Monitoring Box

MB-S4-W4 User Manual

Ver1.1



Ginlong Technologies Co., Ltd.

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1. Manual Description

1.1. Copyright Statement

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1.2. Notes

The products and services you purchased are subject to the commercial contracts and terms of Ginlong Technologies Co., Ltd. Some products or services described in this manual may not be within the scope of your purchase and use. Due to product upgrades or other reasons, the content of the manual will be updated irregularly, so this manual is for reference only. For any questions, please obtain the latest product information from the official website or contact Ginlong official customer service.

1.3. Introduction

This manual mainly introduces the product information, installation and commissioning, operation and maintenance of Solis 4th generation monitoring box MB-S4-W4. Before installation and use, please read this manual carefully to understand the safety knowledge about the monitoring box and familiarize yourself with its functional characteristics. The specific functions supported by the monitoring box shall be subject to the sales contract or technical agreement.

1.4. Target Users

This manual is only applicable to technical personnel who are familiar with the principles of photovoltaic Plantsystems and have professional electrical operation qualifications.

1.5. Symbol Conventions

The following symbols are used in this manual to emphasize important relevant information, and their meanings are as follows:

⚠ Danger
Indicates a risk of personal injury or death if not avoided.
⚠ Warning
Indicates a risk of minor to moderate personal injury if not avoided.
Note
Indicates supplementary explanation of key information in the manual.

2. Safety Precautions

This chapter details the key safety precautions for the monitoring box during installation and commissioning. Following these guidelines can not only ensure the personal safety of operators but also effectively extend the service life of the equipment.

Note
–Users must strictly follow the guidelines in this manual and related documents for equipment installation, configuration and operation. –The user shall be solely responsible for any equipment damage, performance failure or personal injury caused by failure to follow the requirements, which is not within the manufacturer's liability scope.

2.1. Personnel Requirements

Note
Personnel responsible for equipment installation and maintenance must receive strict training, master the equipment usage methods proficiently, understand the relevant standards of the country/region where they are located, and can only perform operations after passing the assessment.

2.2. Personal Safety

Danger
–Be sure to use insulated tools and take personal protection when operating the equipment. –Before electrical work, all power supplies must be disconnected and confirm the equipment is not live. –When the equipment is short-circuited, it is strictly forbidden to approach or touch it, and the power supply should be cut off immediately.

2.3. Equipment Safety

Danger
Before installation, be sure to confirm that the selected installation location has sufficient load-bearing capacity and structural stability to ensure its reliability and firmness.
Warning
–When performing equipment installation, maintenance and other operations, select appropriate professional tools and strictly follow the operating procedures. –All operations must comply with the applicable standards and safety specifications of the equipment location. –Any disassembly or modification without the manufacturer's authorization is strictly prohibited, otherwise the equipment damage caused thereby will not be covered by the warranty service.

2.4. Environmental Requirements

●The equipment shall be stored in a suitable temperature and humidity environment, placed in a clean, dry and well-ventilated area, and protected from dust and condensation.

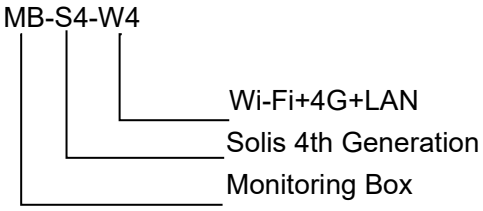
●It is strictly forbidden to install the equipment in flammable, explosive, corrosive and other environments.

●It is strictly forbidden to install the equipment in environments with direct sunlight, dust, smoke, volatile gases, corrosive gases, infrared and other radiation, organic solvents or excessive salt content.

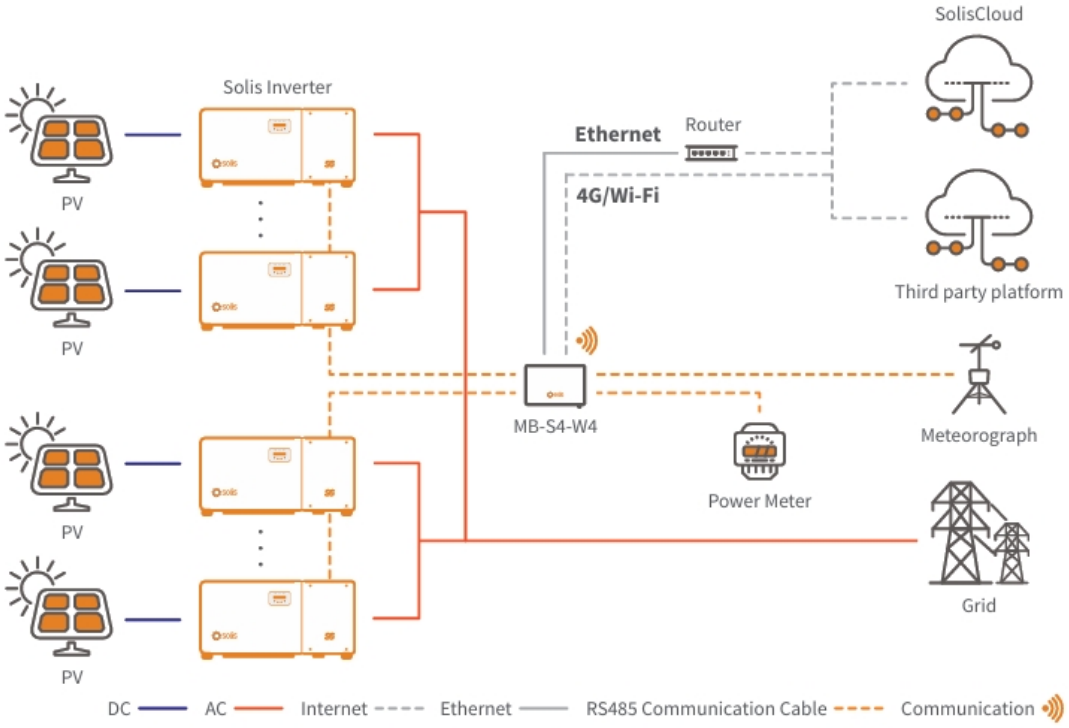
●It is strictly forbidden to install the equipment in areas with strong vibration, strong noise sources and strong electromagnetic interference.

3. Product Introduction

3.1. Model Identification

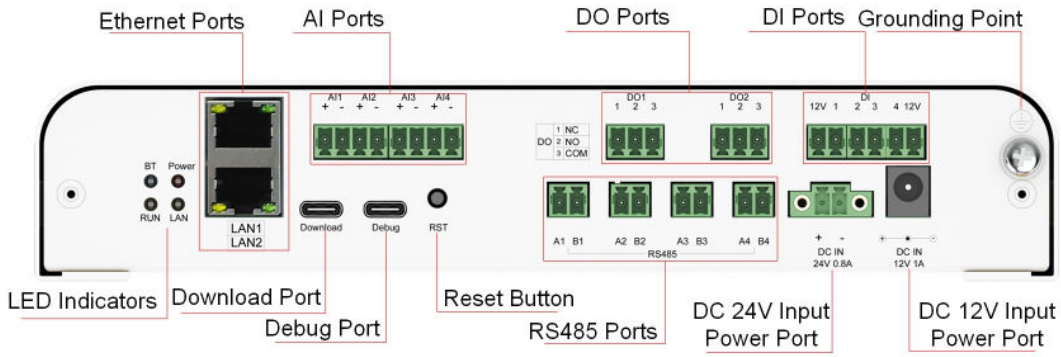


3.2. Application Scenarios



Note
–A maximum of 20 inverters can be connected to the same RS485 bus. –The maximum number of devices that can be connected to the system is 80, including inverters, energy meters, Meteorographs, etc.

3.3. Appearance



3.4. Indicators

Indicator	Color	Status	Description
BT	Blue	Not defined yet	Reserved
Power	Red	Steady on	Power normal
		Steady off/Flashing	Power abnormal
RUN	Yellow	Slow flashing	Operation normal
		Steady on/Steady off	Operation abnormal
LAN	Green	Steady on	Network connected
		Periodic flashing	Network connection failed

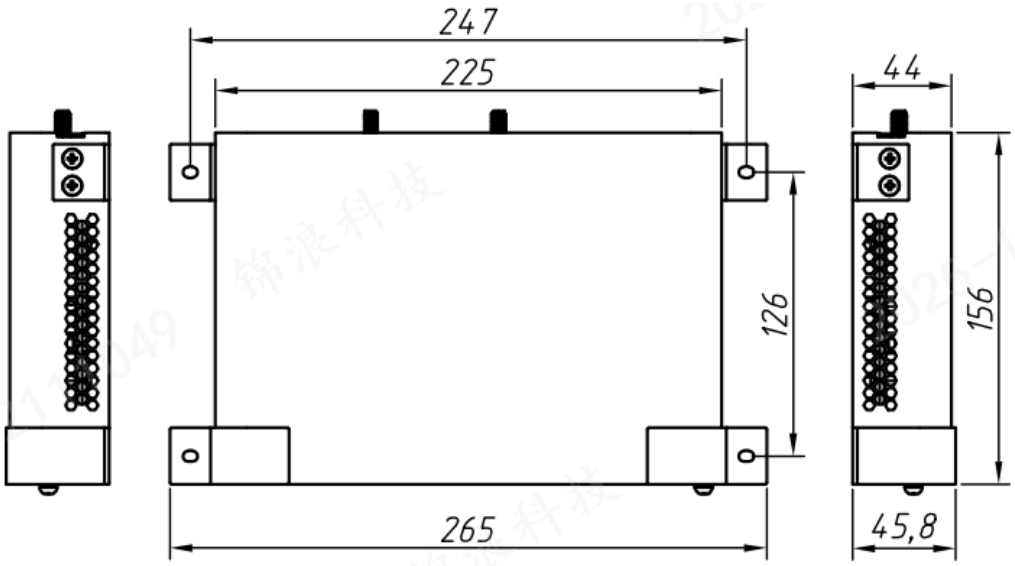
3.5. Communication Ports

Port Name	Identifier	Description
Ethernet	LAN1, LAN2	Network cable connection port. Steady green light: Normal line connection. Blinking yellow light: Normal data communication.
RS485 Port	A1, A2, A3, A4	RS485A, differential signal + of RS485.
	B1, B2, B3, B4	RS485B, differential signal - of RS485.
DI Port	12V	Digital input, access grid dispatching/alarm DI signals. 4 channels passive dry contact supported. Wiring: 1-12V, 2-12V, 3-12V, 4-12V.
	1	
	2	
	3	
	4	
	12V	
AI Port	AI1	Analog input, access Meteorograph AI signals. 1 voltage-type & 3 current-type AI signals supported.
	AI2	
	AI3	
	AI4	
DO Port	DO1	Digital output, 2 channels relay output. Relay spec: 250Vac/1A or 30Vdc/1A.
	DO2	

