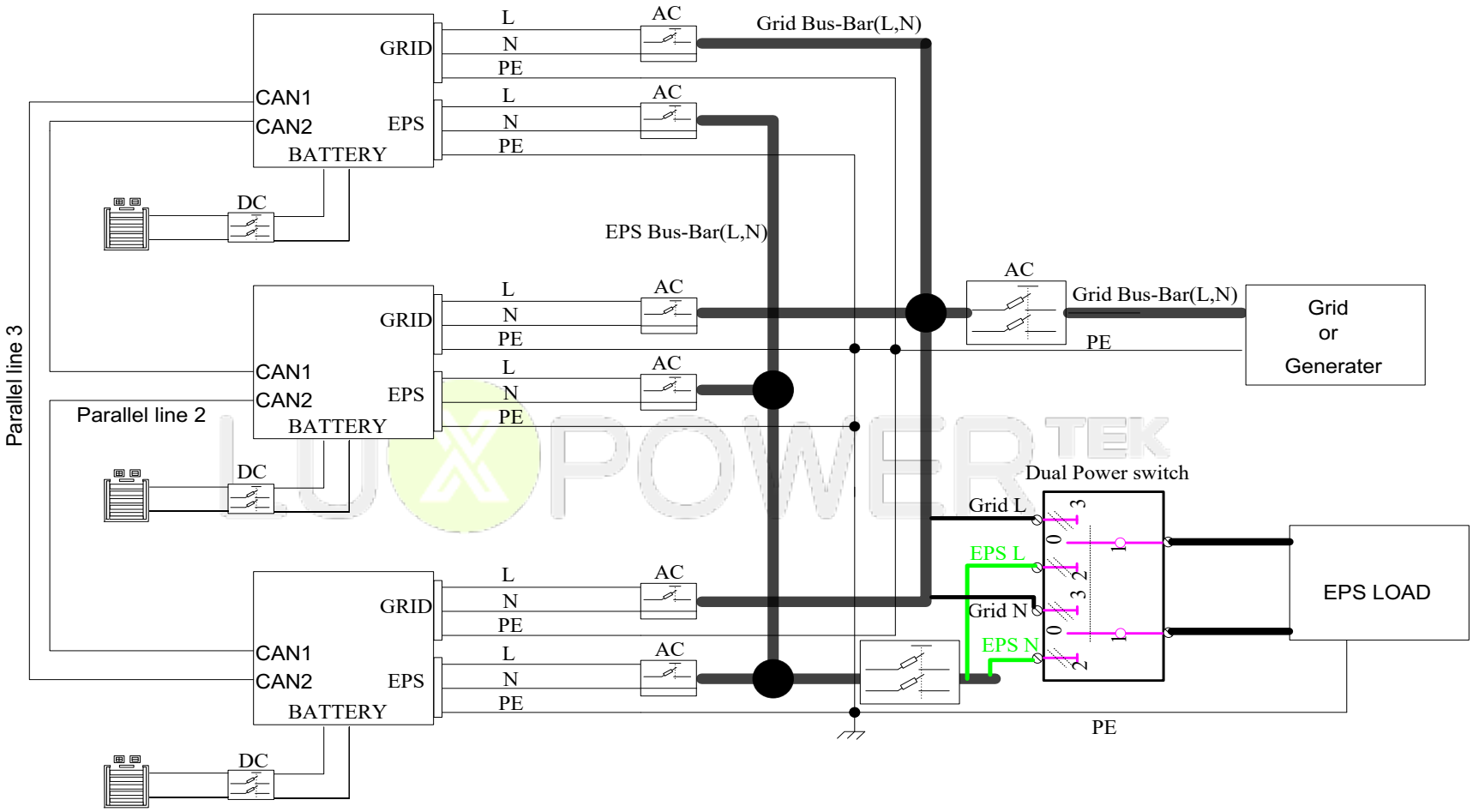
➢ Step1. Single unit installation

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

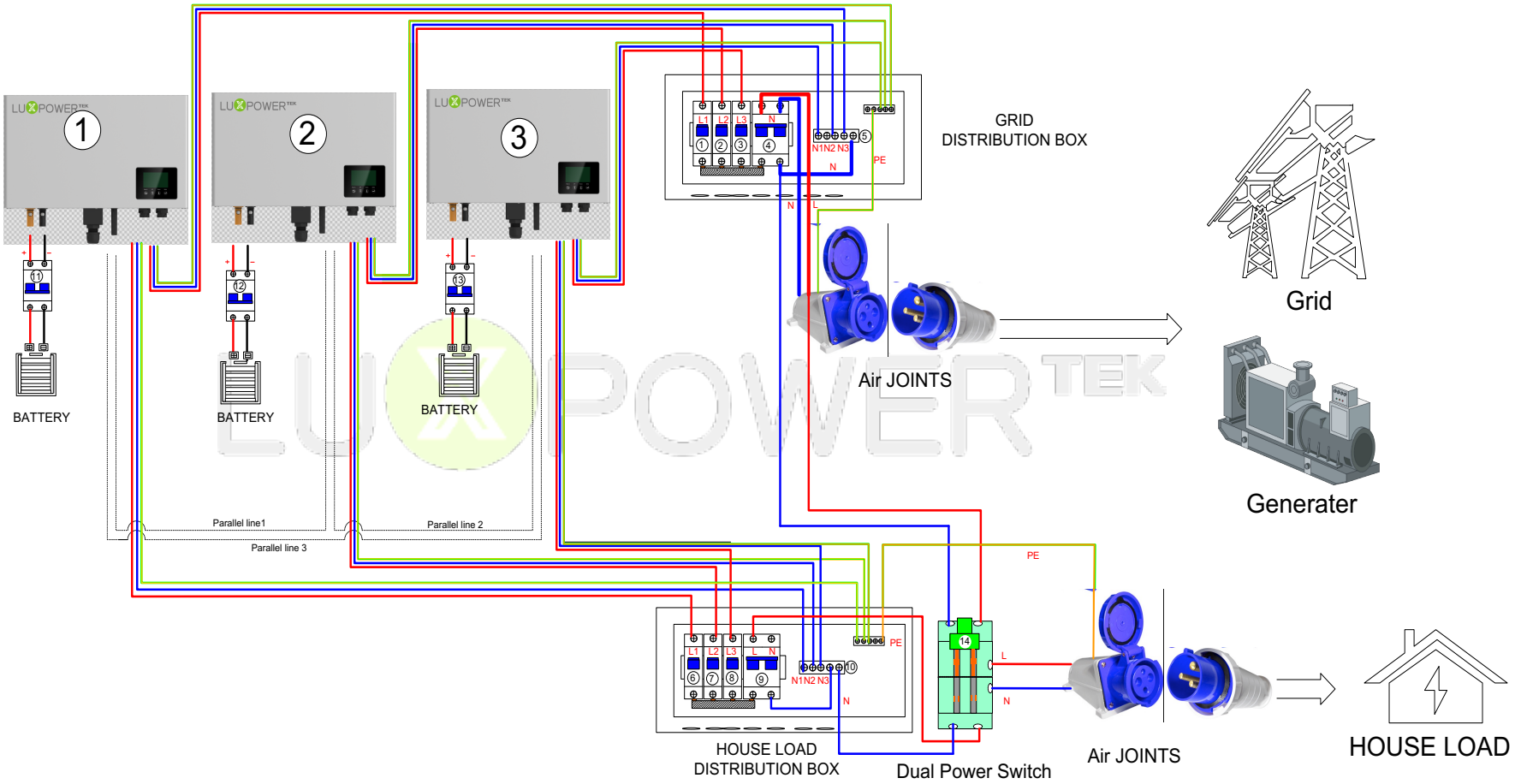
➢ Step2. Parallel system wiring

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.

