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 (≤10pcs), 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.
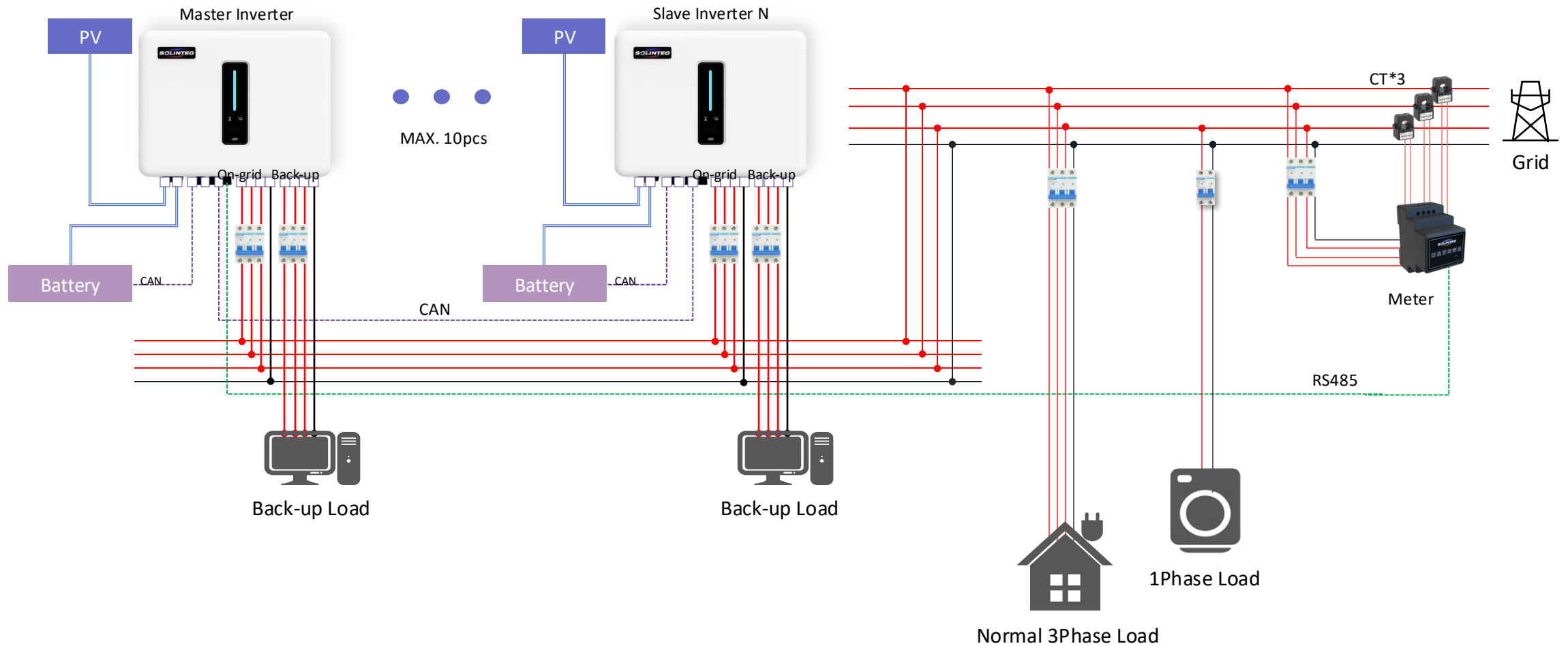
Parallel Solution