3.6. Button

Button	Operation	Description
Rst	Short press 3-5s until yellow light blinks rapidly	Clear embedded WEB login password
	Long press 10-15s until yellow/green/blue lights off	Restart & restore factory settings

3.7. Dimensions

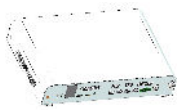
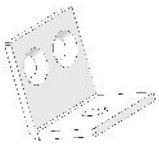
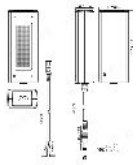
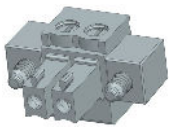


4. Equipment Installation

4.1. Pre-installation Check

4.1.1. Equipment Inspection

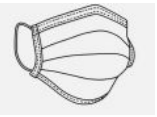
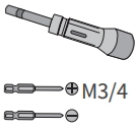
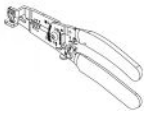
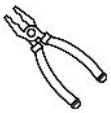
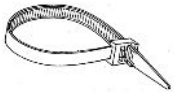
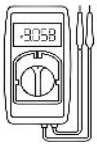
Ensure intact packaging and complete packing list. Delivered contents include:

					
A	B	C	D	E	F
					
G	H	I	J	K	L

No.	Name	Model	Description	Quantity
A	Monitoring Box	MB-S4-W4	Main unit	1
B	Mounting Bracket A		Wall bracket	2
C	Mounting Bracket B		Wall bracket	2
D	Countersunk Screw M4*8	M4*8-SS	Fix bracket to unit	4
E	Expansion Screw & Accessories	T4.8*32-SS	Fix to wall	4
		CH-105		
F	Power Adapter	12V 4A 48W UES48-120400SPA1	Power supply	1
G	Plug-in Connector	2P	Power terminal	1
H		4P	AI terminal	2
I		3P	DO terminal	2
J		2P	RS485/DI terminal	7
K	Antenna	φ29.7*316mm, 3m, SMA Male	4G&WIFI antenna	2
L	Network Cable	Cat 5e UTP	1m	1

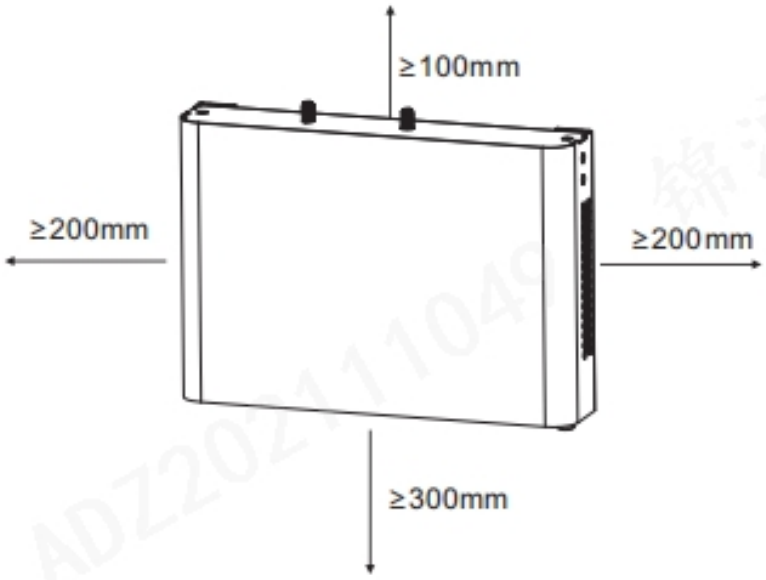
4.1.2. Tool Preparation

Recommended preparation tools (others optional):

Personal Protective Equipment				
	Insulating Gloves	Safety Goggles	Insulating Shoes	Dust Mask
Installation Tools				
	Impact Drill	Torque Screwdriver	Wire Stripper	Marking Pen
				
	Wire Cutter	Cable Tie	Multimeter	Rubber Hammer

4.1.3. Installation Requirements

- Indoor installation only, refer to Chapter 7 for temp & humidity range.
- Install at maintenance-friendly height.
- Ensure sufficient surrounding space for operation/maintenance. Minimum spacing:



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4.2. Install the Monitoring Box

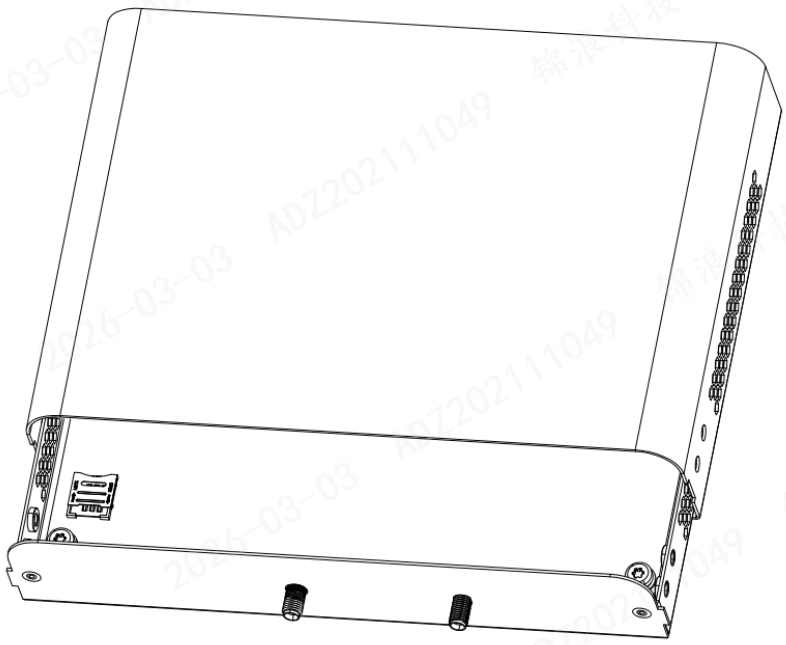
4.2.1. Install the SIM Card (Optional)

• If user choose cellular network for internet connection and communication, a Standard SIM card (25mm x 15mm, capacity ≥ 64KB) is recommended. After inserting the SIM card, follow the settings in Section 5.4.2 to configure the APN.

• Recommended data plan: 100MB/month (1 inverter), 100MB+40MB*n/month (n inverters).

Steps:

1. Remove 4 back fixing screws with cross torque screwdriver (1.2N·m recommended).
2. Pull to open the box, insert SIM card firmly into slot without loosening.



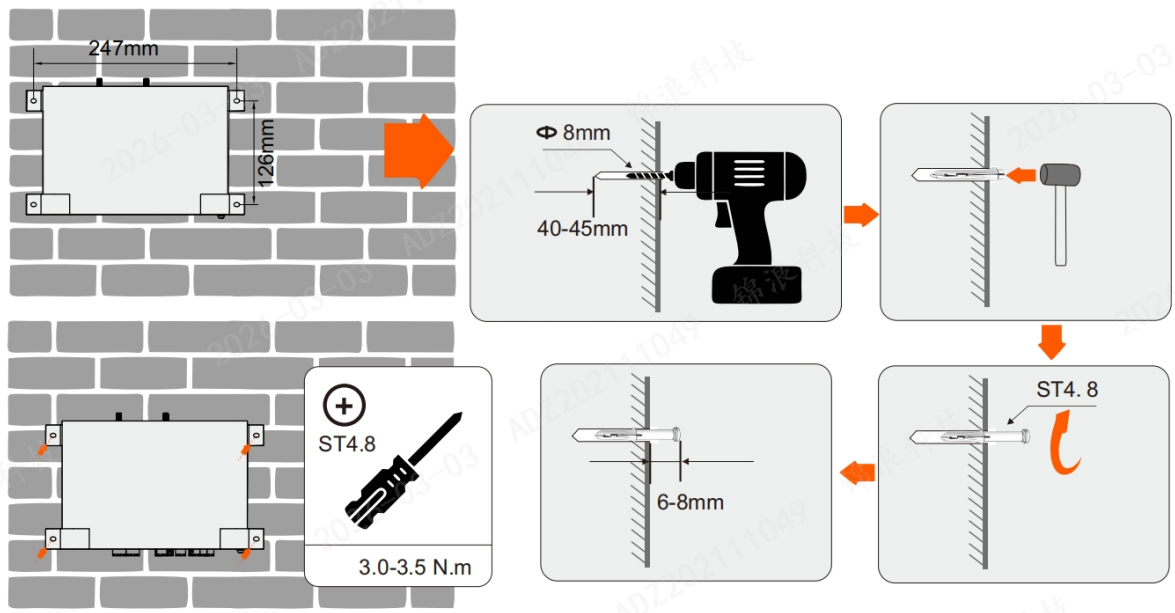
4.2.2. Desktop Installation

Note
•Place on level/stable desktop to avoid damage from falling. •Place in non-easy-touch area to prevent signal interruption from displacement/power off.

