NESR Battery and Inverter Matching Commissioning Instruction Manual

1.Scope of application

This manual is only applicable to the commissioning and matching of NESR lithium batteries and inverters in household energy storage systems.
Inverter brand:
Solis/Deye/ Growatt /Voltronic/SMA/Studer/Megarevo/Must/Luxpower/Victron.

2.Matching debugging of NESR battery and Inverter

2.1 Commissioning guidance between NESR batteries and Solis inverters

2.1.1 Cable preparation

Figure 1 Solis Inverter (Model: RHI-5K-48ES-5G)

Figure 2 Cables used in parallel

Figure 3 Adapter harness of Can interface

Figure 4 Parallel network cables

2.1.2 Communication Interface Definition

CAN_H	Pin4
CAN_L	Pin5

Figure 5 Definition of CAN Interface on the Inverter Side
(Wiring Harness Adapter for CAN Interface)

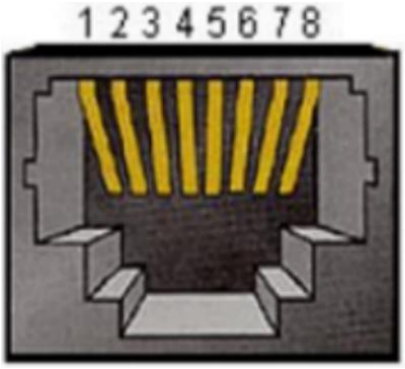


Figure 6 ND1540 BMS- pin number definition of RJ45 connector

Table 1 RJ45 interface definition description-ND1540 BMS

Interface	Directions
RJ45-1 (CAN)	PIN4: CANH
	PIN5: CANL
	PIN1、3、8: NC
	PIN2、6、7: NC
RJ45-2 (485)	PIN2、7: 485-1A
	PIN1、3、8: 485-1B
	PIN4: 485-2A
	PIN5: NC
	PIN6: 485-2B
RJ45-3 (485)	PIN2、7: 485-1A
	PIN1、3、8: 485-1B
	PIN4: 485-2A
	PIN5: NC
	PIN6: 485-2B

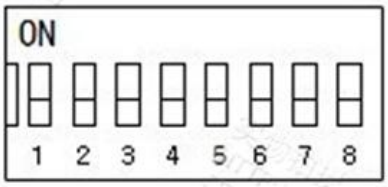


Figure 7 ND1540 BMS- DIP Switch Diagram

DIP switch definition: bit1~bit5 are used to set the slave address or the number of parallel slaves according to the status of the master and slave. bit8 is used to set the master-slave flag. Bit6~bit7 are reserved bits.

Master setting: bit1~bit5 are used to set the number of parallel slaves. bit8 is fixed to

ON. See the host setting table for details.

Slave setting: bit1~bit4 are used for slave address setting, set according to the device sequence, the slave address range is from 1 to 15. bit8 is fixed to OFF.

Table 2 Host settings table

Number of parallel batteries	DIP switch position					
•	#1	#2	#3	#4•	#5•	#8
2	OFF	ON	OFF	OFF	OFF	ON
3	ON	ON	OFF	OFF	OFF	ON
4	OFF	OFF	ON	OFF	OFF	ON
5	ON	OFF	ON	OFF	OFF	ON
6	OFF	ON	ON	OFF	OFF	ON
7	ON	ON	ON	OFF	OFF	ON
8	OFF	OFF	OFF	ON	OFF	ON
9	ON	OFF	OFF	ON	OFF	ON
10	OFF	ON	OFF	ON	OFF	ON
11	ON	ON	OFF	ON	OFF	ON
12	OFF	OFF	ON	ON	OFF	ON
13	ON	OFF	ON	ON	OFF	ON
14	OFF	ON	ON	ON	OFF	ON
15	ON	ON	ON	ON	OFF	ON
16	OFF	OFF	OFF	OFF	ON	ON

Table 3 Slave setting table

Address	DIP switch position			
•	#1	#2•	#3•	#4•
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON

11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

2.1.3Debugging methods and steps

Taking three groups of NESR batteries in parallel as an example, the matching verification of Solis inverter and ND1540 BMS is described in detail. The steps to build the test platform are as follows:

Step1:Establish a parallel connection relationship between batteries: use parallel cables to connect P+ and P+, P- and P- of 3 groups of NESR100 lithium iron phosphate batteries; use 2 network cables to connect the 485 ports of the three groups of batteries to each other connect. As shown in Figure 8.

Figure 8 Schematic diagram of parallel connection

Step2:Set the DIP address of the battery master and slave. The DIP addresses of the master and slave are shown in Figure 9 to Figure 11 respectively.

Figure 9 Schematic diagram of host dialing address

Figure 10 Slave DIP Address 1

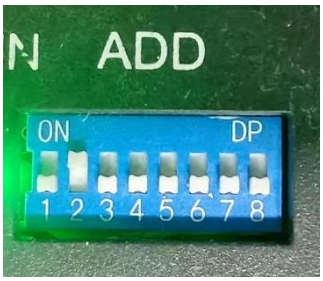


Figure 11 Slave DIP Address 2

Step3:Establish the connection relationship between the inverter and the battery: 1) Connect the CAN interface of the inverter end with the CAN interface of the host battery using the CAN wiring harness, 2) Connect the BAT+ interface of the inverter to the P+ of the host battery; 3) Connect the BAT- interface of the inverter to the P- of the host battery.

The connection between the inverter and the battery is shown in Figure 12 below:

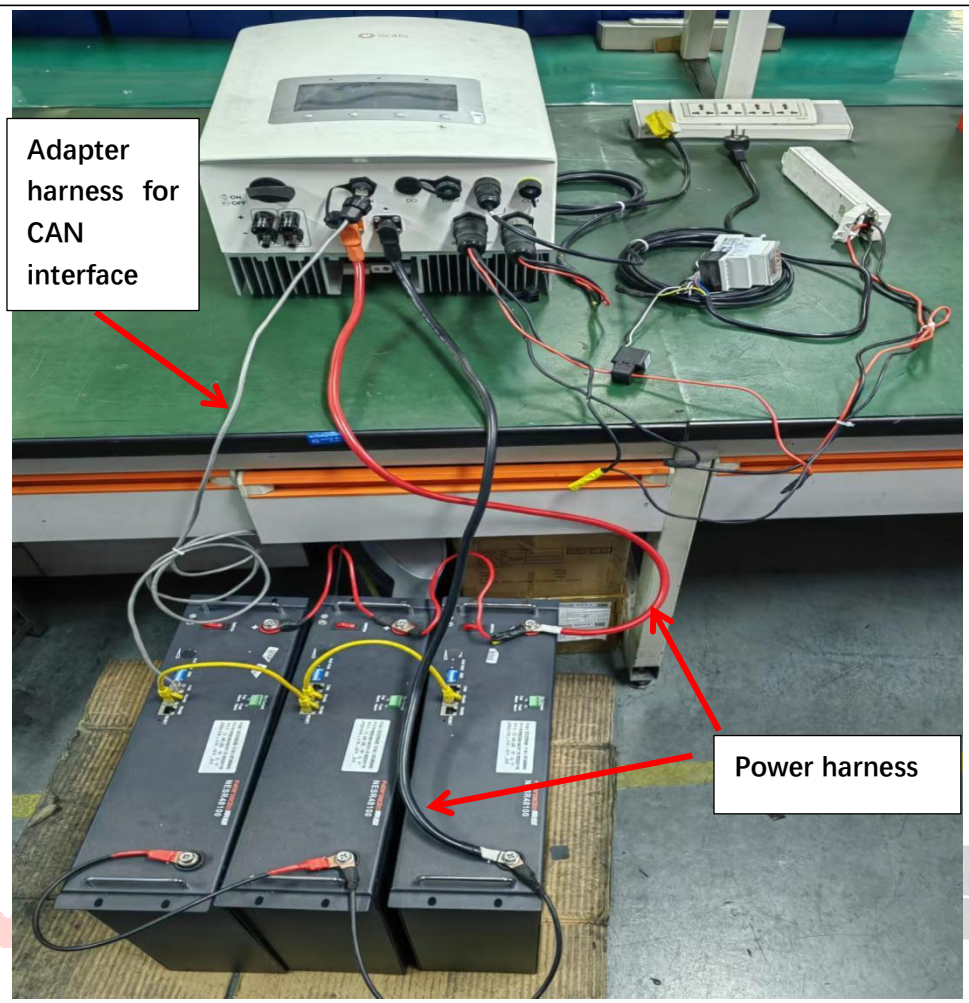


Figure 12 Connection diagram of battery and inverter

Step4:Establish the connection between the inverter and the grid: connect the AC-Grid interface and AC-BackUp interface of the inverter to the external 220V AC power respectively.

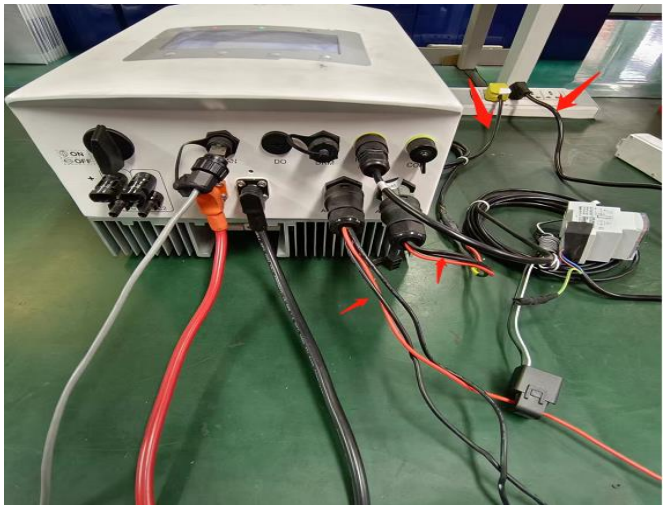


Figure 13 Schematic diagram of the connection between the inverter and the grid

Step5:First turn on the switch of the inverter, put the switch of the inverter in the ON position; then turn on the rocker switch on the front panel of the battery case in turn.

Figure 14 Switch on the inverter

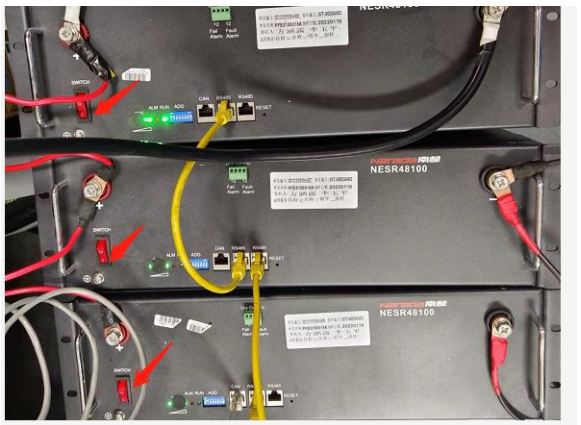


Figure 15 Turn on the rocker switches of the 3 groups of battery case panels in turn

Step 6:Observe whether the display of the monitoring page of the inverter is normal.

The schematic diagram of the normal display is shown in Figure 16. If the monitoring interface prompts CAN ok and RS485 connection is OK, click the ENTER button to enter the main menu interface.

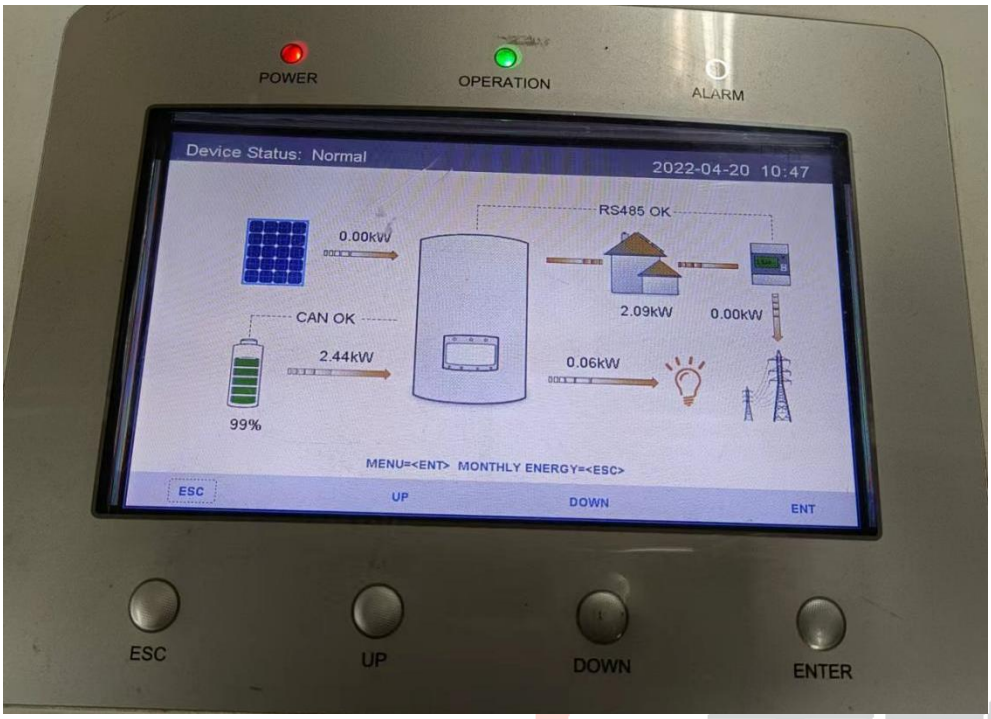


Figure16 Inverter monitoring shows normal interface

Step7:First select the main menu→Information interface, click ENTER and turn to the 3/4 page to confirm that the battery BMS information is displayed normally.

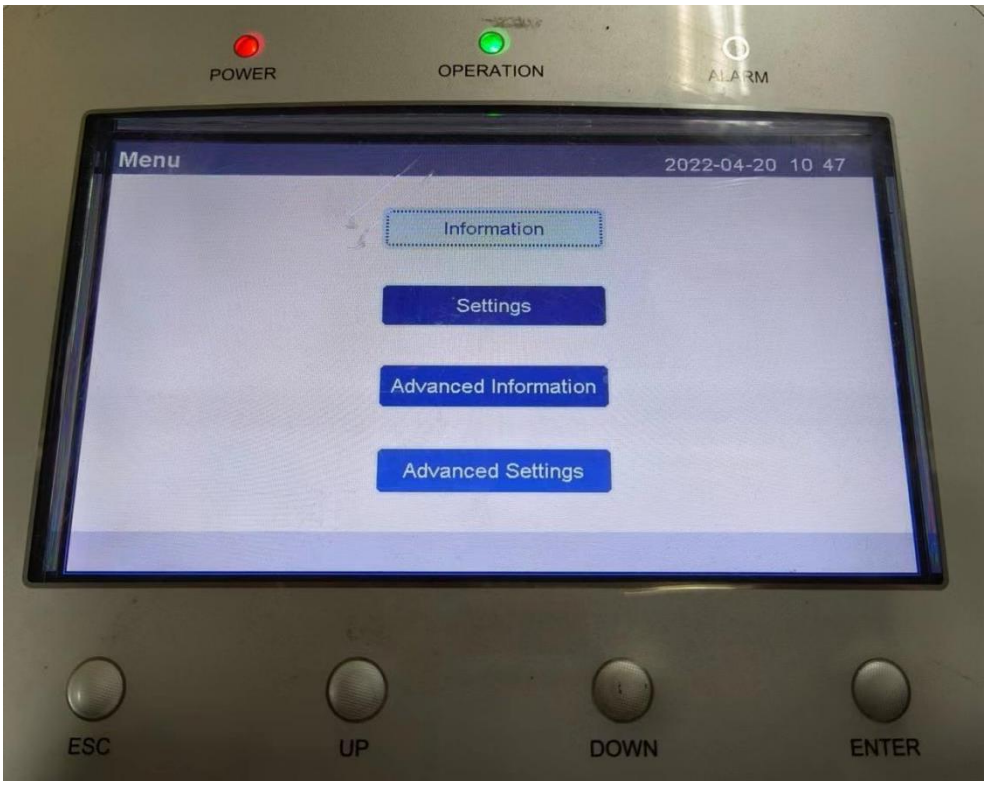


Figure 17 Main menu interface

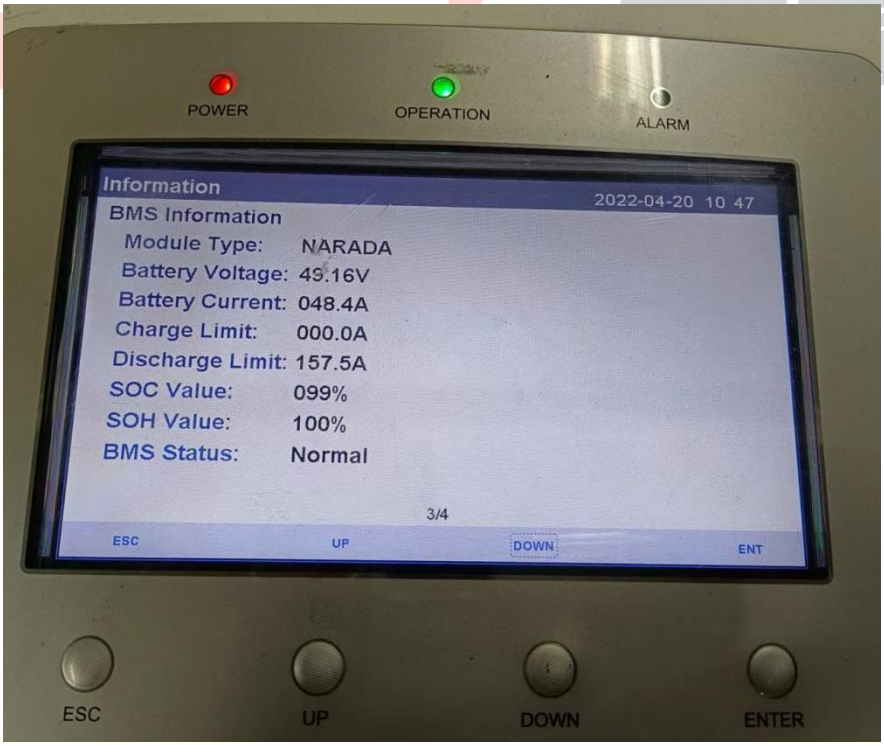


Figure 18 BMS information display normal interface

Step8:Select Main Menu→Advanced information→Alarm Message to view battery fault alarm information.

Figure 19 Select Advanced information and click to enter

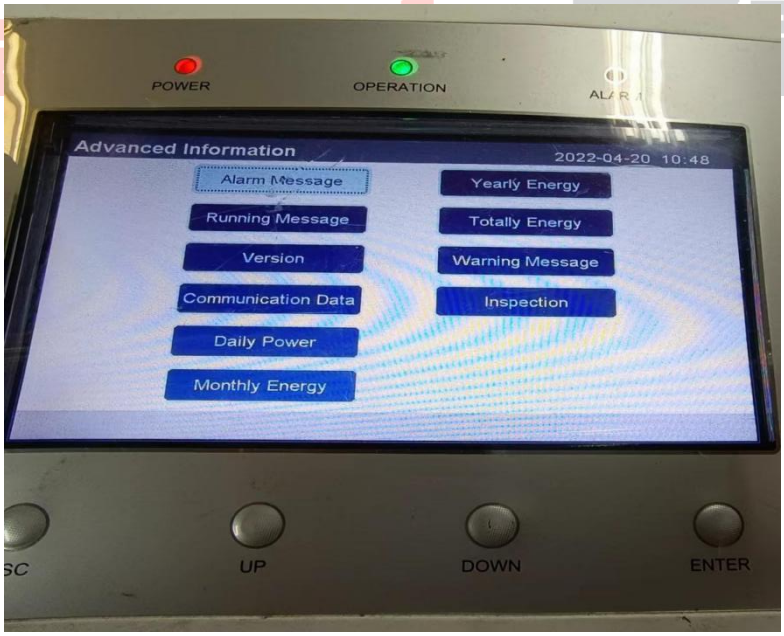


Figure 20 Select Alarm Message and click enter

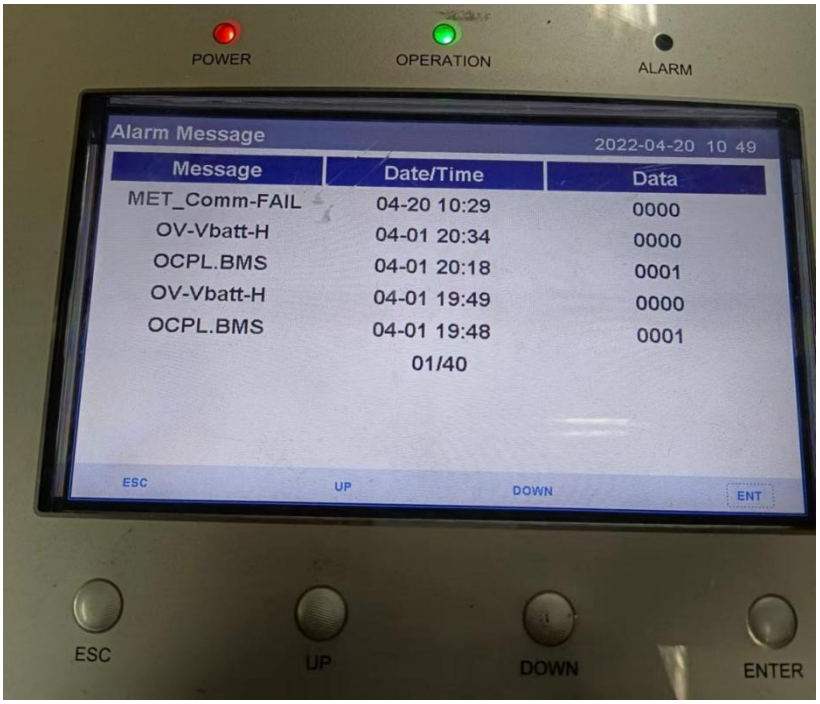


Figure 21 Viewing battery fault alarm information

Step9:The path to enter the energy storage system of the inverter: Menu→Advanced Settings→Enter the password (press twice for down and once for up)→Storage Energy Set.