Notice Before Use
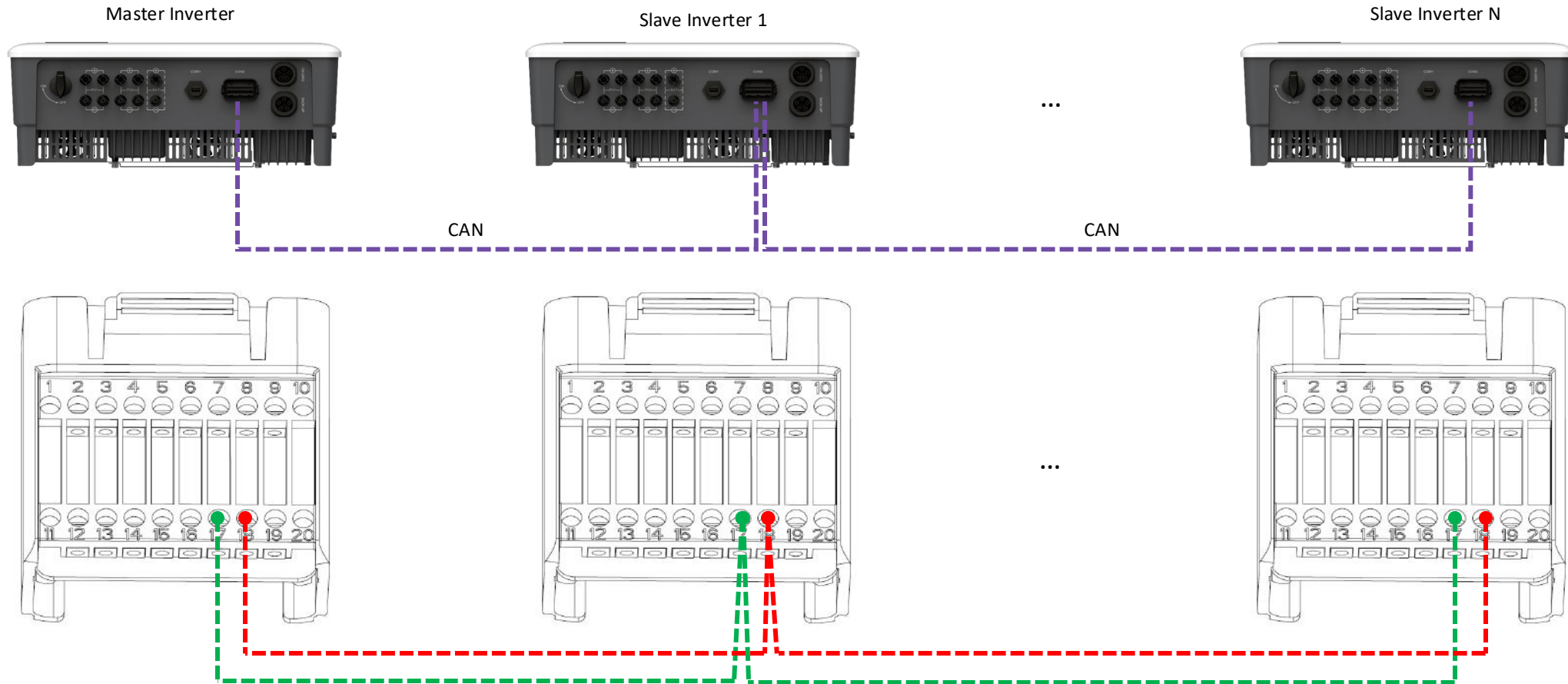
Master-Slave Control Parallel System