4.2.3. Wall Mounting

Note
•Before drilling, confirm the internal condition of the installation wall to avoid water pipes, cables, and other hidden facilities. •When mounting the monitoring box, ensure the wiring area faces downward for easier operation and maintenance. •To ensure firm installation and device compatibility, it is recommended to use the specialized screws and accessories provided in the box.

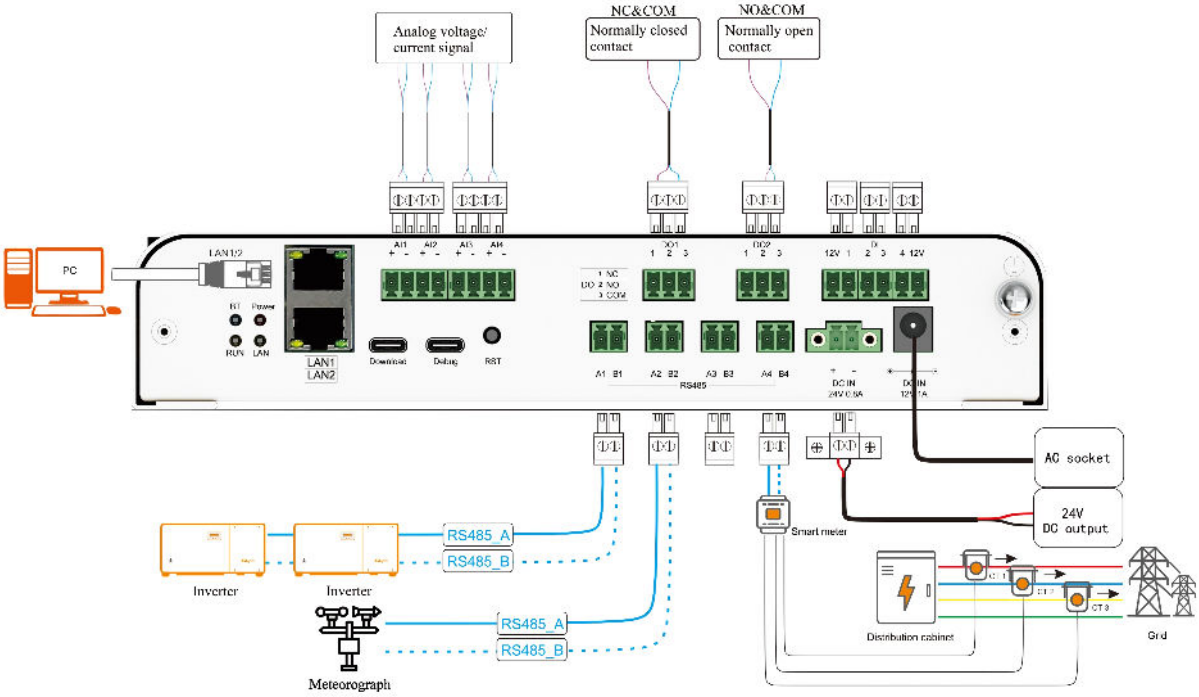
Step 1: Use the M4 x 8 countersunk head screws from the delivery to fix mounting bracket B to the side of the monitoring box. Recommended torque is 1.9 N·m.
Step 2: Mark the drilling positions on the wall with a marker, ensuring they correspond exactly to the mounting holes on the back of the device.
Step 3: Use an impact drill with an 8mm diameter bit to drill holes to a depth of 40-45mm.
Step 4: Install the expansion screws, leaving approximately 6-8mm protruding from the wall to allow space for hanging the device.
Step 5: Hang the device securely onto the expansion screws.



4.3. Electrical Connection

Note
–Wear PPE such as safety shoes and insulated gloves. –Electrical connections must only be performed by professionals. –Cable specs for reference only, comply with local regulations in practice.

4.3.1. System Wiring Diagram



4.3.2. Cable Preparation

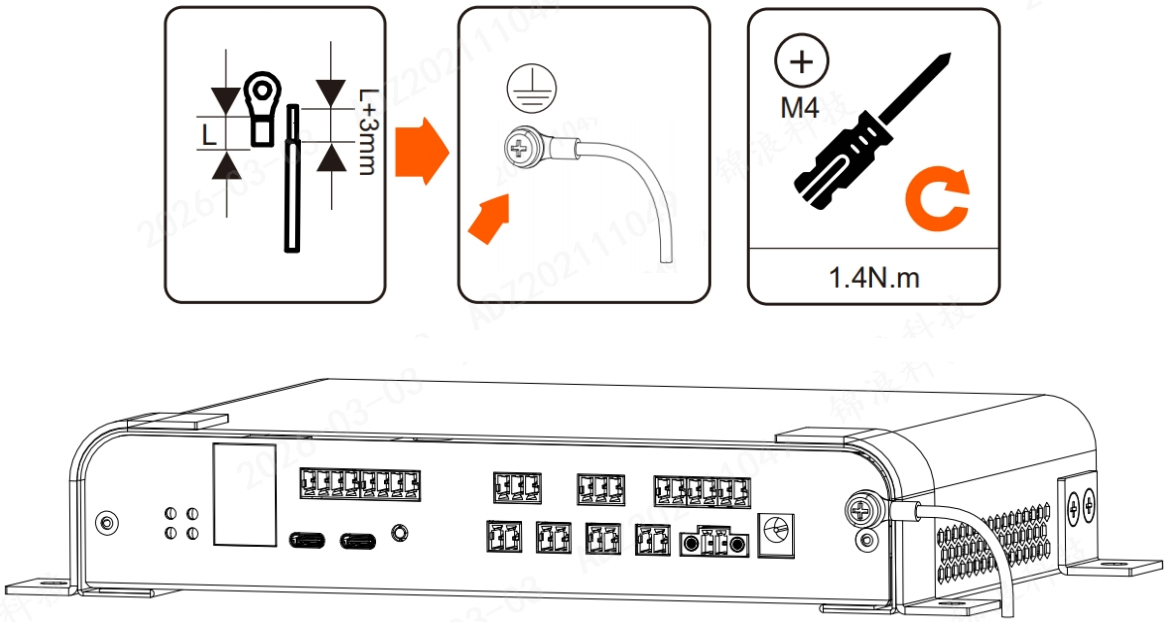
Cable Type		Recommended Specification
Protective Ground Wire		Outdoor copper core, 4mm²~6mm²
RS485 Communication Cable		Outdoor shielded twisted pair, 0.2mm²~1.5mm²
DI Signal Cable		2-core/multi-core, 0.2mm²～1.5mm²
AI Signal Cable		
DO Signal Cable		
Network Cable		1m Cat5e UTP (included); Cat5e+ shielded RJ45 if extended
Power Supply (Two Options)	24V DC Input Cable	2-core, 1mm²~2.5mm²
	100-240V AC Adapter	Included in package

4.3.3. Protective Ground Wire Connection

Note
–The device must be reliably grounded before any other electrical connections.

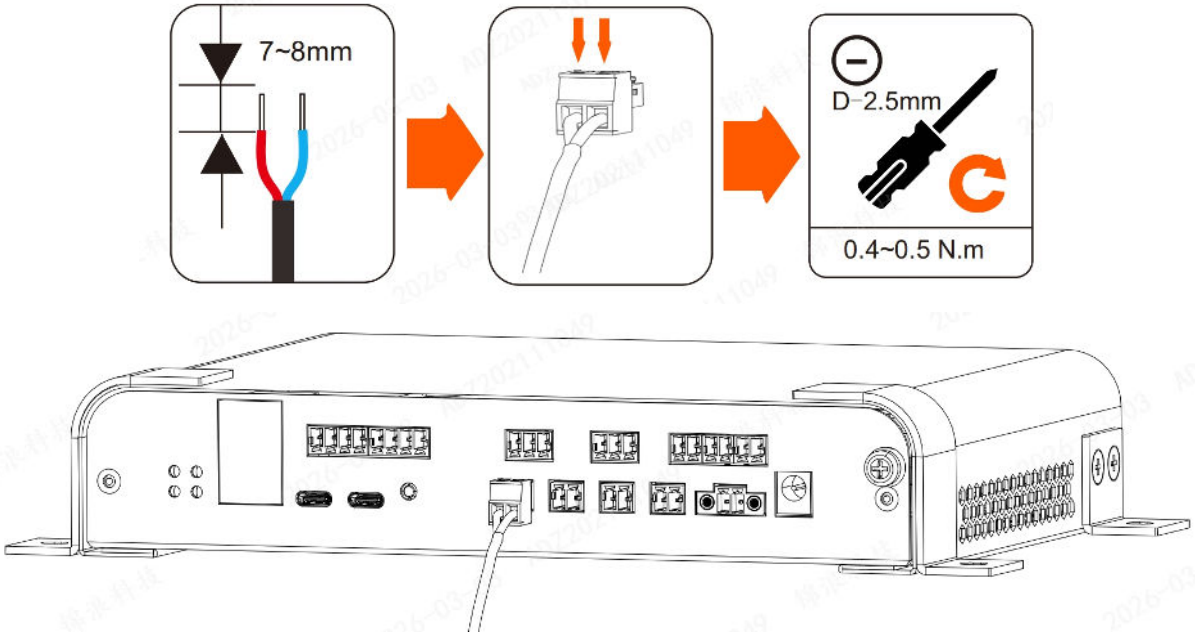
Steps:

1. Strip cable outer skin, reserve L+3mm core length.
2. Crimp core with grounding OT terminal firmly.
3. Insulate connection with heat shrink tube.
4. Fasten to ground terminal with cross torque screwdriver (1.4N·m recommended).



