

MHT4-20kW Master-Slave Paralleling Solution



Solution Introduction

Master-Slave Control Parallel System

The hybrid inverter has become a new trend that has gained popularity in recent years as a result of the rising energy problem and electricity rates. But due to its short emergence, the power range hasn't been enlarged to cover all kinds of scenarios, so in some cases, a parallel system is required to expand the system application diversity.

In a storage system with multiple Integ MHT hybrid inverters (≤ 10 pcs), a parallel solution is required to manage and control all inverters' operation modes, energy supply and use. Solinteg Hybrid inverter supports up to 10pcs parallel with master-slave control, which saves time and money on the installation and provides higher stability. In the parallel system, all batteries connected to different inverters are always kept at the same SOC level no matter how diversified the loads are connected with each inverter.



Parallel Solution

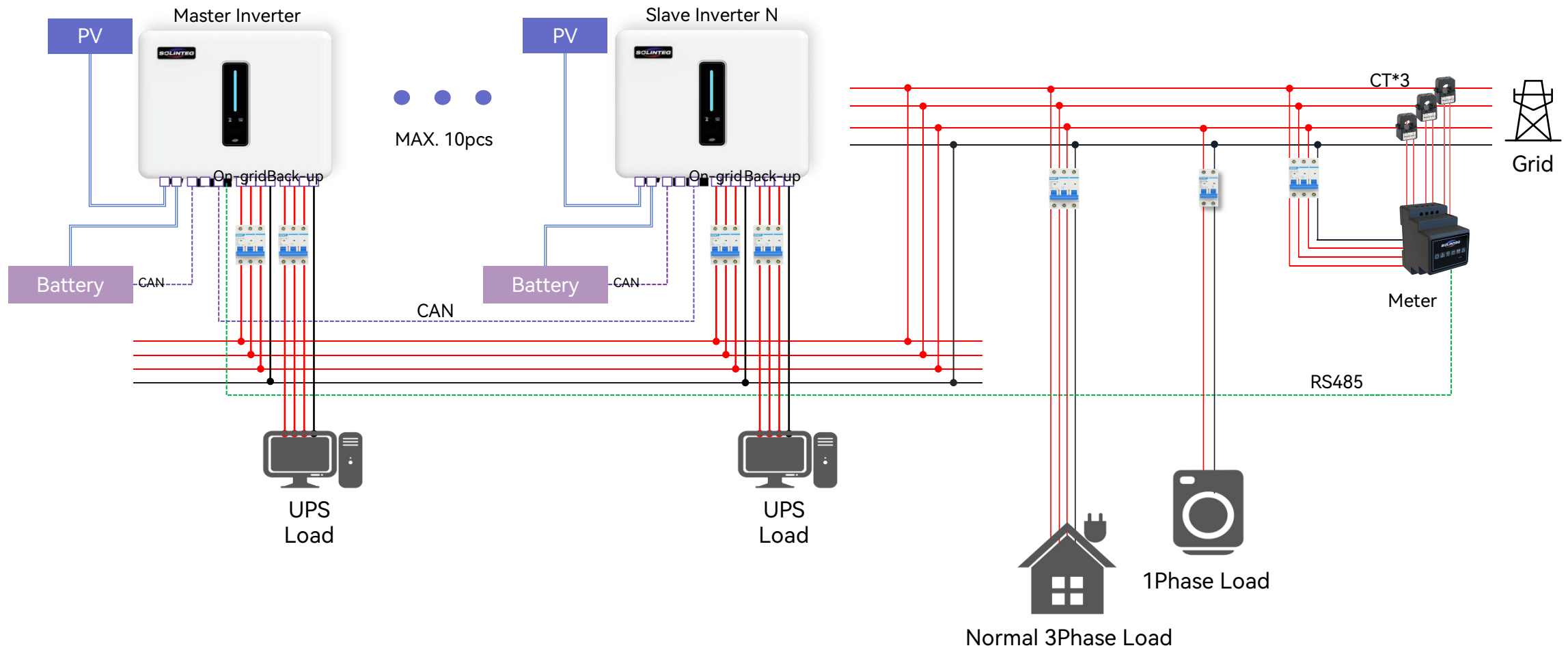
Notice Before Use

Master-Slave Control Parallel System

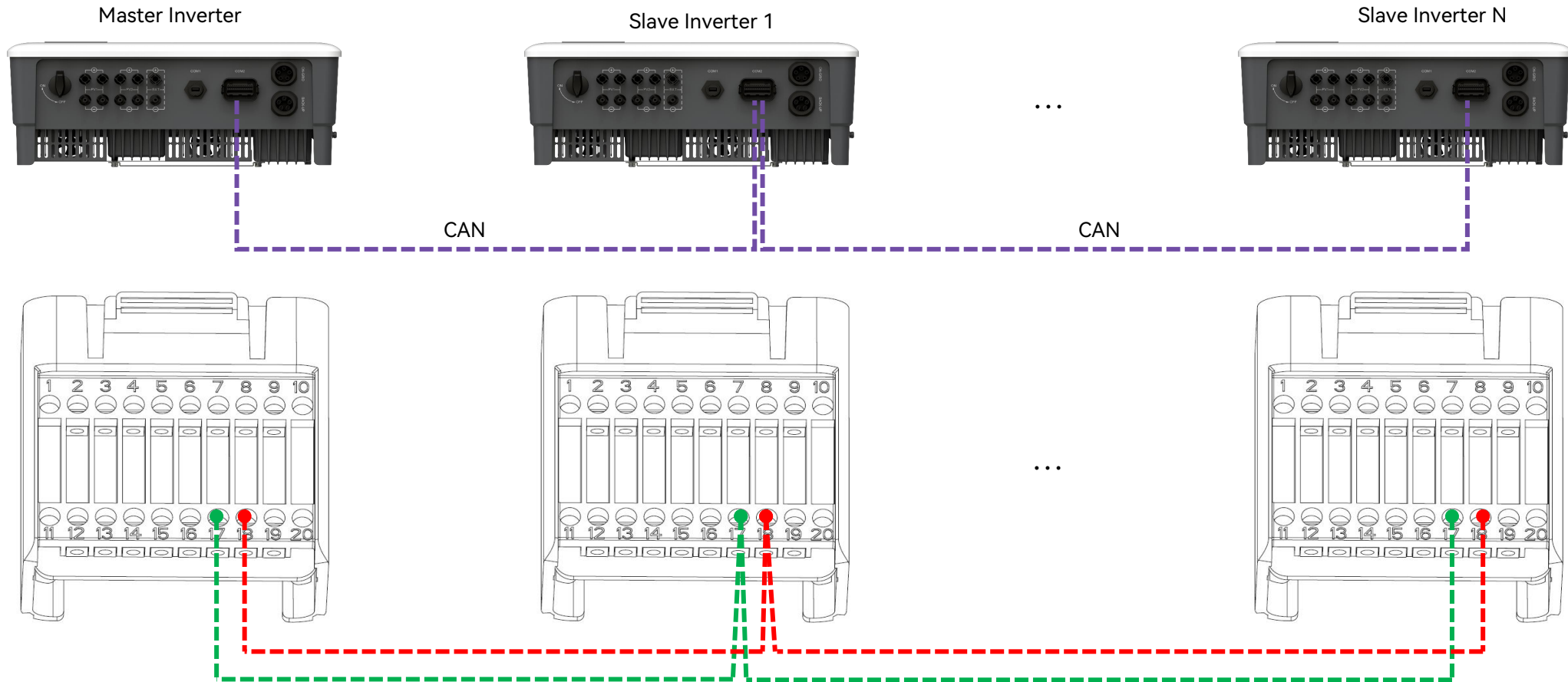
- Only a smart meter and a group of CTs are required for a parallel system.
- Inverters in the parallel system should be the same model, and battery as well.
- On-grid inverter cannot be involved in a paralleled hybrid system.
- Battery cannot be connected in parallel, one battery rack connects to one inverter.
- A slave inverter in a parallel system that loses CAN bus communication won't affect the whole system's operation, just the inverter that lost communication will stop working. However, if a master inverter in a parallel system loses contact with the Smart Meter, the entire system will fail.
- In the parallel system, each battery connected in the system can reach a fully charged status or discharge to a specific SOC value almost at the same time.
- In the parallel system, the settings of the master inverter will automatically sync to all slave inverters which means you just need to set the parameter of the system once.
- At present, only on-grid parallel is available, and off-grid parallel is expected to be available in Q4 2023.