- 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 parameters of the system once.
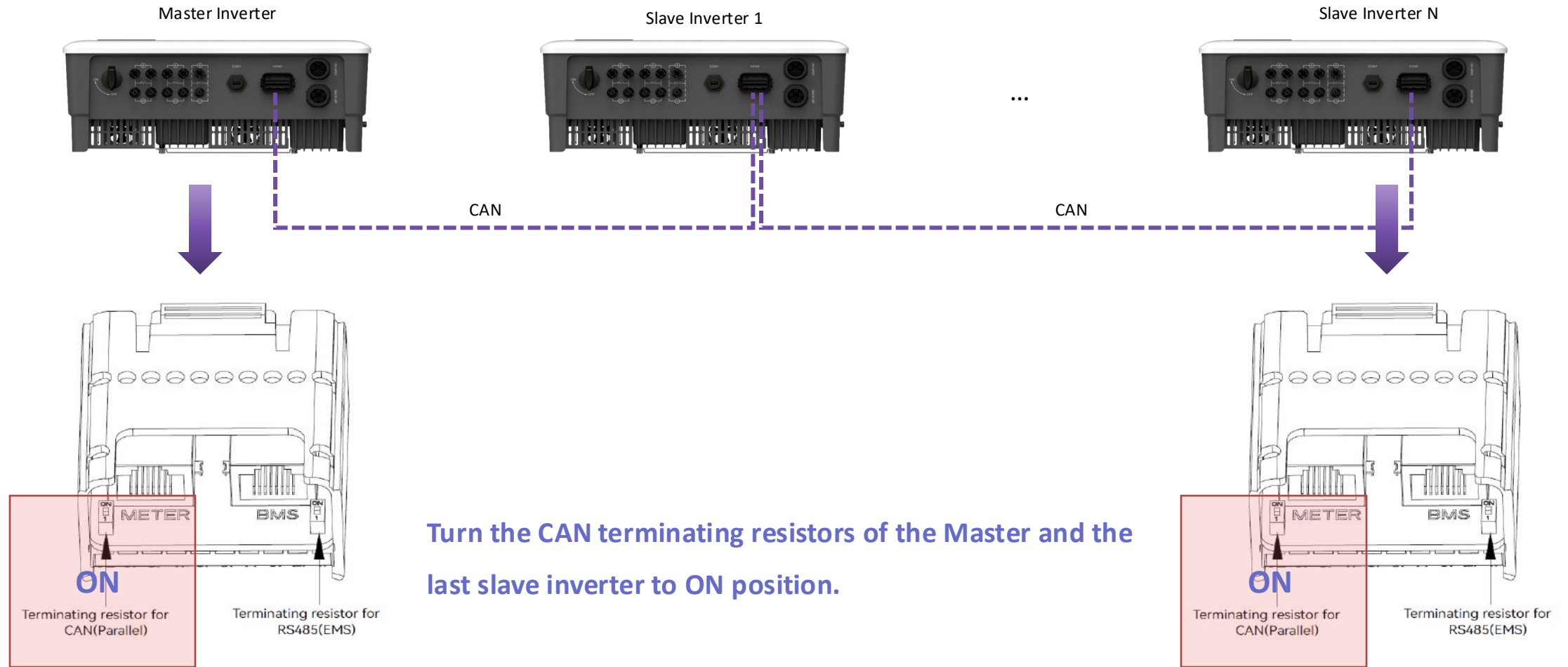
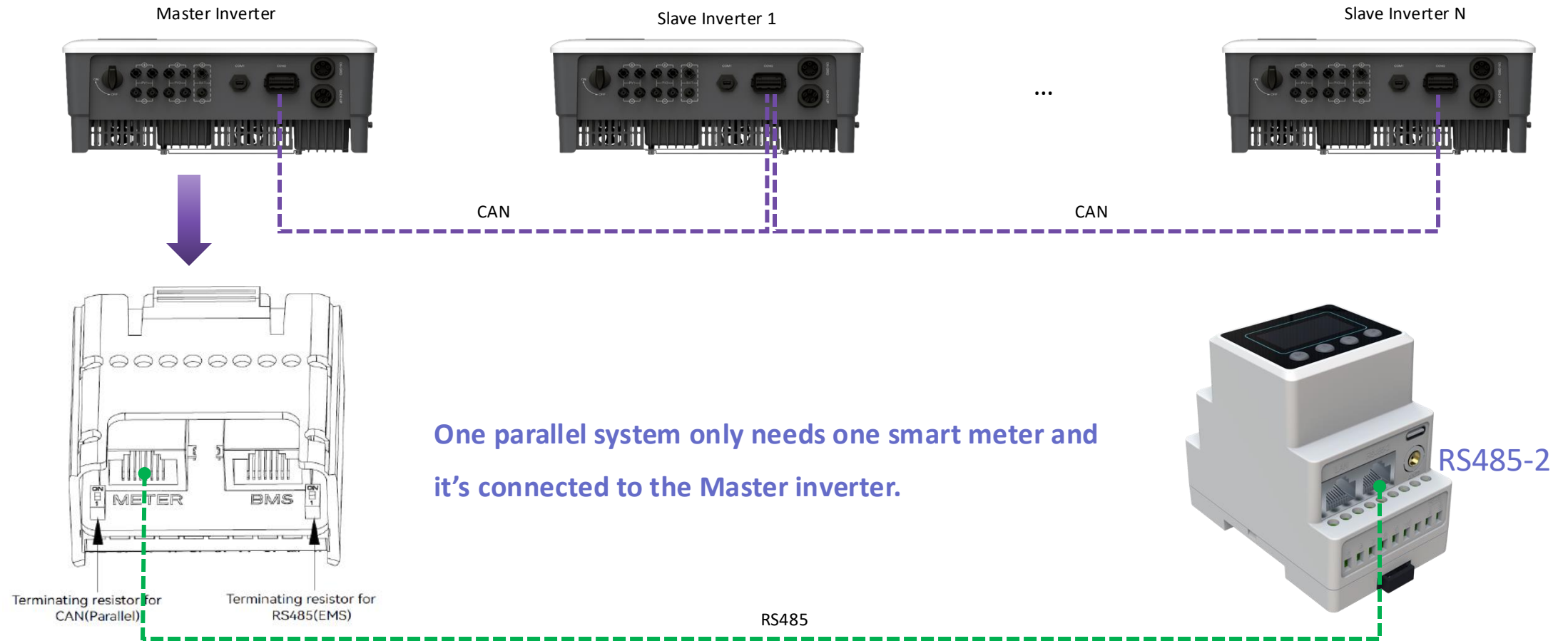# Parallel System-Whole System Wiring Diagram

Master Inverter

PV

Battery

CAN

On-grid Back-up

MAX. 10pcs

CAN

Slave Inverter N

PV

Battery

CAN

On-grid Back-up

CT*3

Grid

Meter

RS485

Back-up Load

Back-up Load

Normal 3Phase Load

1Phase Load

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Parallel System-CAN Communication Illustration

Parallel System-CAN Communication Wiring

Turn the CAN terminating resistors of the Master and the last slave inverter to ON position.