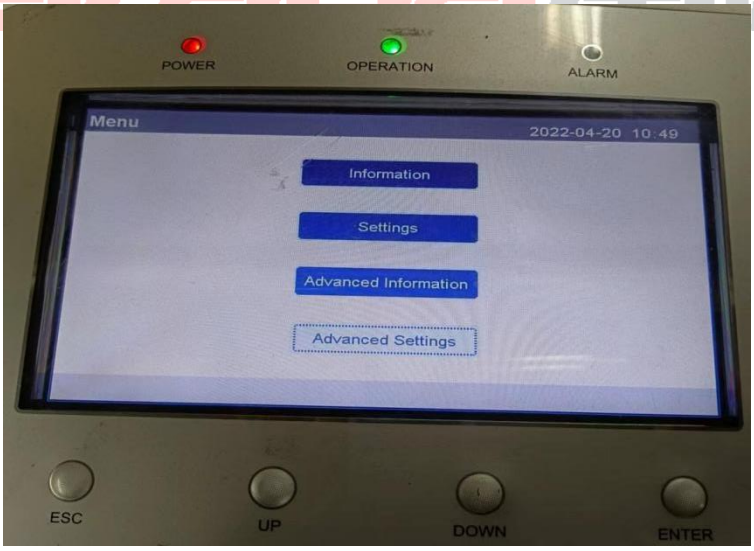


Figure 22 Select Advanced Settings to enter

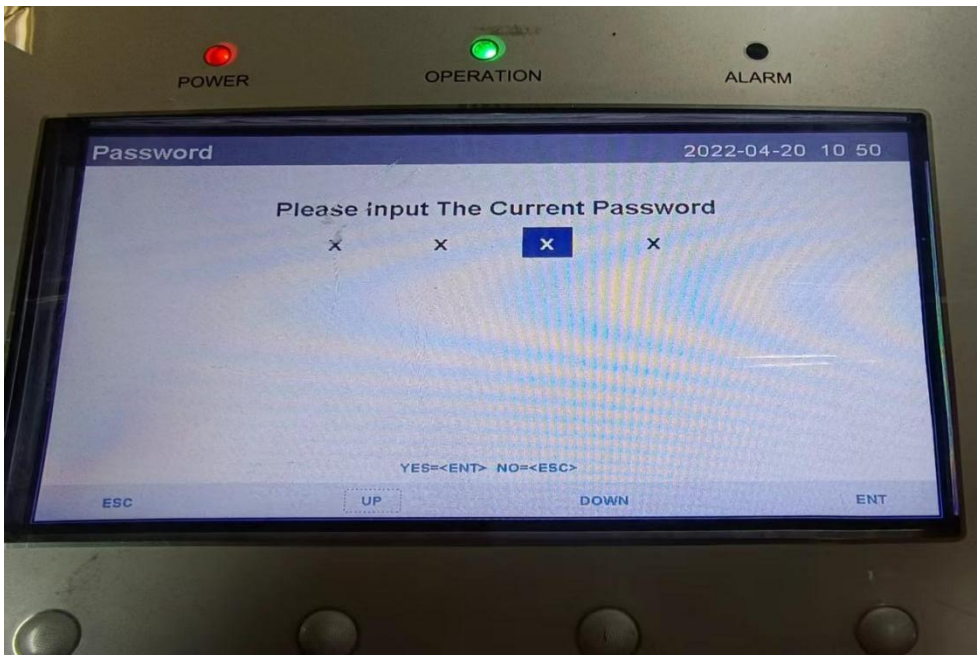


Figure 23 Password input interface

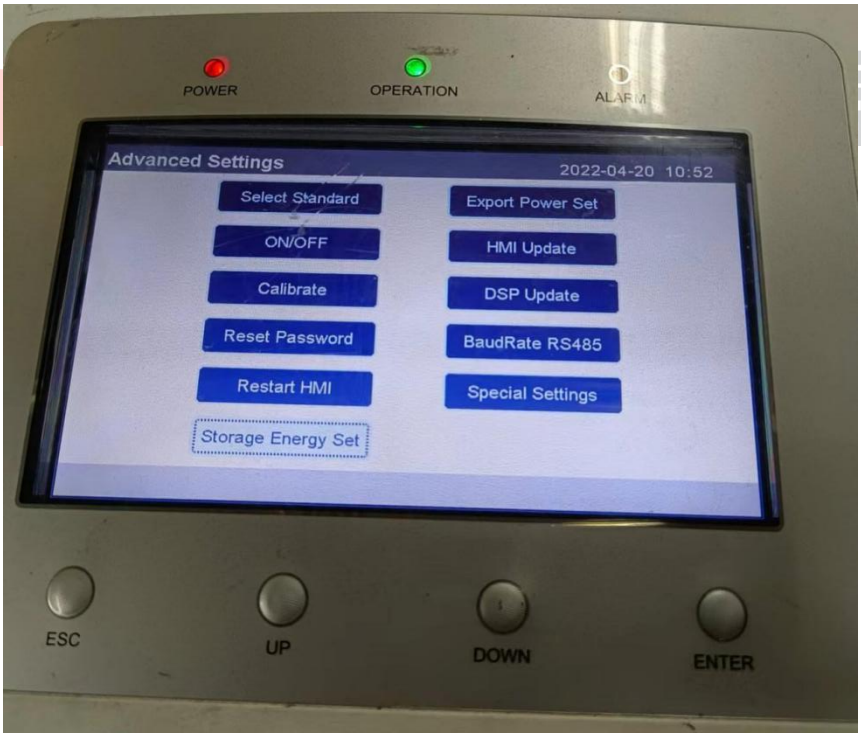


Figure 24 Select Storage Energy Set to enter

Step10:Storage Energy Set→Baterry select ， The battery manufacturer is set to

NARADA.

Figure 25 Battery manufacturers choose NARADA

Step11:According to the following path: Storage Energy Set→Storage Mode select→Self use→Time of use, the charging and discharging time of the inverter can be set separately according to the needs of customers.

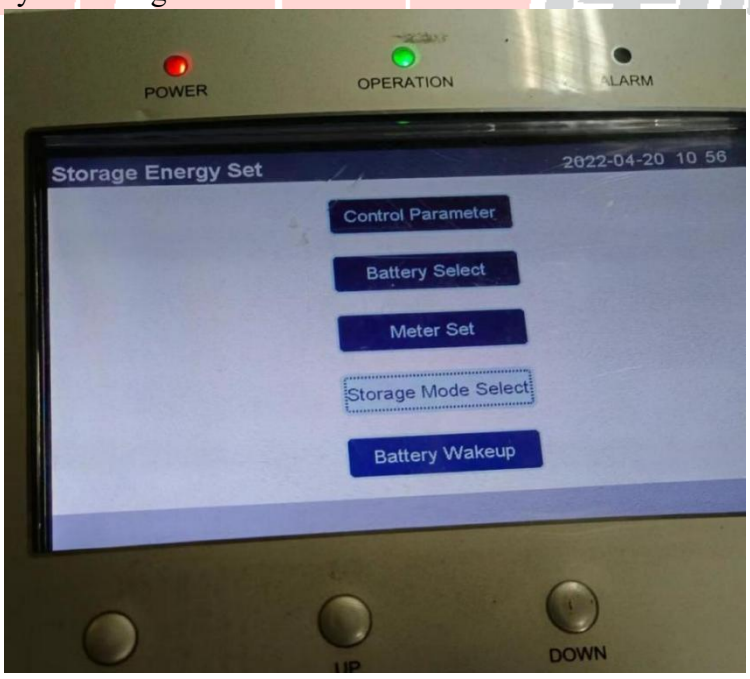


Figure 26 Select“Storage Mode select ” to enter

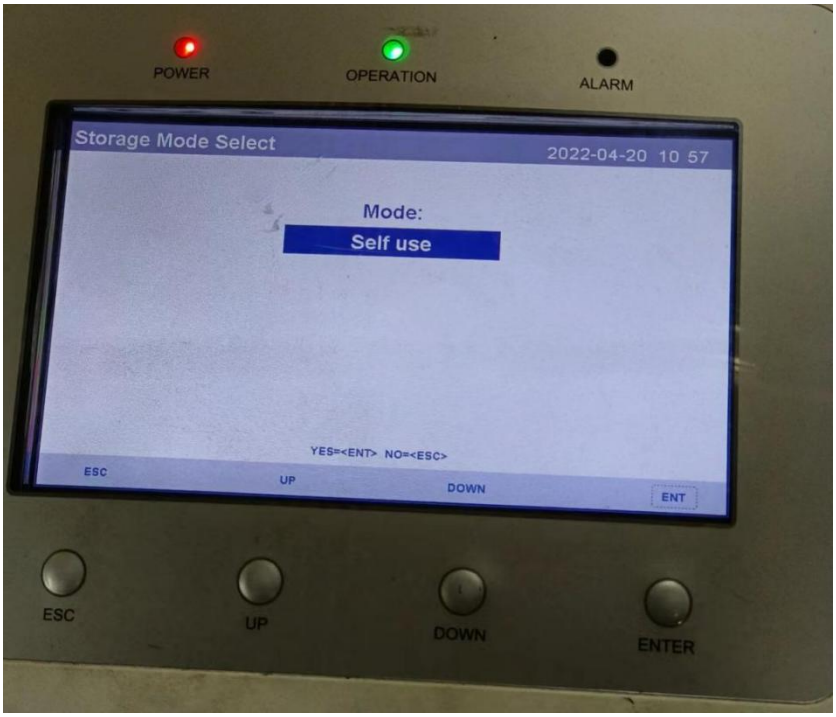


Figure 27 Select Self use to enter

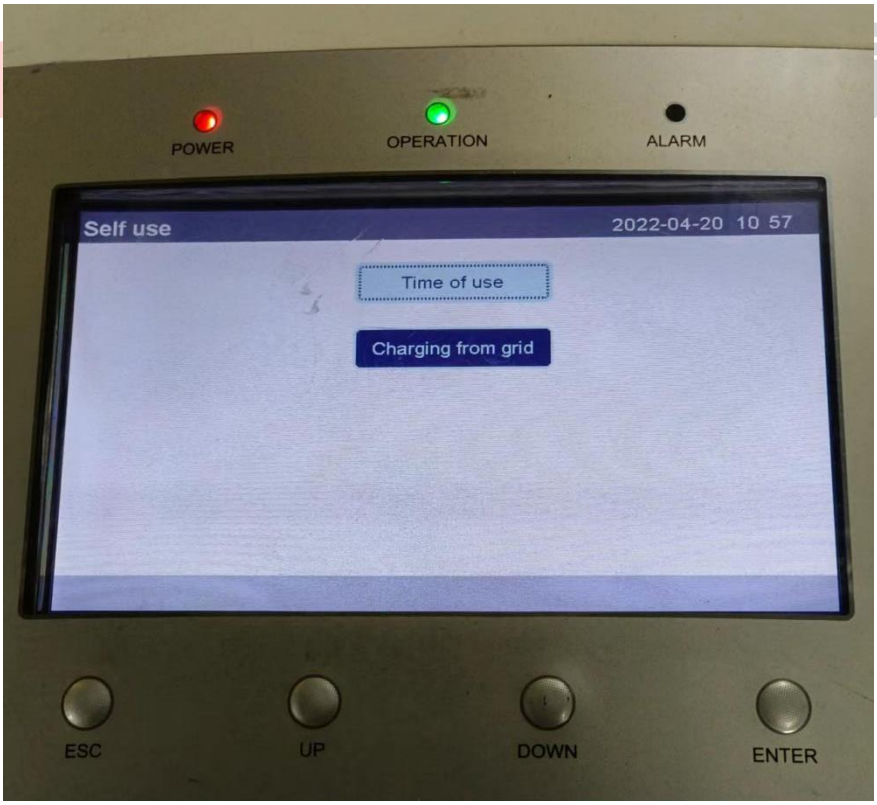


Figure 28 After selecting Time of use, click ENTER

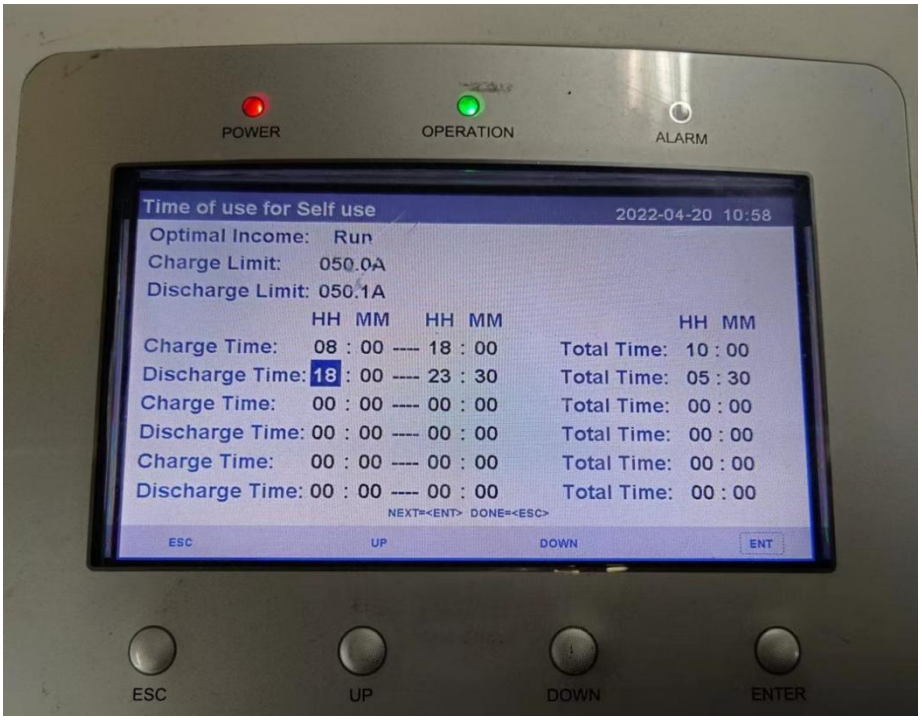


Figure 29 The interface where the inverter can set the charging and discharging time

2.1.4 Precautions

1. For the setting of the master and slave dialing address, please set the dialing address according to the requirements of this manual.
2. For the definition of the communication interface, it is necessary to connect according to the correct RJ485 and CAN interface definition in this manual, so that the communication between the battery and the inverter can be normal.
3. Please select NARADA for battery manufacturer information.
4. Note that after selecting the self-generating and self-use mode, it is convenient for customers to customize the time for the inverter to charge/discharge the battery.
5. Due to the limitation of the inverter itself, the maximum output charge and discharge current is not allowed to exceed 100A. The maximum output current of the NESR battery is not allowed to exceed 100A.

2.2 Commissioning Guidelines for NESR Batteries and Deye Inverters

2.2.1 Cable preparation

Figure 30 DEYE inverter
(Model: SUN-5K-SG03LP1-EU)

Figure 31 Cables used in parallel

Figure 32 Adapter wiring of CAN interface

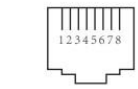
Figure 33 Parallel wiring

2.2.2 Communication Interface Definition

10. Appendix I

Definition of RJ45 Port Pin for BMS

No.	RS485 Pin	CAN Pin
1	RS485B	--
2	RS485A	GND
3	GND	--
4		CANH
5		CANL
6	GND	--
7	RS485A	--
8	RS485B	--



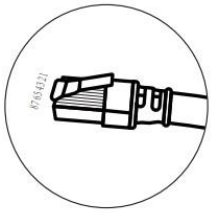


Figure 34 Definition of CAN interface on inverter side

2.2.3 Debugging methods and steps

Taking 3 groups of NESR batteries in parallel as an example, the matching verification of DEYE inverter and ND1540 BMS is described in detail. The steps to build the test platform are as follows:

Step1：Establish the parallel connection relationship between the battery and the battery: the method steps are detailed in chapter 2.1.3 STEP1.

Step2： Set the DIP address of the battery master and slave: The method steps are detailed in chapter 2.1.3 STEP2.

Step3:Establish the connection relationship between the inverter and the battery: 1) Connect the CAN interface of the inverter end to the CAN interface of the host battery

using the CAN harness adapter, 2) Connect the positive port of the inverter end to the P+ of the host battery; 3) Connect the negative terminal of the inverter side to the P- terminal of the host battery.

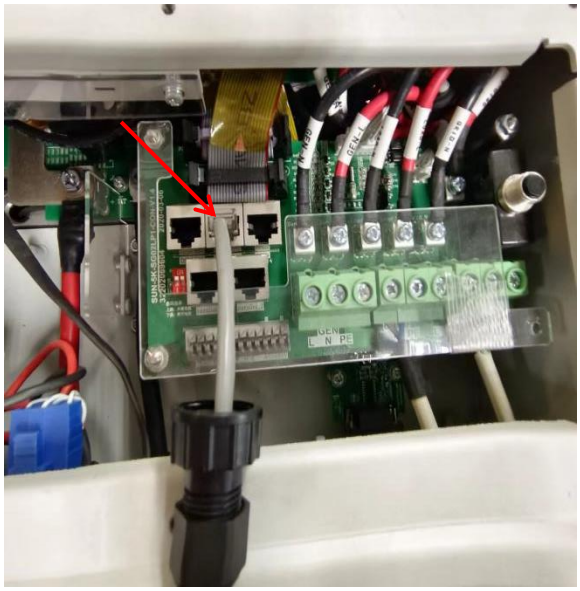


Figure 35 CAN interface on inverter side

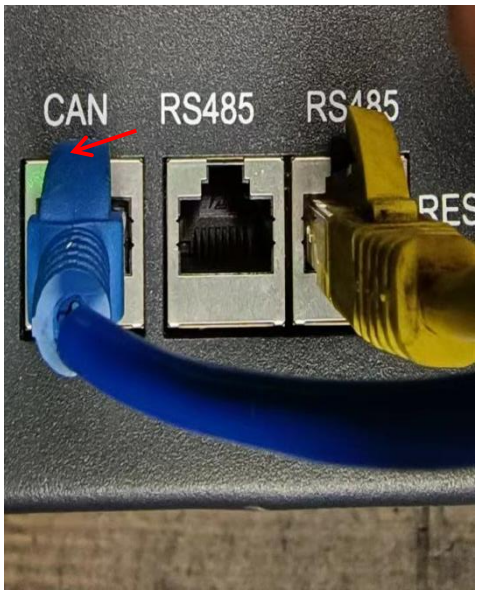


Figure 36 Host battery CAN interface

The connection between the inverter and the battery is shown in Figure 37 below:

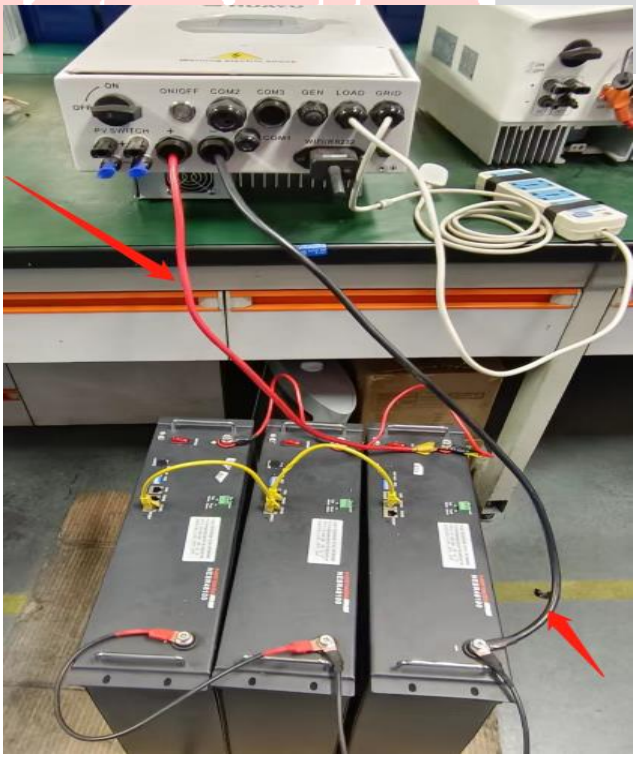


Figure 37 Schematic diagram of the connection between the battery and the inverter

Step4：Establish the connection between the inverter and the grid: connect the GRID interface of the inverter to the external 220V AC power.

Step5：Power on.

Power-on action: DC Switch ON → Press the Power on/off button → press the rocker switch on the front panel of the battery case in turn.

Figure 38 Schematic diagram of startup action

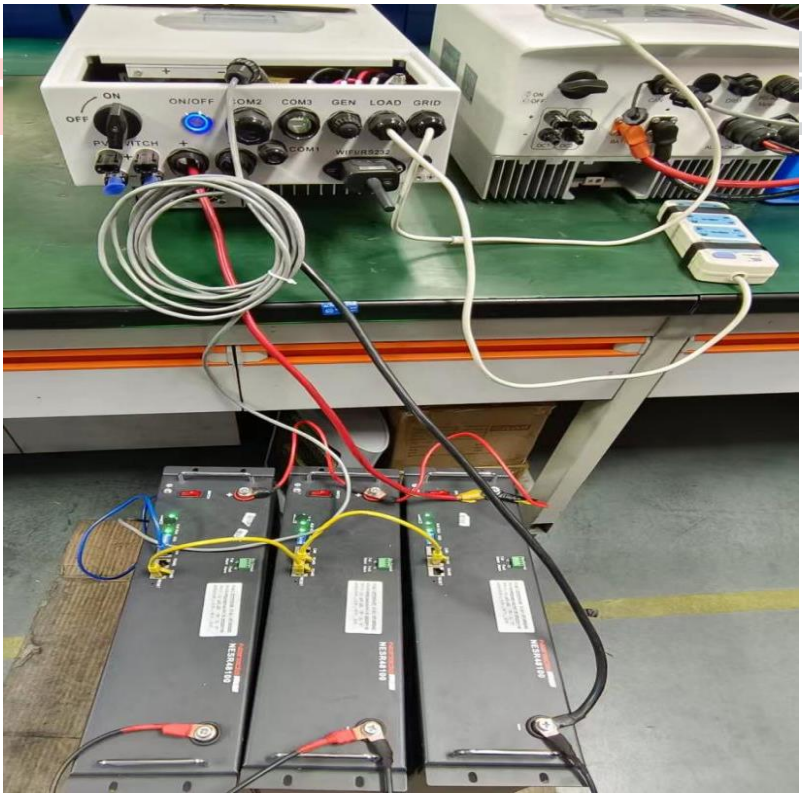


Figure 39 Schematic diagram of the overall system startup

Step6: Establish the connection between the inverter and the load. Connect an external load to the LOAD port on the inverter side.
The overall test platform construction is shown in Figure 40.

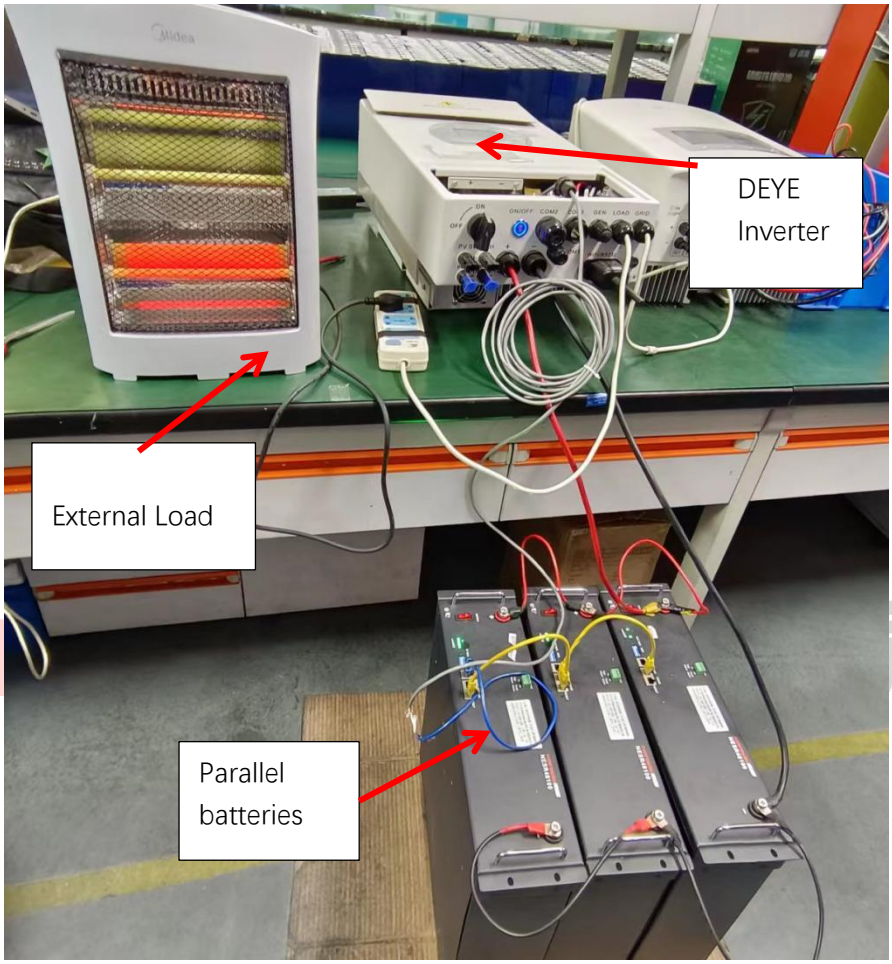


Figure 40 Construction diagram of the overall test system

Step7:Observe whether the display of the monitoring interface of the inverter is normal, as shown in Figure 41.

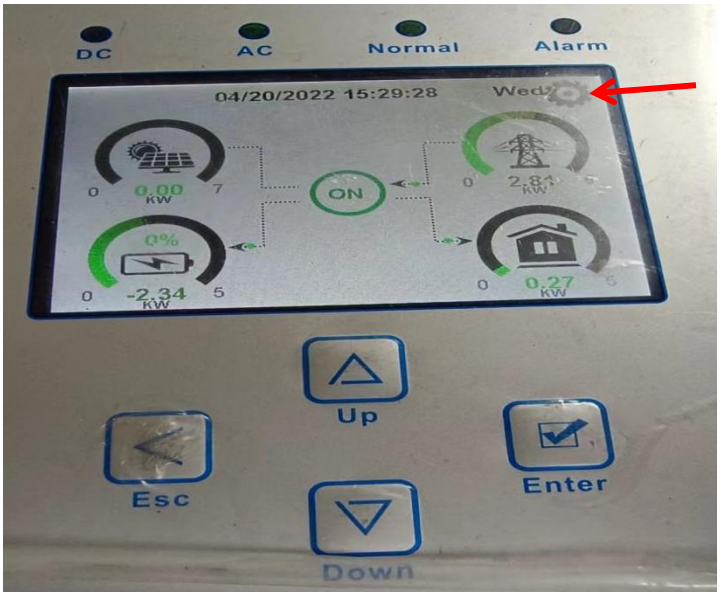


Figure 41 Schematic diagram of inverter display normal

Step8:Click the gear-shaped icon on the monitoring interface to enter the setting interface of the inverter.