The single phase inverters in parallel diagram:


Parallel line 3
Parallel line 2
GRID
EPS
BATTERY
CAN1
CAN2
L
N
PE
AC
DC
Grid Bus-Bar(L,N)
EPS Bus-Bar(L,N)
Grid
or
Generater
Dual Power switch
Grid L
EPS L
Grid N
EPS N
EPS LOAD

The suggested wiring:



✓ **Cross Section of connection cable:**

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

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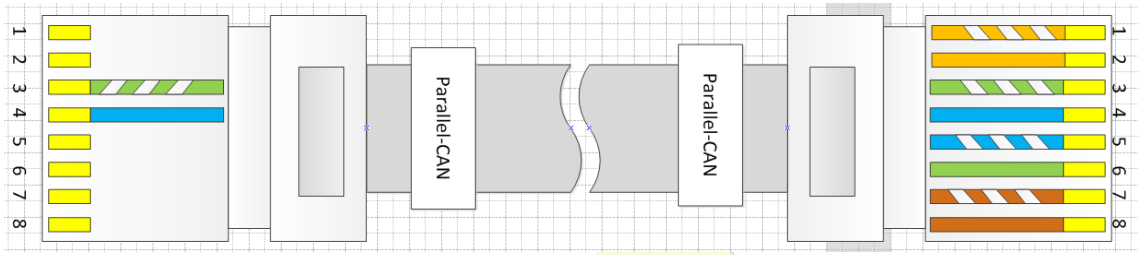
**1) Copper wire 1 mm^2 safe current carrying capacity is 5 amps (within 20 meters distance)

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

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

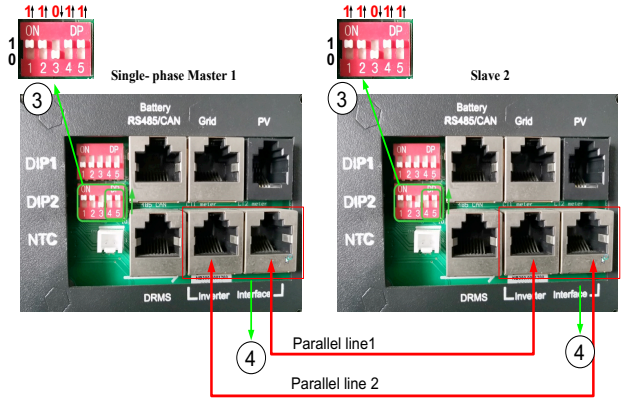
- Connect parallel communication cable. The port4 are used for parallel connection.
  PIN3-4 of the RJ45 plug are for parallel communication, so PIN3-PIN3, PIN4-PIN4 connect straightly.



- Switch ③ ,Pin4 and Pin 5 are used for parallel communication balance resistance. (Pin1-Pin3 are used for battery communication,please keep it as default)

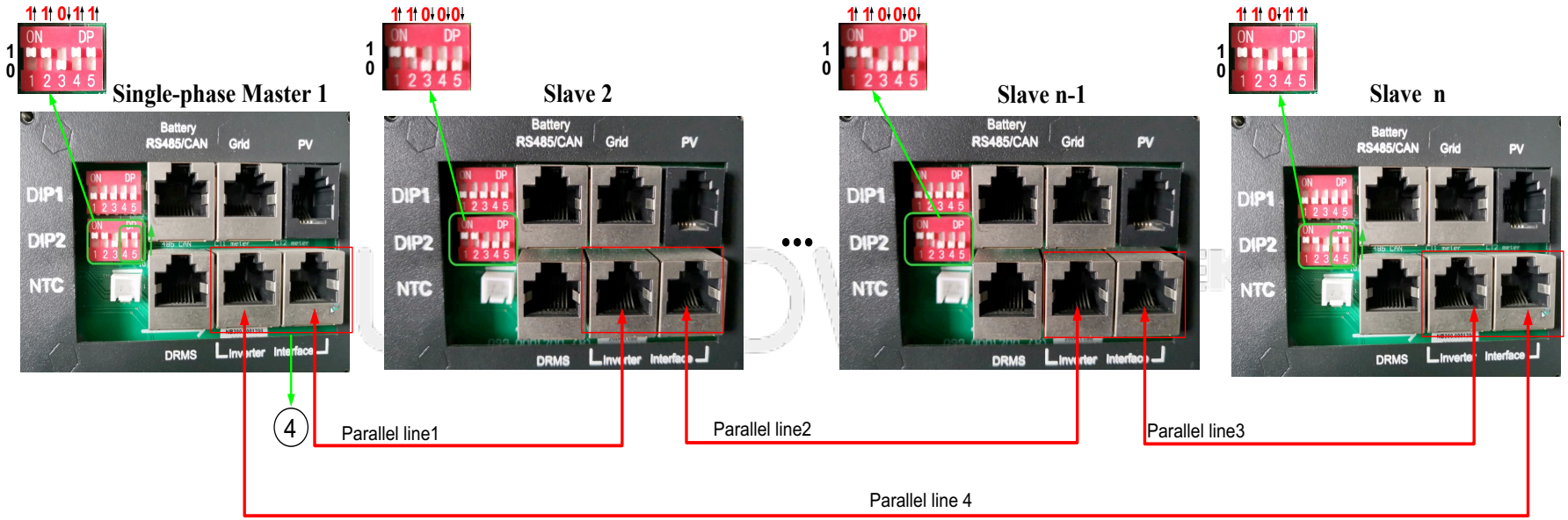
- If there are only two inverters parallel in your system, PIN 4&5 of switch③ must be dialed toward “on” position: .