Parallel System-Smart Meter Connection

Master Inverter

Slave Inverter 1

Slave Inverter N

...

CAN

CAN

RS485-2

Terminating resistor for CAN(Parallel)

METER

BMS

Terminating resistor for RS485(EMS)

One parallel system only needs one smart meter and it's connected to the Master inverter.

RS485

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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;

Master Inverter
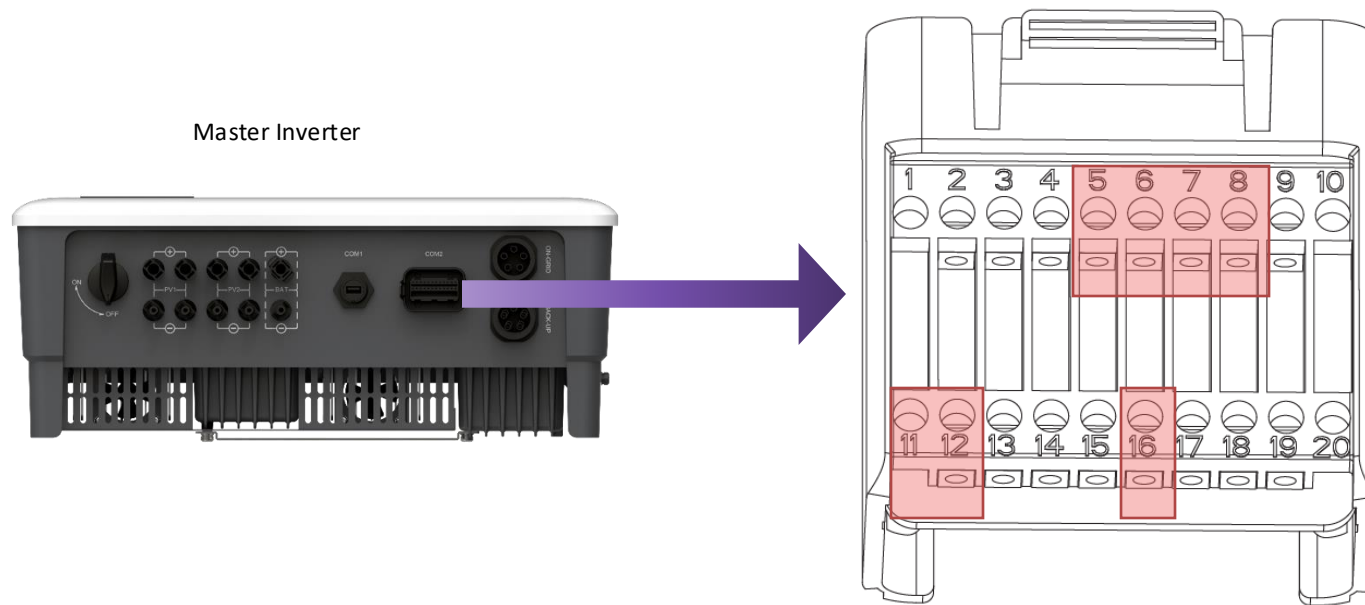
Only the master device needs to be connected.

Only integrated with active power adjusting function.

Parallel System-RCR Connection
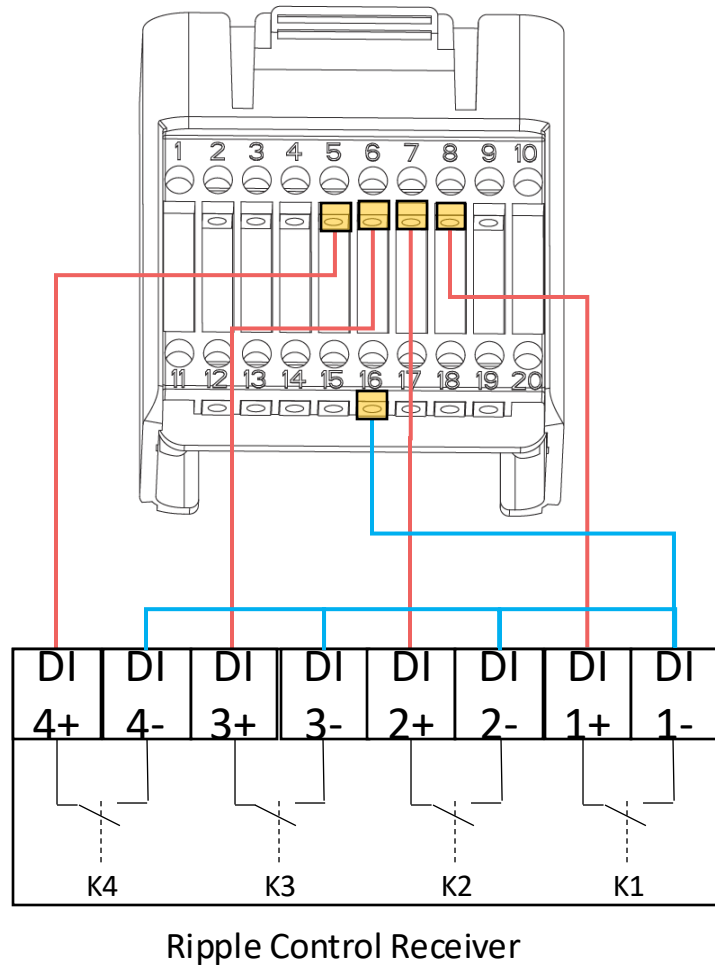
Active Power Dry Contact Connection Diagram