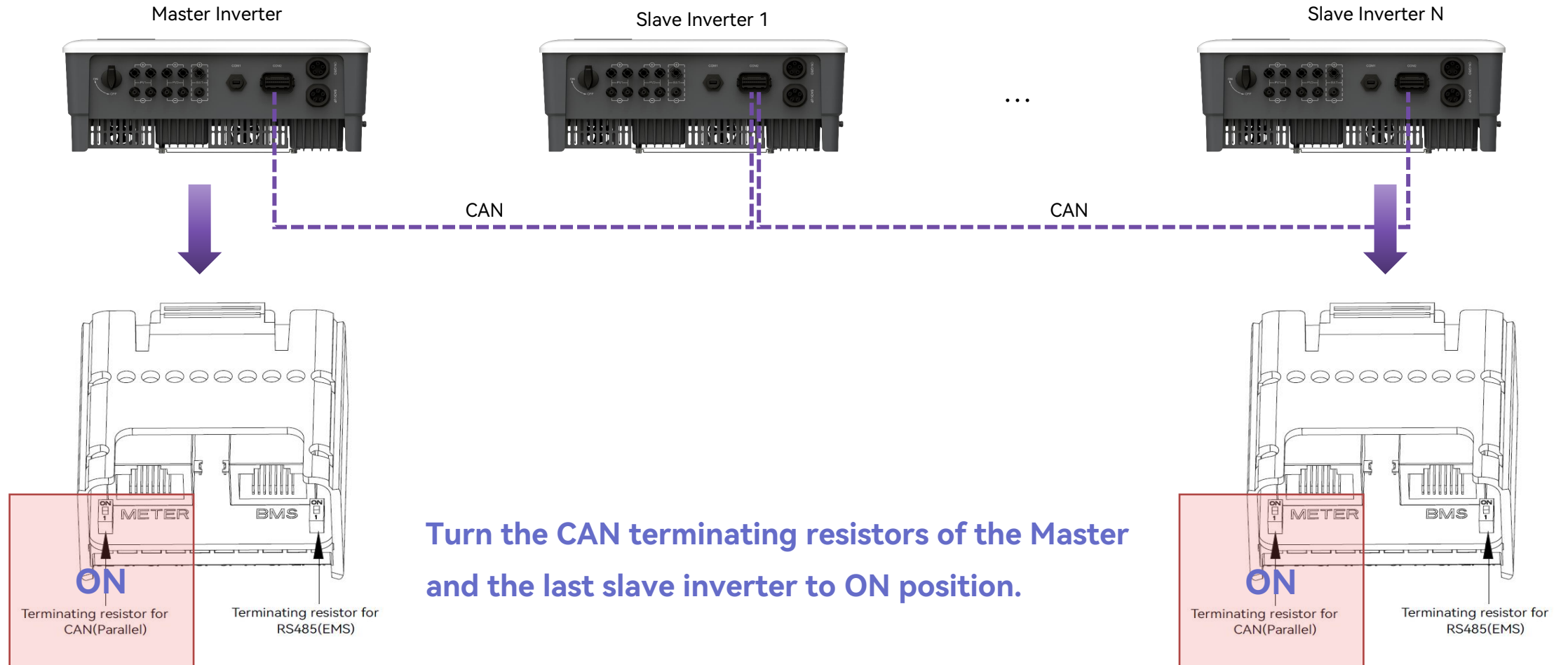
Parallel System-Whole System Wiring Diagram



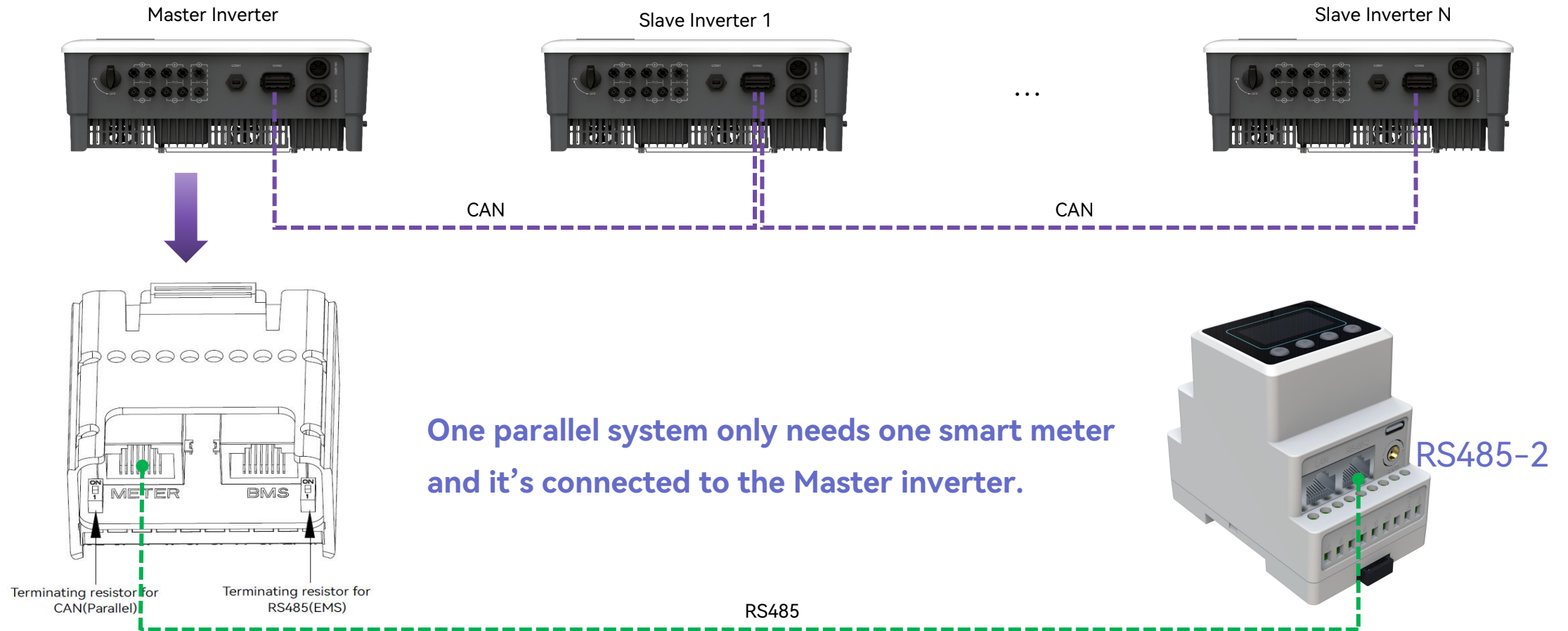
Parallel System-CAN Communication Illustration