Figure 42 Inverter setting interface information

Step9:In the setting interface, select load priority. System Setup→ System Work Mode→Load First, then click √ to complete the setup.

Figure 43 Inverter Setup - Load Priority

Step10：The setting interface, System Setup→Battery Setting, requires to set the battery mode to lithium battery mode, and needs to set the maximum charging current and the maximum discharging current. Note that the maximum charge/discharge current setting cannot exceed 100A. After setting the parameters, click √ finish to confirm.

Figure 44 Inverter Settings - Lithium Battery Mode

Step11: The setting interface, System Setup→Battery Setting, can be set by the customer to set the starting and ending SOC values for charging the battery. If the DEYE inverter matches the LIDE BMS, set the lithium battery mode to 00.

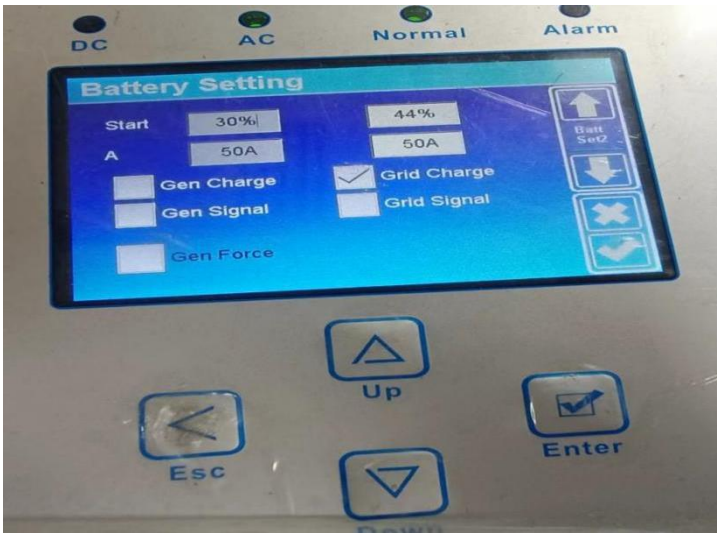


Figure 45 Inverter - set charging start and stop SOC

Figure 46 Set the lithium battery mode to 00

Step12: View battery information. Click the battery Log icon shown in Figure 47 to view battery related information from the inverter monitoring interface. Finally, click the Li-BMS icon in the lower right corner to view the total battery voltage, charge and discharge current, SOC and other information.

Figure 47 Click the battery icon

Figure 48 Click the Li-BMS icon

Figure 49 Viewing battery information

2.2.4 Notes on debugging

1.For the setting of the DIP address of the master and slave, please set according to the

requirements of this manual.

2.For the definition of the communication interface, it is necessary to connect according to the correct RJ485 and CAN interface definition in this manual, so that the communication between the battery and the inverter can be normal.

3.Note about parameters: the battery mode selection should be lithium battery mode, and the lithium battery mode requirement should be set to 00.

The battery capacity needs to be correctly written into the parallel capacity value. Due to the limitation of the inverter itself, the actual maximum charge and discharge current parameters are not allowed to exceed 120A, and the maximum output current of the NESR battery is not allowed to exceed 100A.

2.3 Commissioning guidance between NESR batteries and Growatt inverters

2.3.1 Prepare the cable

Figure 50 Growatt Inverter
(Model: SPF5000ES)

Figure 51 Parallel cable

Figure 52 CAN wiring harness

Figure 53 Parallel network cables

2.3.2 Communication Interface Definition

Pin number	RS485 port	CAN port
1	RS485B	--
2	RS485A	--
3	--	--
4	--	CANH
5	--	CANL
6	--	--
7	--	--
8	--	--

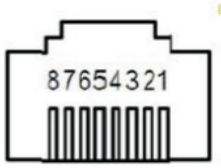


Figure 54 Definition of CAN interface on inverter side

2.3.3 Debugging methods and steps

Taking 4 sets of NESR batteries in parallel as an example, the matching verification of the Growatt inverter and the ND1540 BMS is described in detail. The steps to build the test platform are as follows:

1) Establish a parallel connection relationship between batteries: use parallel cables to connect 4 groups of NESR100 lithium iron phosphate batteries P+ and P+, P- and P-; use 3 network cables to connect the 485 communication ports of the 4 groups of batteries connect. As shown in Figure 55.

Figure 55 Schematic diagram of 4 groups of batteries in parallel

2) Set the dial address of the battery host and slave: The dial addresses of the host and the slave are shown in Figure 56 to Figure 59 respectively.

Figure 56 DIP address of the host

Figure 57 Slave address 1

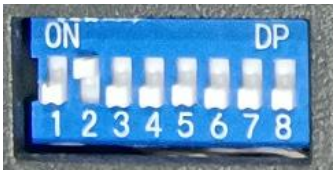


Figure 58 Slave address 2

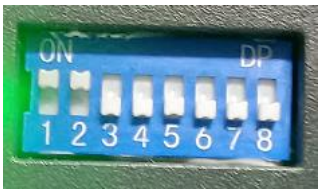


Figure 59 Slave address 3

2）Establish the connection between the inverter and the battery：① Use the CAN harness adapter to connect the CAN interface of the inverter side with the CAN interface of the host battery，② Connect the positive port of the inverter side to the P+ of the host battery,③ Connect the negative terminal of the inverter end to the P- terminal of the host battery.

Figure 60 Schematic diagram of the connection between the battery and the inverter

4) Establish the connection between the inverter and the grid: connect the AC input interface of the inverter to an external 220V AC power.

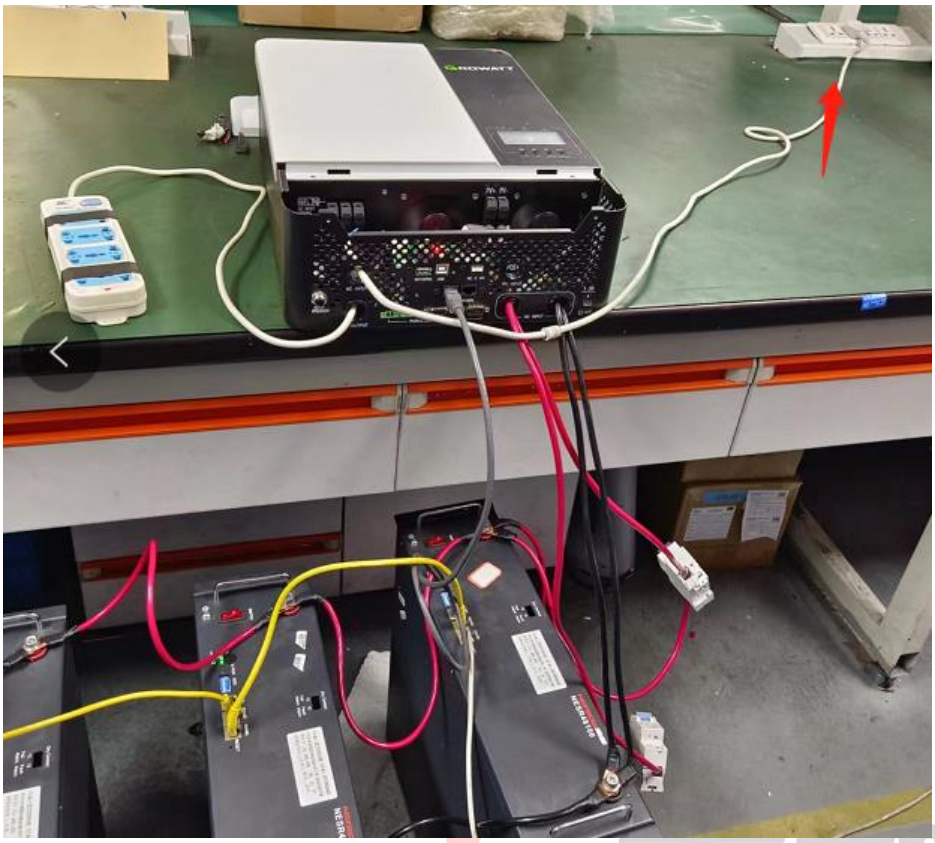


Figure 61 The AC input terminal of the inverter is connected to a 220V power grid

5）Power on. Press the rocker switch on the front panel of the 4-group battery case in sequence → press the rocker switch ON of the inverter → turn on the MCB between the battery and the inverter.

6）Establish the connection between the inverter and the load. Connect an external load to the AC output port of the inverter.

Figure 62 Schematic diagram of the external load at the AC output terminal of the inverter

7) Observe whether the display on the monitoring page of the inverter is normal, as shown in Figure 63.

Figure 63 The inverter displays the normal main interface

8) Set the battery type and protocol type. Always press the ENTER button of the inverter to enter the setting interface, press the DOWN button to item 005, and select the L1 lithium battery mode.

Figure 64 Set lithium battery mode

9) Select L1 and press ENTER to enter the 036 option to confirm the BMS

protocol. L51 corresponds to the Growatt CAN protocol.

Figure 65 Set the protocol type

10) Set the maximum charging current of the mains to the battery. As shown in Figure 66.

Figure 66 Setting the maximum charging current interface of mains

11) Set the battery discharge cut-off SOC. As shown in Figure 67.

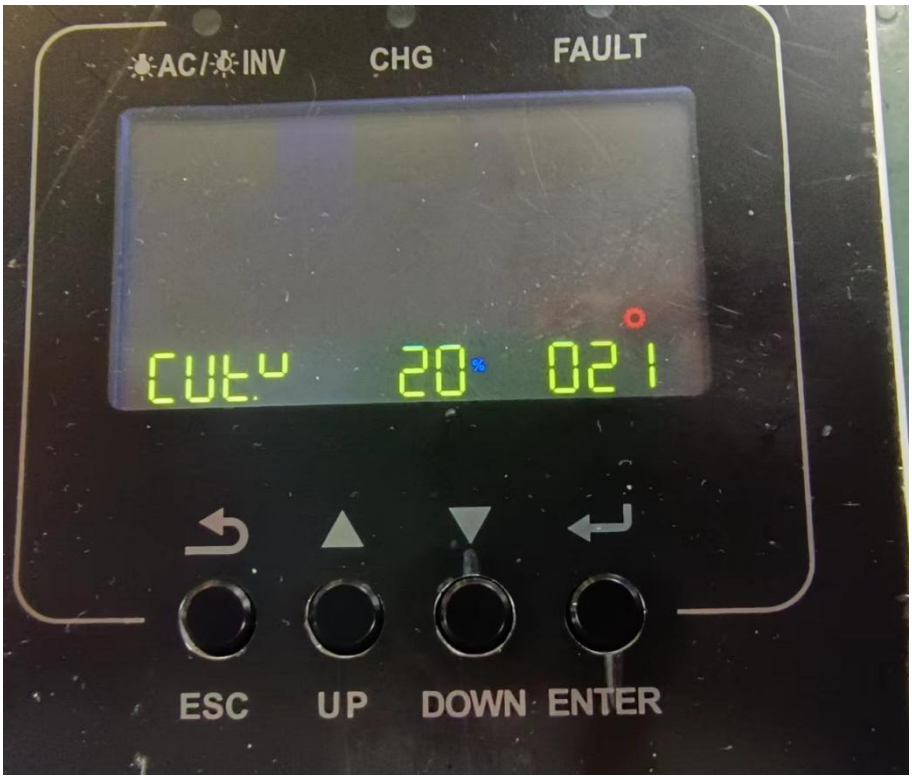


Figure 67 Setting the battery cut-off SOC

2.3.4 Debugging Considerations

1. For the setting of the dialing address of the master and the slave, please set the dialing address according to the requirements of this manual.

2. For the definition of the communication interface, it is necessary to connect according to the correct RJ485 and CAN interface definitions in this manual, so that the communication between the battery and the inverter can be normal.

3. Note about parameters: To select the correct battery mode and protocol of the inverter, the UI Software needs to set the inverter type of the battery to Growatt. Due to the limitation of the length of the wiring harness, the positive and negative poles of the inverter are connected to the P+ and P- of the host in this commissioning. In the actual use scenario, considering the current sharing, the positive pole of the inverter should be connected to the P+ of the host battery, and the negative pole of the inverter is connected to the last battery P- of the slave.

2.4 Commissioning Instructions for NESR Batteries and Voltronic Inverters

2.4.1 Prepare the cable

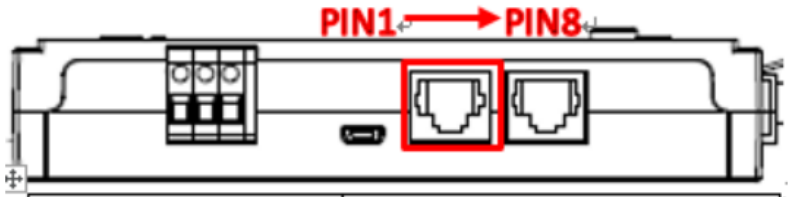
Figure 68 Voltronic inverter ((Model: Axpert King 5K)

Figure 69 Parallel cable

Figure 70 RS485 adapter wiring harness

Figure 71 Parallel network cables

2.4.2 Communication Interface Definition



	Definition
PIN 3	RS485B
PIN 5	RS485A

Figure 72 Definition of RS485 interface on inverter side

Note: 485 patch wiring harness. Interface definition at both ends of the network cable connector: connect the battery 485 network port pin4-inverter pin5; battery 485 network port pin6-inverter pin3

2.4.3 Debugging methods and steps

Taking 4 groups of NESR batteries in parallel as an example, the matching verification of Voltronic inverter and ND1540 is described in detail. The steps to build the test platform are as follows:

1) To establish the parallel connection between the battery and the battery, please refer to step 1 in chapter 2.3.3 for the steps.

2) Set the DIP address of the battery, as shown in Figure 73-76 respectively.

Figure 73 Slave DIP Address 1

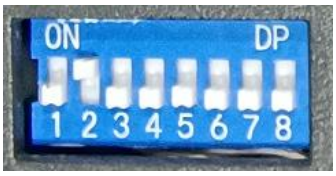


Figure 74 Slave DIP Address 2

Figure 75 Slave DIP Address 3

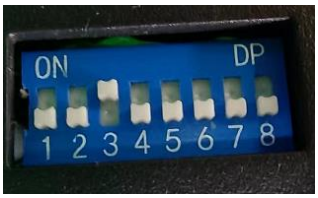


Figure 76 Slave DIP Address 4

3) Establish the connection between the inverter and the battery: connect the BMS communication interface of the inverter to the battery 485 network port of the dial address 1 through the RS485 patch cord, and connect the POS+ interface of the inverter to the battery (dial P+ of code address 1), connect the NEG- interface of the inverter to P- of the battery (dial code address 4).

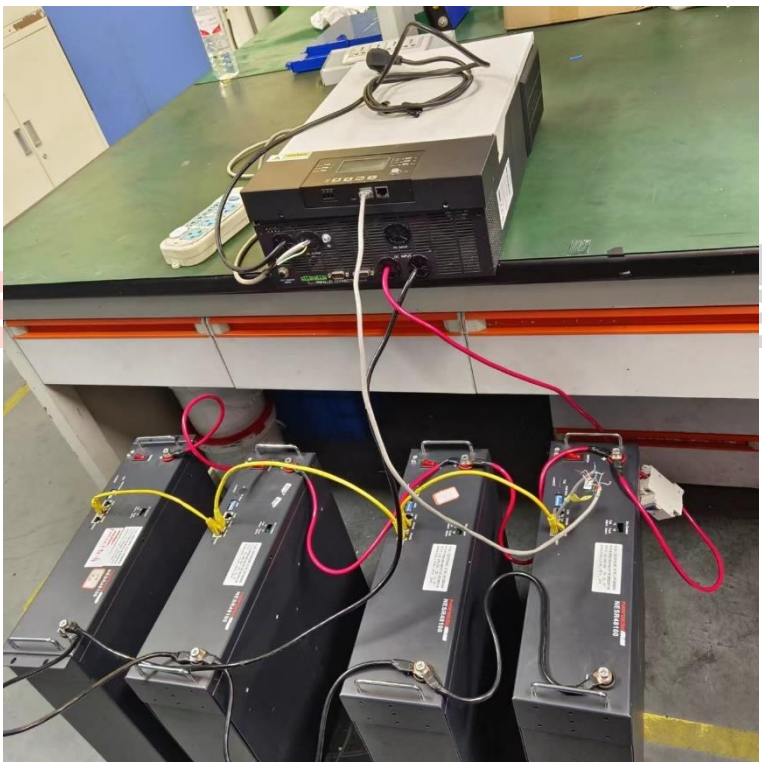


Figure 77 Wiring diagram of battery and Voltronic inverter

4) Establish the connection between the inverter and the power grid: connect the AC INPUT interface of the inverter to the external 220V AC power

5) Power on. Press the rocker switch on the front panel of the 4-group battery case in

sequence → press the power button switch of the inverter → turn on the MCB between the battery and the inverter.

6) Establish the connection between the inverter and the load. Connect an external load to the AC OUTPUT port of the inverter.

Figure 78 Inverter-External Load Diagram

7) Observe whether the display of the monitoring page of the inverter is normal, and the schematic diagram of normal display is shown in Figure 79-80.

Figure 79 Schematic diagram of normal connection to the mains

Figure 80 Schematic diagram of normal load connection

8) Set the lithium battery mode. Press and hold the inverter enter key for 3s to enter the setting item, click the down arrow to enter item 05, and select the LIB iron lithium battery communication protocol for the battery type setting item. The setting success interface is shown in Figure 81.

Figure 81 Setting Lithium Battery Protocol

2.4.4 Debugging Considerations

1. The batteries are all slaves, so the dialing address setting is set according to the dialing address of the slaves in this manual.

2. The 485 adapter wiring harness should be wired according to the interface

definition in this manual.

3. Set the correct lithium battery communication protocol as shown in Figure 81.

2.5 Commissioning Guidelines for NESR Batteries and SMA Inverters

2.5.1 Prepare the cable

Figure 82 SMA inverter
(Model: Sunny Island 8.0H)

Figure 83 Parallel cables

Figure 84 Parallel wiring

Figure 85 CAN interface adapter wiring harness

Figure 86 The wiring harness between the inverter Ethernet port and the computer RJ-45

2.5.2 Interface definition

Pin	Signal
1	Sync1 - reserved
2	CAN_GND
3	SYNC_H
4	CAN_H
5	CAN_L
6	SYNC_L
7	Sync7 - reserved
8	Sync8 - reserved

Figure 87 Definition of CAN interface of inverter

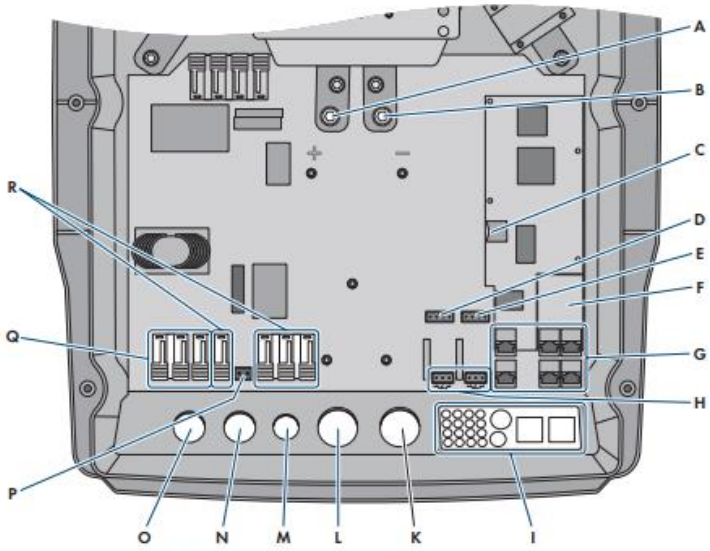


Figure 7: Connection area of the Sunny Island inverter

Position	Designation	Position	Designation
A	**DC+** connection	K	Enclosure opening for **DC-**
B	**DC-** connection	L	Enclosure opening for **DC+**
C	Slot for optional micro SD card	M	Enclosure opening **ExtVtg**
D	**BatTmp** and **BatCur** connections	N	Enclosure opening **AC2**
E	**BatVtgOut** and **DigIn** connections	O	Enclosure opening **AC1**
F	Slot for optional communication interface SI-SYSCAN.BGx*	P	**ExtVtg** connection
G	Connecting the communication unit	Q	**AC1** connection
H	**Relay1** and **Relay2** connections	R	**AC2** connection
I	Cable feed-through plate		

* If the inverter was ordered with the **Communication for multicluster system** order option, SI-SYSCAN.BGx is installed in each master.

Figure 88 Inverter interface definition

2.5.3 Debugging methods and steps

Taking 3 sets of NESR batteries in parallel as an example, the matching verification of the SMA inverter and the ND1540 BMS is described in detail. The steps to build the test platform are as follows:

1） To establish a parallel connection relationship between batteries, pls refer to step 1 in chapter 2.1.3 for the steps.

2) Set the DIP addresses of the battery master and slave. For the steps, pls refer to step 2 in chapter 2.1.3.

3) Establish the connection between the inverter and the battery. Connect the DC+ port of the inverter to the P+ terminal of the host battery through the MCB, and connect the DC- port of the inverter to the P- terminal of the last slave battery; connect the CAN port of the inverter to the CAN port of the host battery .