Two inverters parallel:



- If there are more than two inverters parallel in your system, only two of longest distance of them need to be dialed toward “on ” position: 1↑ 1↑, and others keep off: 0↓ 0↓

Multiple inverters parallel:

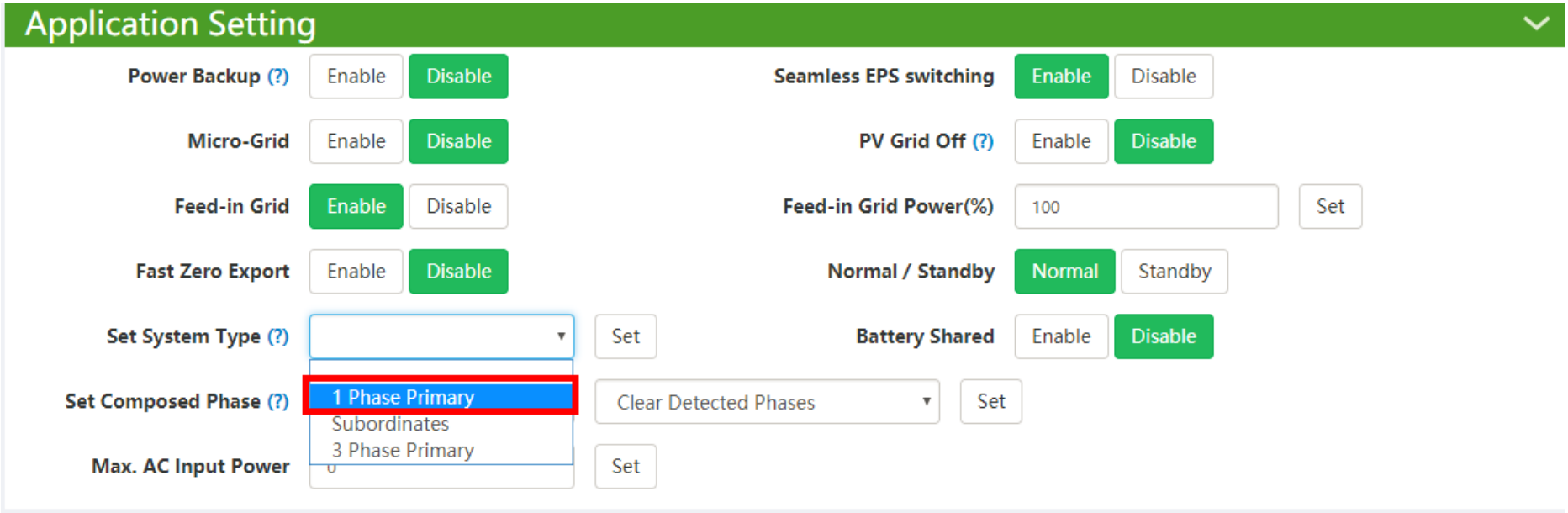


The maximum parallel quantity is 10, so 2≤ n ≤ 10

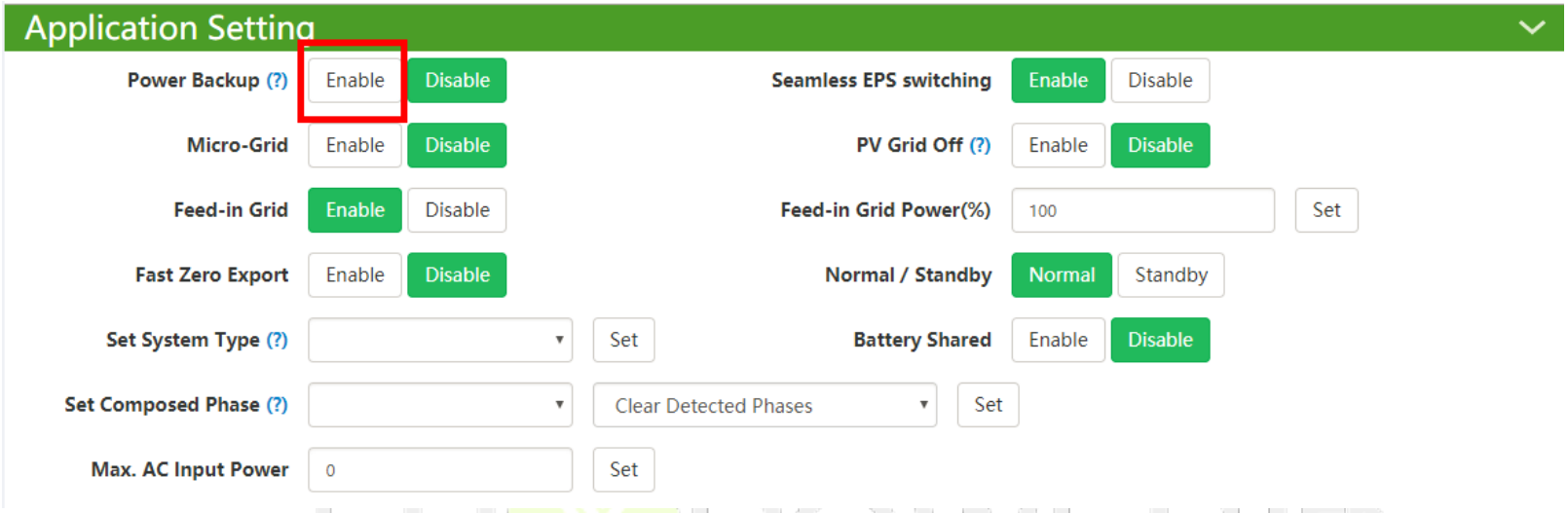
- For other ports’ definition, please refer to user manual.
- Please double check if the wirings are correct.

➢ Step4. Set up the monitor system and do settings

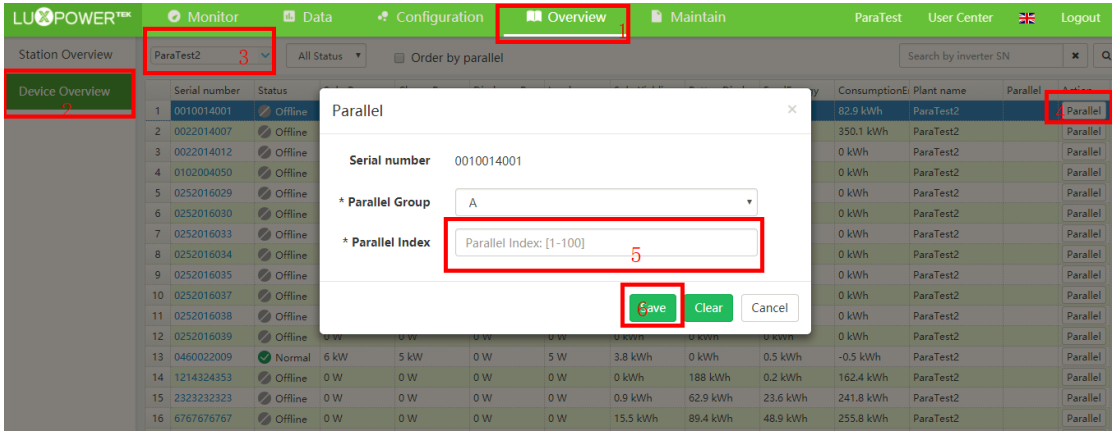
- Power on the inverter and connect Wi-Fi to dongle to internet.
- Please set one of them to ‘1 Phase Primary’ via Web (http://server.luxpowertek.com) or App (Luxpowerview) and others as ‘Subordinates’. when you run parallel model as stand-alone inverter, please set it to "1 Phase Primary ".