Parallel System-CAN Communication Wiring

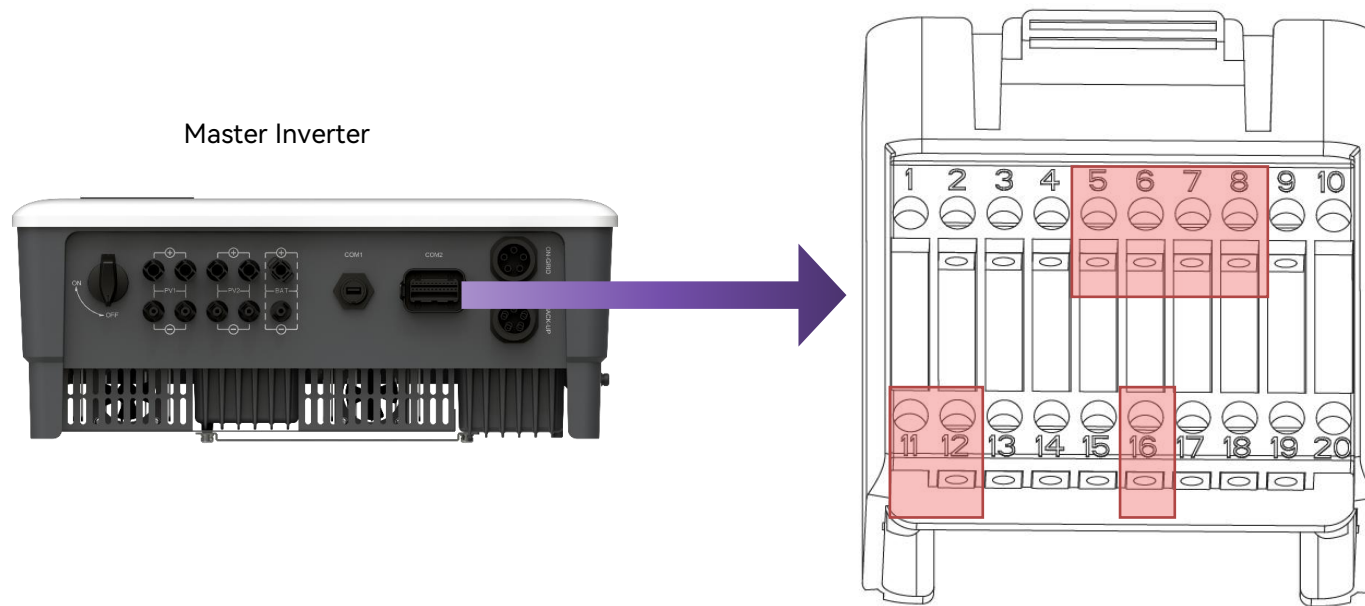


Parallel System-Smart Meter Connection



Parallel System-RCR Connection

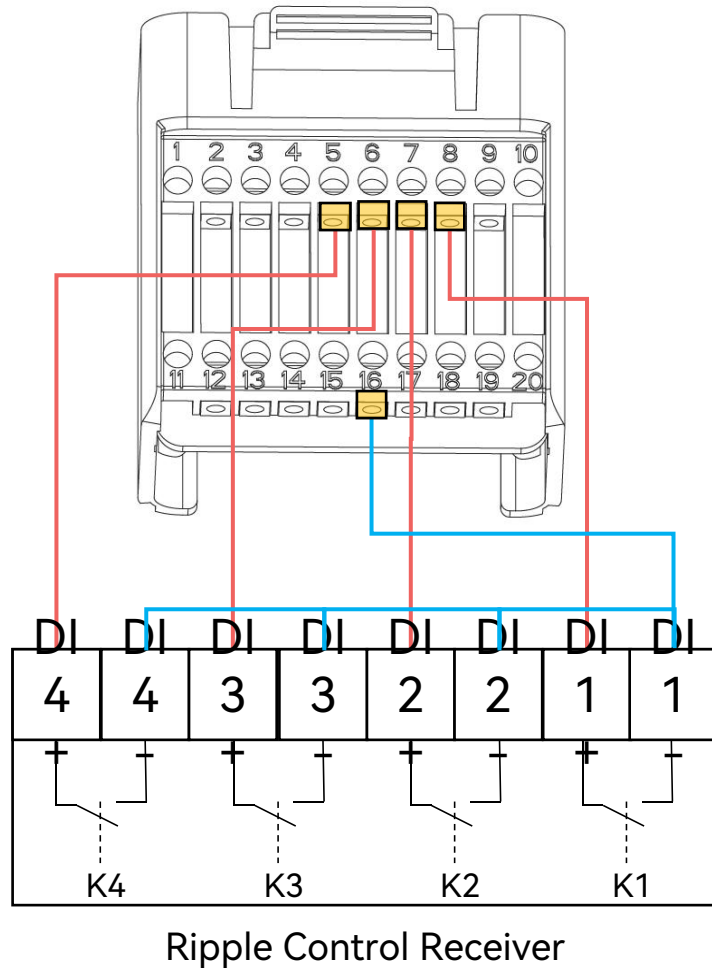
In Germany and some European countries, an inverter connected to the grid must be able to receive the grid dispatch instructions to feed the power to the grid as required, which we called the RCR function. The communications ports for the RCR device to connect are shown below;



Only the master device needs to be connected.

Only integrated with active power adjusting function.

Parallel System-RCR Connection



- When K1 is turned on, the maximum allowed feed-in power is 100% of the total rated power of the inverter.
- When K2 is turned on, the maximum allowed feed-in power is 60% of the total rated power of the inverter.
- When K3 is turned on, the maximum allowed feed-in power is 30% of the total rated power of the inverter.
- When K4 is turned on, feed-in power is not allowed.



The RCR function must be enabled on the inverter screen or the App. If the Ripple Control Receiver is not connected or the RCR function is not enabled, the inverter will fail to output.



Only the master inverter needs to connect to the Ripple Control Receiver in a parallel system.