Ripple Control Receiver

🕐 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.

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 be equipped with a WiFi/LAN/DuoCom dongle.

3. Batteries need to be connected 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 means, 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, RRCR, 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.

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Parallel System-Inverter Role Setting
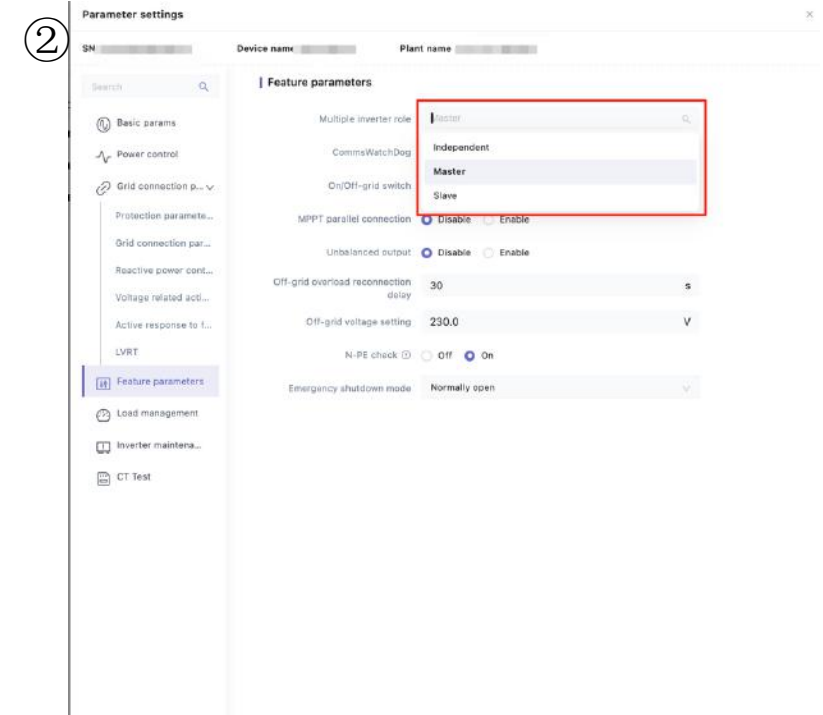
Inverter Screen Settings
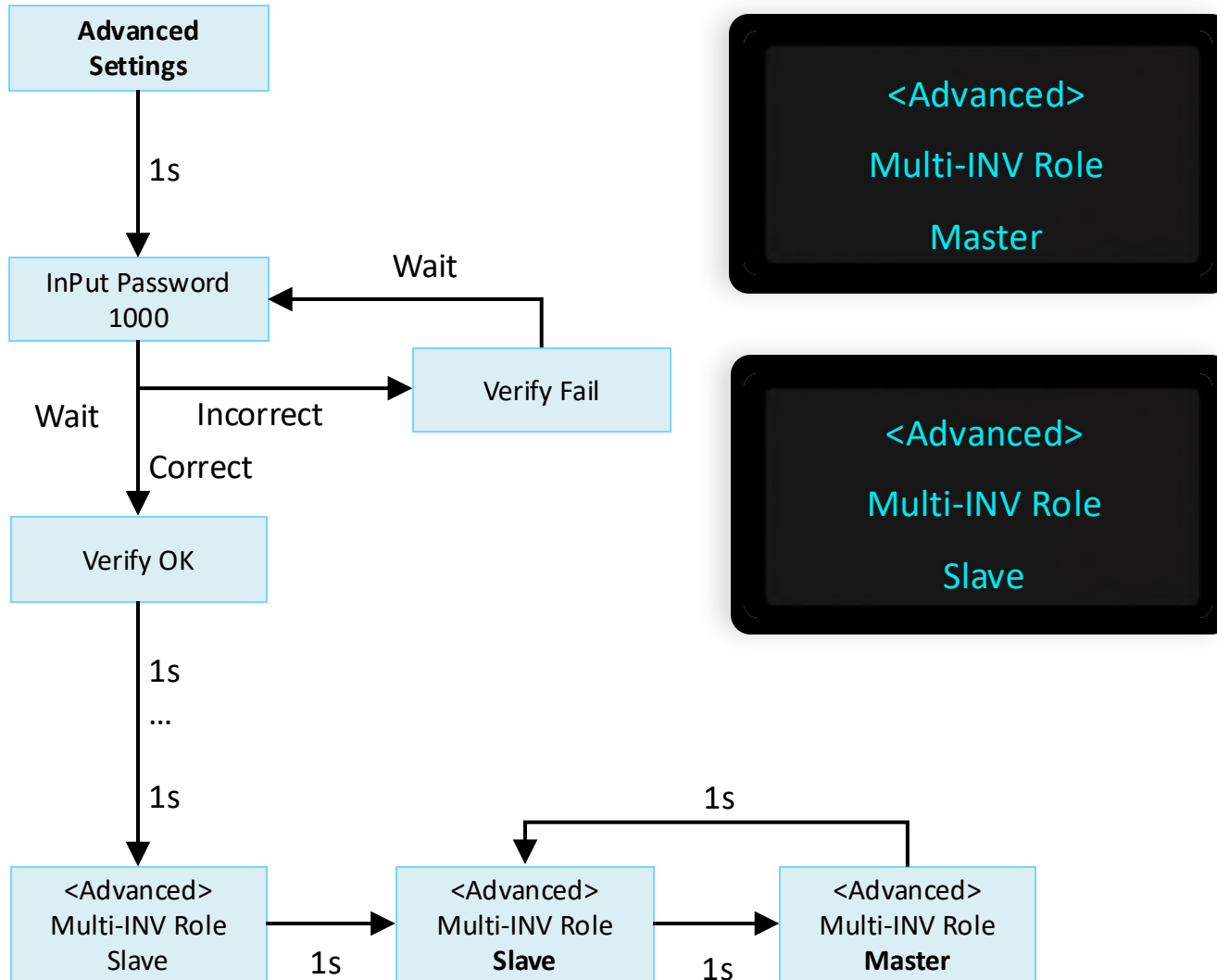
Inverter App Settings
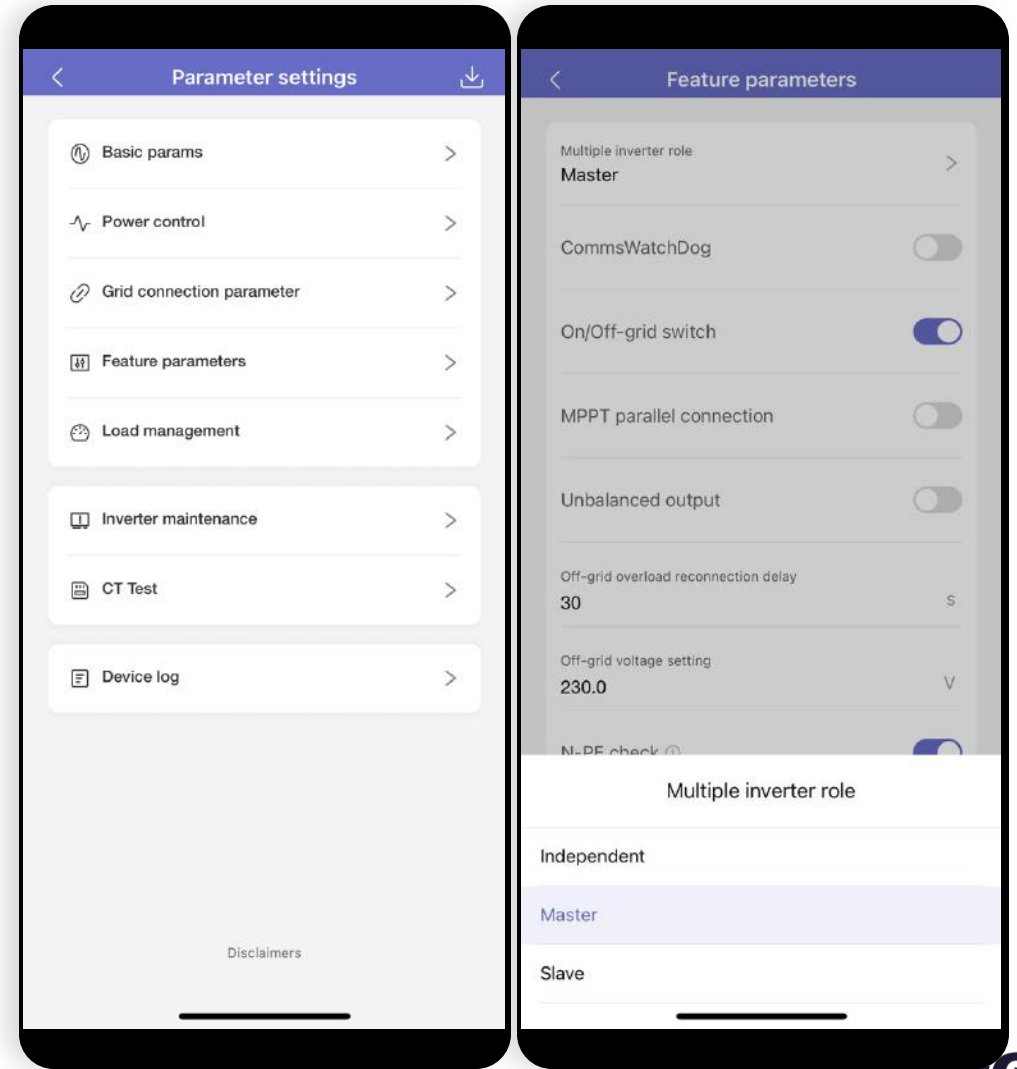
Parallel System-Inverter Role Setting