4.3.4. RS485 Communication Cable Connection

Supports Modbus-RTU devices: inverters, Meteorographs, Meters, etc.



Port		Identifier	Description
RS485	RS4851	A1	RS485A, RS485 differential signal +
		B1	RS485B, RS485 differential signal -
	RS4852	A2	RS485A, RS485 differential signal +
		B2	RS485B, RS485 differential signal -
	RS4853	A3	RS485A, RS485 differential signal +
		B3	RS485B, RS485 differential signal -
	RS4854	A4	RS485A, RS485 differential signal +
		B4	RS485B, RS485 differential signal -

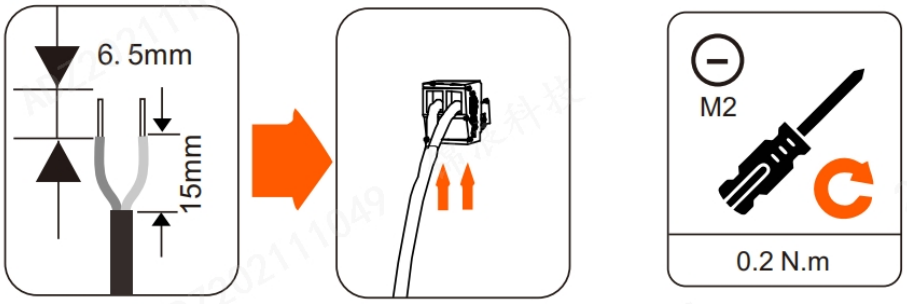
Note

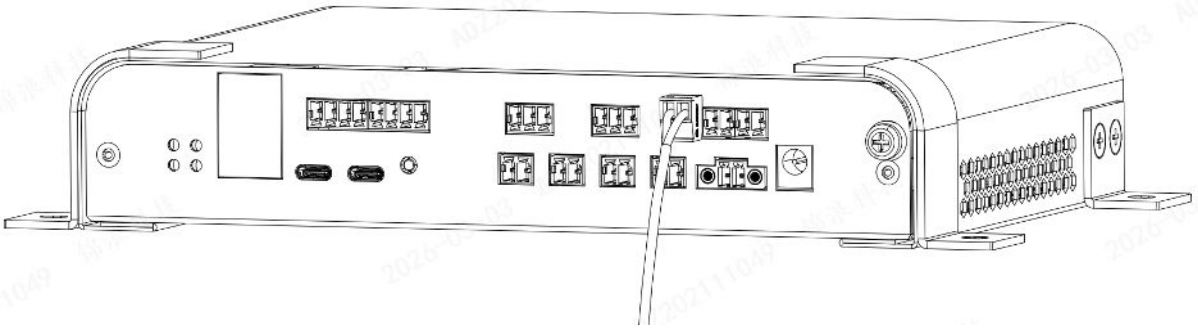
- To connect multiple inverters, use the "hand-in-hand" (daisy chain) method as described in the inverter manual
- A single RS485 cable supports a maximum of 20 inverters
- Each RS485 line must only connect to the same type of device
- The system can handle up to 80 total devices (inverters, meters, Meteorographs, etc.)
- The total length of a single RS485 cable must not exceed 1000 meters

4.3.5. DI Signal Cable Connection

Only supports passive dry contact signals for grid scheduling or alarms.

Recommended transmission distance ≤10m.

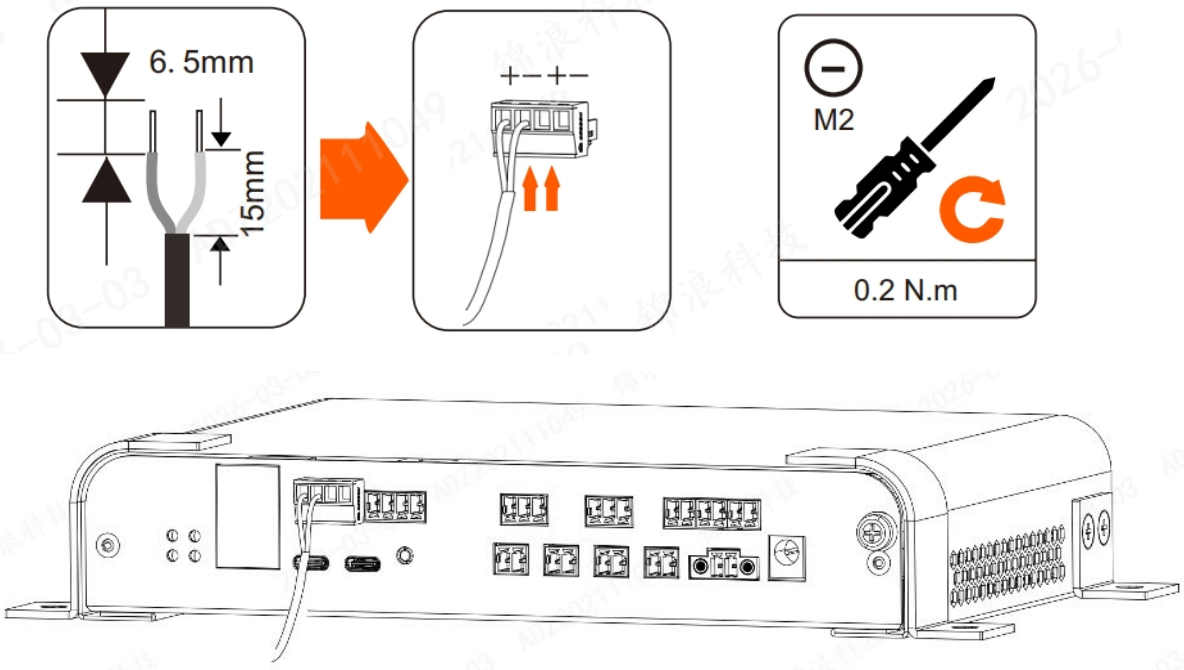




Port		Identifier	Description
DI	DI1	1	4 channels passive dry contact supported
		12V	
	DI2	1	
		12V	
	DI3	1	
		12V	
	DI4	1	
		12V	

4.3.6. AI Signal Cable Connection

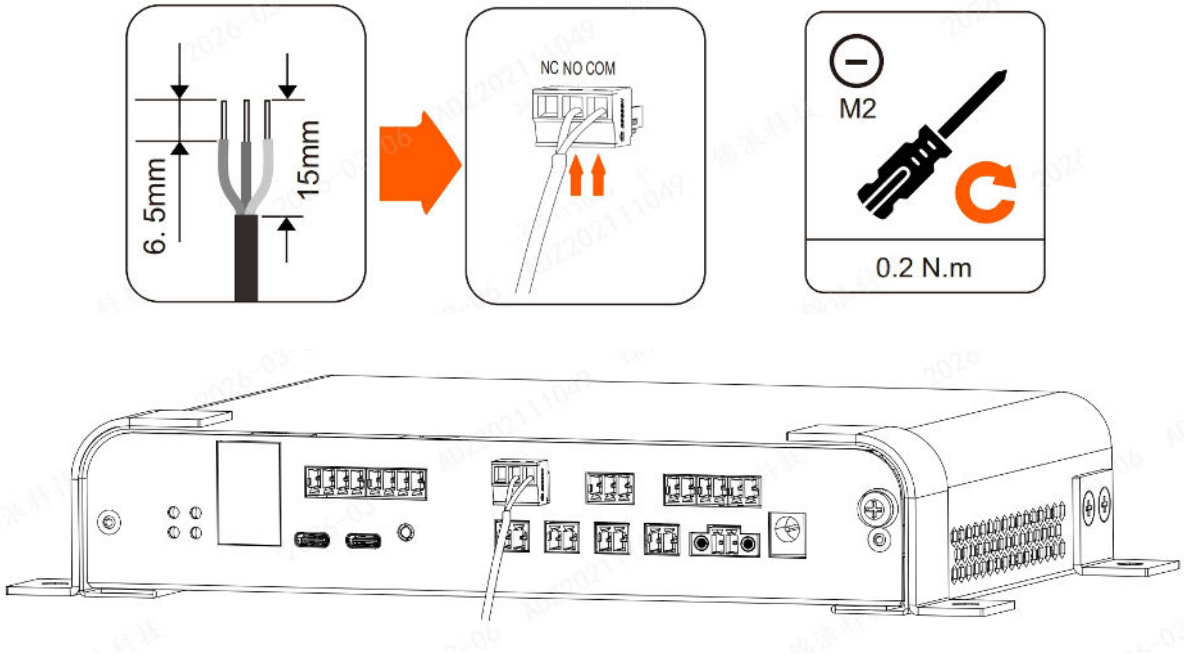
Access Meteorograph sensor AI signals
recommended transmission distance ≤10m.