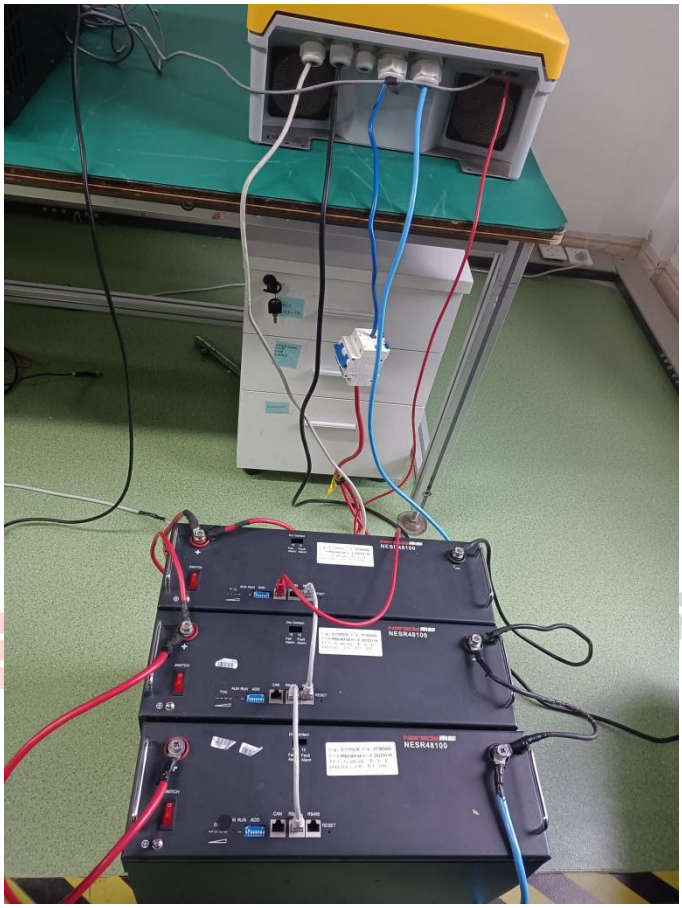


Figure 89 Connection diagram of battery and inverter

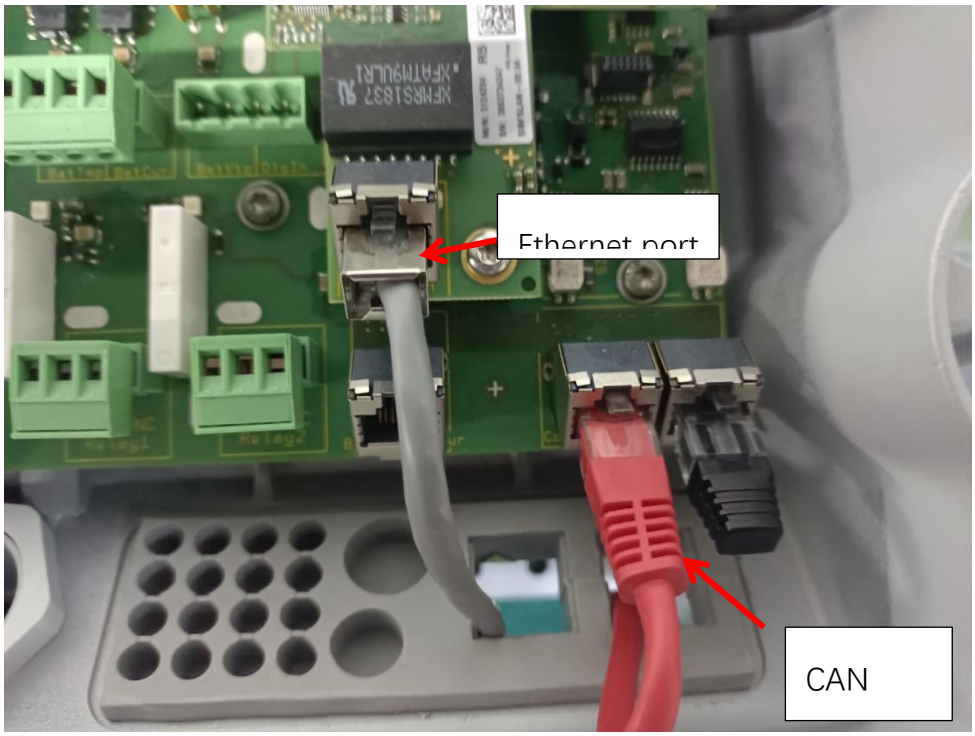


Figure 90 CAN and Ethernet ports of the inverter

4) Establish the connection between the inverter and the grid, and establish the connection between the inverter and the computer. Connect the AC2 port of the inverter to an external 220V power grid. Connect the Ethernet port of the inverter to the Ethernet port of the laptop.

Figure 91 Schematic diagram of inverter-computer-grid connection

5)Power on. Turn on the MCB first, then turn on the rocker switch of the parallel batteries in turn, and finally turn on the key switch of the inverter.

Figure 92 Schematic diagram of the key switch-turning on the inverter

6) Establish the connection between the inverter and the load, and connect the AC1 port of the inverter to the external load.

Figure 93 Schematic diagram of inverter-load connection

7) Open the laptop, log in to the http://169.254.12.3/ website, enter the user name and password, and click Login.

Select Installer for the user name and CenRF2201 for the password.

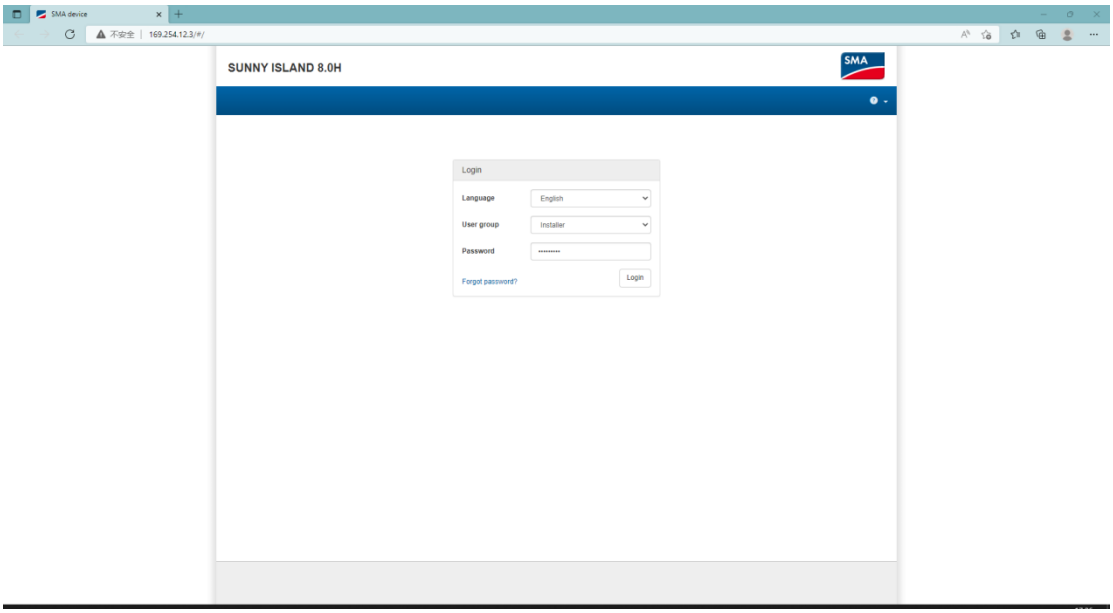


Figure 94 Schematic diagram of the login interface

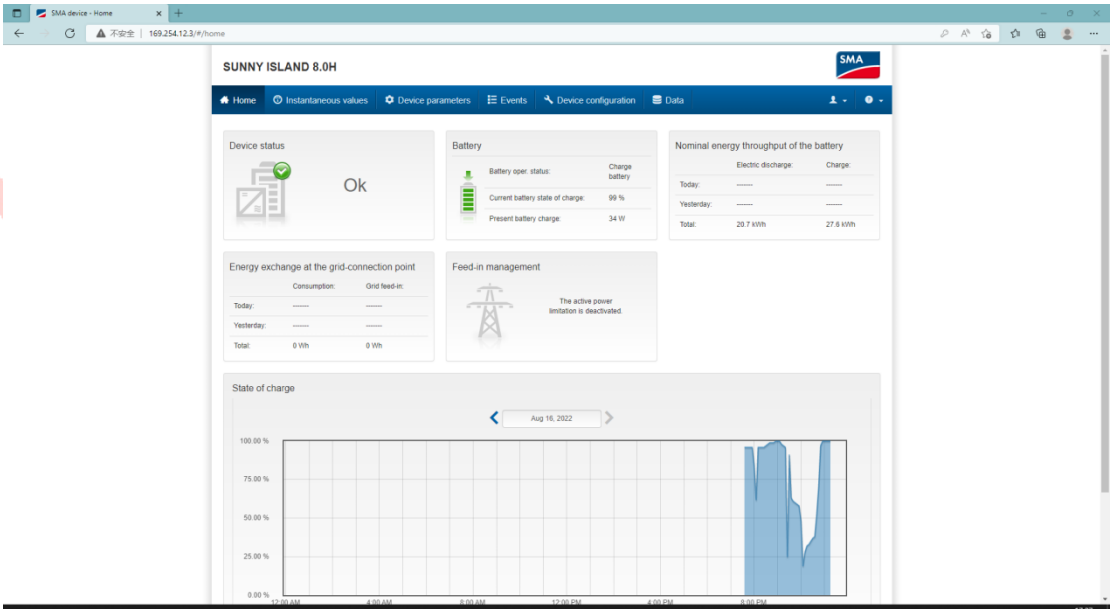


Figure 95 Schematic diagram of the interface after successful login

8）Click as shown in Figure 96， Start the installation Assitant.

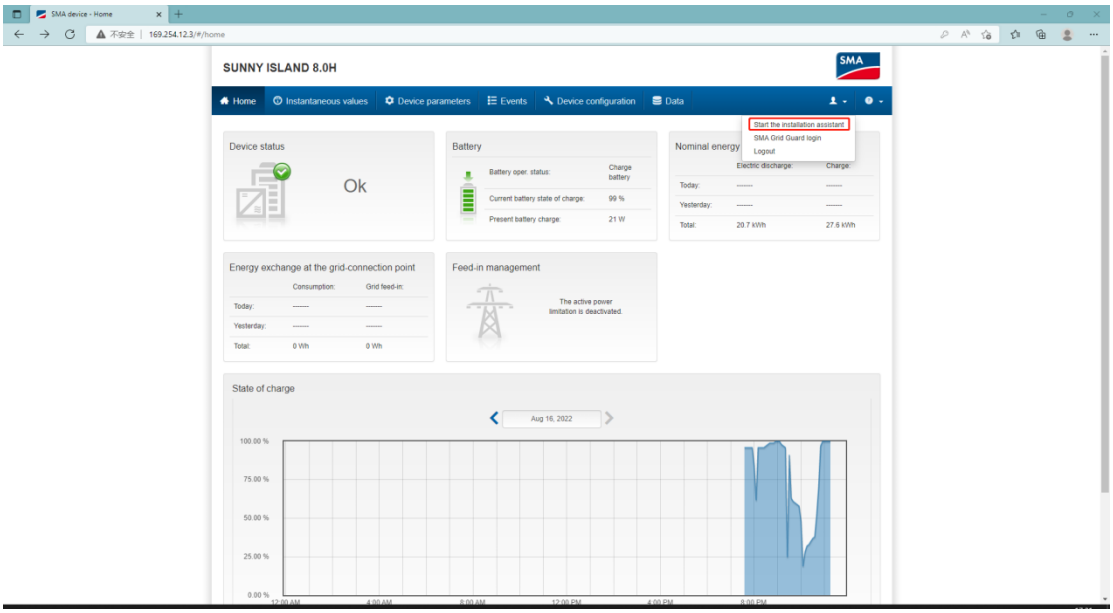
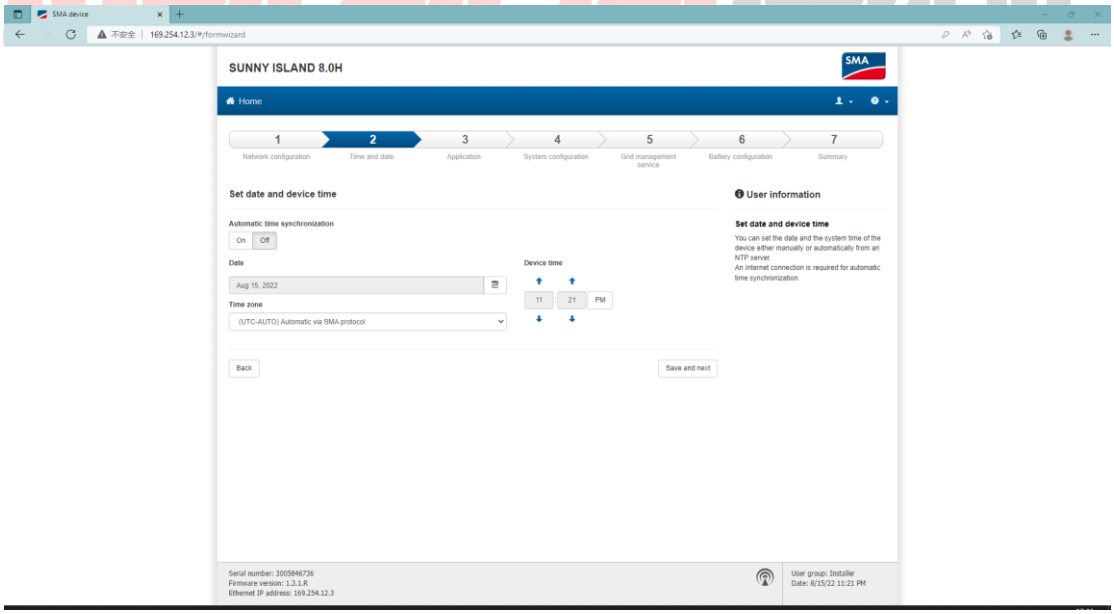


Figure 96

9）Click Save and Next, switch to the Battery Configuration interface, you need to set the battery to lithium battery mode. The battery capacity is set as the total capacity of the batteries after parallel connection.



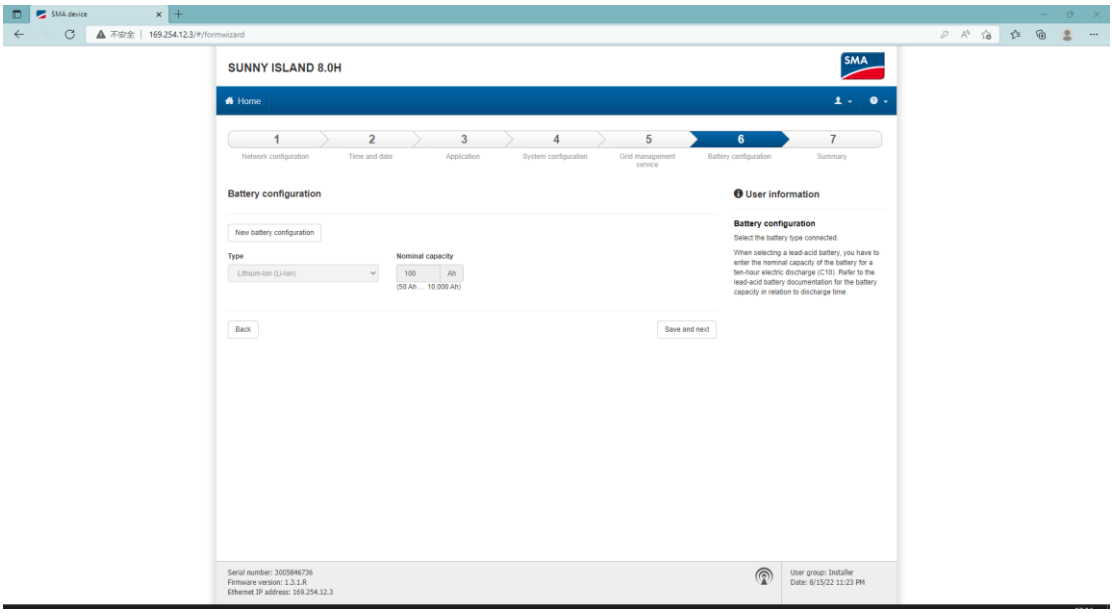


Figure 97 Battery configuration interface

10)Click continue to save the settings.

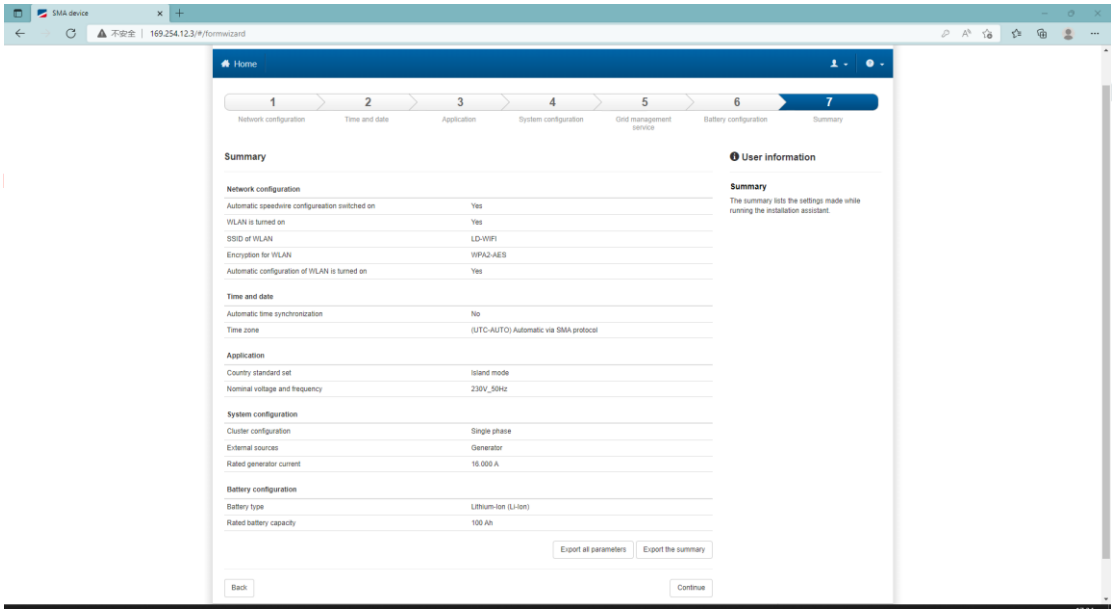


Figure 98 Save configuration

11)As shown in Figure 99, view the battery information parameters.

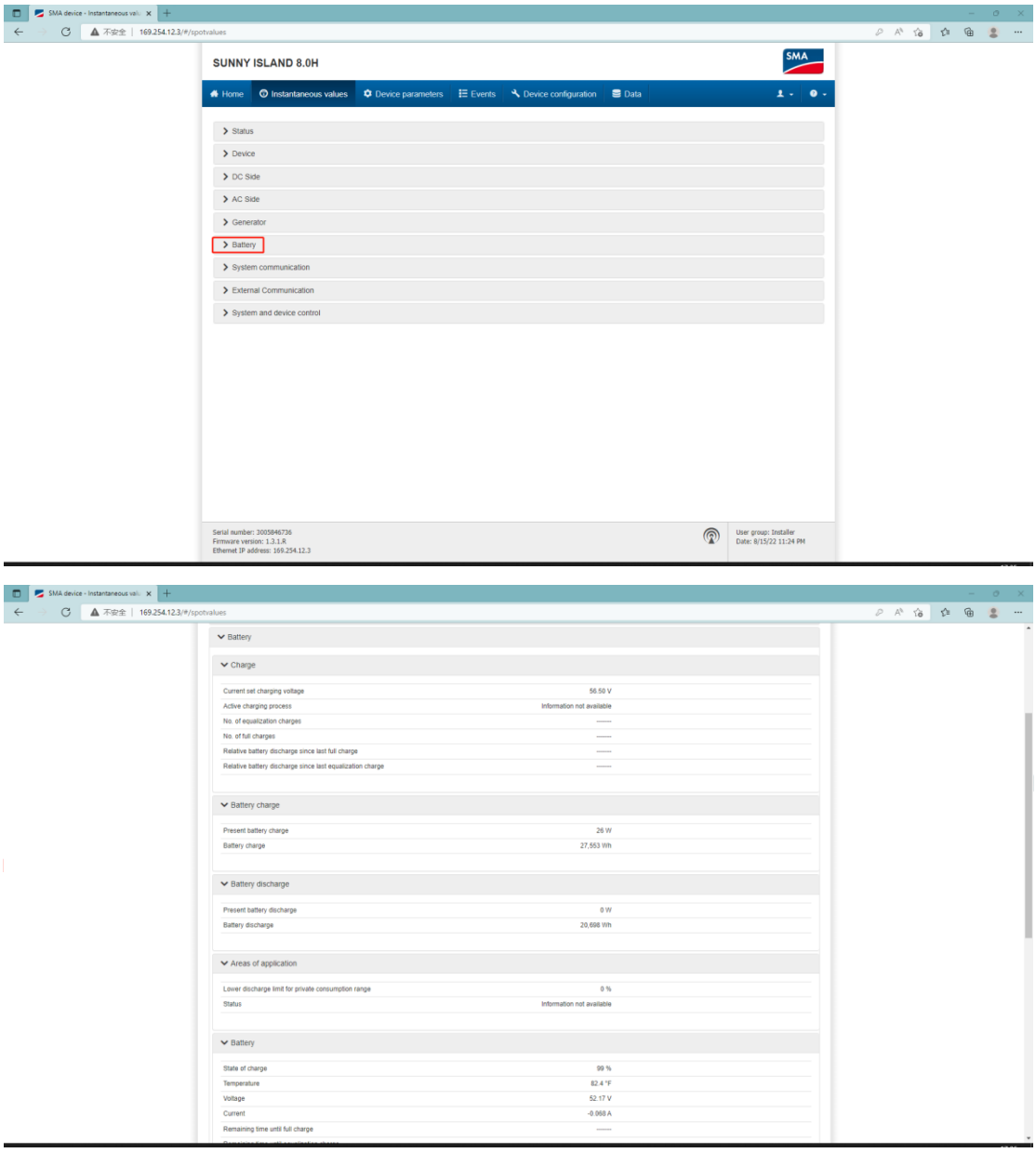
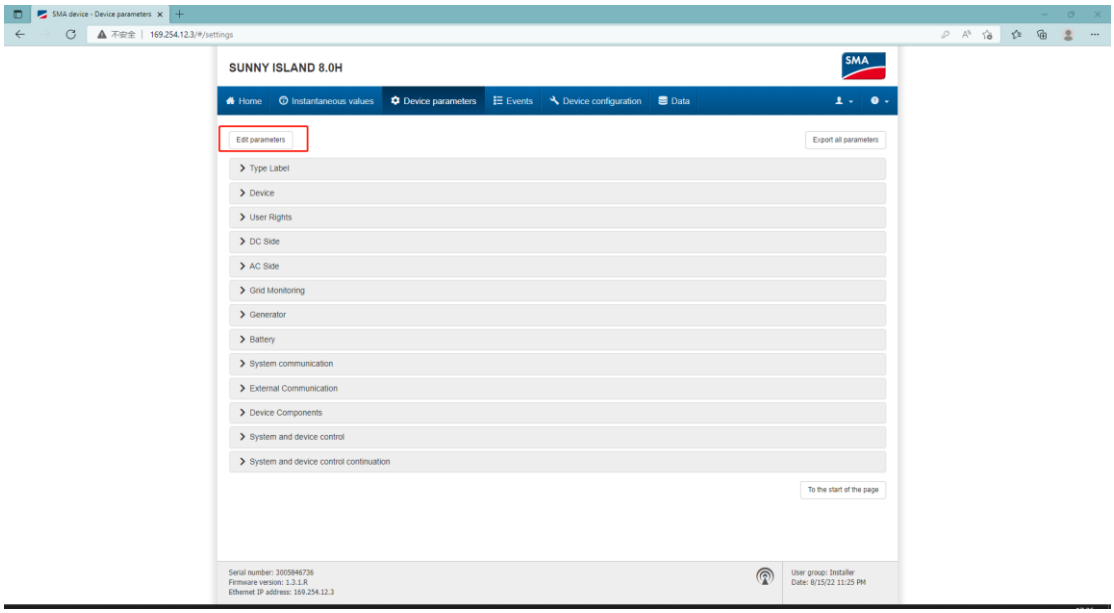
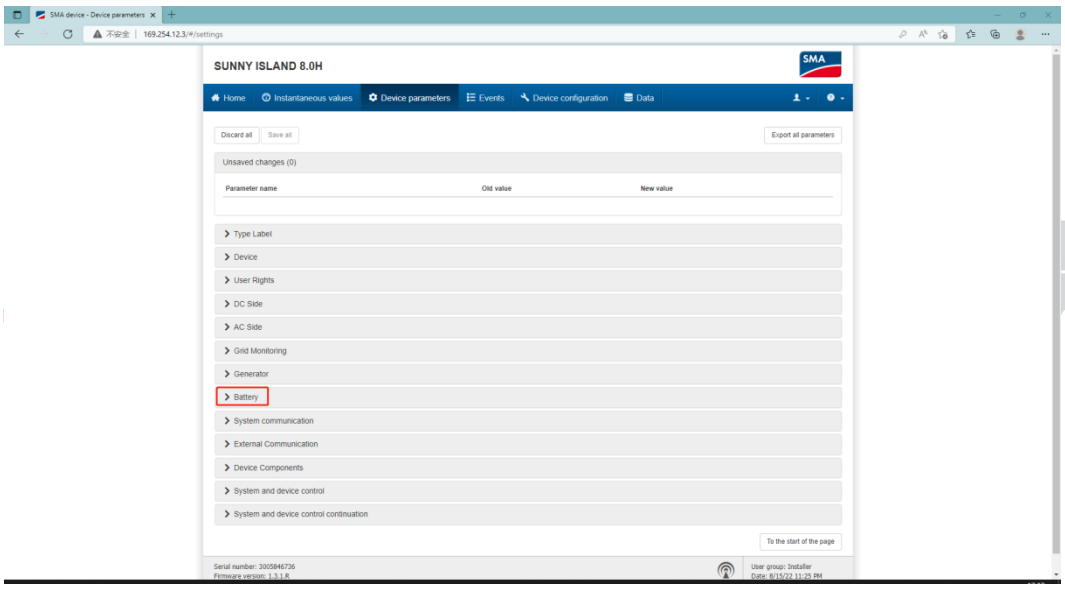


Figure 99 View battery information

12)As shown in Figure 100, parameters such as the charging voltage of the inverter, the charging and discharging duration, and the cut-off SOC value can be set. Kindly note, after modifying the parameters, pls click SAVE ALL to save the set parameters.