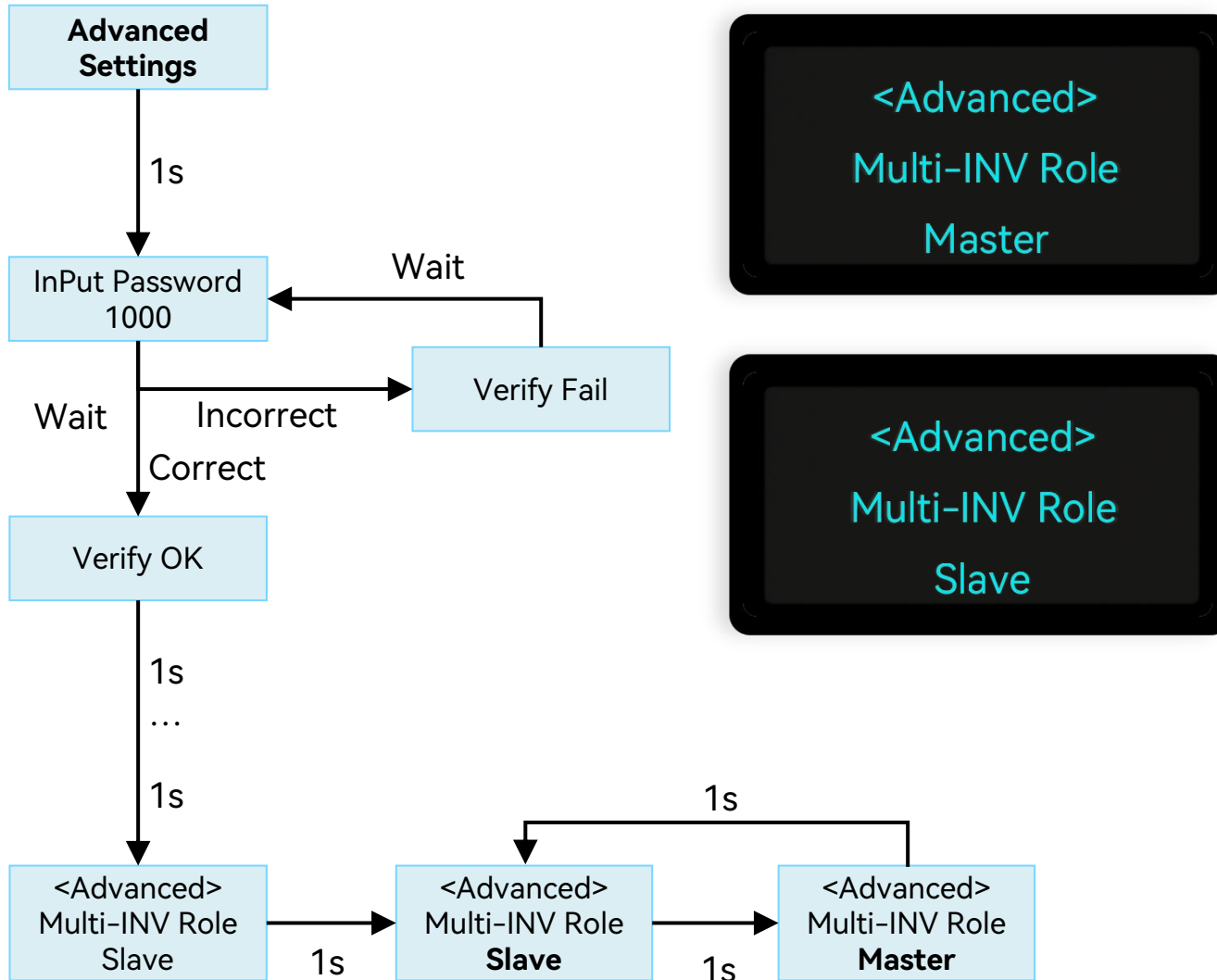
Active Power Dry Contact Connection Diagram

Parallel System-Operation Procedures

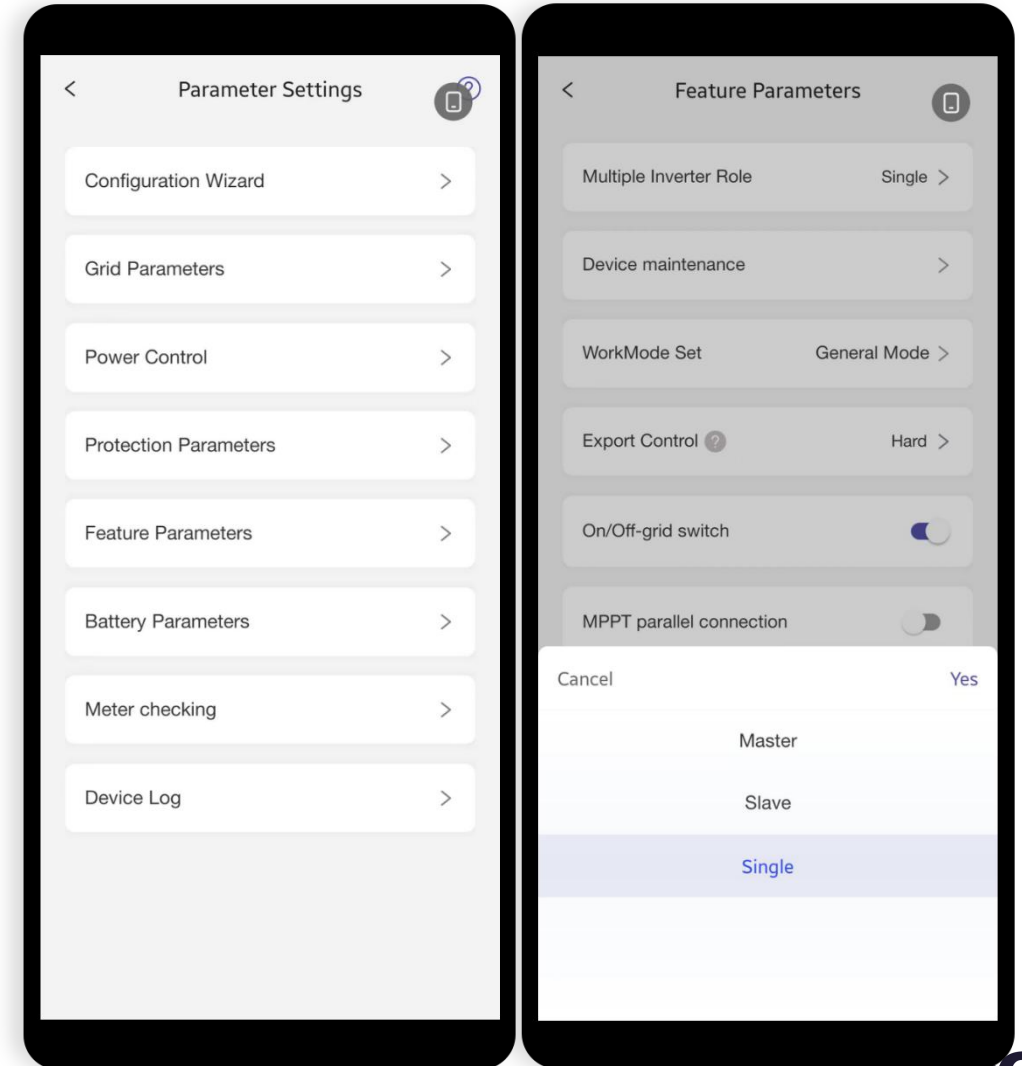
1. Install the parallel system according to the system wiring diagram, especially the CAN communication between each inverter.
2. Each inverter has to equip with a WiFi/LAN dongle.
3. Batteries need to connect to each inverter separately.
4. Power on all the inverters (Don't turn on the backup loads before the parallel system commissioning is completed.)
 - ① If there is a power grid connection, connect the inverter to the power grid.
 - ② If there is no power grid, switch on the battery and PV.
5. Configure the WIFI network for the whole system.
6. Create a power plant in the SOLINTEG monitoring platform and add all inverters in the plant.
7. Set the inverter connected to the smart meter as the Master via the monitoring platform (or the screen) and set other inverters as Slave by the same mean, turn on the terminal resistor of the Master and last Slave inverter.
8. Confirm that all inverters are online in the monitoring platform.
9. Set the necessary parameters of the master inverter via APP or screen, such as safety code, export limit, RRCCR, etc.
10. All inverters are connected to the power grid, batteries and PV to make sure that the system can run normally.
11. When the parallel system runs properly, turn on the loads connected to the backup side.