Port		Identifier	Description
AI	AI1	+	0V-10V voltage input supported
		-	
	AI2	+	0-20mA/4-20mA current input supported
		-	
	AI3	+	
		-	
	AI4	+	
		-	

4.3.7. DO Signal Cable Connection

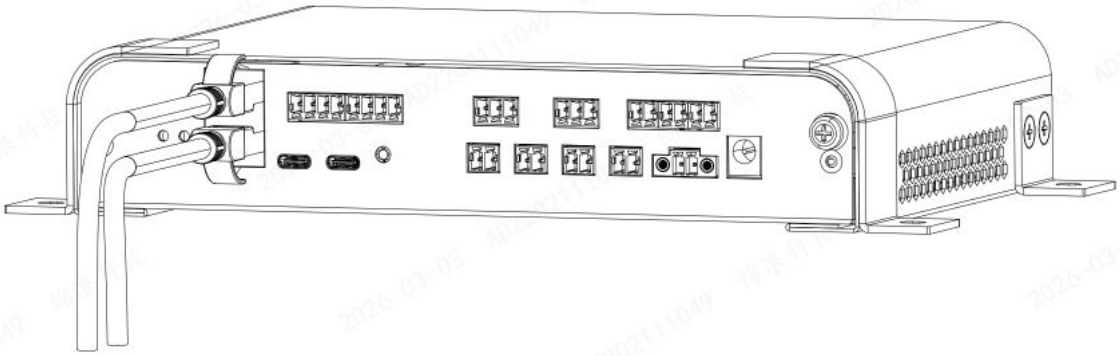
Supports 250V/1A or 30V/1A; NC/COM=normally closed, NO/COM=normally open.
Recommended transmission distance ≤10m.



Port		Identifier	Description
DO	DO1	1	NC
		2	NO
		3	COM
	DO2	1	NC
		2	NO
		3	COM

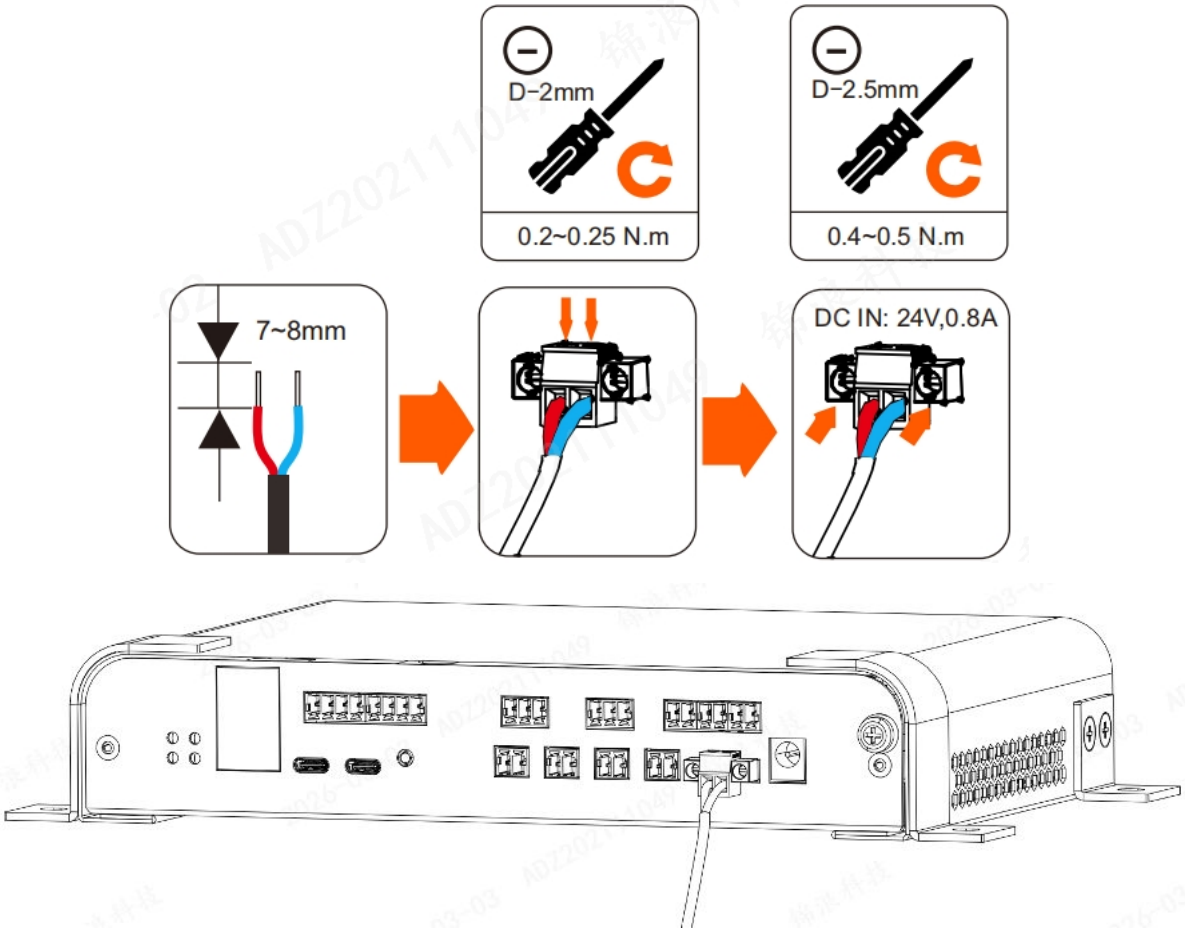
4.3.8. Network Cable Connection

- LAN1/LAN2: Connect to router/switch for public cloud transmission (Solis/3rd-party cloud) or local WEB setting.
- LAN2 extra: Forward data to 3rd-party local management system.
- Standard wire sequence: Orange-White, Orange, Green-White, Blue, Blue-White, Green, Brown-White, Brown.



4.3.9. Power Cable Connection

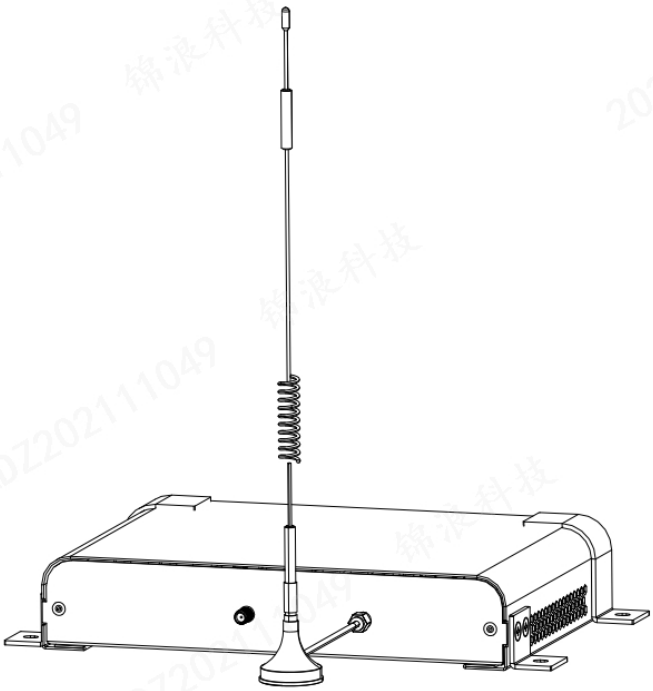
Option 1: 24V DC supply - Use 2-core cable (1mm²~2.5mm²).



Option 2: AC supply - Connect included adapter to 12V power input port.

4.3.10. Install the Antennas

Install 4G and Wi-Fi antennas separately, ensure firm installation.

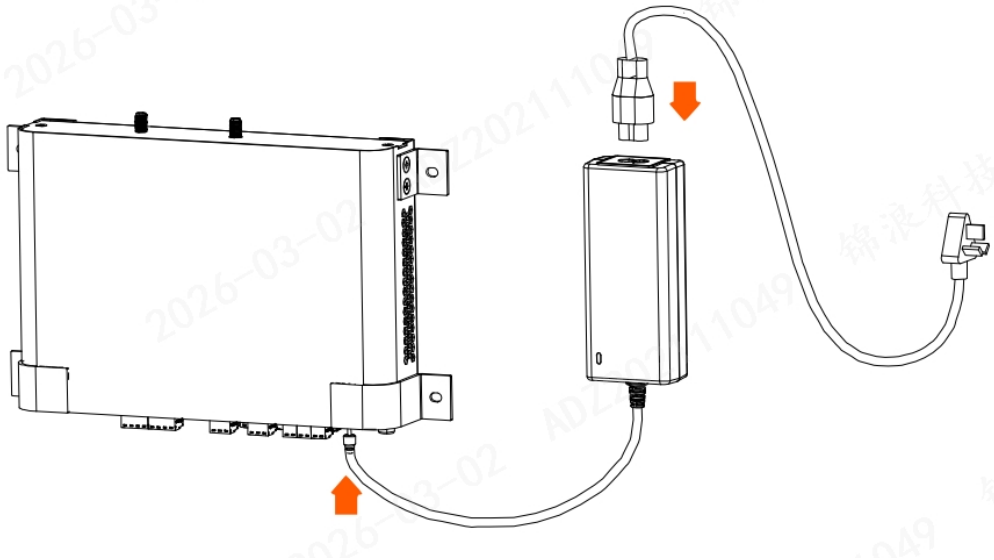


4.4. Pre-power-on Inspection

No.	Inspection Item
1	Verify firm and in-place installation of monitoring box
2	Check all cable connections for firmness (no loosening)
3	Separate strong/weak electricity routing, comply with system plan
4	Neat cable binding (uniform tie spacing, proper tightness, unified direction)
5	No redundant debris (tape, ties) on/around cables

4.5. Power on the Equipment

Option 1: 24V DC supply - Confirm cable connection, close front-stage power switch.
Option 2: AC supply - Install plug manually, connect adapter to AC socket, close socket switch.