Web Portal Settings

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

②

Parameter settings

SN ⬛⬛⬛   Device name ⬛⬛⬛   Plant name ⬛⬛⬛

| Feature parameters

Basic params	Multiple inverter role	Master
Power control	CommsWatchDog	Independent
Grid connection p...	On/Off-grid switch	Master
Protection paramete...		Slave
Grid connection par...	MPPT parallel connection	⦿ Disable ○ Enable
Reactive power cont...	Unbalanced output	⦿ Disable ○ Enable
Voltage related acti...	Off-grid overload reconnection delay	30	s
Active response to f...	Off-grid voltage setting	230.0	V
LVRT	N-PE check ⓘ	○ Off ⦿ On
Feature parameters	Emergency shutdown mode	Normally open
Load management		
Inverter maintena...		
CT Test		

①

Plants ⬛⬛⬛ — Dashboard — Feedback — 🔔 — English — ⬚

← Overview   Devices   Alarm   Basic info   Scan devices   Add devices

Status	Device name	Device SN	SOC	Superior device	Device type	Device model	Remote - Local	Slave firmware version	Operate	
📶	M ⬛⬛⬛	⬛⬛⬛	69.30%	--	Hybrid Inverter	⬛⬛⬛	LAN-/	⬛⬛⬛	🗐 🗐 ✏ 🗐 🗑	
📶	S ⬛⬛⬛	⬛⬛⬛	99.90%	⬛⬛⬛	Hybrid Inverter	⬛⬛⬛	LAN-CAN	⬛⬛⬛	🗐 🗐 ✏ 🗐 🗑	
📶	S ⬛⬛⬛	⬛⬛⬛	99.90%	⬛⬛⬛	Hybrid Inverter	⬛⬛⬛	LAN-CAN	⬛⬛⬛	🗐 🗐 ✏ 🗐 🗑	

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Parallel System-Create A Parallel Plant in Solinteg Monitoring

Log in Solinteg cloud @ https://www.solinteg-cloud.com/login and click [New Plant].