Parallel System-Inverter Role Setting

Inverter Screen Settings





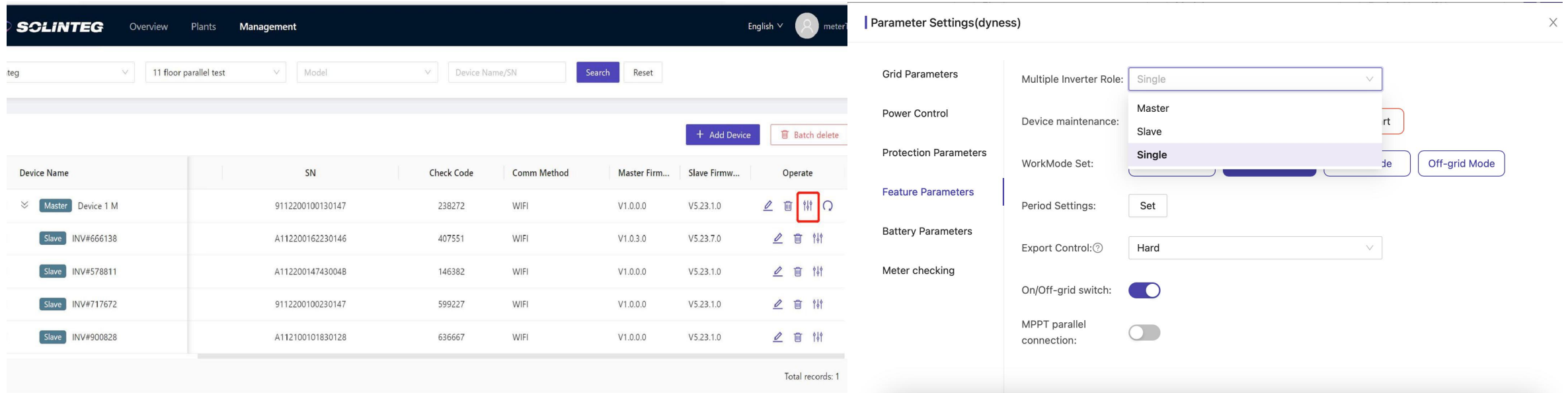
Inverter App Settings



Parallel System-Inverter Role Setting

















Web Portal Settings

 Set each inverter's role in a parallel system in the Web portal. Click [Management], [Device Management],[], [Feature Parameters], [Multiple Inverter Role] to set or change the inverter role.



The screenshot displays the SOLINTEG web portal interface. The top navigation bar includes 'SOLINTEG', 'Overview', 'Plants', and 'Management'. The main content area is divided into two sections: a table of inverter devices and a 'Parameter Settings(dyness)' sidebar.

Device Management Table:

Device Name	SN	Check Code	Comm Method	Master Firm...	Slave Firmw...	Operate
Master Device 1 M	9112200100130147	238272	WIFI	V1.0.0.0	V5.23.1.0	   
Slave INV#666138	A112200162230146	407551	WIFI	V1.0.3.0	V5.23.7.0	  
Slave INV#578811	A112200147430048	146382	WIFI	V1.0.0.0	V5.23.1.0	  
Slave INV#717672	9112200100230147	599227	WIFI	V1.0.0.0	V5.23.1.0	  
Slave INV#900828	A112100101830128	636667	WIFI	V1.0.0.0	V5.23.1.0	  

Parameter Settings(dyness) Sidebar:

- Grid Parameters
- Power Control
- Protection Parameters
- Feature Parameters**
- Battery Parameters
- Meter checking

Key settings in the Feature Parameters section:

- Multiple Inverter Role: Single (dropdown menu)
- Device maintenance: Master, Slave, Single (radio buttons)
- WorkMode Set: Off-grid Mode (radio button)
- Period Settings: Set (button)
- Export Control: Hard (dropdown menu)
- On/Off-grid switch:
- MPPT parallel connection:

Parallel System—Create A Parallel Plant in Solinteg Monitoring

Login Solinteg cloud @ <https://www.solinteg-cloud.com> and click [Plant Management]—[Add Plant].

The image displays two screenshots of the Solinteg Monitoring Dashboard. The left screenshot shows the 'Management' menu with 'Plant Management' highlighted. The right screenshot shows the 'Add Plant' button in the top right corner of the 'Plant List' table.

Dashboard Overview (Left Screenshot):

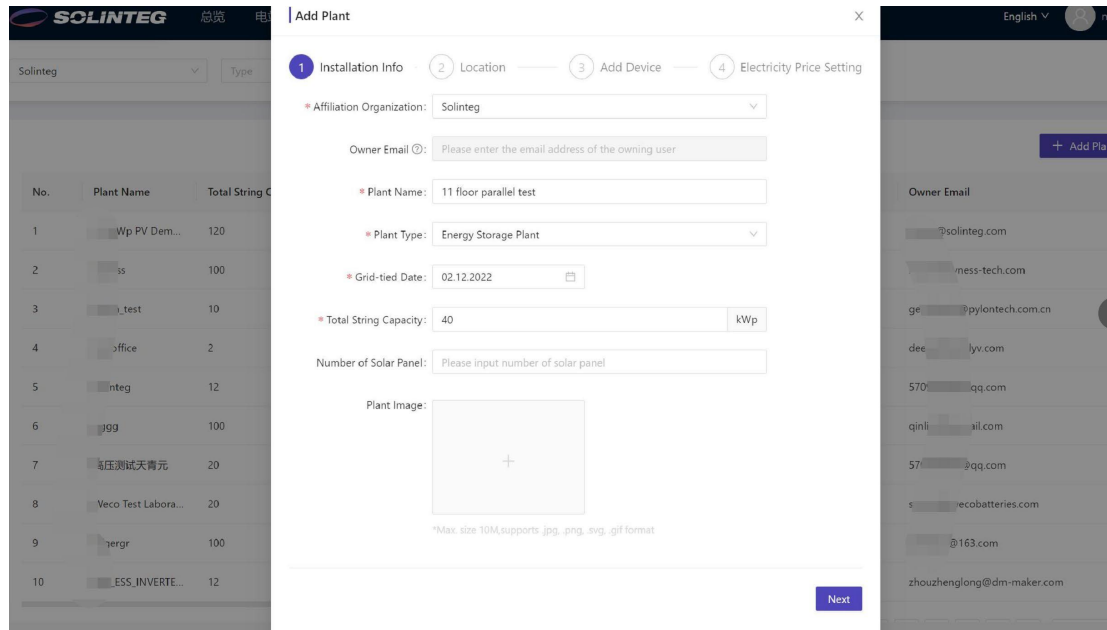
- Efficiency:** 0%
- CO₂ Avoided:** 204,011.53 t
- Equivalent Trees Planted:** 278,704
- Coal Savings:** 171,799.18 t
- Plant List:** 3 Plant List (3 Normal, 0 Faulty, 50 Offline)
- Device List:** 6 Device List (6 Normal, 0 Faulty, 1 Standby, 32 Offline)
- Unit Power Generation Ranking:**
 - 固性升级测试电站: 0.1 kWh / kWp
 - 110kWp PV De...: 0 kWh / kWp
 - dyness: 0 kWh / kWp
 - Pylon_test: 0 kWh / kWp

Plant List Table (Right Screenshot):

No.	Plant Name	Total String Capacity(kW...)	Address	Creation time	Owner Email
1	PV Dem...	120	浙...	18.12.2021	solinteg.com
2		100	...	06.07.2022	i@dyness-tech.com
3	t	10	...	14.07.2022	longya@pylontech.com.cn
4		2	...n, Net	08.08.2022	pak@getlyv.com
5		12	江苏省无锡市梁溪区...	11.08.2022	306049@qq.com
6		100	无锡...	12.08.2022	z@foxmail.com
7	武天青元	20	...	19.08.2022	306049@qq.com
8	t Labor...	20	Si... 7 San Pier...	22.08.2022	ce@wecobatteries.com
9		100	江苏省无锡市梁溪区...	29.08.2022	163.com
10	DM_ ESS_INVERT...	12	江苏省无锡市滨湖区...	30.08.2022	nglong@dm-maker.com

Parallel System—Create A Parallel Plant in Solinteg Monitoring

 Fill in the required fields which are marked with * in Installation Info and Location menu.