- 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.



➢ Step5. Running the system

- Turn on the all units to check if all EPS outputs are OK.
- Turn on all breakers in the Grid Distribution Box and EPS Load Distribution Box.

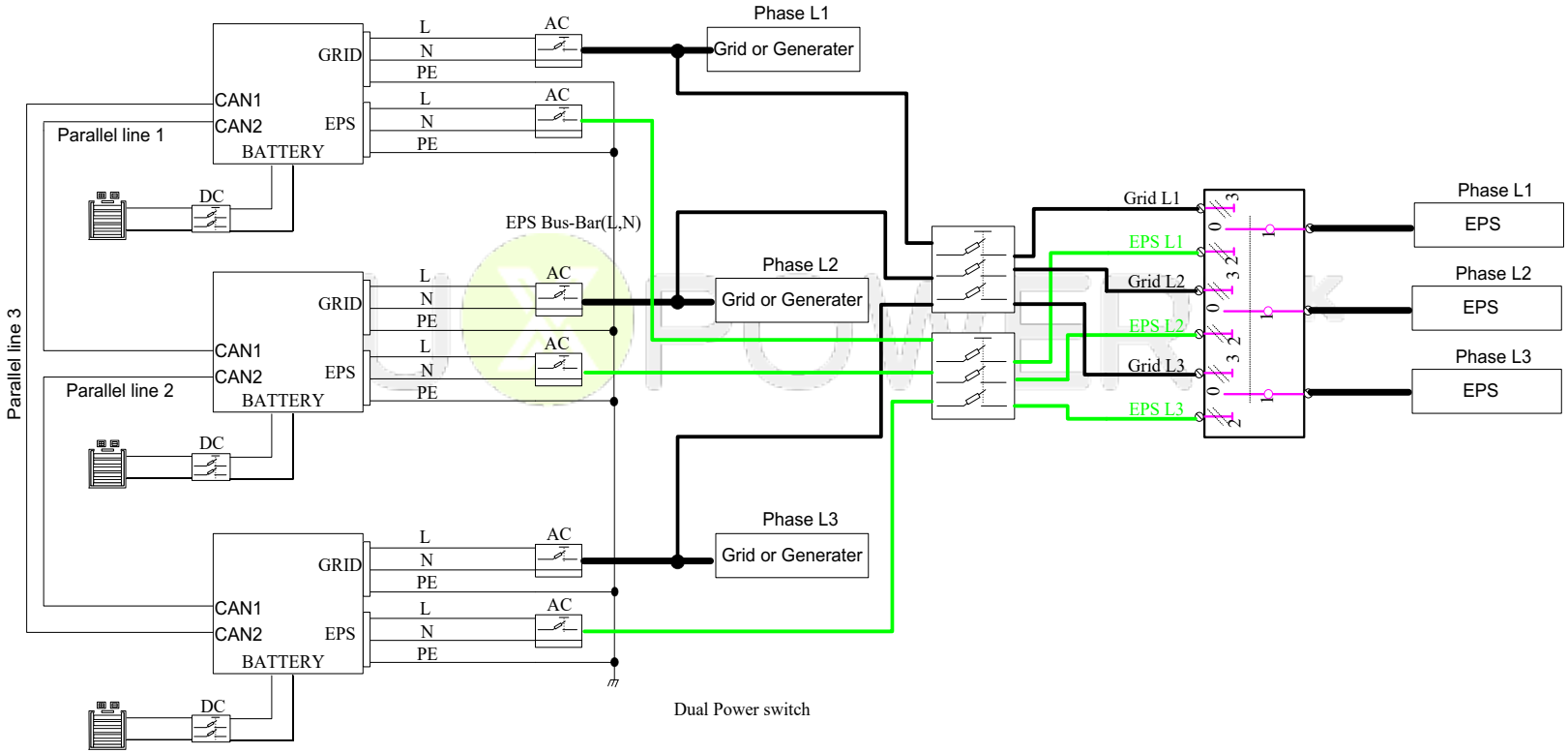
PART2: Three Phase System Wiring

➢ Step1. Install each single inverter as user manual

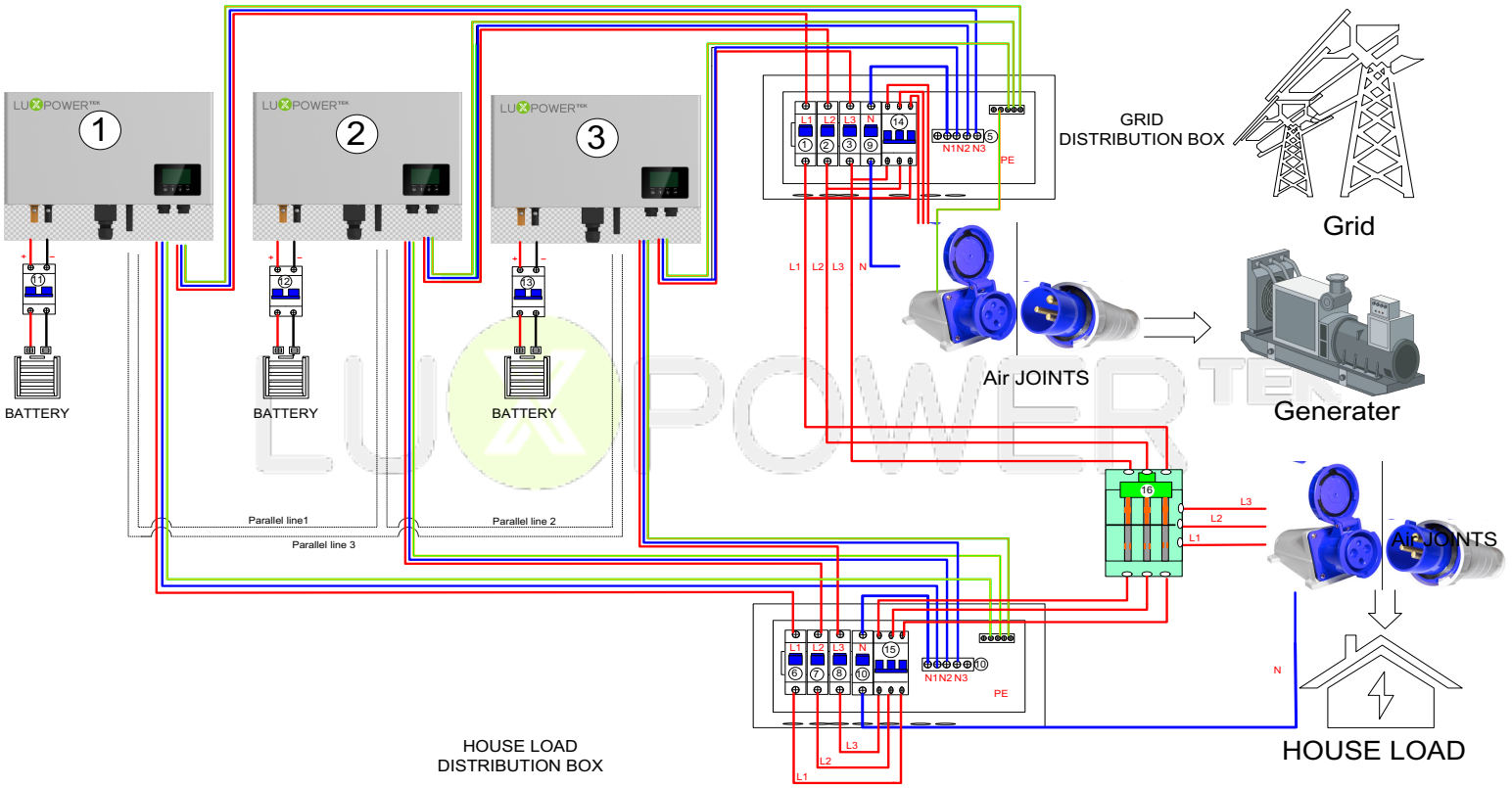
Lux power inverter support three phase system, which means 3pcs or more inverters can be used to compose a three phase system. Please note that this model is different from the standard one, please make it clear to distributor to get parallel unit. This document is used to show you how to set up a three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