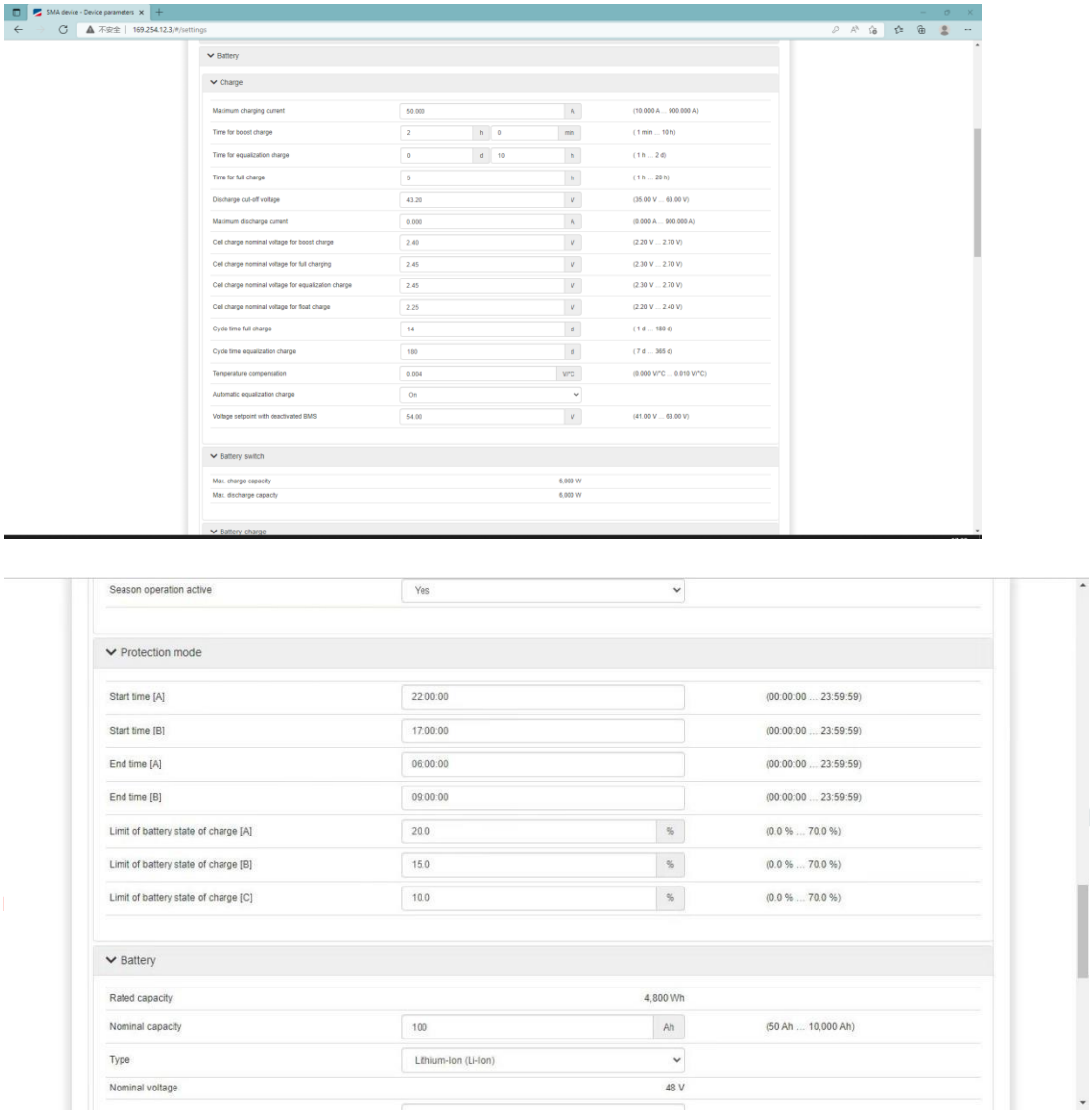


Figure 100 Setting related parameters of inverter /battery

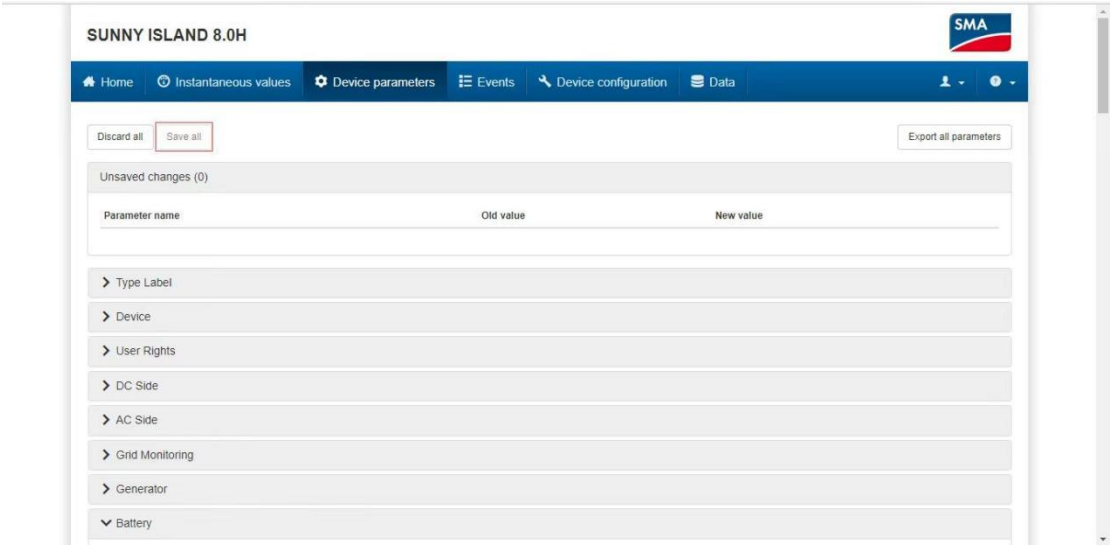


Figure 101 Save setting parameters

2.5.4 Debugging Considerations

1. The setting of the battery DIP address is set according to the DIP address of the master and slave devices in this manual.

2. The CAN adapter wiring harness should be wired according to the interface definition in this manual.

3. The inverter needs to set the lithium battery mode, capacity value and appropriate charge and discharge parameters.

2.6 Commissioning Guidelines for NESR Batteries and Studer Inverters

2.6.1 Prepare the cable

Figure 102 Studer inverter (Model: XTS1400-48)

Figure 103 Parallel cable

Figure 104 Parallel network cables

Figure105 Xcom-CAN

2.6.2 Interface definition

The interface definition of Xcom-CAN can be found in the Studer Manuel Xcom-CAN V2.1 operation manual, and will not be repeated here.Remarks: The pin definition of the inverter CAN_H and CAN_L is consistent with the pin definition of the BMS for the CAN interface.

2.6.3 Debugging methods and steps

Taking 3 groups of NESR batteries in parallel as an example, the matching verification of the Studer inverter and the ND1540 BMS is described in detail. The steps to build the test platform are as follows:

1) Establish the parallel connection between the battery and the battery. For the steps, please refer to step 1 in chapter 2.1.3.

2) Set the DIP address of the battery host and the slave. For the steps, please refer to step 2 in chapter 2.1.3.

3) Establish the connection between the inverter and the battery. Connect the external interfaces of the inverter to the corresponding positions as shown in Figure 107.

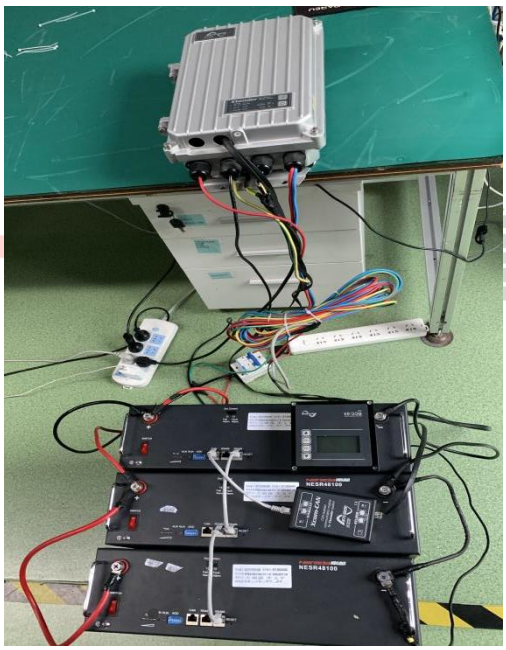


Figure 106 Schematic diagram of battery and inverter connection

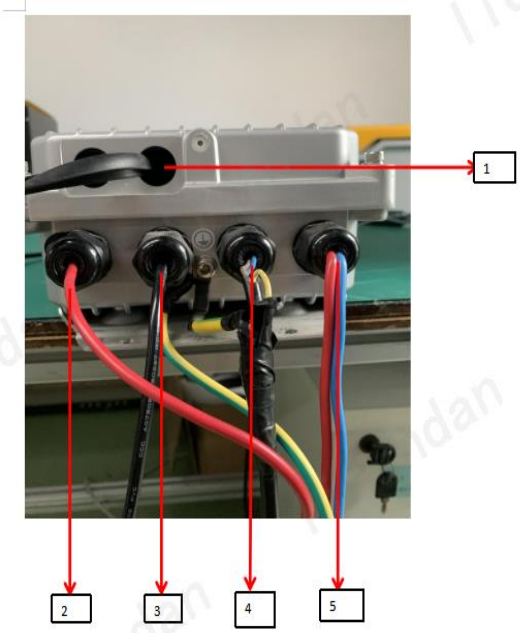


Figure 107 Studer inverter interface definition

Interface meaning description:

1—External Xcom-CAN box and controller;

2—P+ terminal of external host battery;

3—P-terminal of the last slave battery when connected in parallel;

4—External to the mains;

5—External to the load

4）Establish the connection relationship between the inverter and the power grid, as shown in Figure 107, the serial number 4 interface to the external 220V power grid.

5）Power on. First turn on the rocker switch on the front panel of the battery case, then turn on the MCB (between the host battery P+ and the inverter), and finally press the power button switch of the inverter.

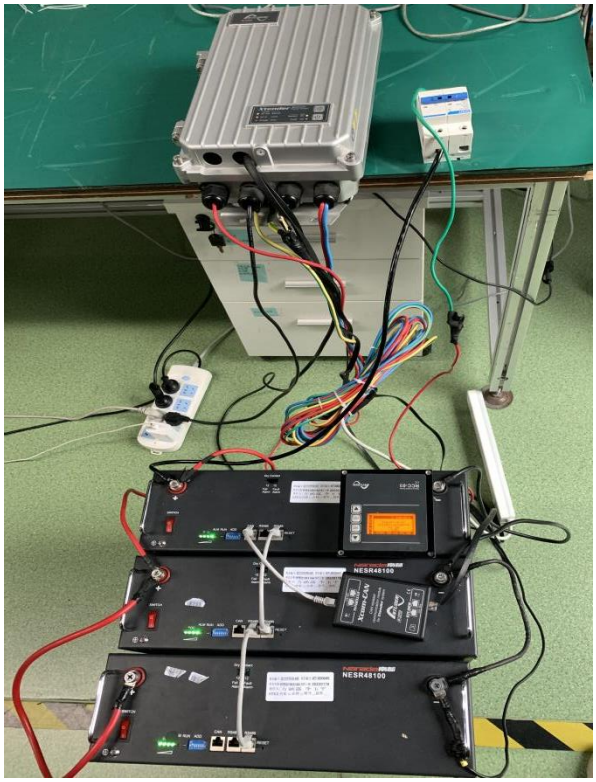


Figure 108 Schematic diagram after booting

6）Establish the relationship between the inverter and the load. Connect the serial number 5 interface shown in Figure 107 of the inverter to an external load.

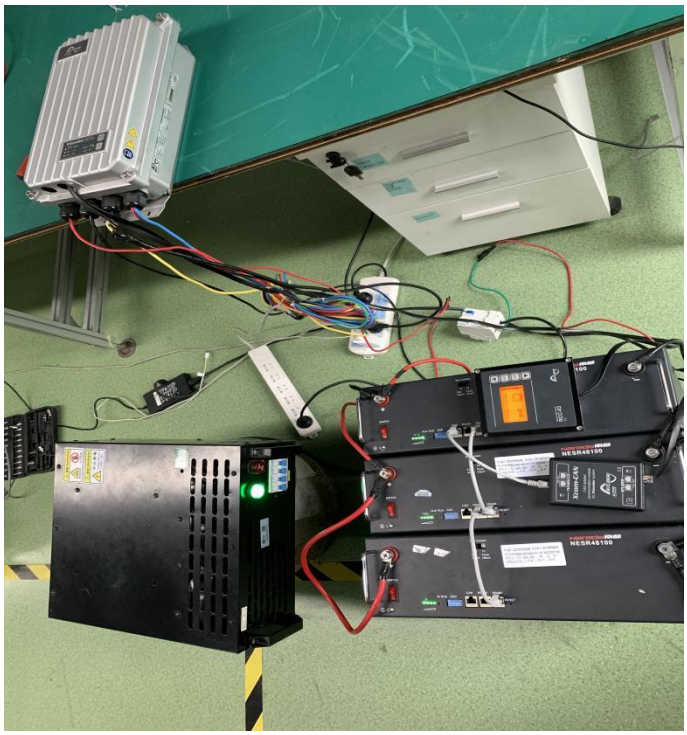


Figure 109 Schematic diagram of external load

7)Open the controller monitoring interface, and the schematic diagram of normal communication is shown in Figure 110.

Figure 110 Normal communication interface Figure 111 Communication failure interface

8)Set battery-related parameters in the inverter. Note that the charging voltage of the inverter to the battery cannot exceed 54V.

End SOC setting: scroll down to the Xcom-CAN BMS setting interface, click the SET button, scroll down to the ADVANCED SETTING option, click the SET button This

interface is the discharge end option, click up and down to set the size of the SOC end capacity.

Figure 112 Battery SOC cut-off setting

Charging current setting: Turn to the Xtender setting page, click the SET button, select "by menu" and click the SET button to enter BASIC SETTING, click the SET button This interface is the charging current setting interface, and the current can be set up and down.

Figure 113 Charge current cut-off setting

2.6.4 Debugging Considerations

1. The setting of the battery DIP address is set according to the DIP address of the master and slave devices in this manual.

2. The inverter needs to set appropriate charge and discharge cut-off voltage and current parameters.

2.7 Commissioning Guidelines for NESR Batteries and Megarevo Inverters

2.7.1 Prepare the cable

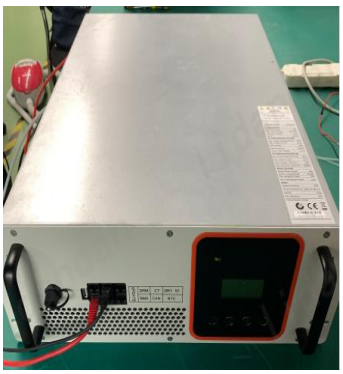


Figure 114 Megarevo inverter (Model: Hb-5KL1-M)

Figure 115 Parallel cable

Figure 116 Network cable used in parallel

Figure 117 CAN interface adapter wiring harness between inverter side and battery side

2.7.2 Interface definition

Definition of the CAN interface of the inverter, pin4-CAN_H; pin5-CAN_L.

2.7.3 Debugging methods and steps

Taking 3 sets of NESR batteries in parallel as an example, the matching verification of Megarevo inverter and ND1540 BMS is described in detail. The steps to build the test platform are as follows:

1) Establish the parallel connection between the battery and the battery. For the steps, please refer to step 1 in chapter 2.1.3.

2) Set the DIP address of the battery host and the slave. For the steps, please refer to step 2 in chapter 2.1.3.

3) Establish the connection between the inverter and the battery. Connect the external interfaces of the inverter to the corresponding positions as shown in Figure 119.

Interface meaning description:

1— connected to the load; 2— connected to the mains; 3— connected to the P+ terminal of the host battery; 4— connected to the P- terminal of the last slave battery in parallel; 5— connected to the CAN interface of the host battery.

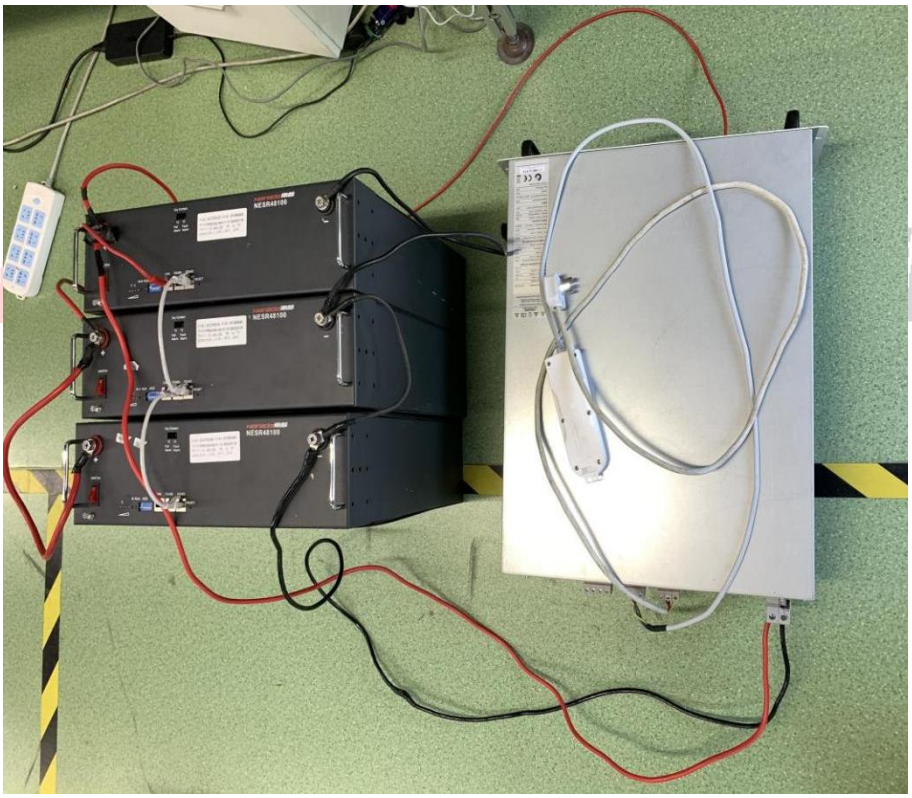


Figure 118 Schematic diagram of battery and inverter connection

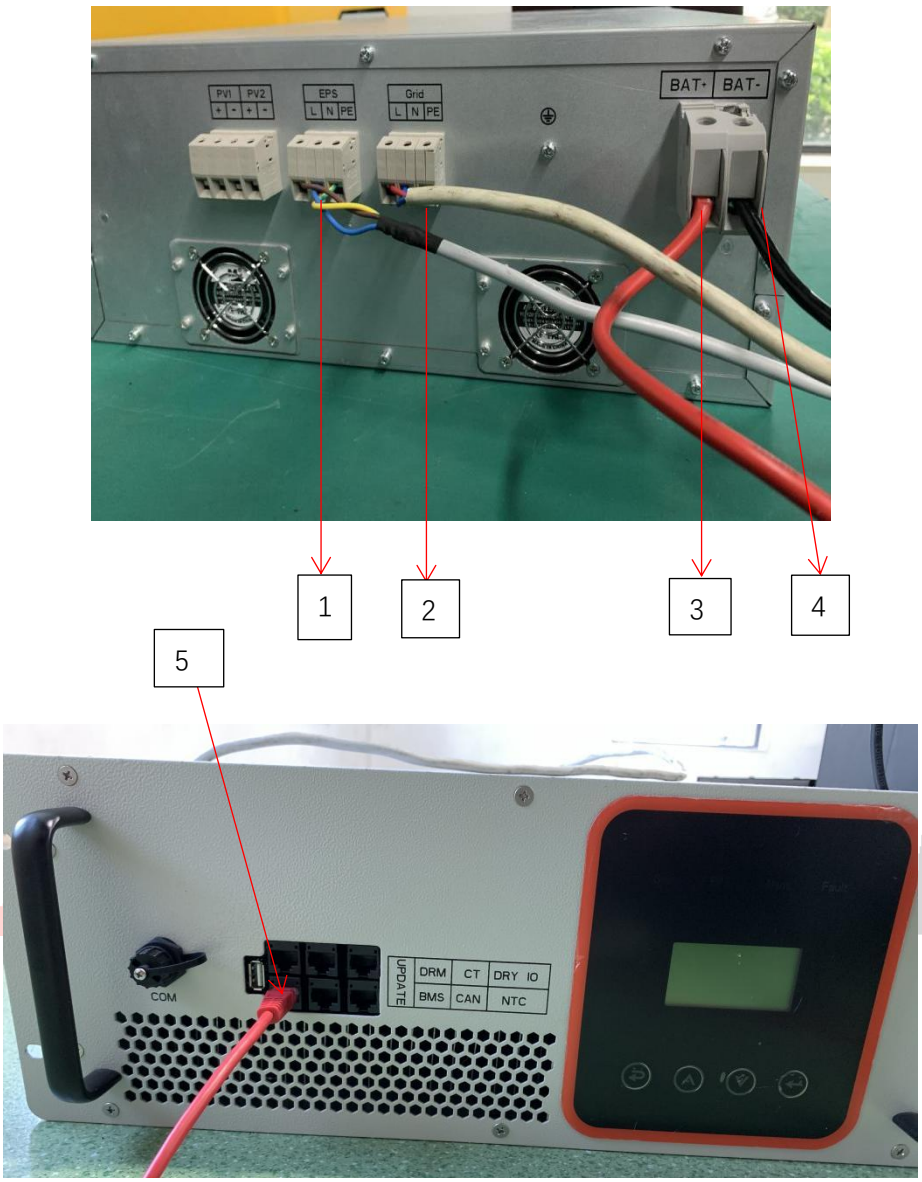


Figure 119 Schematic diagram of Megarevo inverter interface definition

4)The connection relationship between the inverter and the grid is established.

The connection diagram is shown in Figure 120.

Figure 120 Externally connected to 220V mains

5）Power on. Turn on the rocker switches on the front panel of the battery case in sequence.

6）Establish the relationship between the inverter and the load. The connection diagram is shown in Figure 121.

Figure 121 Schematic diagram of external connection to the load

7）Set the battery voltage, current, protocol, grid standard, etc. on the inverter side.

a. Battery type setting, 15 strings of batteries need to choose standard 48V. Path: open the main menu of the home page → click settings → enter the password 00000 → battery parameters → battery type → standard 48v.

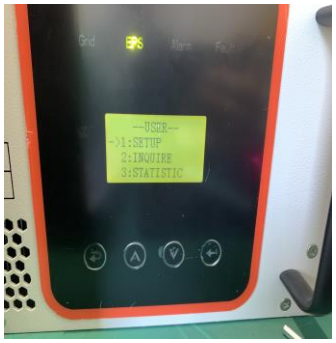
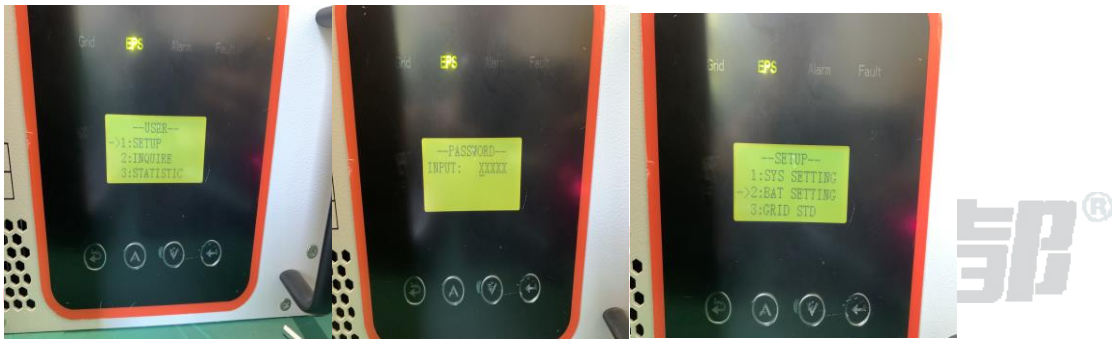


Figure 122 Battery type setting

b. Communication protocol setting, select CAN. On the home page, click Settings → Enter password 00000 → Battery parameters → Battery communication mode → CAN.