5. Equipment Commissioning and Testing

The WEB interface screenshots in this document are for reference only; the actual display shall prevail.

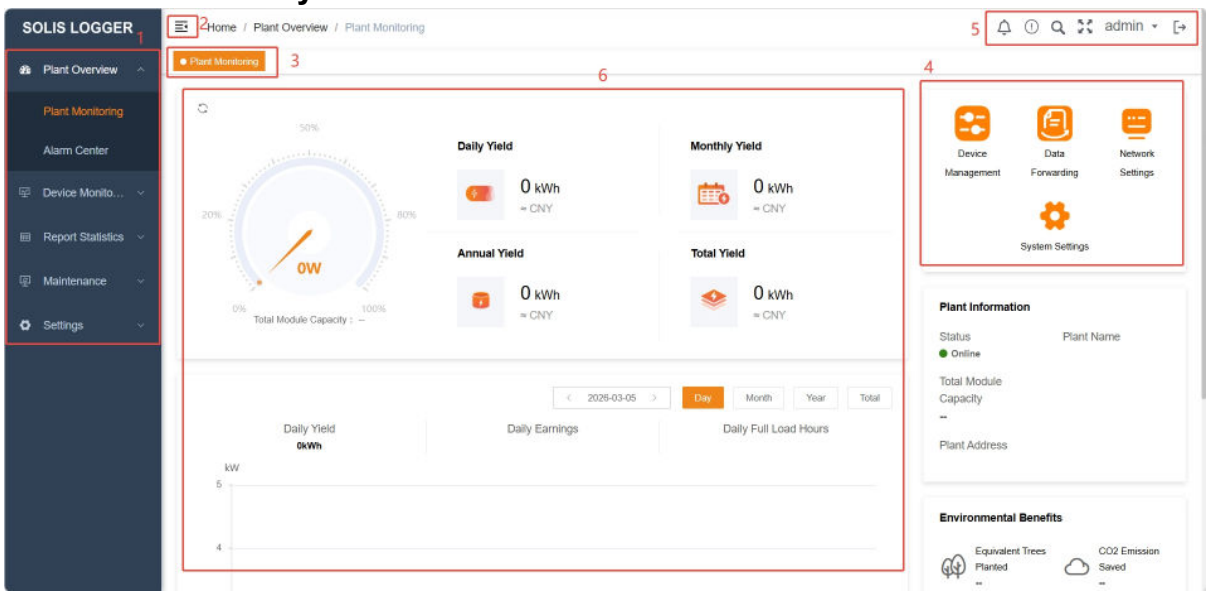
5.1. WEB Interface Introduction

The embedded WEB interface of the device is supported for parameter configuration, device operation status monitoring, alarm information viewing, etc., to keep abreast of the system operation status in a timely manner.

Note

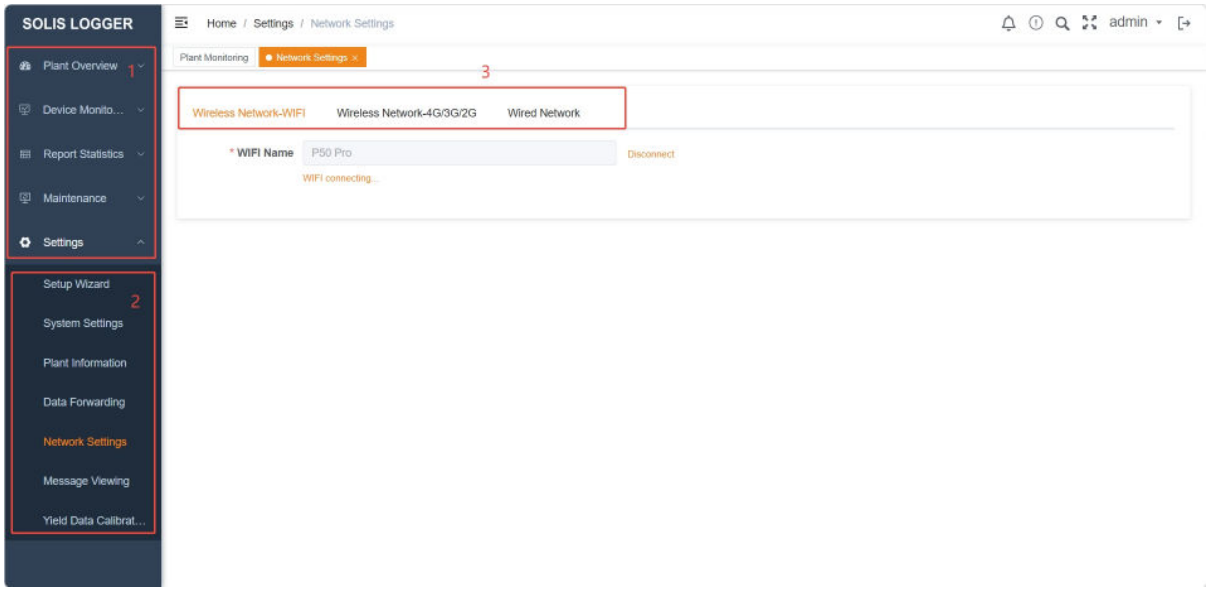
- The WEB interface screenshots in this document are for reference only; the actual display shall prevail.
- Parameter names, ranges and default values may be modified or adjusted in the future; the actual display shall prevail.
- Issuing reset, shutdown, upgrade and other commands to the inverter may cause the inverter to disconnect from the grid and affect power generation.
- Grid parameters, protection parameters, characteristic parameters and power regulation parameters of the inverter must be set by professionals. Incorrect settings of grid parameters, protection parameters and characteristic parameters may cause the inverter to disconnect from the grid; incorrect settings of power regulation parameters may cause the inverter to connect to the grid not in accordance with grid requirements and affect power generation.
- Grid dispatching parameters must be set by professionals. Incorrect settings may cause the Plantto connect to the grid not in accordance with grid requirements and affect power generation.

5.1.1. Interface Layout



No	Function Area	Description
1	Menu Bar	–Interface menu area. Select primary menus as needed, and secondary/tertiary menus will be displayed after selection. –Some primary menus have no secondary menus.
2	Menu List Button	Click to expand or collapse the menu list.
3	Tab List	Displays the opened menus.
4	Quick Setting Entrance	Displays commonly used setting functions, click to jump to the corresponding operation interface quickly.
5	System Status	–Alarm Center: Click to view alarm information. –Version information –Search function –Full-screen button –Personal Center: Click to modify the login password of the embedded web and switch system language. –Logout: Click to exit the system.
6	Detail Interface	Displays detailed information query or parameter setting interface.

5.1.2. Interface Menus



Primary Menu	Secondary Menu	Tertiary Menu	Description
Plant Overview	Plant Monitoring	-	Query Plantinformation.
	Alarm Center	-	Query inverter alarm information.
Device Monitoring	Datalogger	Operation Data	Query operation data.
		Basic Data	Query basic data.
		Device List	Query device list.
		Broadcast Settings	Broadcast and issue inverter setting parameters.

	Inverter	Operation Data	Query operation data.
		Basic Data	Query basic data.
		Device Control	Set inverter control parameters.
		Custom Control	Issue custom control commands.
	Meteorograph	Operation Data	Query operation data.
		Basic Data	Query basic data.
	Meter	Operation Data	Query operation data.
		Basic Data	Query basic data.
Report Statistics	Export Historical Data	-	Export device historical data.
	Operation Log	-	Query operation logs.
Maintenance	Device Management	-	–Add or unbind devices. –Export device information.
	Device Upgrade	-	Upgrade firmware of Monitoring Box or inverter.
	Firmware Management	-	Add or delete firmware of Monitoring Box and inverter.
	Broadcast Upgrade	-	Broadcast and upgrade inverters.
	Active Power Control	-	–Unlimited –Power-limited Grid Connection –Gen-set Controller Anti Back-flow
	Alarm Management	-	Function reserved.
Settings	Setup Wizard	-	Supports setup wizard function for time zone setting, device access and data forwarding according to the wizard.
	System Settings	Basic Settings	Set system time, time synchronization server, etc.
		Security Settings	Set network security certificate.
		Factory Settings	–Datalogger Restart –Restore factory settings –Data Clearance –Export full configuration file –Full configuration file import f
		DI	Set effective status of DI dry contact.
		DO	Set DO activation status and contact trigger status (function reserved).

		RS485	Set RS485 parameters.
	Plant Information	-	Set Plantinformation.
	Data Forwarding	Modbus-TCP	Set Modbus-TCP parameters.
		IEC104	Set IEC104 parameters.
		MQTT	Set MQTT forwarding parameters.
	Network Settings	Wireless Network - WIFI	Set wireless network - WIFI parameters.
		Wireless Network - 4G/3G/2G	Set wireless network - 4G/3G/2G parameters.
		Wired Network	Set wired network parameters.
	Message Viewing	-	View port messages.
	Yield Data Calibration	-	Set inverter power generation calibration data.