➢ Step2. Parallel connection

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. Three phase system composed by three inverters diagram:



The suggested wiring:

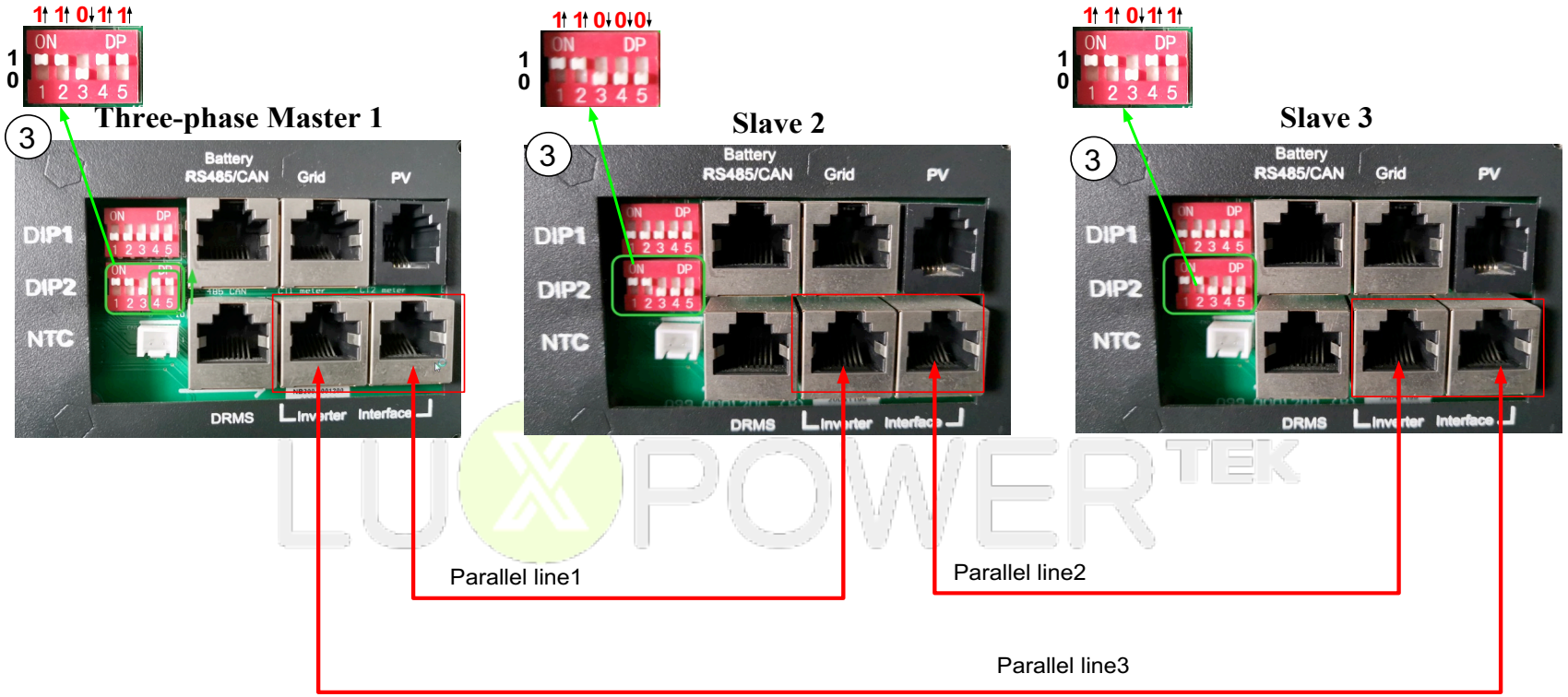


✓ **Cross Section of L1,L2,L3&N lines:**

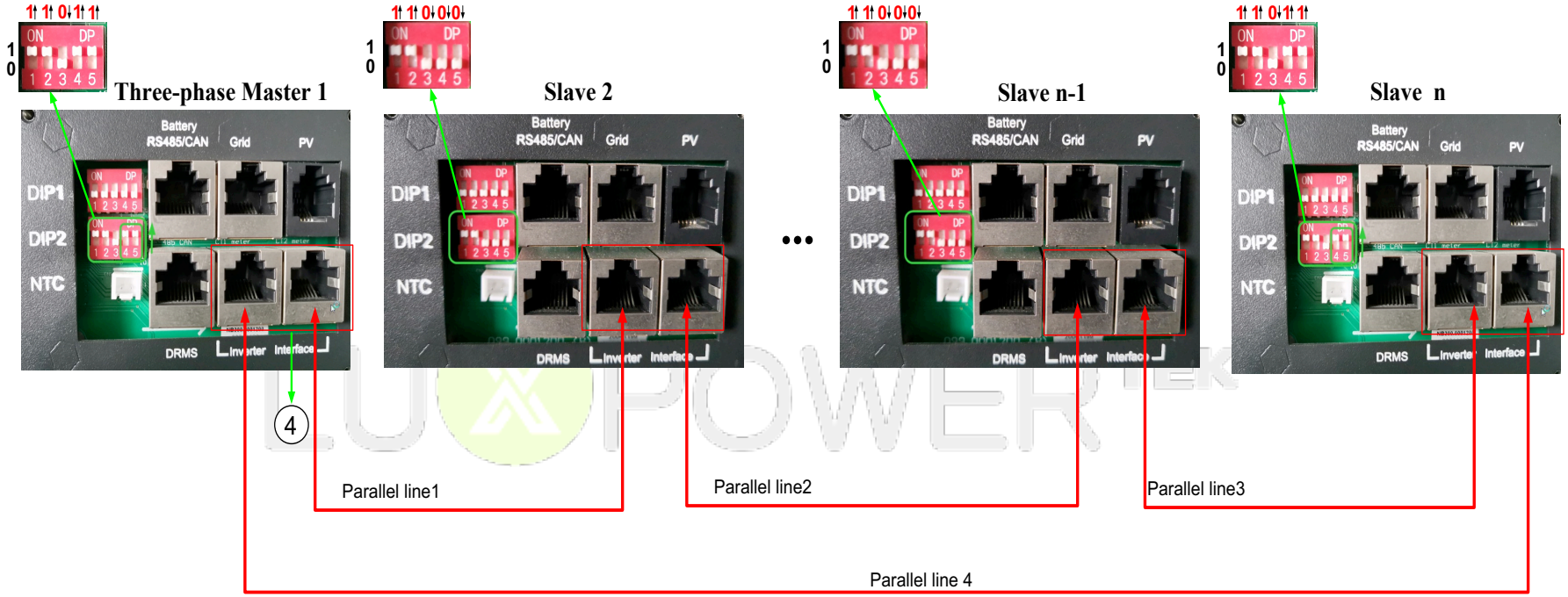
Position	Cross Section（Length≤20m）	Note
AC Connector(L1,L2,L3&N) to Grid Distribution Box	$\geq 6.66\,mm^2$	Maximum Grid current is32A
EPS Connector(L1,L2,L3&N) to EPS Load Distribution Box	$\geq 3.332\,mm^2$	Nominal EPS current is 16A
Grid Distribution Box (L1,L2,L3) to Air Joints	$\geq 6.66\,mm^2$	Maximum Grid current is 32A
Grid Distribution Box (N) to Air Joints	$\geq 20\,mm^2$	Maximum Grid current is 32A * 3 inverters output together
EPS Load Distribution Box(L1,L2,L3) to Air Joints	$\geq 6.66\,mm^2$	Nominal EPS current is 16A
EPS Load Distribution Box(N) to Air Joints	$\geq 20\,mm^2$	Nominal EPS current is 16A * 3 inverters output together
Battery lines	$\geq 20\,mm^2$	Maximum Battery current is 70A

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

- Connect parallel communication cable. The port4 are used for parallel connection.
- Switch ③ Pin4&Pin5 are used for the parallel communication balance resistance. (Pin1-Pin3 are used for other functions, just keep it as before)
- There are only three inverters parallel in this three-phase system, Switch③ No.4,5 need to be dialed toward “on” position:


1↑ 1↑ 0↓ 1↑ 1↑
ON DP
1 2 3 4 5
1
0
Three-phase Master 1
3
Battery
RS485/CAN
Grid
PV
DIP1
DIP2
NTC
DRMS
Inverter
Interface
1↑ 1↑ 0↓ 0↓ 0↓
Slave 2
Slave 3
Parallel line1
Parallel line2
Parallel line3

Multiple inverters parallel:

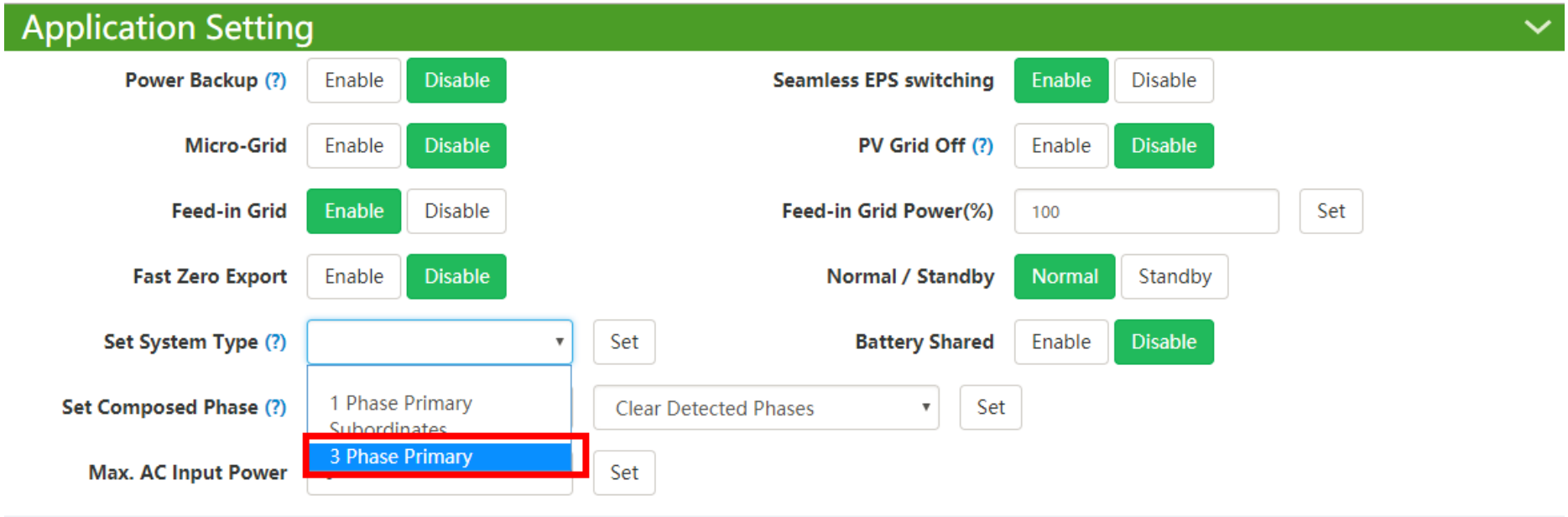


The maximum parallel quantity is 10, so 2≤ n ≤ 10

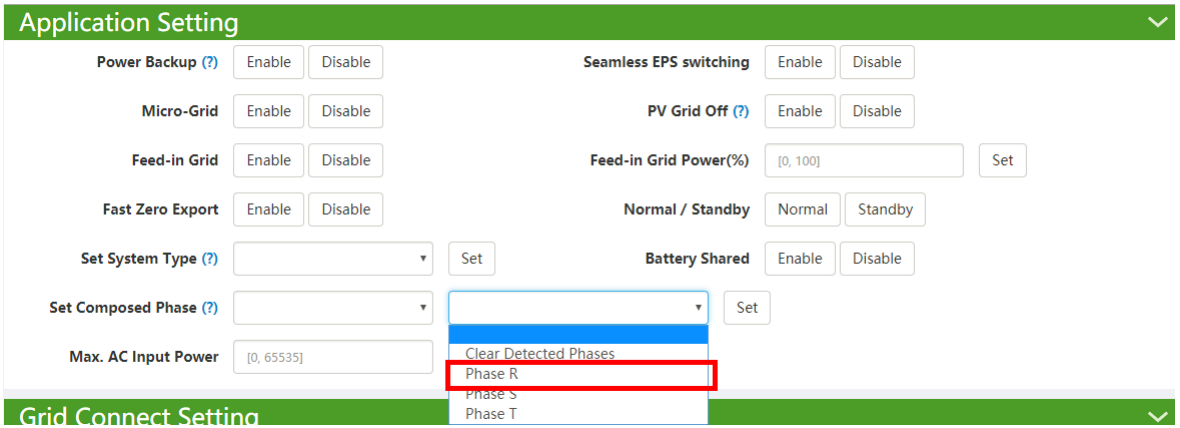
- For other ports' definition, please refer to user manual.
- Please double check if the wirings are correct.

➢ Step4. Set up the monitor system and do settings

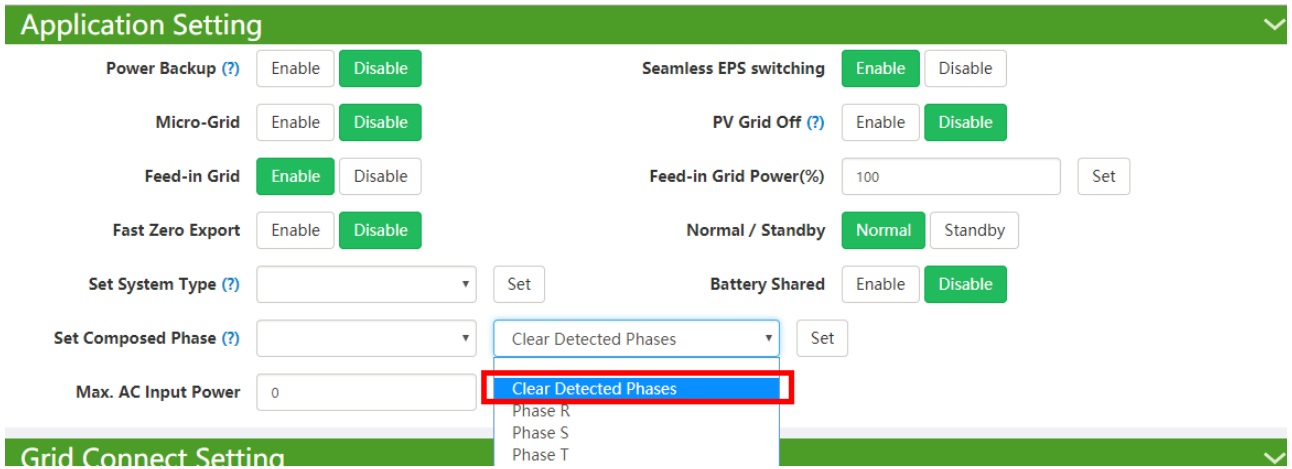
- Power on the inverter and connect Wi-Fi dongle to internet.
- Please set one inverter to '3 Phase Primary' and others as 'Subordinates' via Web (http://server.luxpowertek.com) or App (Luxpowerview).



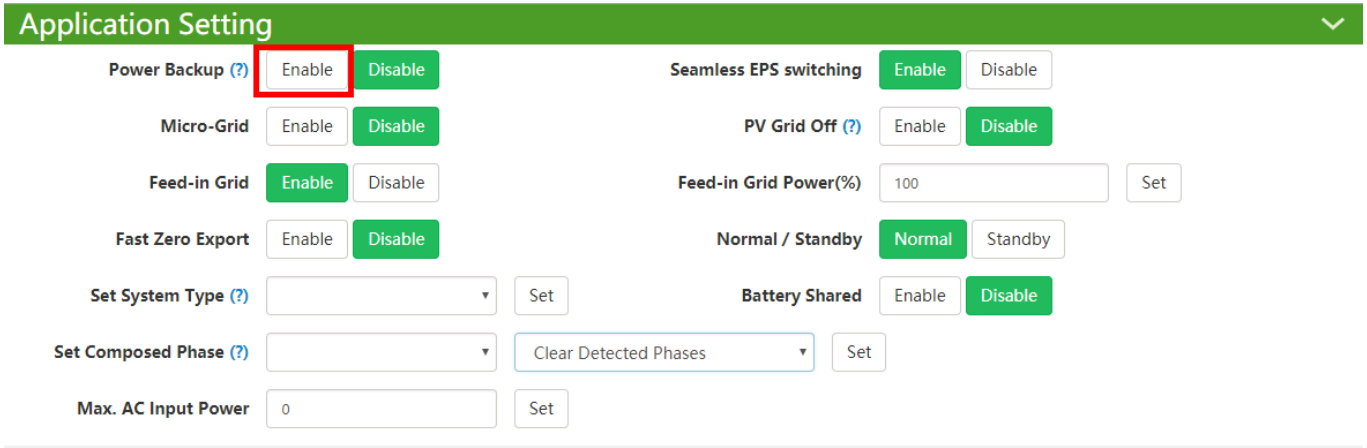