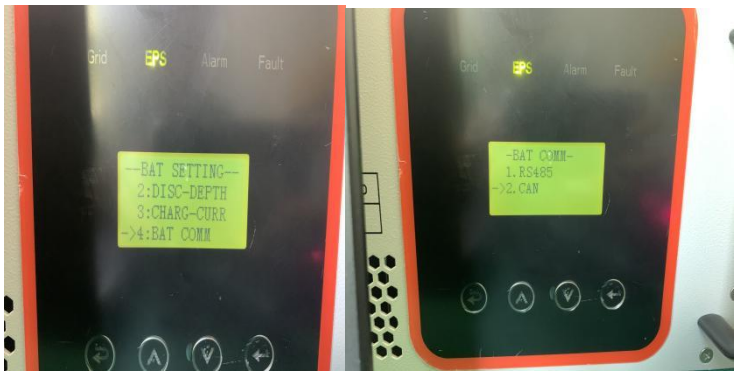
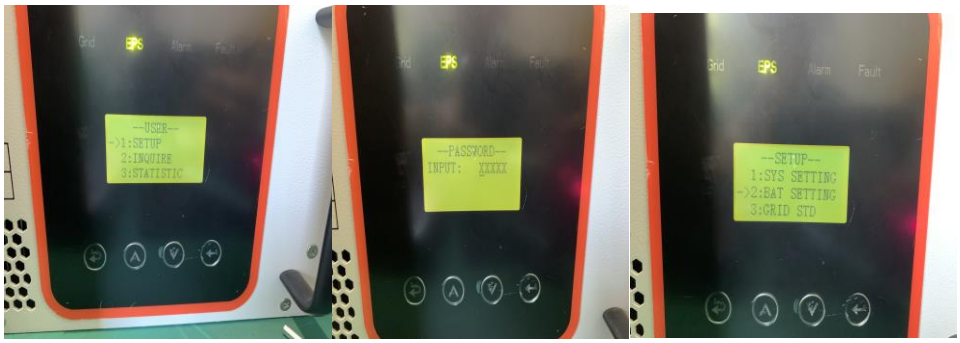


Figure 123 Communication protocol needs to select CAN

c.Battery charging current setting. On the home page, click Settings→Enter password 00000→Battery parameters→Battery charging current.



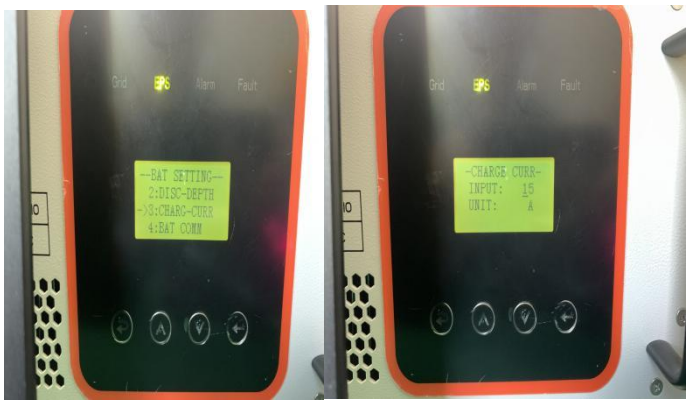
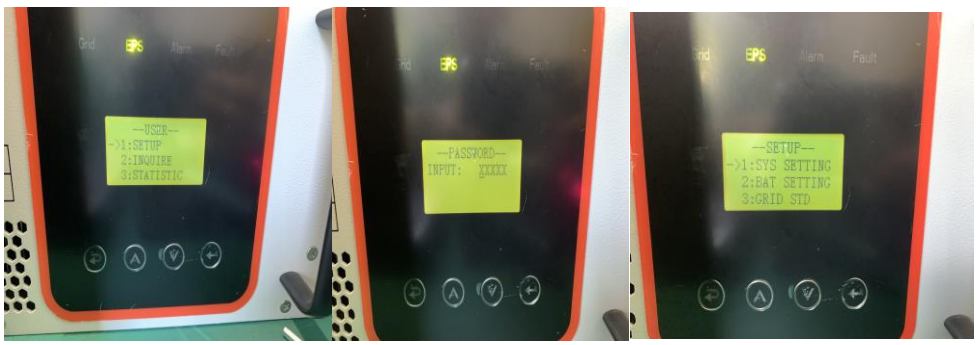


Figure 124 Setting of charging current

d.The working mode can be set according to the needs of customers: there are three modes for customers to choose: spontaneous and self-use, peak shaving - valley filling and battery priority. On the home page, click Settings→Enter password 00000→System Settings→Work Mode Selection.



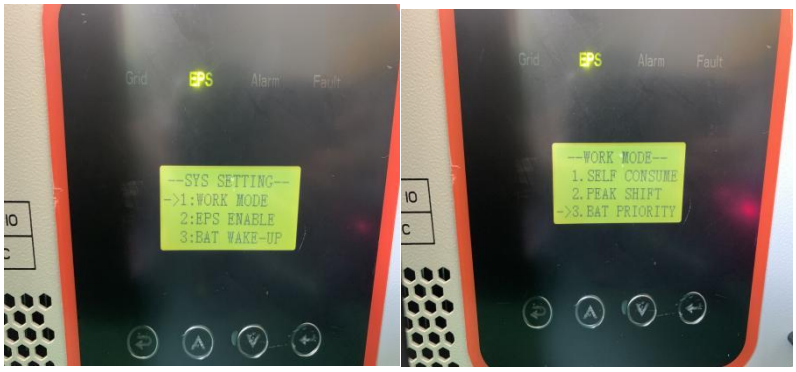


Figure 125 Selection and setting of working mode

e.PV input type setting. On the home page, click Settings→Enter Password 00000→System Settings→PV Input Type→Independent.

Figure 126 Input type setting of PV

f.Anti-Reverse setting. On the home page, click Settings→Enter password 00000→System Settings→Anti-Reverse Settings→Allow.

Figure 127 Anti-Reverse setting

g.Grid standard settings. It can be selected according to the customer's local grid standard. This test selects China. On the home page, click Settings→Enter password 00000→Grid Standard Settings→China.

Figure 128 Grid standard setting

2.7.4 Debugging Considerations

1. The setting of the battery DIP address is set according to the DIP address of the master and slave devices in this manual.
2. The inverter needs to set the battery related voltage, communication mode, current, grid standard and so on.

2.8 Commissioning guidance for NESR batteries and Must inverters

2.8.1 Prepare the cables

Figure 129 Must inverter
(Model: PV18-5048VHM)

Figure 130 Parallel cables

Figure 131 Parallel network cable

Figure 132 CAN interface adapter harness at the inverter-battery end

2.8.2 Interface definition

The definition of the CAN interface of the MUST inverter is shown in Figure 133. Kindly Note: The different interface definitions at both ends of the CAN interface adapter harness. Table 4 shows the connection diagram.

Table 4 Definition of CAN interface adapter harnesses

CAN interface of the battery	CAN interface of the inverter	Pin definition
Pin4	Pin6	CAN_H
Pin5	Pin5	CAN_L

Below chart show RJ45 Pins definition

Pin	Define
1	RS-485-B
2	RS-485-A
3	GND
4	
5	CANL
6	CANH
7	
8	

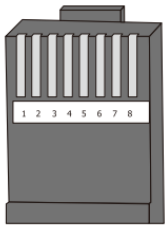


Figure 133 CAN interface definition of inverter

2.8.3 Debugging methods and steps

Taking 3 groups of NESR batteries in parallel as an example, the matching verification of the MUST inverter and ND1540 BMS is carried out in detail. The steps to build the test platform are as follows:

1) Establish the parallel connection relationship between the battery and the battery, pls refer to step 1 in section 2.1.3.

2) Set the dial addresses of the battery to master and slave, pls refer to step 2 in section 2.1.3.

3) Establish the connection relationship between the inverter and the battery. Connect the external interfaces of the inverter to the corresponding positions as shown in Figure 134. The meaning of the interface is described as follows:

1—connect to mains power; 2—connect to AC load; 3—connect to P+ terminal of host battery; 4—connect to P-terminal of the last slave battery when connected in parallel; 5—CAN interface of the host battery.

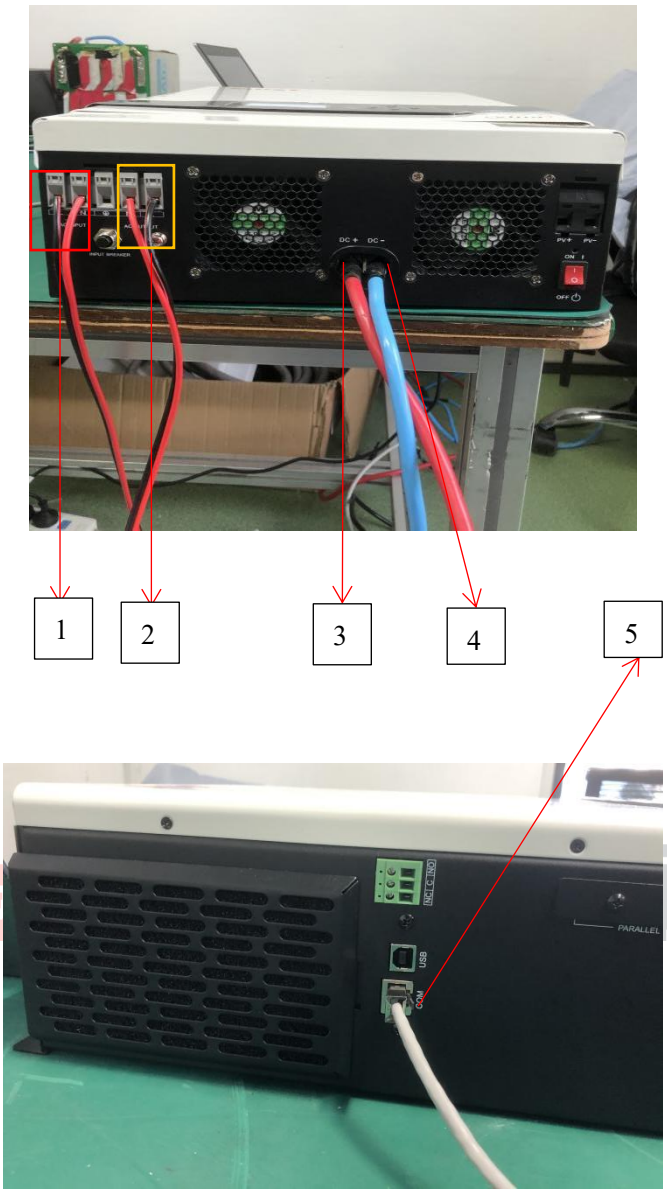


Figure 134 Description of the external port definition of the inverter

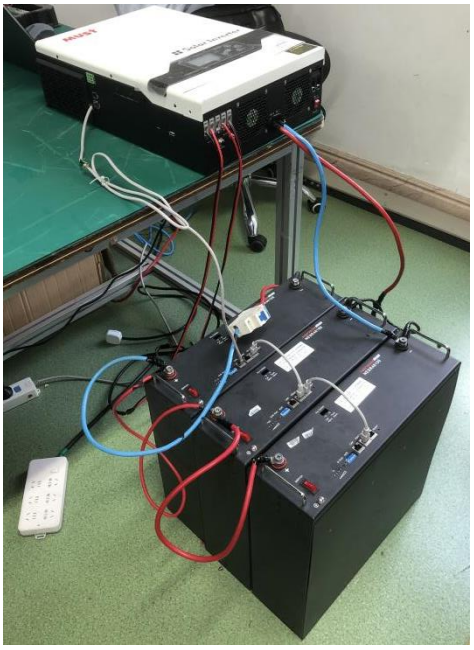


Figure 135 Schematic diagram of the connection between the battery and the inverter

4）Establish the connection relationship between the inverter and the power grid, and the connection diagram is shown in Figure 136.

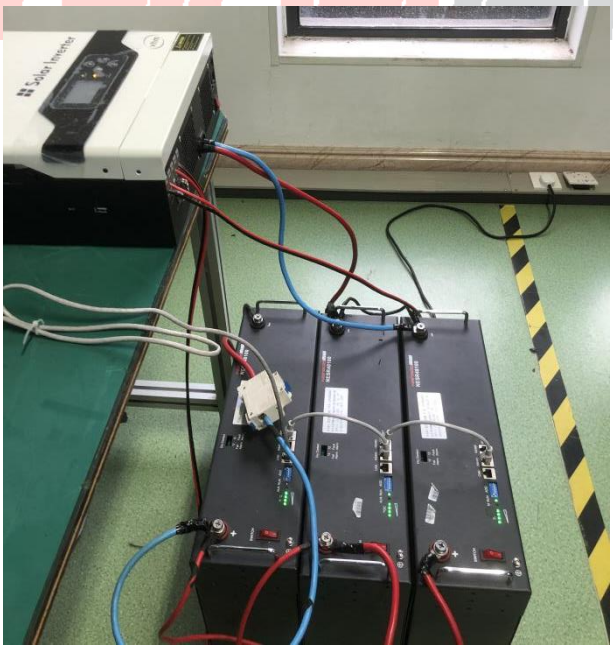


Figure 136 External connection to 220V mains power

5)Power on. Turn on the MCB between the inverter and the battery first→ Turn on the MCB between the inverter and the battery→ Turn on the inverter's power switch.

6)Establish the relationship between inverter and load. The connection diagram is shown in Figure 137.

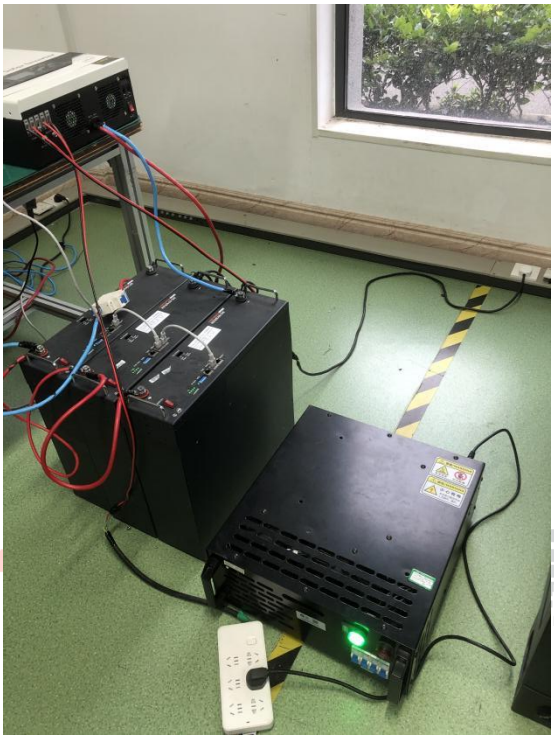


Figure 137 Schematic diagram of the inverter connected to the load

7） Set battery voltage, current, grid standards, etc. at the inverter end.

(a) After successful communication between the inverter and the battery, the interface is shown in Figure 138.

Figure 138 Schematic diagram of successful communication

（b）Press the "Enter" button for about 3s to enter the parameter setting interface of the inverter.

（c）For Output Type, select the default mode.

Figure139 Output source priority selection

（d）It is necessary to set the relevant parameters of the battery, such as maximum charging current, battery mode setting, float voltage setting, etc. The maximum charging current does not exceed 60A; Battery mode should select LI mode; CV voltage setting value default is 56.4V, float voltage setting is not allowed to exceed 54V; and low voltage cut-off setting is 42V; BMS control method selects the default voltage method, the specific parameter setting can be seen in Figure 140 below.

Figure 140 The inverter needs to set the relevant parameters of the battery

2.8.4 Debugging considerations

1. The battery dial address is set according to the master and slave dial address of this

manual.

2. The inverter needs to set the battery-related voltage, battery mode, current, etc.

3. The CAN interface adapter harness is properly connected as defined in this manual.

4. After the battery is turned on, use the UI software to set the battery to the inverter brand that needs to match.

2.9 Commissioning guidance for NESR batteries and Luxpower inverters

2.9.1 Prepare the cables

Figure 141 Luxpower inverter (Model: LXP 6K)

Figure 142 Parallel cables

Figure 143 Parallel network cable

Figure 144 CAN interface adapter harness at the inverter-battery end

2.9.2 The definition of the interface

The CAN interface definition of the Luxpower inverter is shown in Figure 145.Kindly Note: Pay special attention to the different interface definitions at both ends of the CAN interface adapter harness, as shown in Table 5.

Table 5 Definition of adapter wiring harness for CAN interface

CAN interface of the battery	CAN interface of the inverter	Pin Definition
Pin4	Pin4	CAN_H
Pin5	Pin3	CAN_L

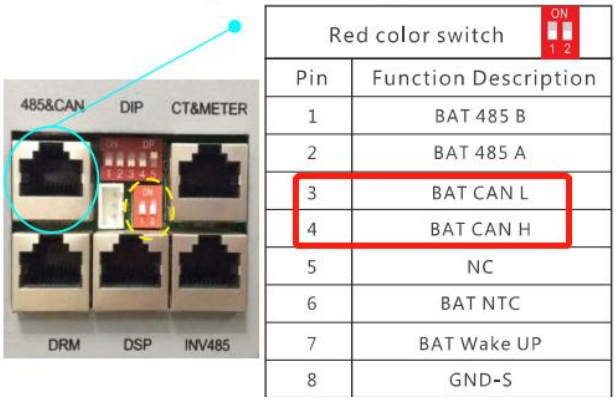


Figure 145 CAN interface definition of the inverter

2.9.3 Debugging methods and steps

Taking the parallel use of three NESR batteries as an example, the matching verification of the Luxpower inverter and ND1540BMS is carried out in detail. The steps to build the test platform are as follows:

1) Establish the parallel connection relationship between the battery and the battery, please refer to step 1 in section 2.1.3.

2) Set the dial addresses of the battery master and slave, and refer to step 2 in section 2.1.3.

3) Establish the connection relationship between the inverter and the battery. Connect the external interface of the inverter to the corresponding position as shown in Figure 146 and Figure 147. Interface meaning description:

1—Connect to P+ terminal of the host battery; 2—Connect to P-terminal of the last slave battery ; 3—Connect to photovoltaic cathode; 4—Connect to photovoltaic anode; 5—DC switch of inverter; 6—Wifi interface; 7—CAN interface connected to the host

battery; 8—Connect to load; 9—Connect to power grid.

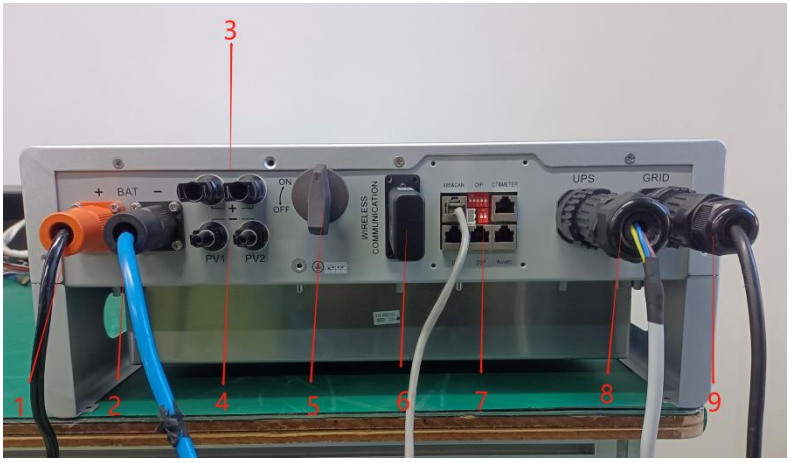


Figure 146 Interface definition description of the inverter

Figure 147 Schematic diagram of the connection between the battery and the inverter

4）Establish the connection relationship between the inverter and the power grid, and the connection diagram is shown in Figure 148.

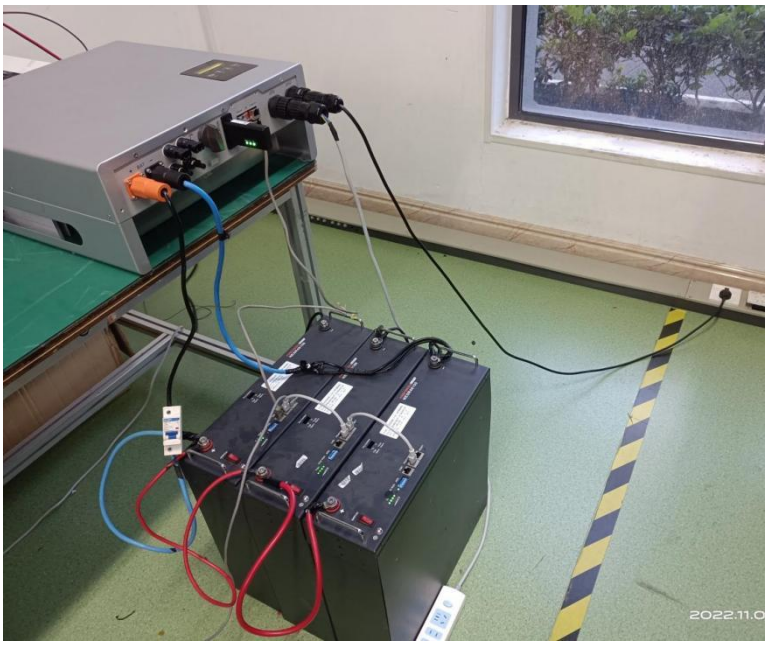


Figure 148 The inverter is connected to a 220V mains power

5）Power on. Turn on the battery rocker switch→ turn on the MCB between the inverter and the host battery→ turn on the inverter's power switch.

6）Establish the relationship between inverter and load. The connection diagram is shown in Figure 149.

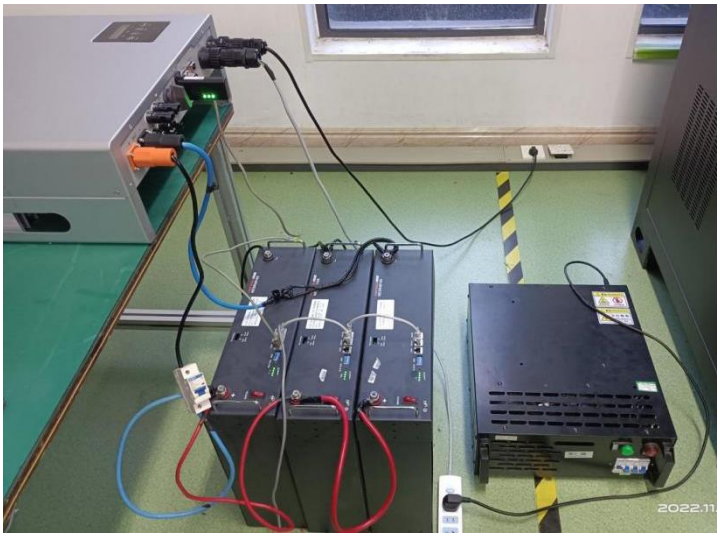


Figure 149 Schematic diagram of inverter-load connection

7) Set battery type settings, protocol type settings, cut-off SOC settings and other battery-related parameters on the LCD screen interface and web interface of the inverter. After successful communication between the battery and inverter, the battery can be charged and discharged normally, shown in Figure 150.

