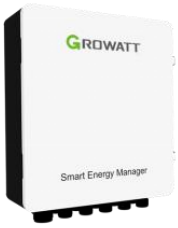
How to Parallel WIT 4-15K-HU Inverter

The WIT 4-15K-HU inverter supports parallel operation for up to 6 units in off-grid solutions. With a peak system capacity of 90kW, it effortlessly handles high-demand applications while ensuring reliable energy distribution. Its ensures the 100% three-phase unbalanced output capability and single-phase export limitation, ensuring compliance with diverse installation requirements.

System Composition

			
WIT4-15K-HU (Up to 6 units)	Battery System	ShineSEM-X-RM	CT*3

Note:

- Each inverter is connected to a separate battery system. In this document, we take AXE as an example. WIT can also be connected to third-party batteries. Please confirm with Growatt's engineer.
- The parallel system requires ShineSEM-X-RM as the energy management.
- The CT is a standard component in the WIT package and can be directly used with ShineSEM-X-RM. If the monitored load is less than 60kW, there is no need to purchase another CT separately.

Parallel System Wiring

WIT 4-15K-HU supports parallel operation of up to 6 units, providing a highly scalable energy solution with a maximum capacity of 90kW. The specific on-grid/off-grid wiring are shown in the following figure:

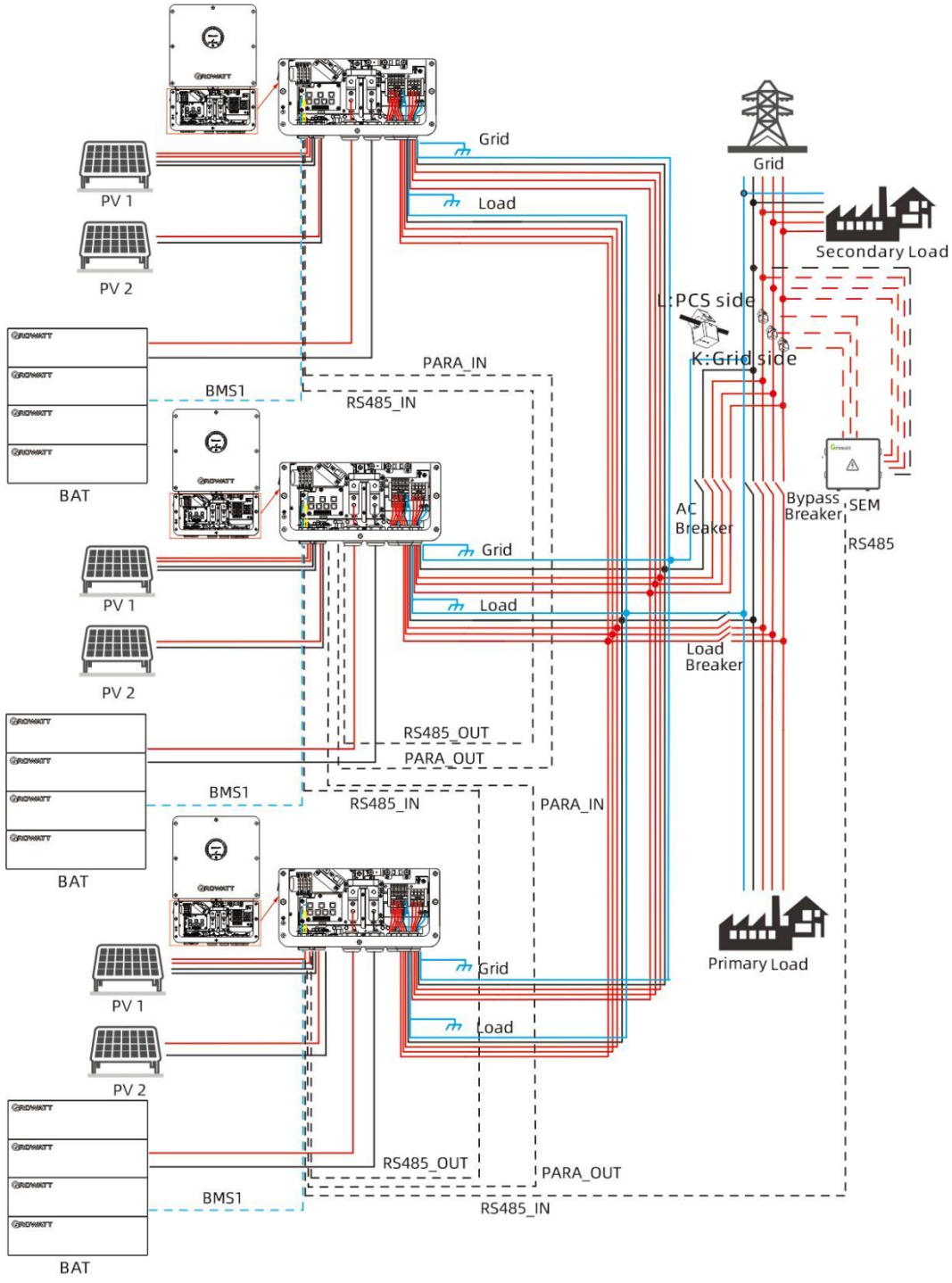


Figure 1: Wiring diagram of the parallel system

Parallel communication cable: PARA-IN of the previous inverter is connected to PARA-OUT of the next inverter, RS485_1 is connected to the RS485_2 of the next inverter, and so on; then the RS485_1 of the first inverter is connected to SEM-X, and the BMS-1 interface is used to access battery communication. Please refer to

the following figure:

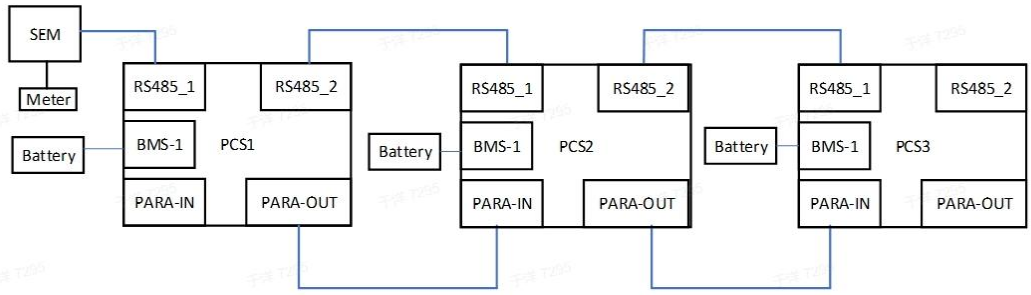


Figure 2: Parallel communication cable wiring diagram

➢ **On-grid Parallel Operation Wiring:**

If only on-grid parallel operation is required, connect all loads to the GRID port of the inverter, then sequentially connect the RS485 and PARA_IN/OUT communication cables. The detailed wiring is shown in the figure below:

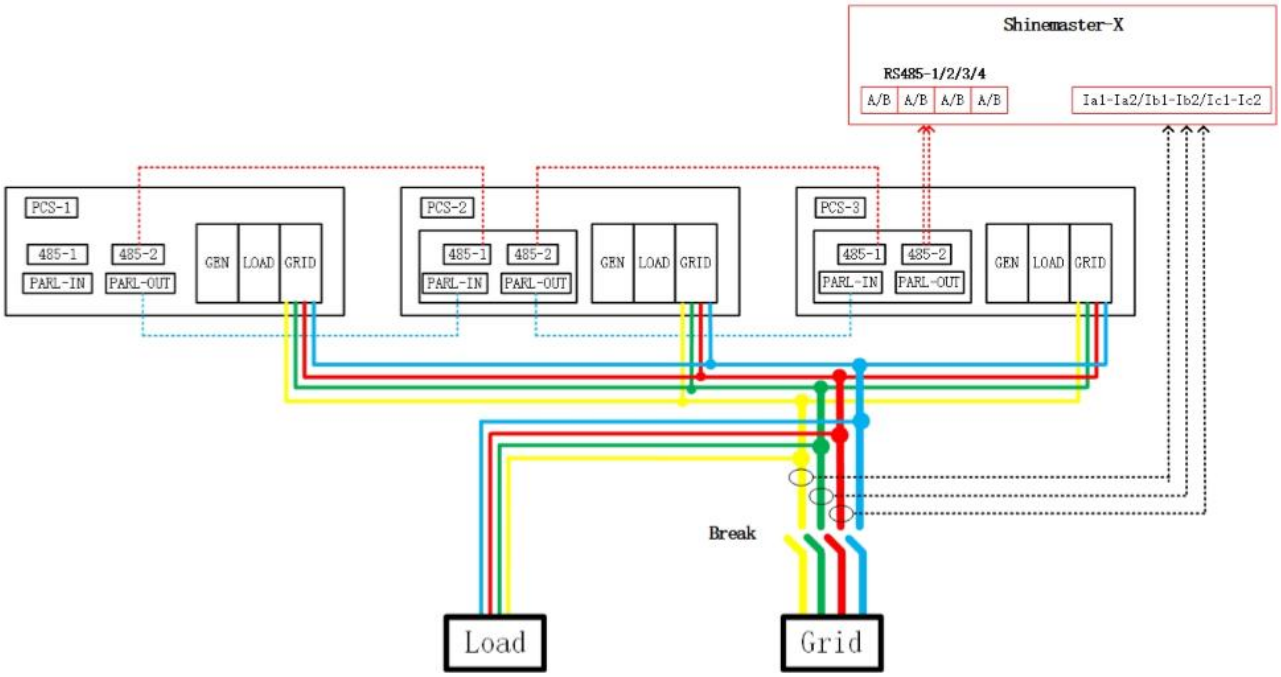


Figure 3: On-grid parallel wiring diagram

➢ **Off-grid Parallel Operation Wiring:**

If only off-grid parallel operation is required, connect the backup load to the

LOAD port of the inverter, then sequentially connect the RS485 and PARA_IN/OUT communication cables. The detailed wiring is shown in the figure below:

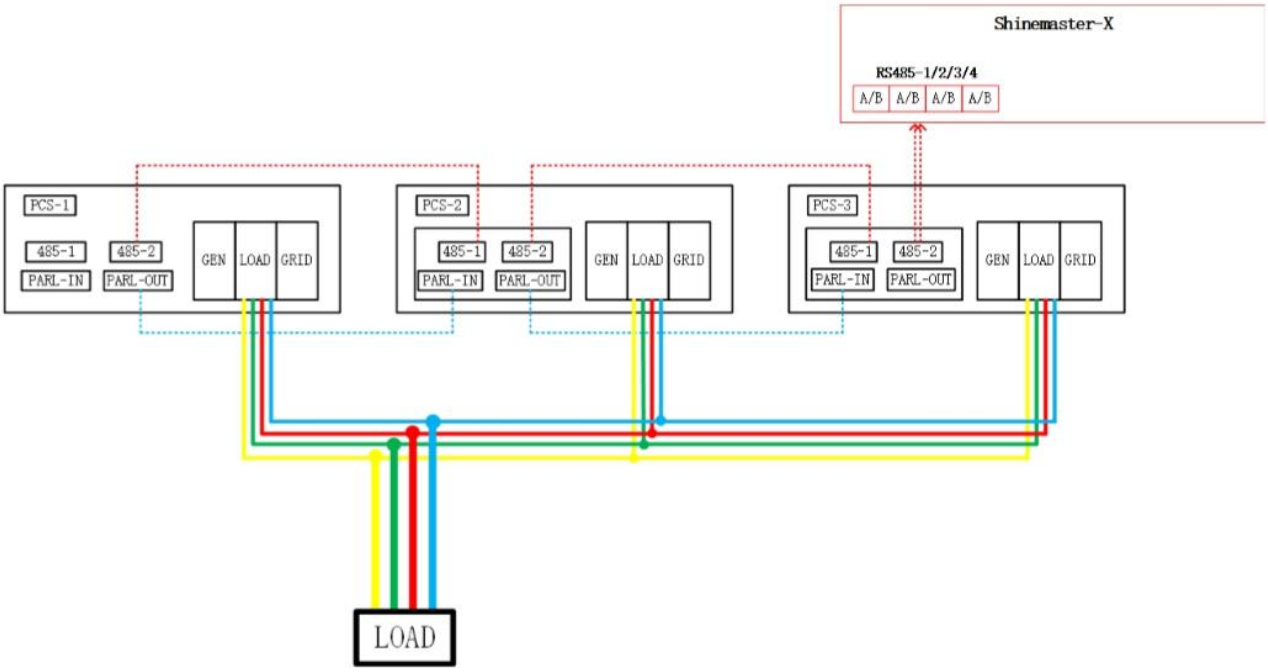


Figure 4: Off-grid parallel wiring diagram

Parallel Configuration

After completing all the wiring, please follow the steps below for configuration:

1. **SEM-X-RM IP Configuration**

The IP configuration for the SEM-X-RM can be static or dynamic. The interfaces after logging in are the same for both methods, so you can choose one method to log in according to the actual situation.

· Static IP configuration

Connect the PC and SEM-X-RM directly through the LAN network cable. The default factory IP address of SEM-X-RM) is: 192.168.0.254. Change the PC's IP to 192.168.0.XXX (the range of XXX is 2 to 253). The SEM-X-RM built-in page can be accessed by typing 192.168.0.254 into your browser and both the initial username

and password are "admin". The computer IP settings are shown in the figure below:

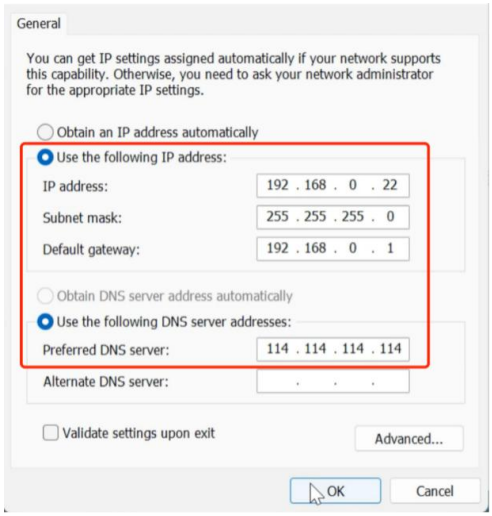


Figure 5: IP address setting

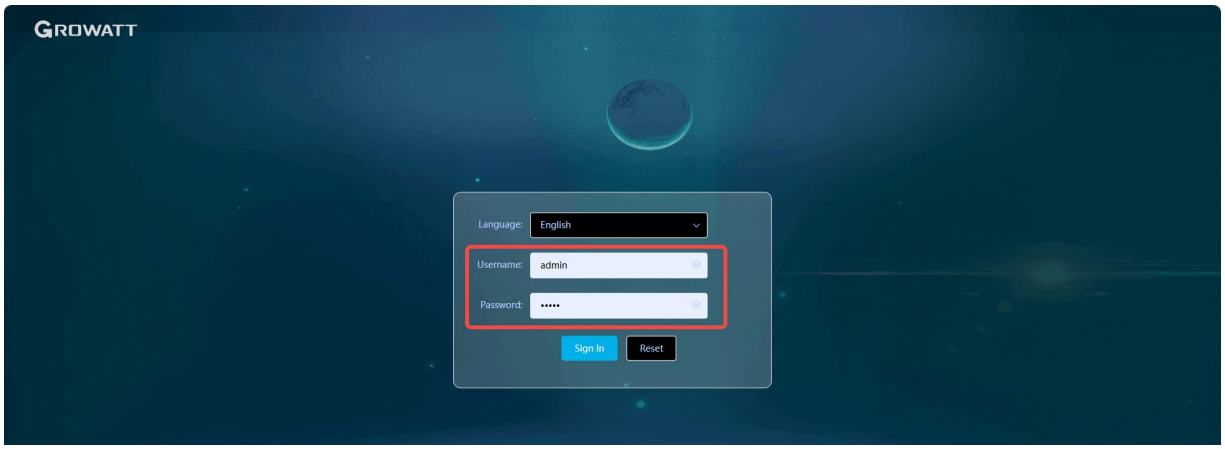


Figure 6: SEM-X-RM build-in page login

· Dynamic IP configuration

Connect PC, SEM-X-RM to the same router so that they are in the same LAN. The router must have DHCP enabled, and SEM-X-RM also needs to have DHCP enabled (this is enabled by factory default).

In Windows, the IP address assigned to the computer by the router can be read in the command terminal. Open the command terminal by pressing WIN+R and type cmd. Type “ipconfig” into the terminal and the IP assigned to the computer by the router will be displayed.

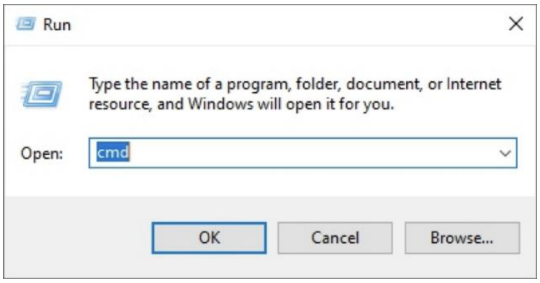


Figure 7: Open the command terminal

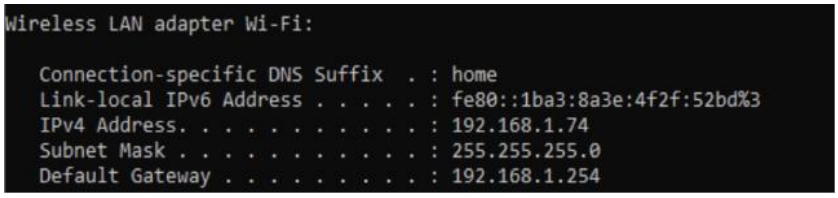


Figure 8: Input ipconfig to display IP address (here it is the IPv4 address)

You can access the SEM-X-RM built-in page by typing 192.168.1.254 into the browser. (The first three addresses need to match the three addresses of the default gateway, and the last one is 254).

2. Inverter Communication Address Settings

Each inverter in the parallel system needs to have an individual and continuous communication address. The communication address of the inverter at the factory is generally set to 1 by default. The address can be set in ShineTools or on the built-in page of SEM-X-RM, as shown in the figure below:

Set the inverter address in Basic Parameters of ShineTools:

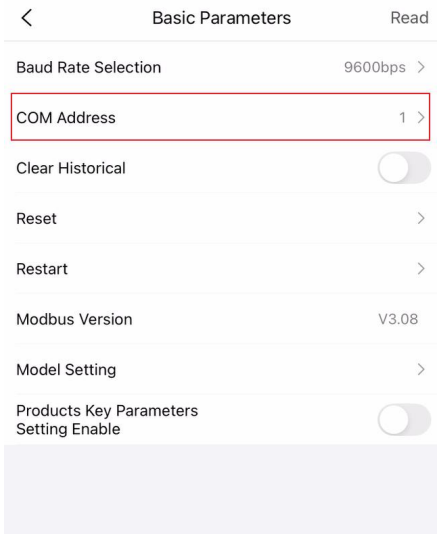


Figure 9: Inverter address setting in ShineTools

Register 30 is the address of the inverter. In built-in page, you can also set the 30 register to corresponding addresses, such as 1, 2, 3:

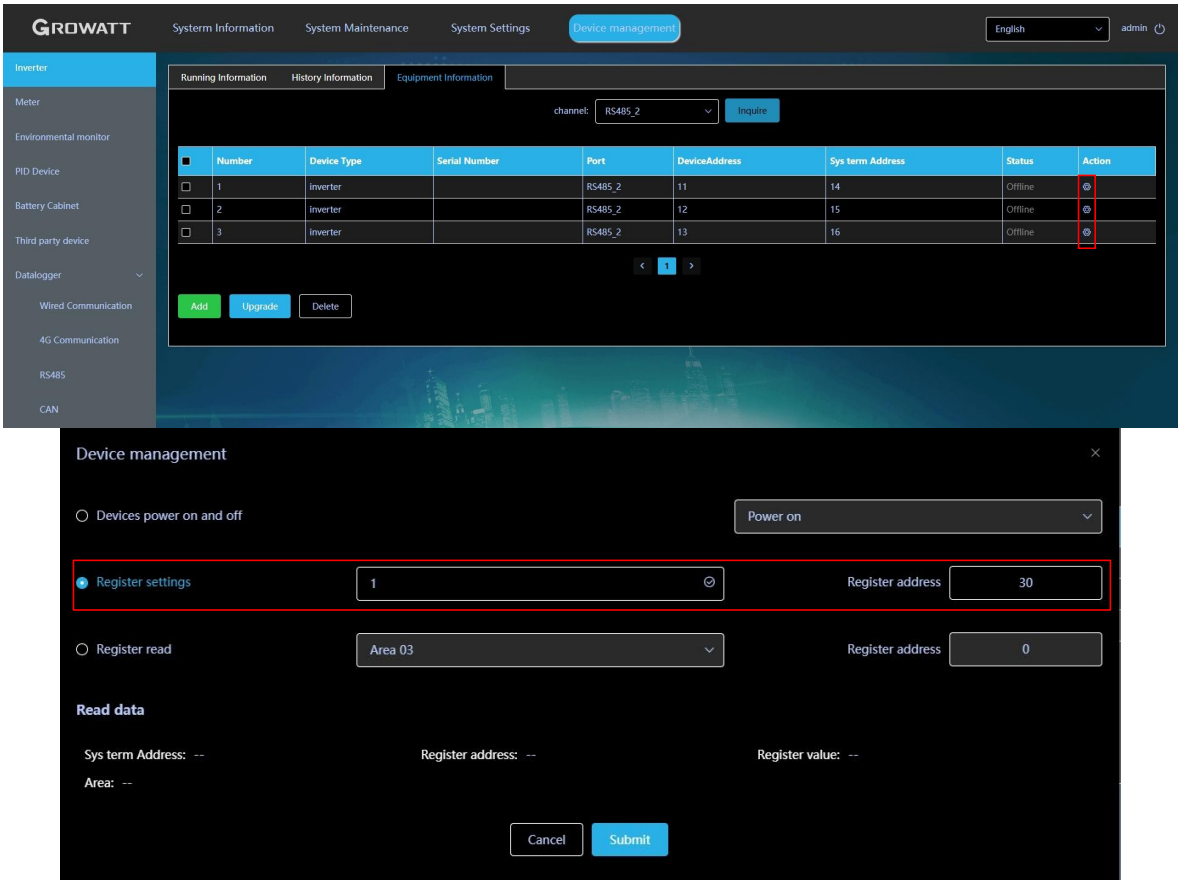


Figure 10: Inverter address setting in built-in page

3. Adding Inverters to SEM-X-RM

SEM-X-RM has a total of 4 channels of 485 communication interfaces. The 485 communication cable of the inverter connected to the RS485 channel of SEM-X-RM must be consistent with the RS485 channel of the added inverter.

Device Management → Inverter → Equipment Information → Add → Channel → Type → Start Address → Number of Addresses → Submit

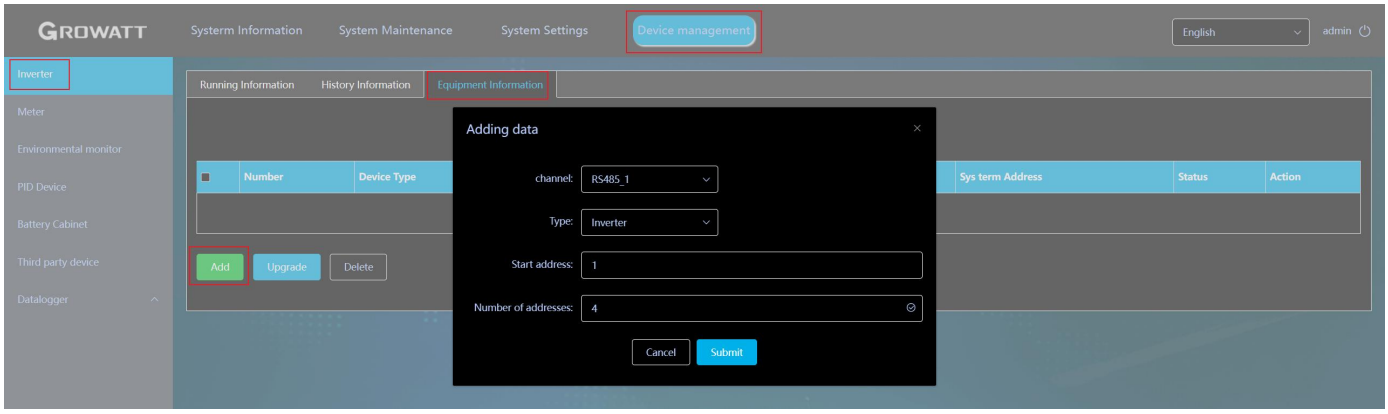


Figure 11: Adding inverters to SEM-X-RM

In the Add data section: The "Start Address" defines the address of the first added device, the “Number of Addresses” is the number of devices added to the selected channel.

Notes: Devices with the same address cannot be connected to the same 485 channel. SEM-X-RM supports adding multiple devices of the same type with consecutive addresses at once. For example, if there are four inverter addresses to be monitored, with addresses 1, 2, 3, and 4 respectively. Then write "1" in the "Start Address" and write "4" in the "Number of Addresses".