- **Two ways for composed phase setting:**
  - Composed phase will be automatically set according to the grid once connected with grid successfully, and it will store it in the system memory.
  - If there is no grid input ever, composed phase need to be set manually as below. For primary inverter, the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



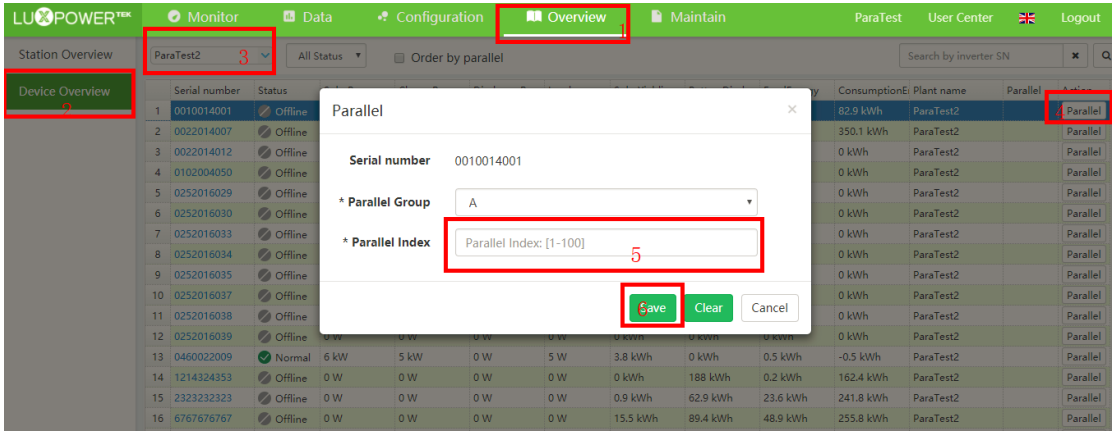
- If there is a phase inconsistency problem, please check if there is any phase without inverter connected.
- If the wiring is correct, please clear the phase detection as below.