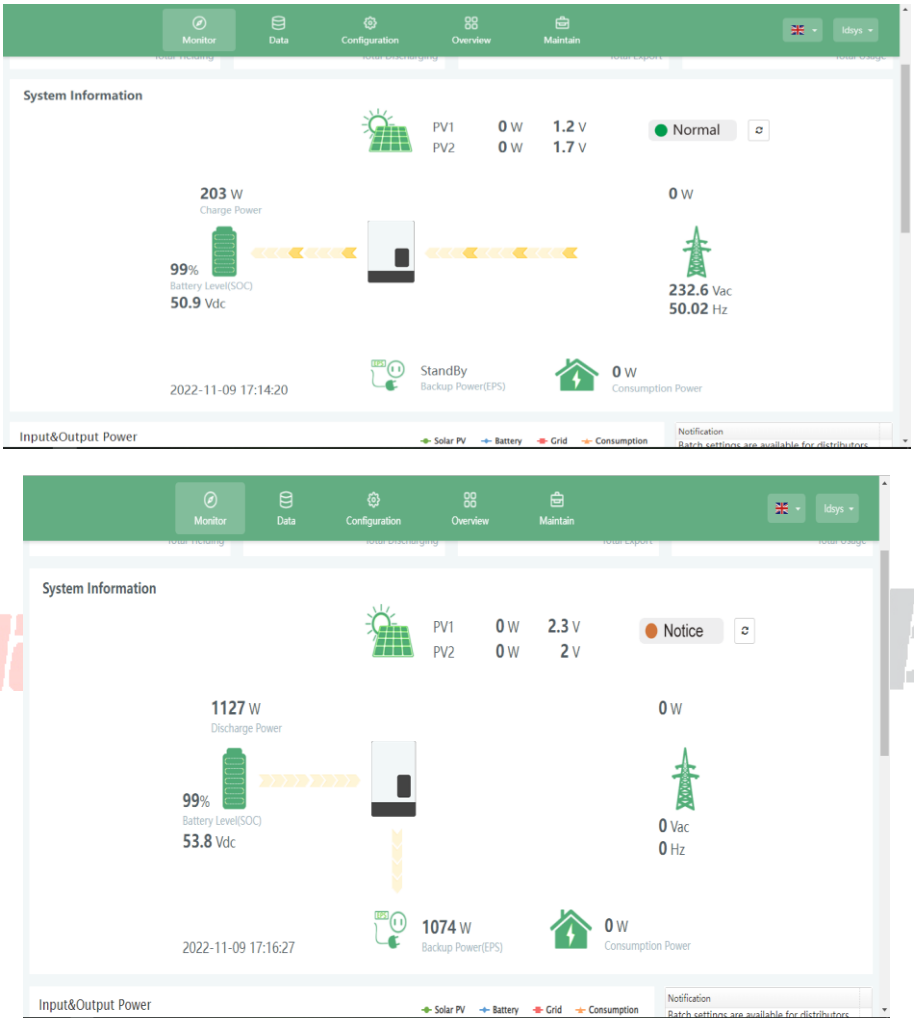


Figure 150 Schematic diagram of the battery charge/discharge monitoring interfac

a) Set the battery type to lithium mode and set the protocol type. Select “Setting” in the Display menu, press “ENTER” to enter→ select “Set Battery” in the Setting menu, press“ ENTER” to enter, and then press “ENTER” to confirm→ select“ Lithum-Ion” in the Set Battery menu, press “ENTER“ to enter→ select “Lithum-Ion LUX ”, press “ENTER ”to select, press“ ENTER ”to confirm.

Figure 151 Schematic diagram of setting up the lithium battery mode and protocol

b) The setting of the discharge cut-off SOC, if the client inverter adopts on-grid mode, then follow the following steps to set it.

Select "Set EOD "under the Setting menu, press" ENTER" to enter→ set the appropriate SOC value, and then press "ENTER" to confirm, This completes the cut-off SOC value setting.

Figure 152 Setting the cut-off SOC in grid-connected mode

c) Configure the Wifi collector, plug the sampler in the position shown in Figure 153, and then use the computer to connect the device hotspot.

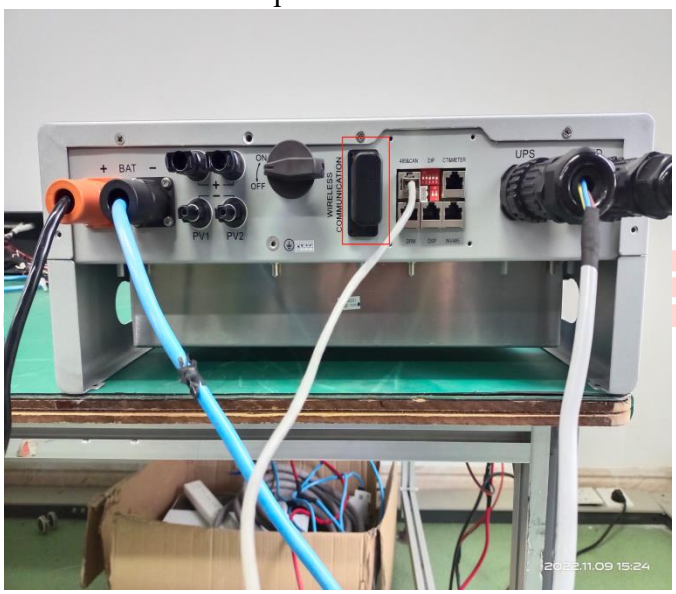


Figure 153 Schematic diagram of Wifi collector

Figure 154 Connecting to a WiFi hotspot

d) Computer login. Login http://10.10.10.1; Login account: admin ; Login password: admin;

Go to Station Mode Settings, click SCAN, select an available home wifi hotspot, enter your password, and click Save. The three lights of the collector are always on, that is, the collector is successfully configured, and you can log in to the inverter website to monitor the status of the battery.

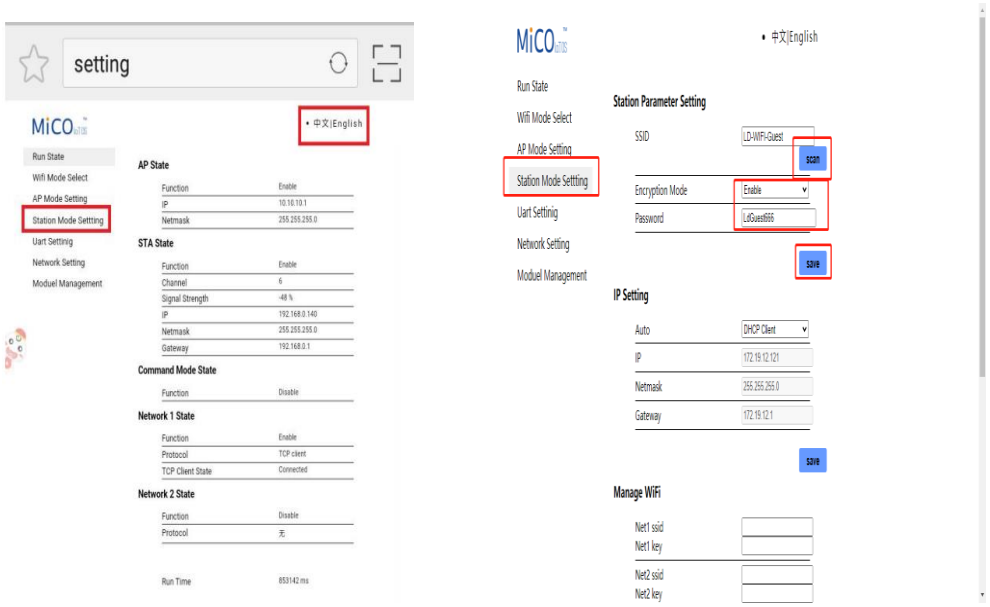
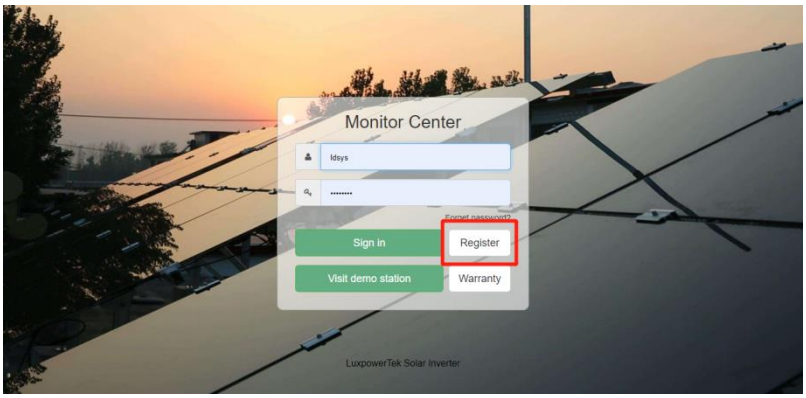


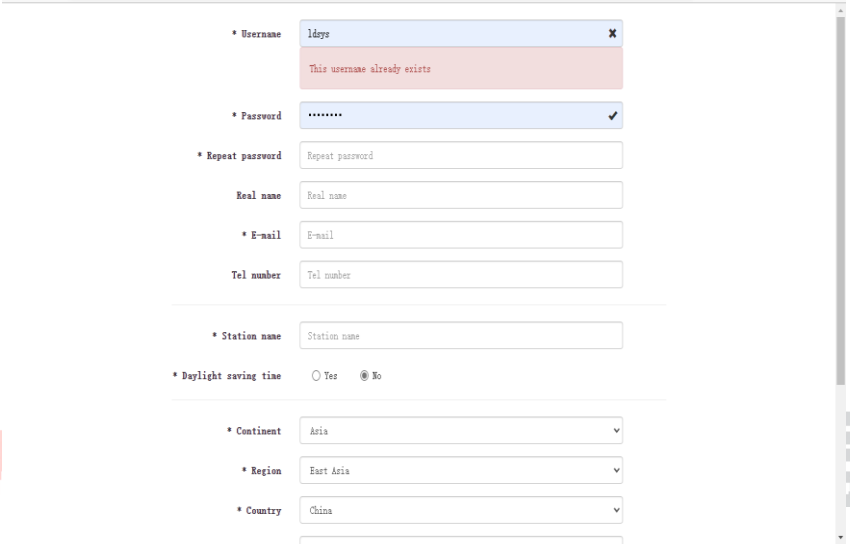
Figure 155 Configuring the collector

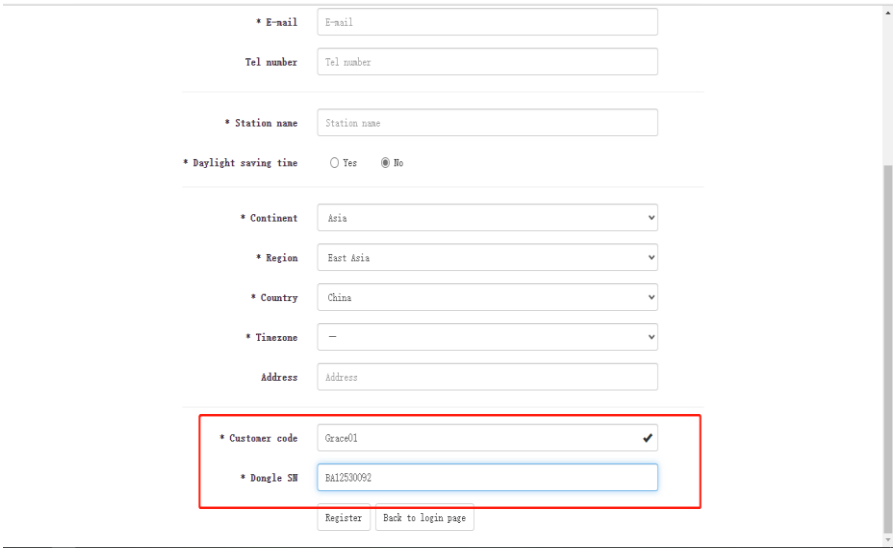
e)Battery discharge cut-off SOC setting (off-grid mode)

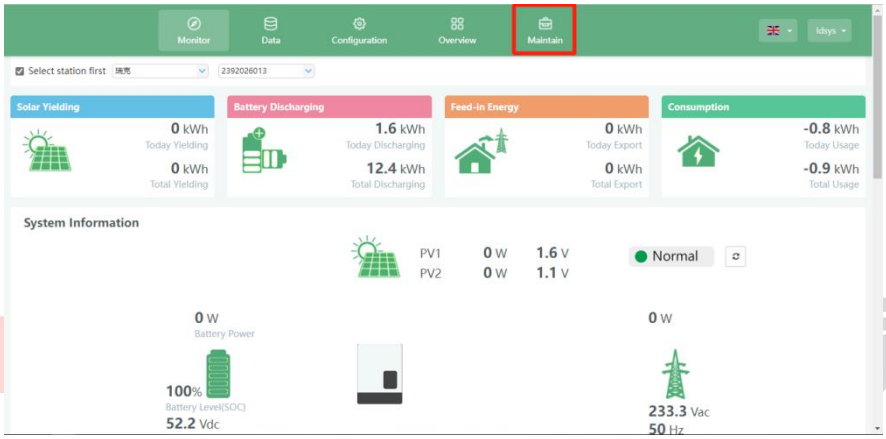
If the client inverter adopts off-grid mode, follow the steps below to set it.

Go to the "https://server.luxpowertek.com/" inverter website (sampler needs to be configured) →Enter the website, click to register the account (user name and password can be customized) → customer code filled in "Grace01", Dongle SN filled in the sampler SN code (as shown in Figure 156 position) → enter the inverter setting website, click "maintenance after-sales" → in the discharge settings interface, customers can customize the setting "off-grid discharge cut-off SOC limit (%)".









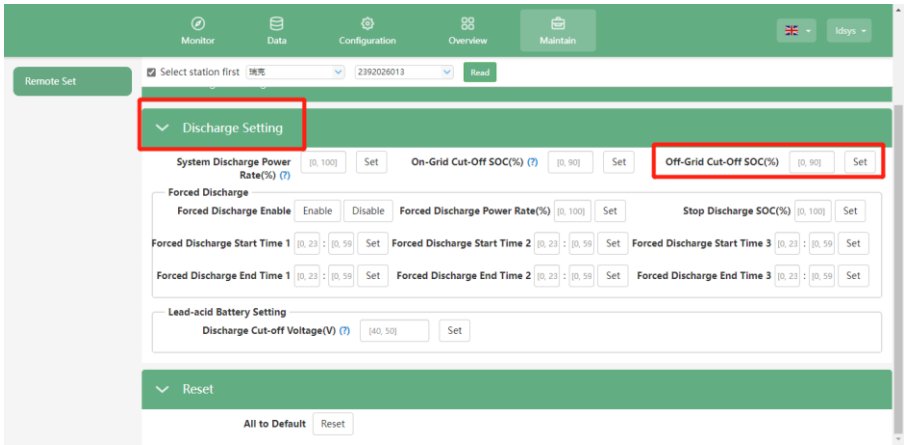


Figure 156 SOC setting in off-grid mode

f) On the charging setting interface, the charging power percentage of the system is set to 100%; AC charge and charge priority require manual operation to enable.

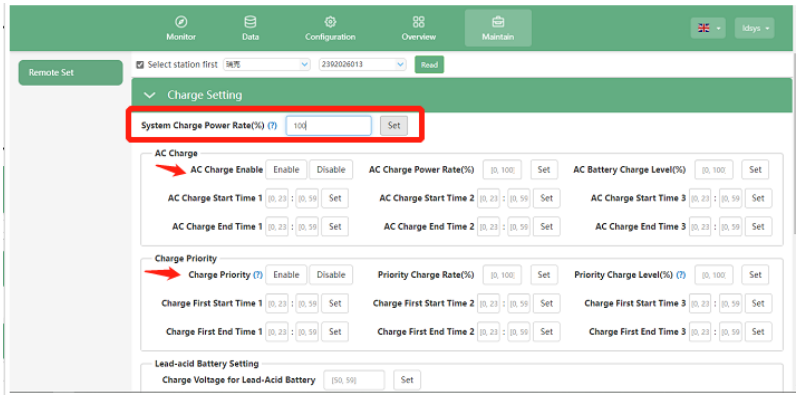


Figure 157 Charging settings

g)View error code and alarm code information.

Select History in the Display menu, press “ENTER” to enter→Error Record in the History menu is the error code to view, Alarm is the alarm code to view→ select Alarm Record in the History menu, press “ENTER” to enter, then you can check the

specific meaning of the code according to the operation manual of the inverter.

Figure 158 Schematic diagram of alarm code information viewing

2.9.4 Debugging considerations

1. The battery dial address is set according to the master and slave dial address of this manual.

2. The inverter needs to set the battery-related lithium battery mode, cut-off SOC setting (off-grid or on-grid), charging enable, etc.

3. The CAN interface adapter harness is properly wired as defined in this manual.

4. After the battery is turned on, use the UI software to set the battery to the inverter brand that needs to match.

2.10 Commissioning guidance for NESR batteries and Victron inverters

2.10.1 Prepare the cables

Figure 159 Victron inverter + controller
（Inverter model：Quattro II 48/5000/70-50/50
Controller model：Color control GX(CCGX)）

Figure 160 Parallel cables

Figure 161 Communication line when connected in parallel

Figure 162 CAN adapter harness for battery and controller communication /wiring harness for external mains power connection to inverter

2.10.2 The definition of the interface

The CAN interface for the Victron controller and battery is defined in Table 6.

Table 6 Definition of adapter bundles for CAN interfaces

CAN interface of the battery	CAN interface of the controller	Pin Definition
Pin4	Pin7	CAN_H
Pin5	Pin8	CAN_L

2.10.3 Debugging methods and steps

Taking the parallel use of three NESR batteries as an example, the matching verification of the Victron inverter and ND1540BMS is carried out in detail. The steps to build the test platform are as follows:

1) Establish the parallel connection relationship between the battery and the battery, please refer to step 1 in section 2.1.3.

2) Set the dial addresses of the battery master and slave, and refer to step 2 in section 2.1.3.

3) Establish the connection relationship between the inverter and the controller. Connect the communication interface of the inverter to the communication interface of the controller, and the power supply B+ and B- terminals of the inverter are connected to the power interface of the controller through the power cord.

Figure 163 Schematic diagram of the controller interface

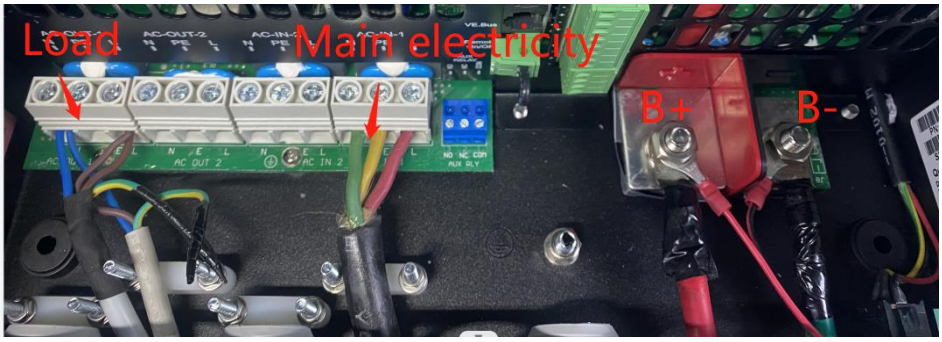


Figure 164 Schematic illustration of the interface of the inverter

Figure 165 Schematic diagram of the connection between the inverter and the controller

4) Establish the connection relationship between the controller and the battery. Connect the BMS. Can interface of the controller to the CAN communication interface of the host battery through the CAN adapter harness. Kindly Note: The pins at both ends of the CAN adapter bundle are defined according to Table 6.

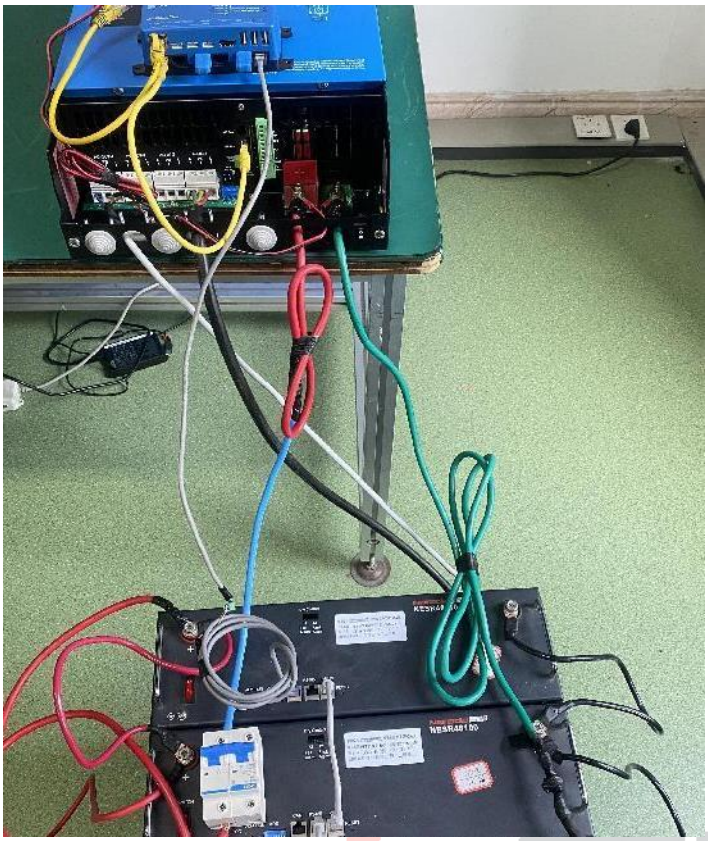


Figure 166 Schematic diagram of the connection between the controller and the host battery

5) Establish a connection between the inverter, controller, and battery. Connect the B+ and B- terminal positions of the inverter to the P+ of the host battery and the P- terminal position of the last slave battery, respectively.

6) Establish the connection between the inverter and the power grid. Connect the inverter to the mains. A schematic diagram of the connection of the battery, controller, inverter, and grid is shown in Figure 167.

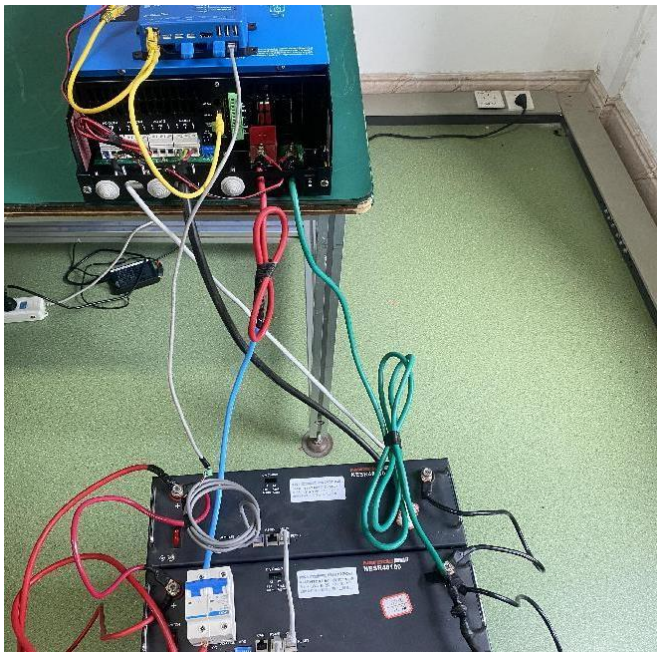


Figure 167 Schematic diagram of the connection between the inverter and the power grid

7) Establish the connection between the inverter and the load. A schematic diagram of the connection between the battery, inverter, controller, grid, and load is shown in Figure 168.