Energy Management Settings

➢ On-grid Parallel Settings

During on-grid parallel operation, SEM-X-RM controls the system operation through inverter information and meter data; the inverter does not need to set parameters such as Export limitation and work mode; after SEM-X sets the relevant parameters, the inverter responds according to the scheduling instructions of SEM-X-RM. Please refer to the following for settings:

If the system requires Export limitation, enable the Export limitation function and set parameters such as power limit. Finally, click Submit:

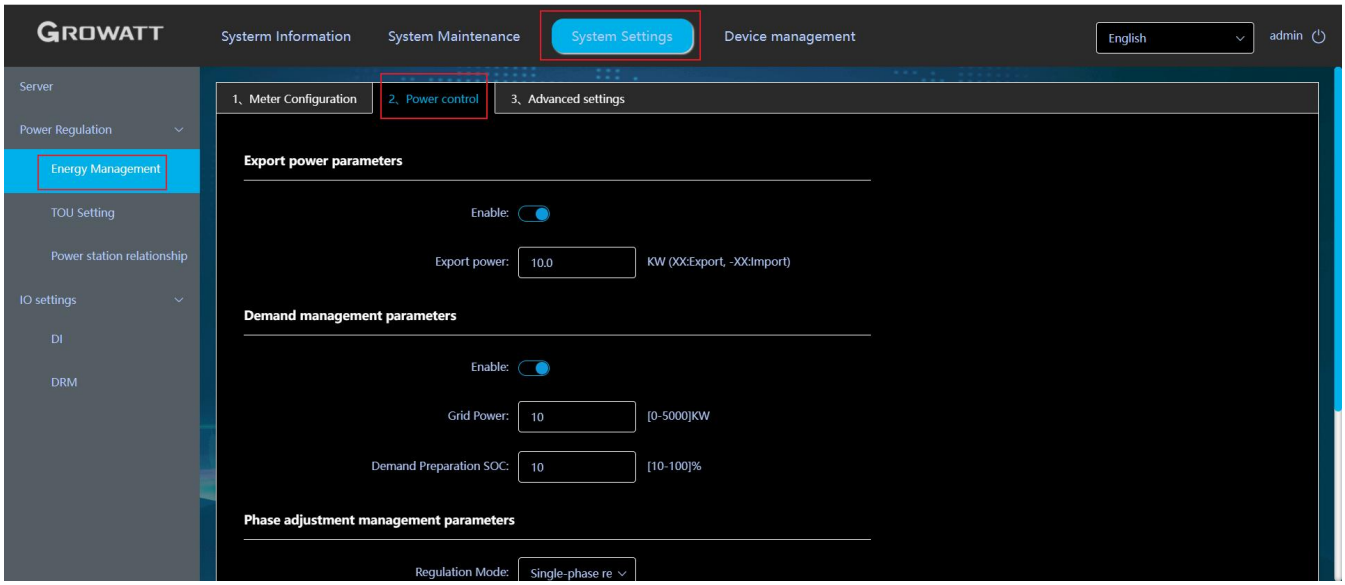


Figure 12: Export limitation setting

If the system does not require Export limitation, select Disable the Export limitation function. Finally, click Submit:

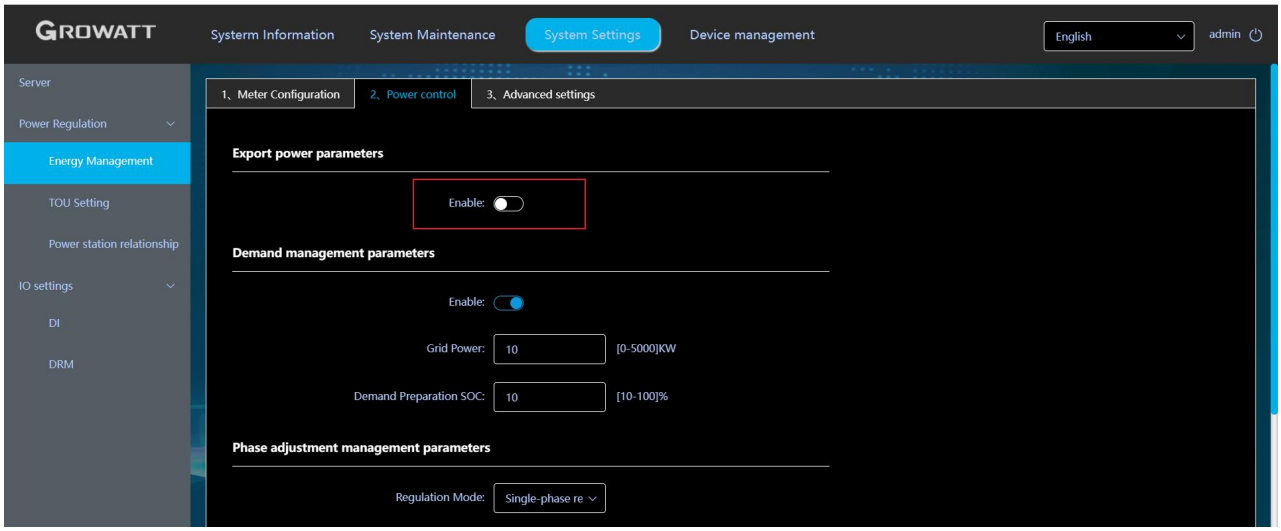


Figure 13: Disable Export limitation

The default mode of the system is Load-first. If other modes are required, you can set other work modes in the TOU:

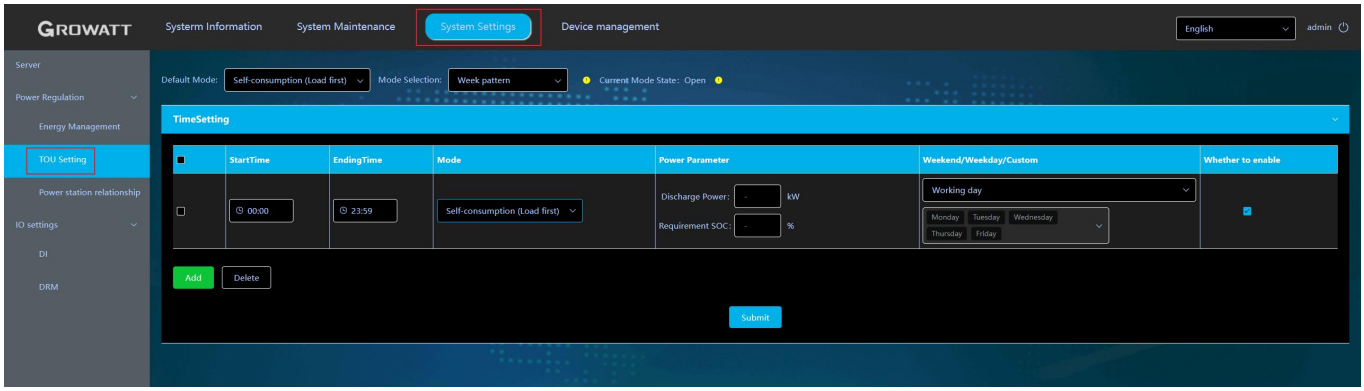


Figure 14: TOU setting

➢ Off-grid Parallel Settings

During off-grid parallel operation, SEM-X-RM only monitors the entire system without issuing control instructions . So relevant parameters such as energy management need to be set on the inverter side.

Before performing off-grid parallel operation, please confirm with Growatt technicians whether the software version is for off-grid parallel operation and if it's the latest. If it is not, we recommend to upgrade to the latest off-grid parallel operation version. After the upgrade is complete, shut down all inverters through OSS/Shinetools. All the above settings will only take effect when all inverters are turned off.

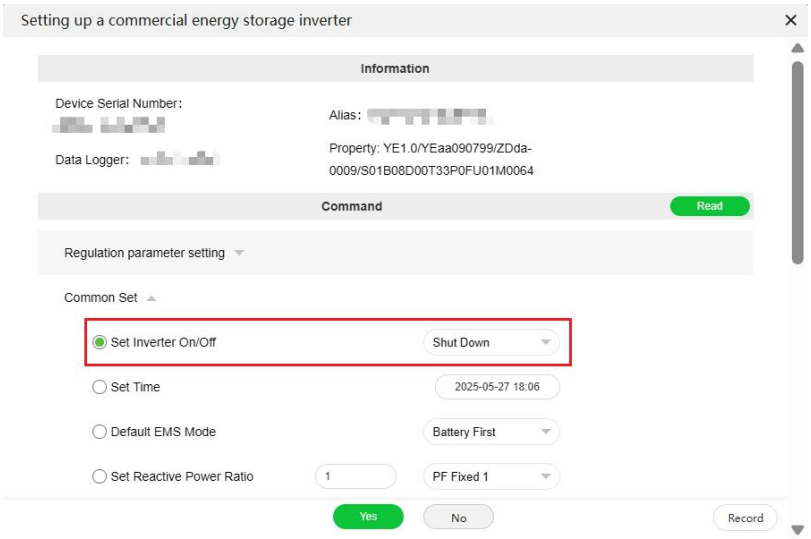


Figure 15: Turn off all the Inverters

(1) Set to enable parallel and the number of parallel units

Enable parallel operation and select the corresponding number of parallel units:

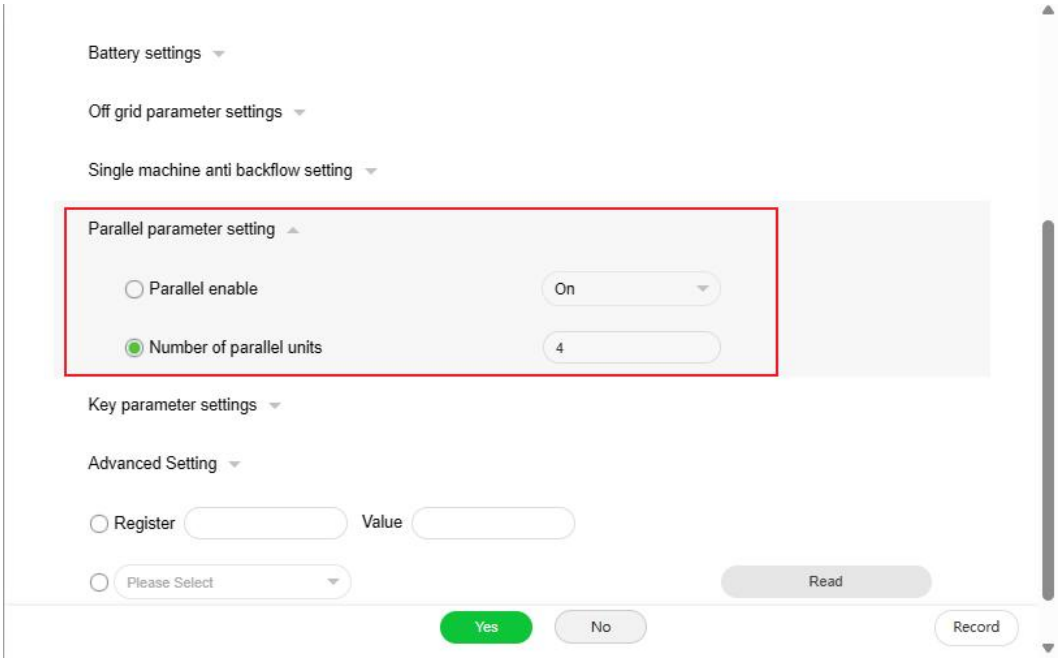


Figure 16: Set parallel operation enable

(2) Set parallel operation enable

Set "Off grid manual/automatic switching" to Automatic, and set "Set Eps On/Off" to On.

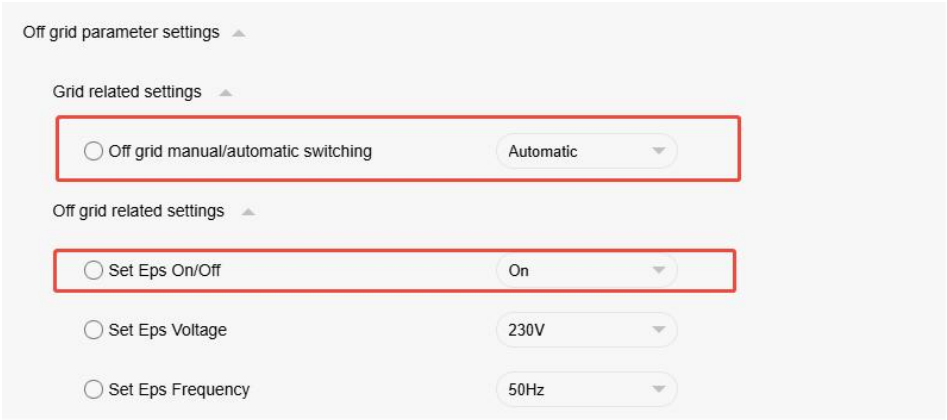


Figure 17: Set up automatic off-grid switching

(3) Turn on all inverters

After the above settings are completed, turn on the inverters one by one and check whether the inverters can operate normally.

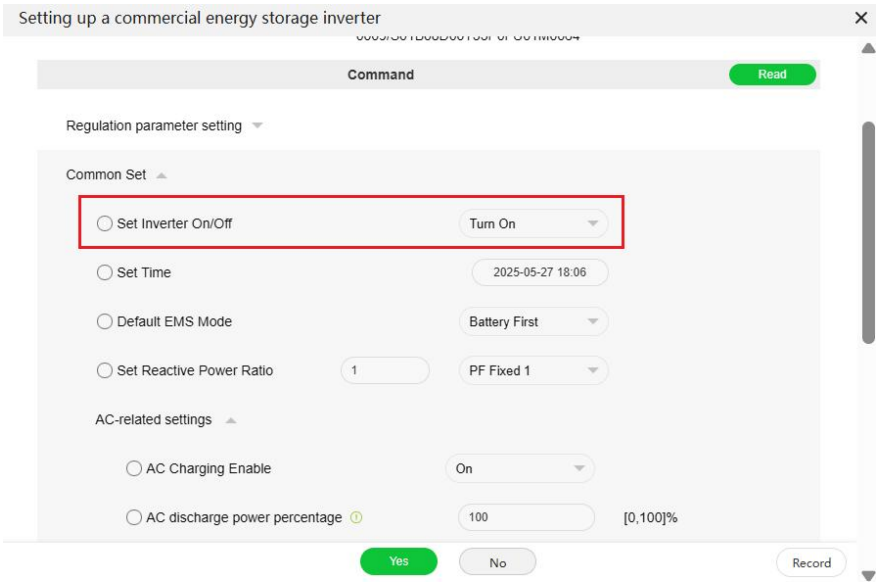


Figure 18: Turn on all the Inverters

Note: All the above settings will only take effect when all inverters are turned off.

➢ Off-grid Backup Capacity

In order to ensure the stability of off-grid backup power, and considering multi-inverter power and load fluctuations, as well as conversion efficiency, it is recommended to leave a certain amount of power redundancy for off-grid parallel operation. You can also consult Growatt's technicians to ensure that there's sufficient battery backup power during off-grid operation.