Parallel System-Create A Parallel Plant in Solinteg Monitoring

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

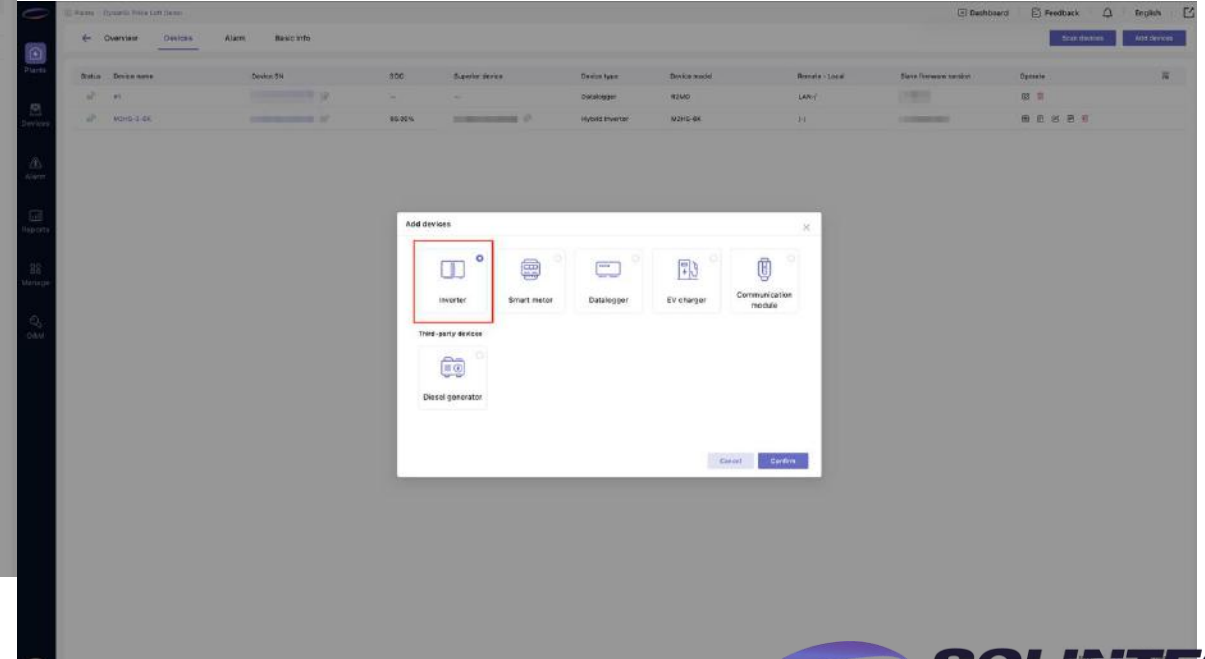# Parallel System-Create A Parallel Plant in Solinteg Monitoring

🧭 Once information from one device in the paralleling system is filled, and all the wiring between other inverters has been finished. Click [Scan devices] to add all the inverters detected. Or you can click [Add device] –[Inverter] to add the other inverters one by one (Please remember to set the inverter's role as Master or Slave via the inverter screen or IntegHub APP).
Note: The inverter connected with Smart Meter must be set as Master inverter.

Batch scan after wiring and powering on all devices
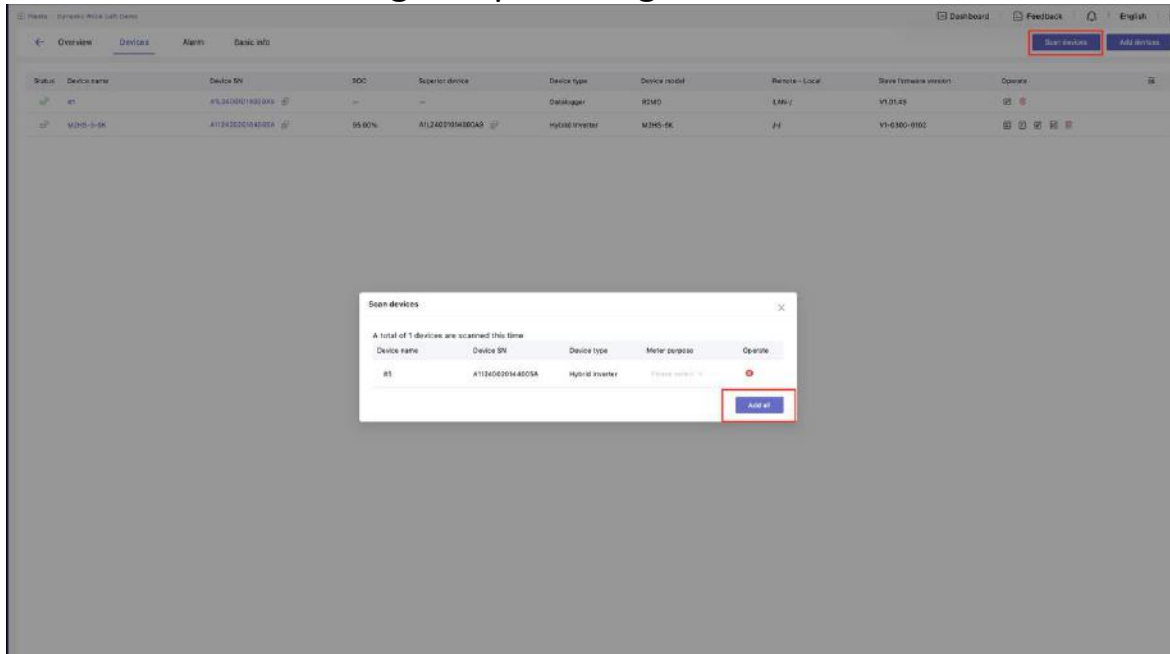
Add devices one by one

THANK YOU

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