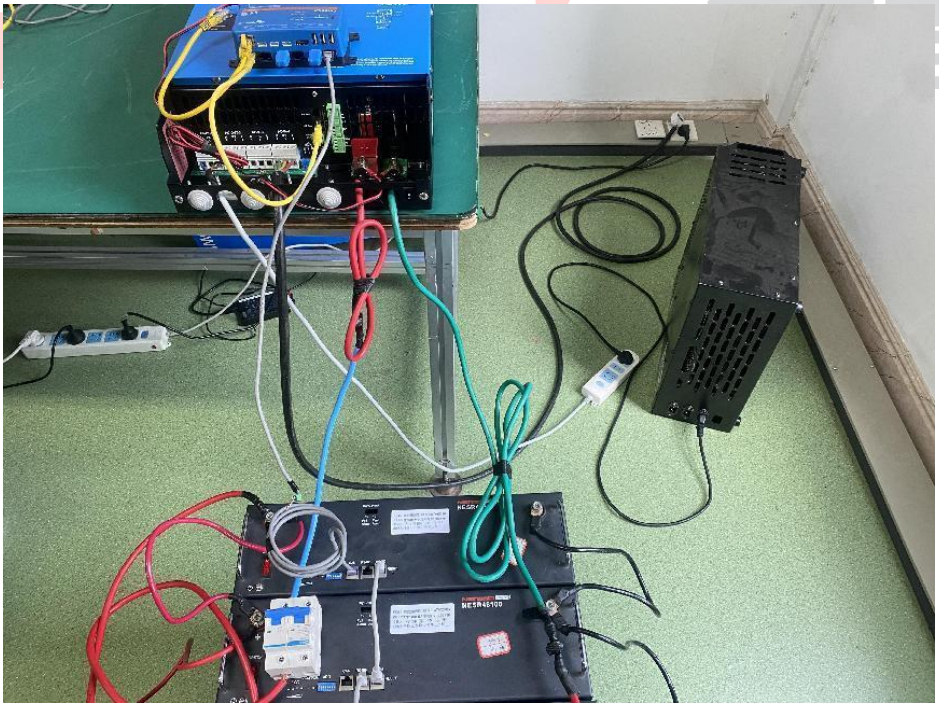


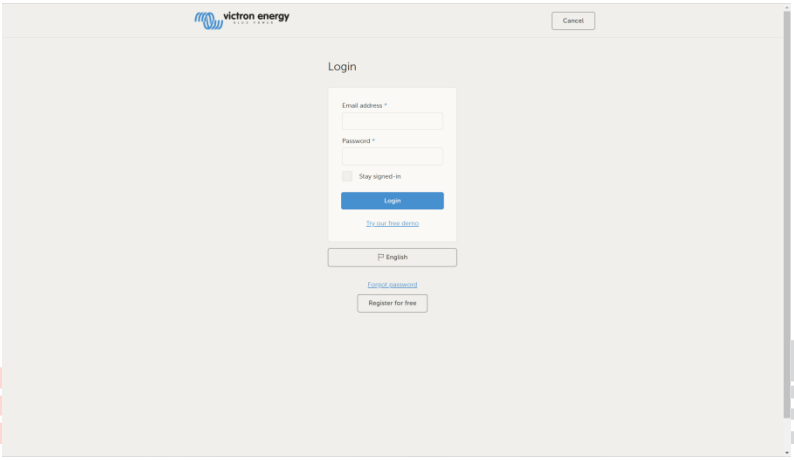
Figure 168 Construction diagram of the system test platform

8) Power on. First turn on the rocker switch of the battery in turn→ turn on the MCB between the inverter and the battery→ turn on the power switch of the inverter. Note: The power switch of the inverter is set to I gear.

9) The controller is connected to the external network, first register the account, password. Then set the protocol of the inverter and the parameters of the battery in the background monitoring platform of the inverter. The steps to register an account password are as follows:

a) Log in to the official website address of the inverter to register.

https://vrm.victronenergy.com/login



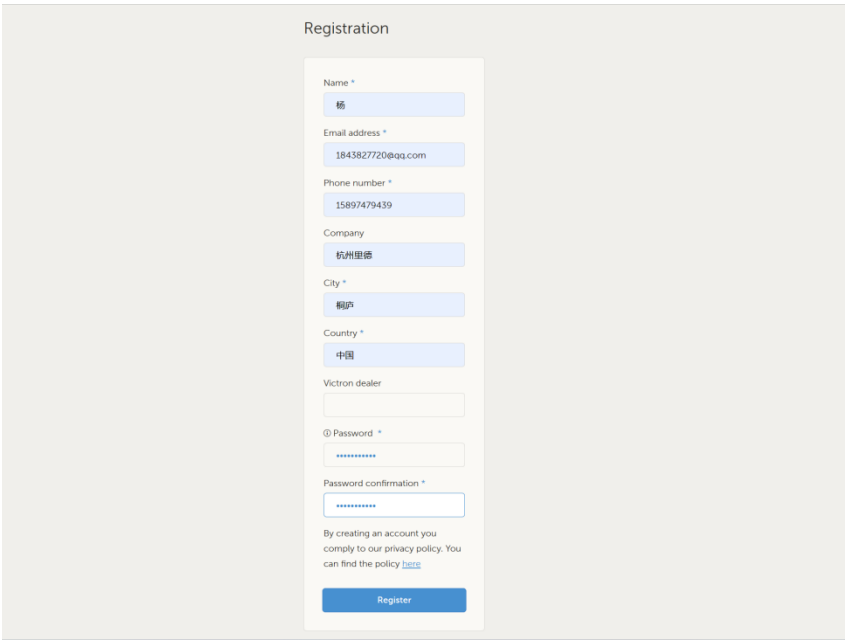


Figure 169 The interface for registering a user name and password

b) When the registration is successful, the email address will be verified again.

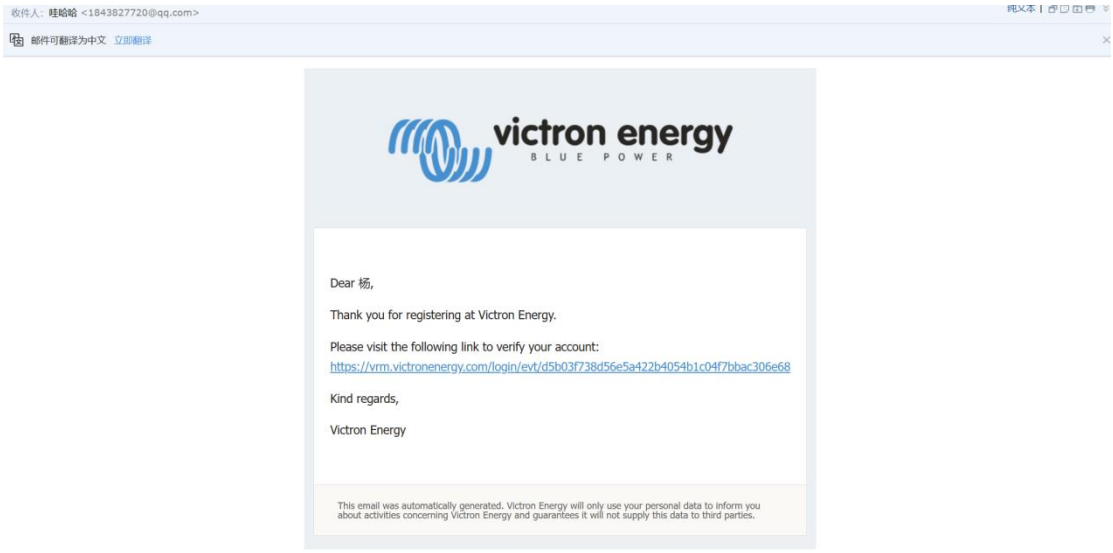
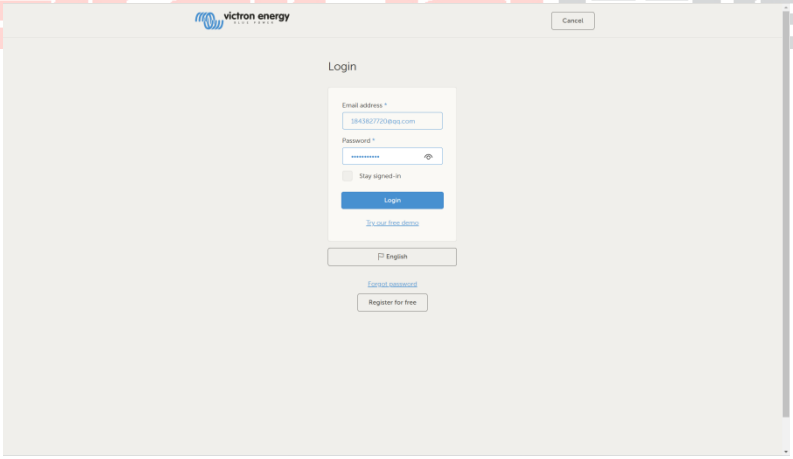
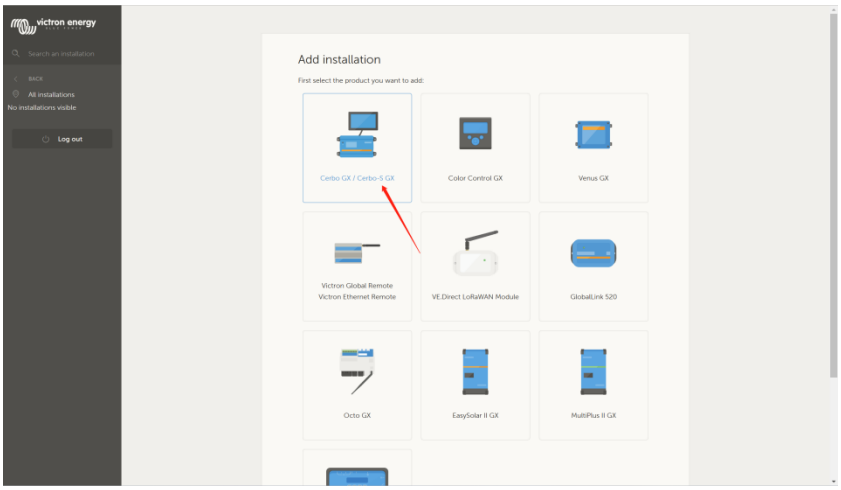


Figure 170 Email verification link

c) When logging in the username and password, add the device to the background monitoring interface and fill in the ID of the controller.





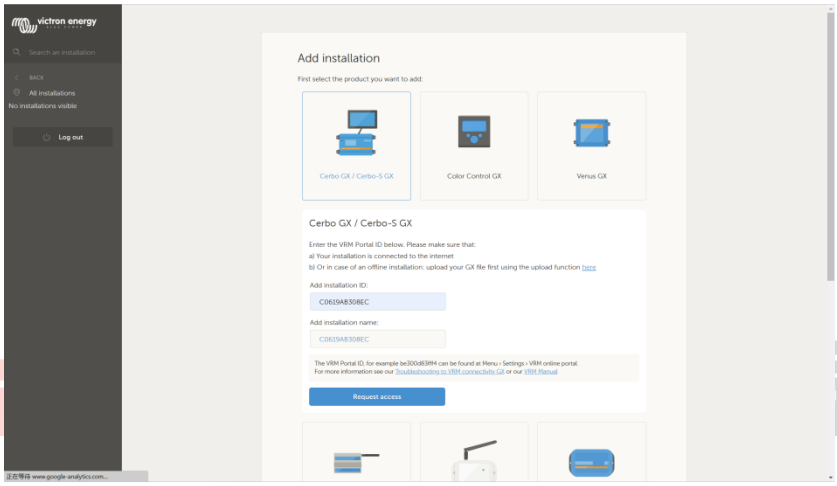


Figure 171 Fill in the ID of the controller to the new device information of the monitoring platform

d) The new controller device success interface prompt is shown in Figure 172.

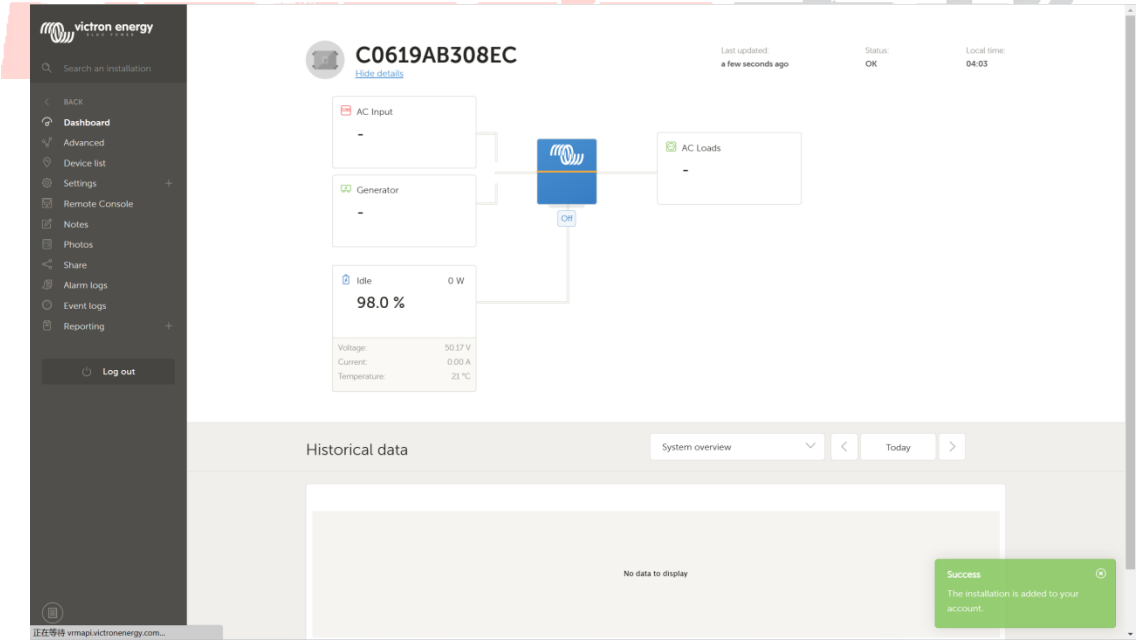
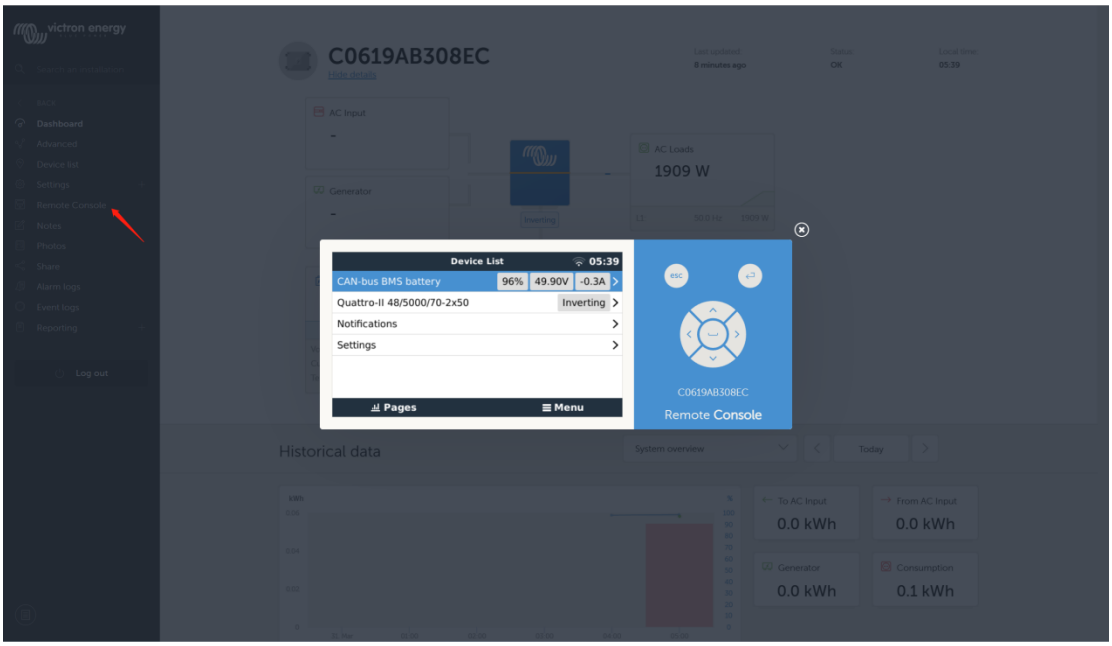


Figure 172: The interface after the device is successfully added

e) Set the maximum charging current and voltage. Path: Click Remote

Console→setting→DVCC. Requirements: The maximum charging voltage is set to 54V.



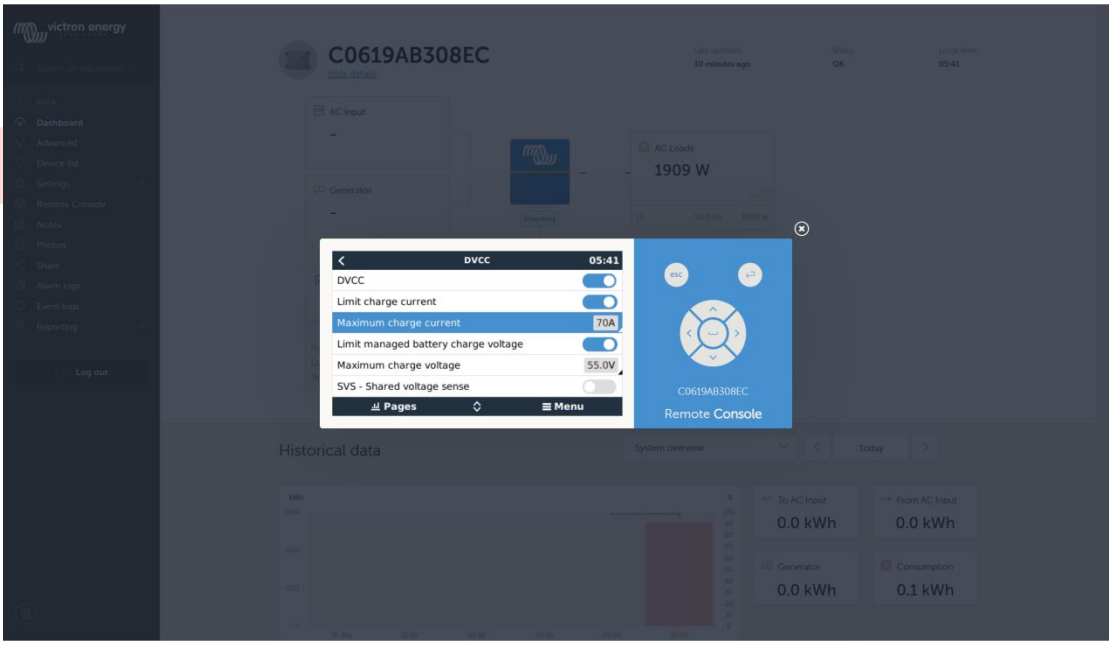


Figure 173 Sets the maximum charging voltage to 54V

f) Set the communication protocol to CAN communication protocol. Path: Device List:

Settings→ System setup →Battery monitor→ NARADA on CAN-bus.

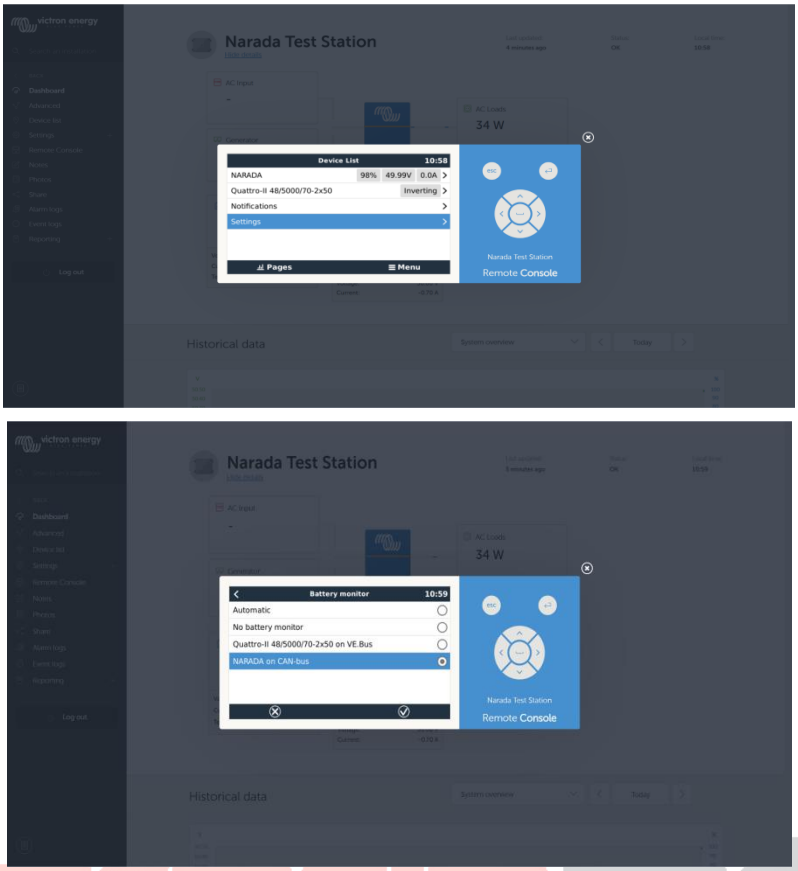
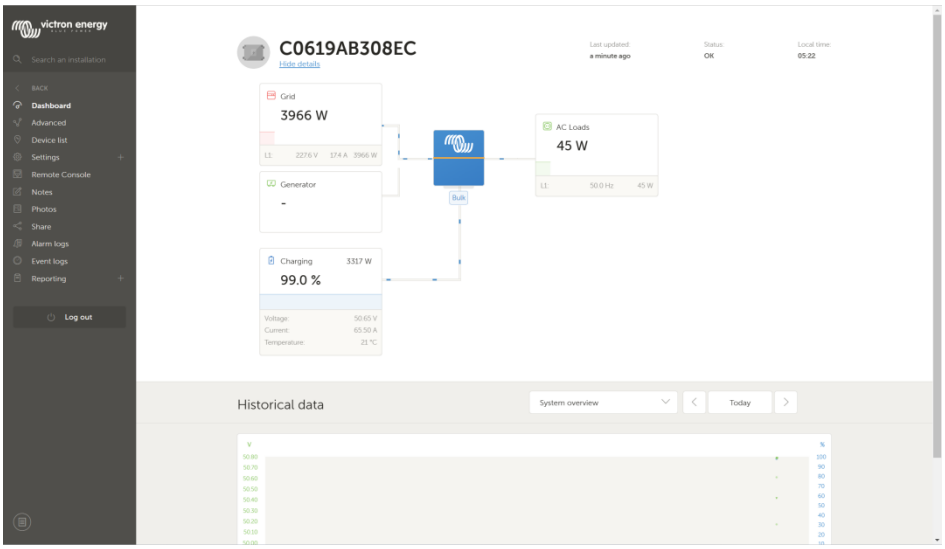


Figure 174 Setting the protocol type

g) The background monitoring platform can observe the status information of the battery.



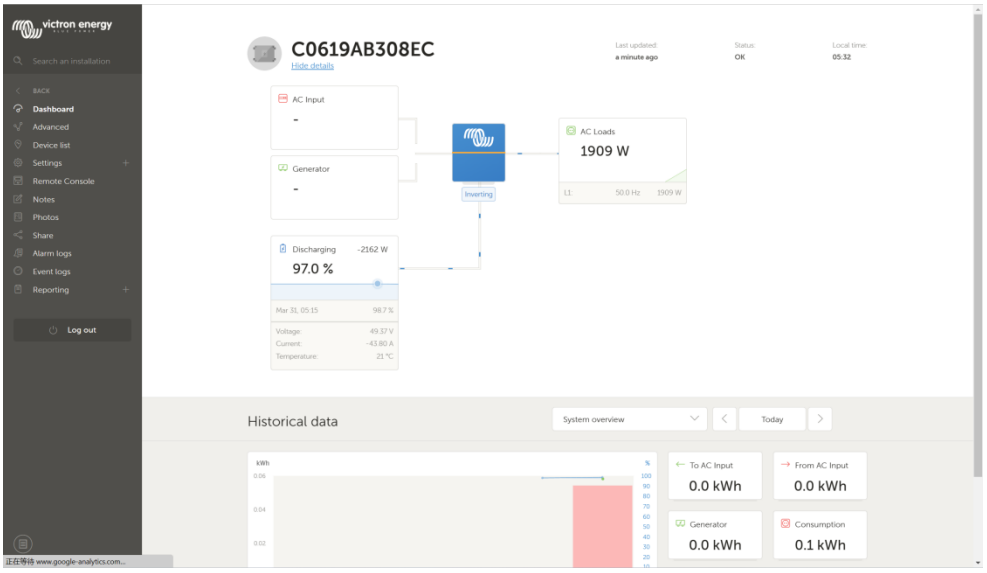


Figure 175 View battery information

2.10.4 Debugging considerations

1. The battery dialing address setting is set according to the dialing address of the master and slave in this manual. This is

2. The inverter needs to set the battery-related communication protocol and maximum charging voltage.

3. The CAN interface adapter harness is properly wired as defined in this manual.

4. After the battery is turned on, use the UI software to set the battery to the inverter brand that needs to be matched.