1 Installation Info 2 Location 3 Add Device 4 Electricity Price Setting

* Affiliation Organization: Solinteg

Owner Email: Please enter the email address of the owning user

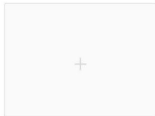
* Plant Name: 11 floor parallel test

* Plant Type: Energy Storage Plant

* Grid-tied Date: 02.12.2022

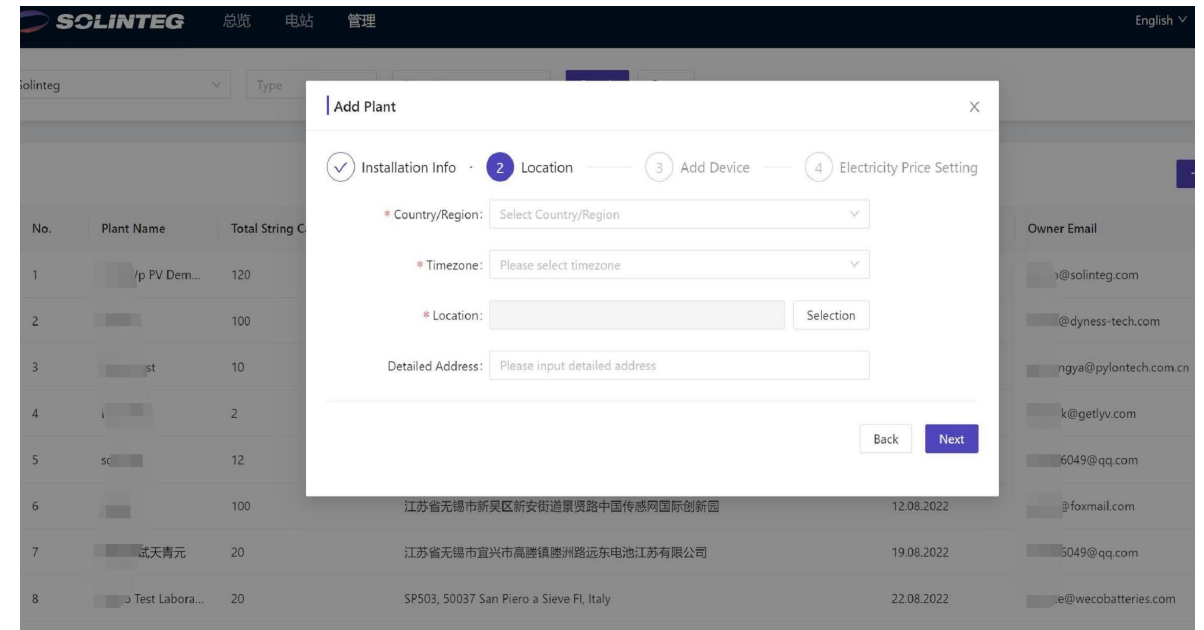
* Total String Capacity: 40 kWp

Number of Solar Panel: Please input number of solar panel

Plant Image: 

*Max. size 10M, supports jpg, png, svg, gif format

Next



2 Location 3 Add Device 4 Electricity Price Setting

* Country/Region: Select Country/Region

* Timezone: Please select timezone

* Location: Selection

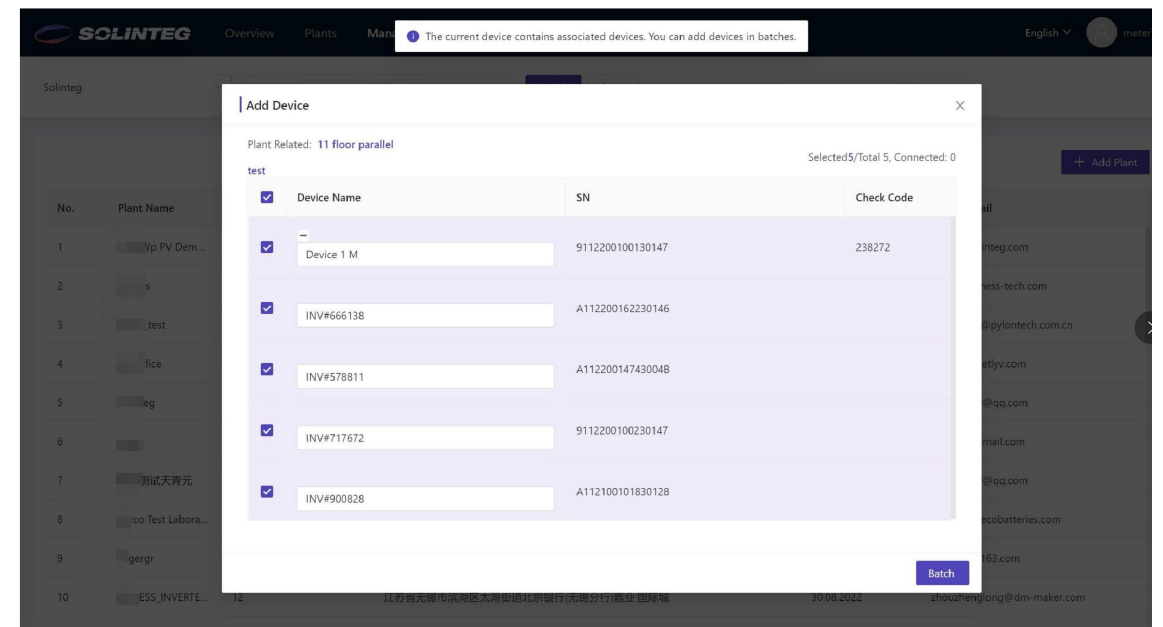
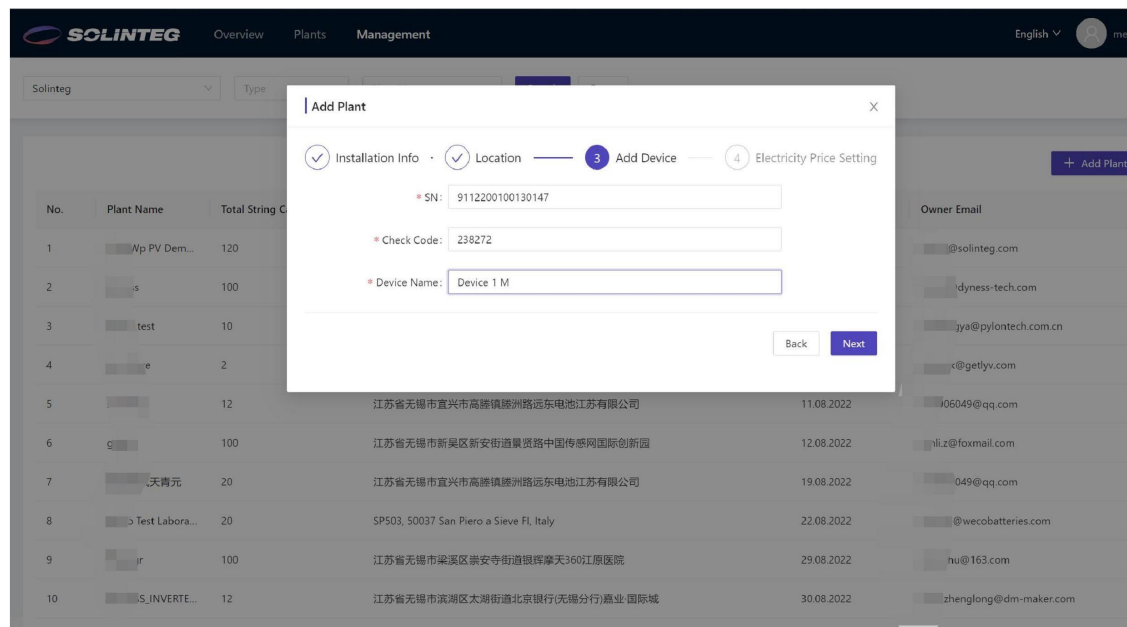
Detailed Address: Please input detailed address