5.2. Interface Menus

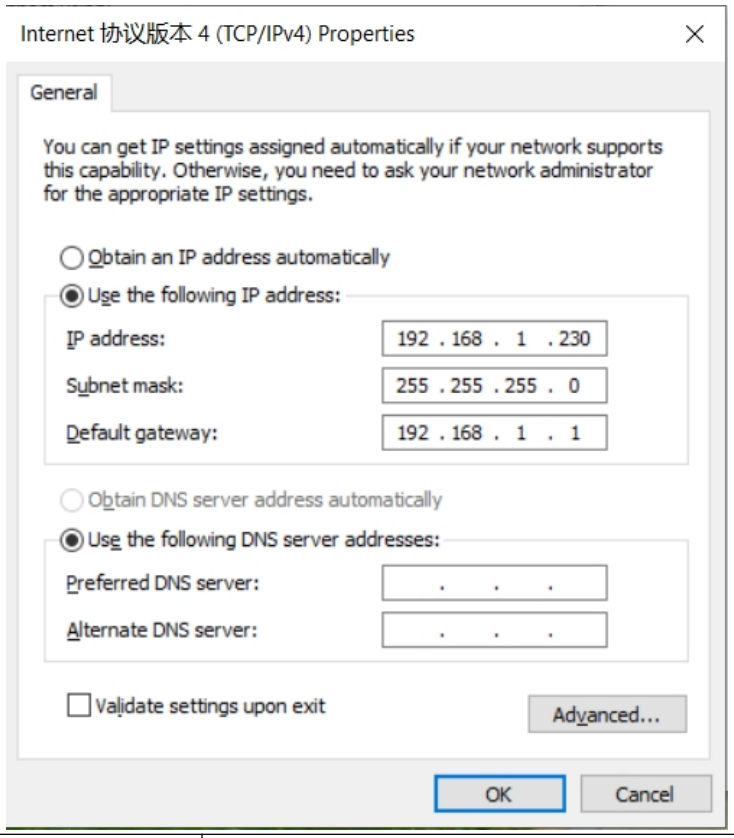
Note
–Ensure all devices in the photovoltaic system are installed correctly and powered on. –Supports Windows 7 and above operating systems. –Browser: Chrome 80, Firefox 74 and above versions are recommended.

5.2.1. Log in to the WEB Interface with Default IP

Steps:

1. Connect the computer to the LAN1 port of the monitoring box via network cable.

2. In the computer system, select Network and Internet > Change adapter options. Double-click the corresponding network name in the pop-up network connection dialog box, or right-click and select Properties, and configure the computer's IP address in the same network segment as the monitoring box.



IP Setting	Monitoring Box Default Value	Computer Setting Example
IP Address	192.168.1.253	192.168.1.230
Subnet Mask	255.255.255.0	255.255.255.0
Default Gateway	192.168.1.1	192.168.1.1

3. Enter 192.168.1.253 in the browser address bar to enter the login interface.

4. Select the language as needed, enter the initial username and password "admin", click Login, set a new password according to the system pop-up prompt, re-enter it and complete the login.

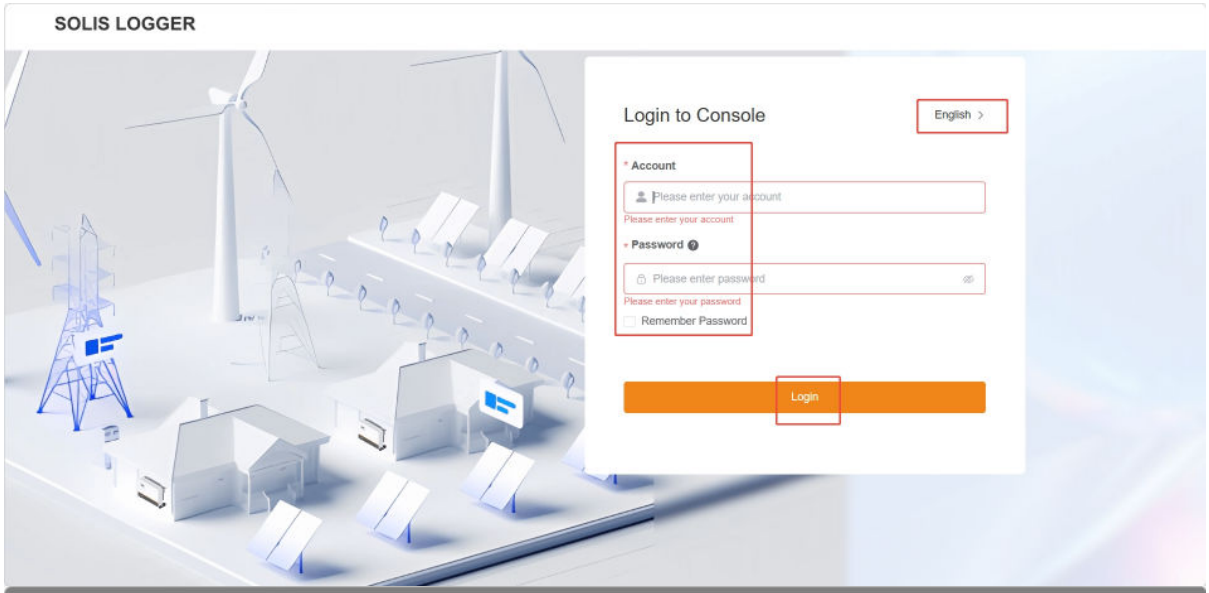
5.2.2. Log in to the WEB Interface with Dynamic IP

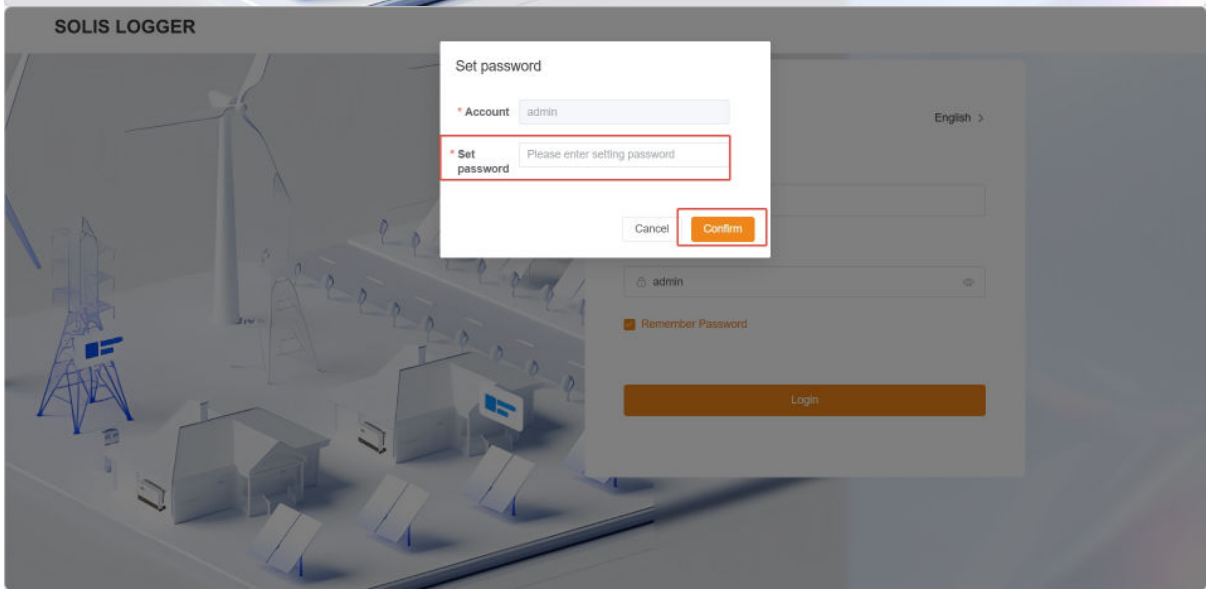
1. Connect both the monitoring box and the computer to the router via network cables.
2. View the IP address assigned by the router to the monitoring box through the router management page.
3. Enter the IP address in the browser address bar to enter the login interface.
4. Select the language as needed, enter the initial username and password "admin", click Login, set a new password according to the system pop-up prompt, re-enter it and complete the login.