- 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.



➢ **Step5. Running the system**

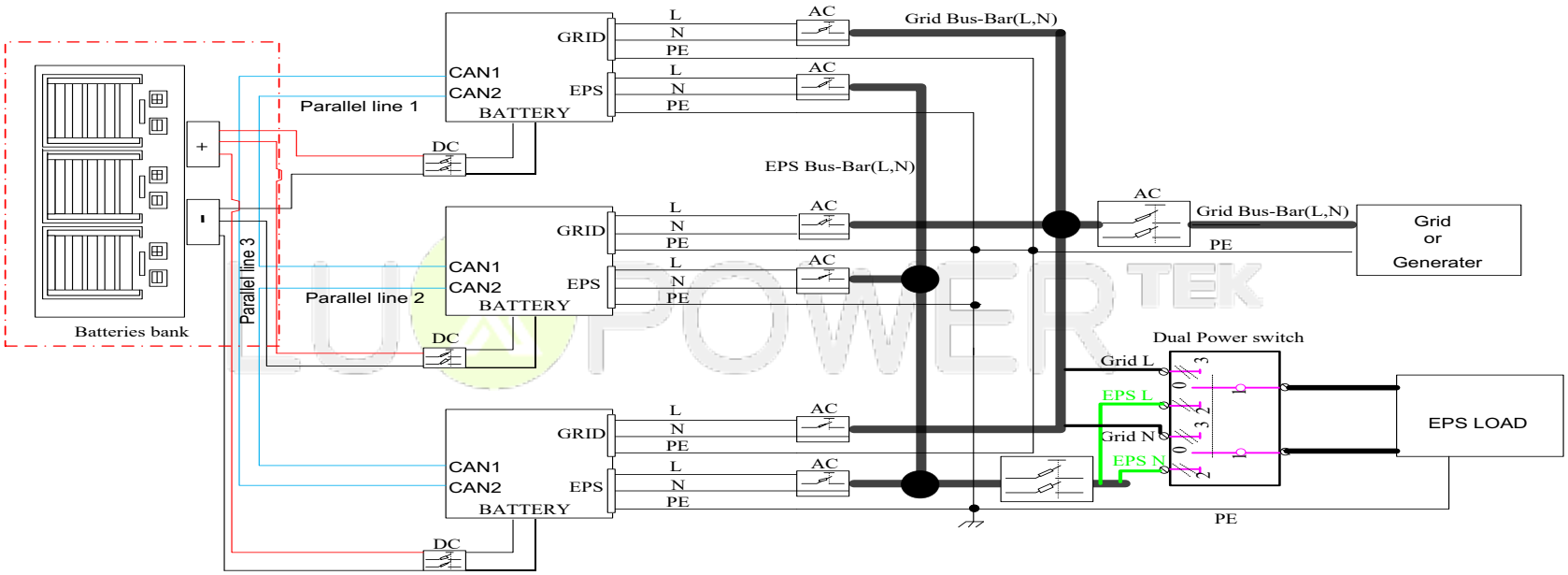
- Turn ON the primary Unit and sub Units and Check the all EPS output is OK.
- Turn on all breakers in the Grid Distribution Box and EPS Load Distribution Box.

PART3: Battery Connection in Parallel System

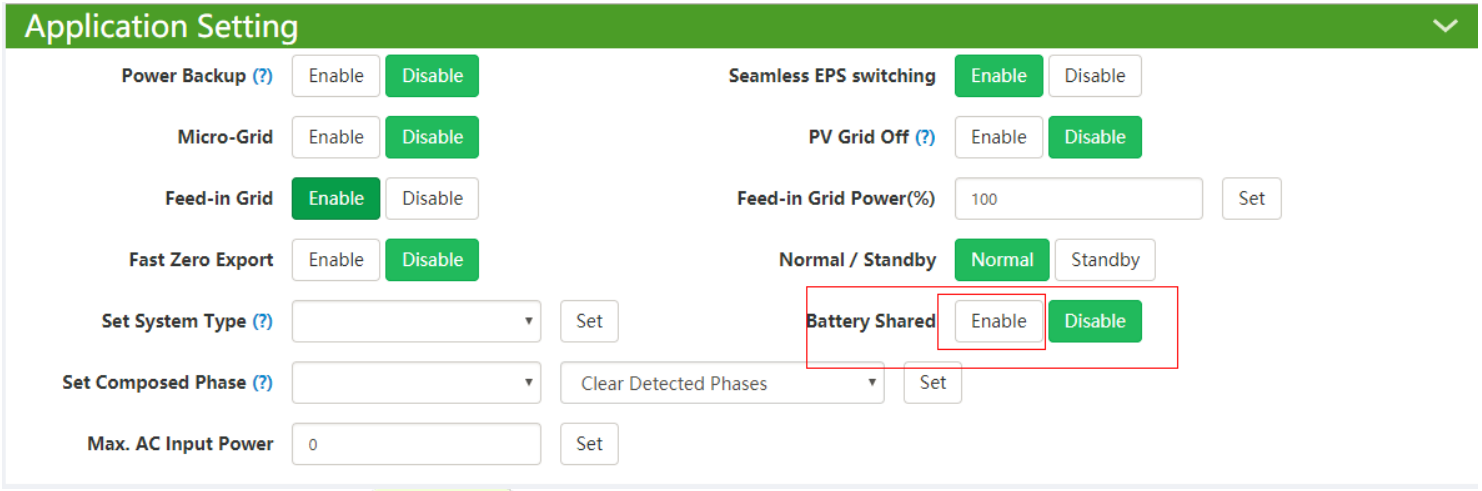
For parallel system battery connection, we support 2 connection ways, you can either connect all inverters to one battery bank or connect each inverter to

separate battery group. For above system in this document, it is each inverter connected 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”.



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PART4: Troubleshooting

LCD Display	Description	Troubleshooting
Fault 08	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.
	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.
	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.
	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.
	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.
	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.
	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 .