Back Next


Parallel System—Create A Parallel Plant in Solinteg Monitoring

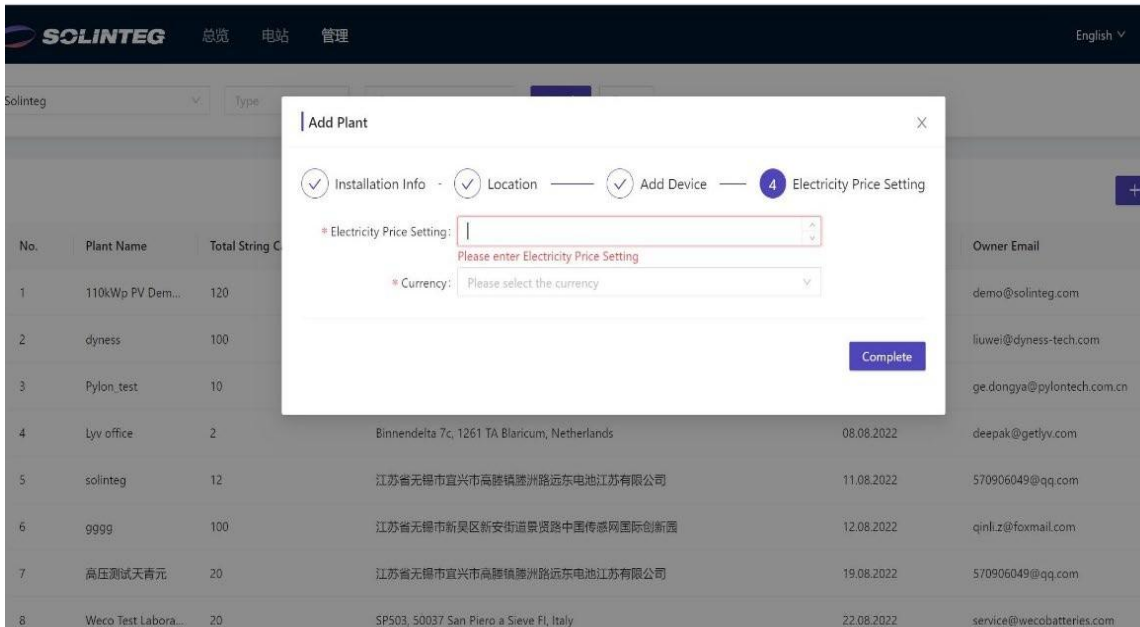
Once one device information from the paralleling system is filled in, the others in this parallel system will automatically pop up. Click [Batch] to add all the inverters. (Please remember to set the inverter's role as Master or Slave via the inverter screen or SolintegSet APP).

Note: The inverter connected with Smart Meter must be set as Master inverter.

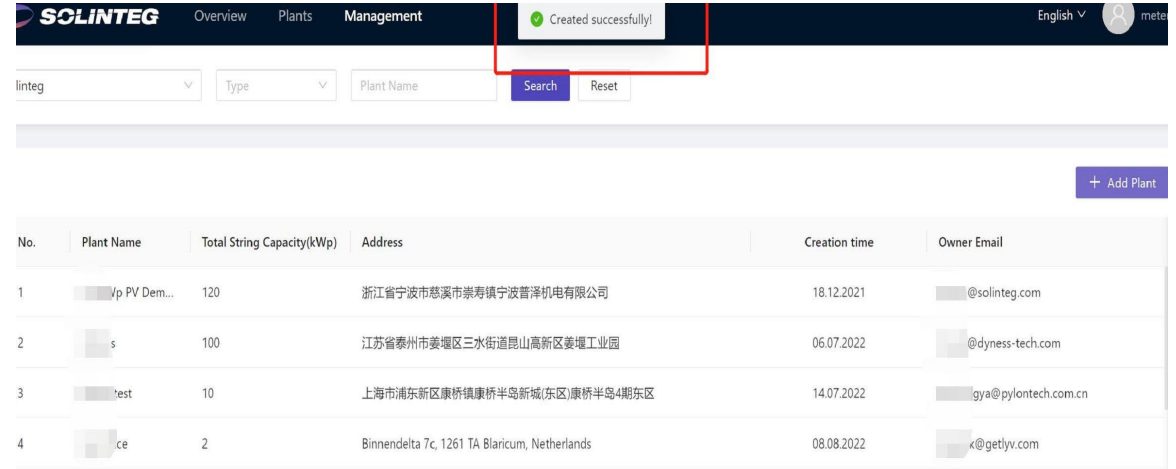


Parallel System-Create A Parallel Plant in Solinteg Monitoring

 Input the electricity price and select currency according to the local policy. Click the [Complete] button, and a notice of creating plant successfully will pop up.



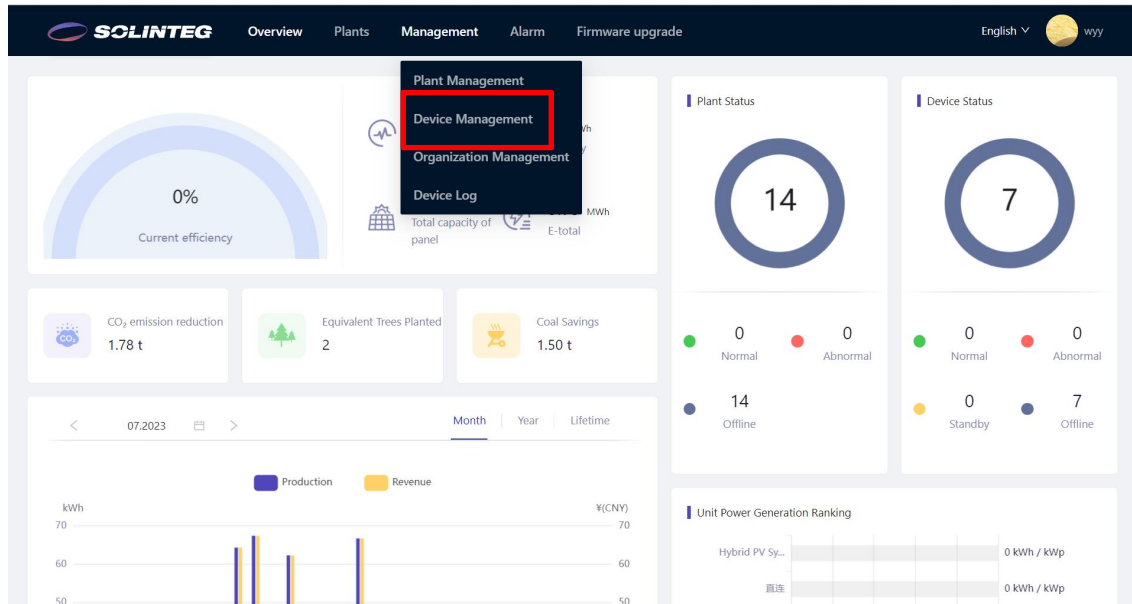
No.	Plant Name	Total String C	Owner Email
1	110kWp PV Dem...	120	demo@solinteg.com
2	dyness	100	liuwei@dyness-tech.com
3	Pylon_test	10	ge.dongya@pylontech.com.cn
4	Lyv office	2	deepak@getlyv.com
5	solinteg	12	570906049@qq.com
6	gggg	100	qinl.z@foxmail.com
7	高压测试天青元	20	570906049@qq.com
8	Weco Test Labora...	20	service@wecobatteries.com



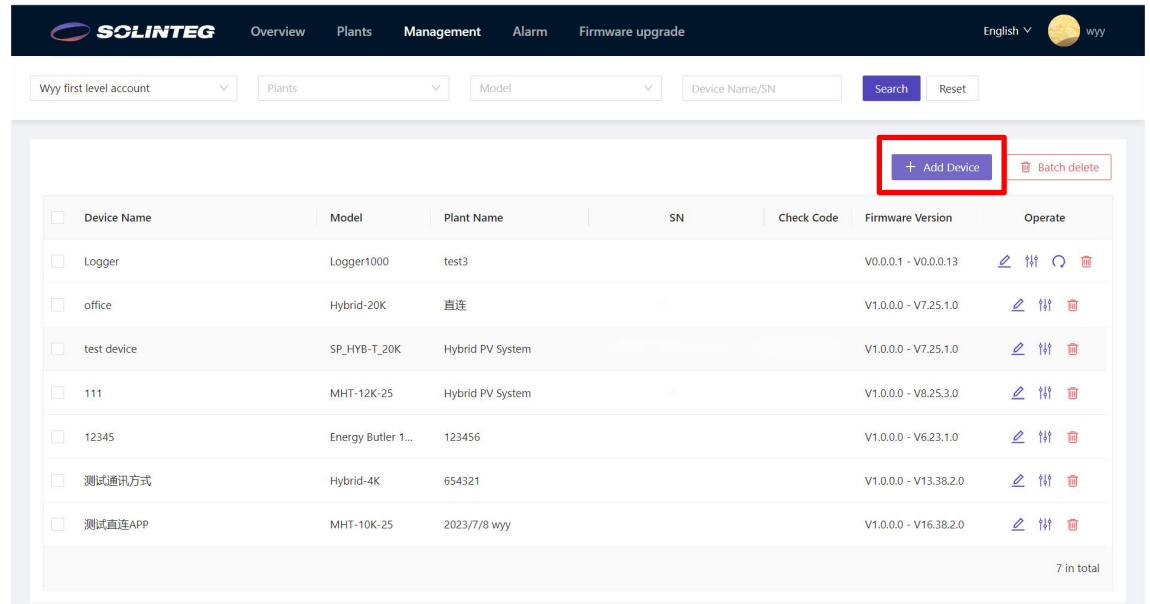
No.	Plant Name	Total String Capacity(kWp)	Address	Creation time	Owner Email
1	110kWp PV Dem...	120	浙江省宁波市慈溪市崇寿镇宁波普泽机电有限公司	18.12.2021	demo@solinteg.com
2	dyness	100	江苏省泰州市姜堰区三水街道崑山高新区姜堰工业园	06.07.2022	liuwei@dyness-tech.com
3	Pylon_test	10	上海市浦东新区康桥镇康桥半岛新城(东区)康桥半岛4期东区	14.07.2022	ge.dongya@pylontech.com.cn
4	Lyv office	2	Binnendelta 7c, 1261 TA Blaricum, Netherlands	08.08.2022	deepak@getlyv.com

Parallel System-Add Device to An Existing Plant

 Login Solinteg cloud , enter [Device Management] menu, and then click [Add Device].



The dashboard shows a navigation menu with 'Management' selected. A dropdown menu is open, highlighting 'Device Management' with a red box. Other menu items include 'Plant Management', 'Organization Management', and 'Device Log'. The main content area displays 'Plant Status' with 14 Offline and 0 Normal devices, and 'Device Status' with 7 Offline and 0 Standby devices. A bar chart shows Production and Revenue for July 2023, and a 'Unit Power Generation Ranking' table is visible at the bottom.



The device management interface shows a search bar with filters for 'Plants' and 'Model'. A '+ Add Device' button is highlighted with a red box. Below is a table of devices with columns for Device Name, Model, Plant Name, SN, Check Code, Firmware Version, and Operate. The table contains 7 rows of device data.

Device Name	Model	Plant Name	SN	Check Code	Firmware Version	Operate
<input type="checkbox"/> Logger	Logger1000	test3			V0.0.0.1 - V0.0.0.13	Edit Refresh Delete
<input type="checkbox"/> office	Hybrid-20K	直连			V1.0.0.0 - V7.25.1.0	Edit Refresh Delete
<input type="checkbox"/> test device	SP_HYB-T_20K	Hybrid PV System			V1.0.0.0 - V7.25.1.0	Edit Refresh Delete
<input type="checkbox"/> 111	MHT-12K-25	Hybrid PV System			V1.0.0.0 - V8.25.3.0	Edit Refresh Delete
<input type="checkbox"/> 12345	Energy Butler 1...	123456			V1.0.0.0 - V6.23.1.0	Edit Refresh Delete
<input type="checkbox"/> 测试通讯方式	Hybrid-4K	654321			V1.0.0.0 - V13.38.2.0	Edit Refresh Delete
<input type="checkbox"/> 测试直连APP	MHT-10K-25	2023/7/8 wyy			V1.0.0.0 - V16.38.2.0	Edit Refresh Delete

Parallel System-Add Device to An Existing Plant

Once one device information from the paralleling system is filled in, the others in this parallel system will automatically pop up. Click [Batch] to add all the inverters. (Please remember to set the inverter's role as Master or Slave via the inverter screen or SolintegSet APP).

Note: The inverter connected with Smart Meter must be set as Master inverter.

The screenshot displays the Solinteg Management interface for adding a device to a parallel system. The main window is titled "Add Device" and shows a form for entering device information. The "Plant Related" dropdown is set to "11 floor parallel test". The form includes fields for "Device Name" (Device 1M), "SN" (9112200100130147), and "Check Code" (238). A modal window is open, showing a list of associated devices with checkboxes and roles (Master/Slave) for each. The table below shows the existing devices in the system.

Device Name	Model	Plant Name	SN	Check Code	Comm Method
Master Device 1M	MHT-10K-25	11 floor parallel test	9112200100130147	238272	WIFI
Slave INV#173251	MHT-10K-25	11 floor parallel test	A112200162230146	407551	WIFI
Slave INV#931668	MHT-10K-25	11 floor parallel test	A11220014743004B	146382	WIFI
Slave INV#942585	MHT-10K-25	11 floor parallel test	9112200100230147	599227	WIFI
Slave INV#081647	MHT-6K-25	11 floor parallel test	A112100101830128	636667	WIFI

THANK YOU

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