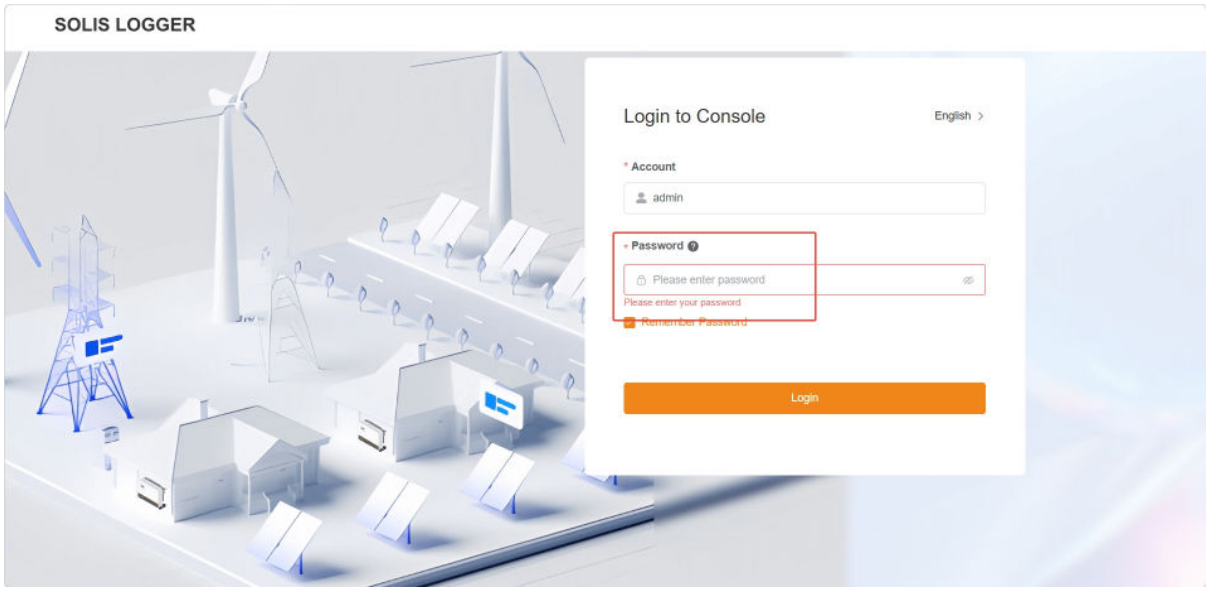
5.2.3. Log in to the WEB Interface via Wi-Fi

Steps:

1. Open the wireless network settings of the computer, search and connect to the default Wi-Fi hotspot of the monitoring box "LoggerXXX (XXX is the device serial number)", the default password is "123456789".
2. Enter 192.168.2.253 in the browser address bar to enter the login interface.
3. Select the language as needed, enter the initial username and password "admin", click Login, set a new password according to the system pop-up prompt, re-enter it and complete the login.







Note

–The initial username and password are "admin". Click Login and set a new password according to the system pop-up prompt.

–For account security, it is recommended to change the password regularly.

–If the wrong password is entered 5 times consecutively within 5 minutes, the user will be locked and need to try logging in after 30 minutes.

–If the password is forgotten, short press the RST button for 3-5 seconds to clear the set login password.

–A security risk prompt will pop up on the web page for the first login to the WEB. Click "Continue to browse this website" to log in to the WEB.

–It is recommended that the user replace it with their own security certificate, otherwise a security risk prompt will pop up every time they log in. After logging in to the WEB, the network security certificate can be imported through "Settings > System Settings > Security Settings".

5.3. Setup Wizard Configuration

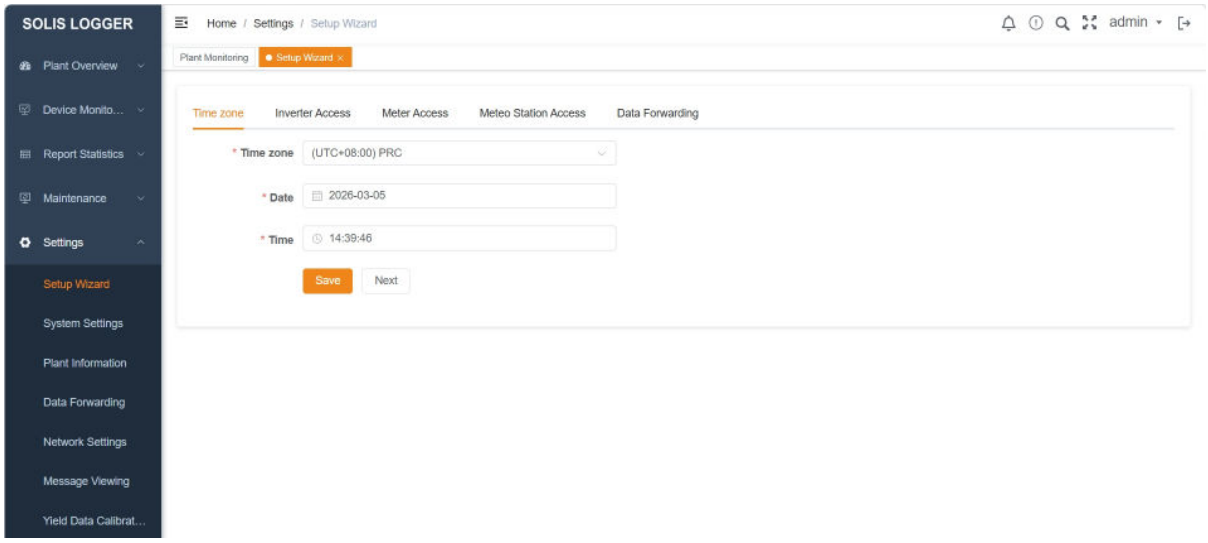
• After logging in to the WEB interface, the system can be configured quickly through the commissioning wizard. Please configure according to the interface prompts and actual requirements.

• Supports configuration of time zone setting, inverter access, Meter access, Meteorograph access, data forwarding, etc.

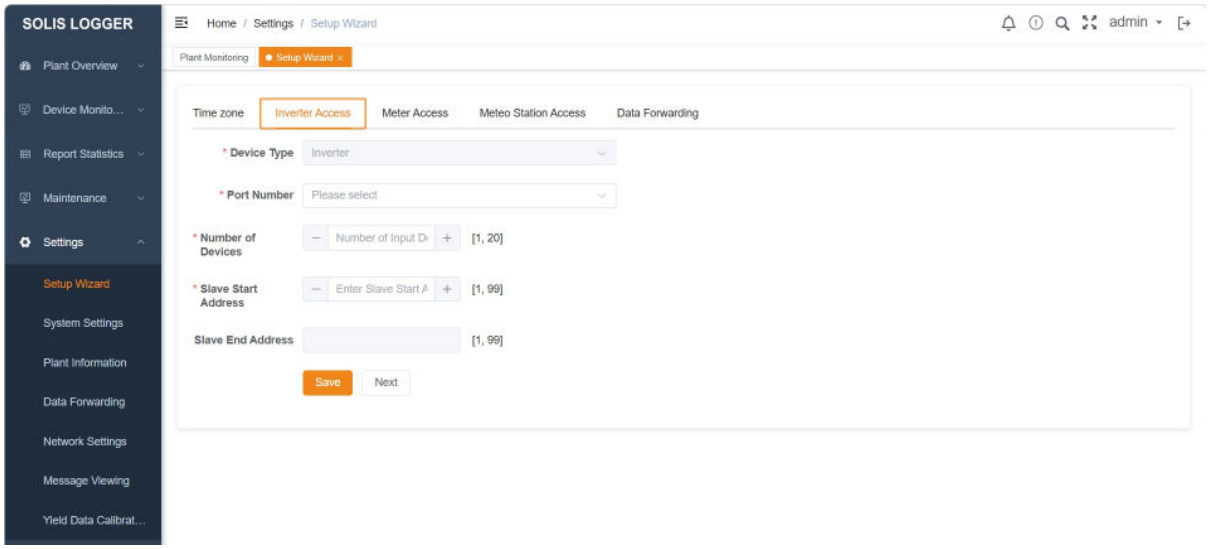
•For detailed understanding of the corresponding setting functions, please refer to the function explanation in the corresponding chapter of the manual.

•During parameter setting, click "Save", "Next" or directly click the corresponding tertiary menu for relevant settings as needed. For each configuration step to take effect, you need to click "Save" separately, then jump to the next page to continue completing the configuration.

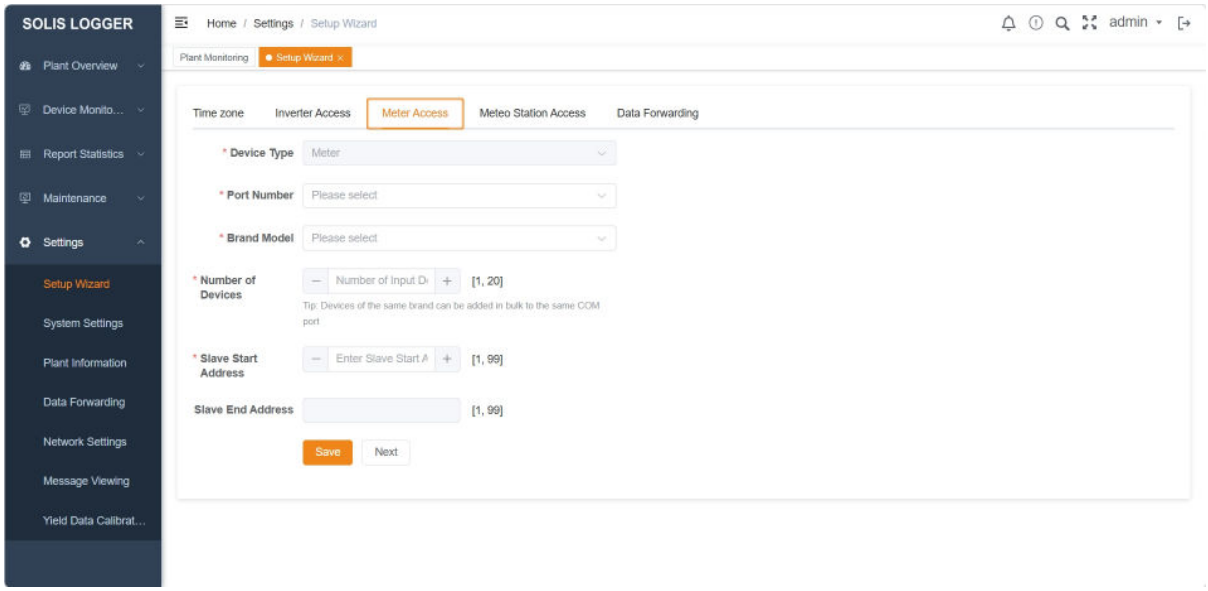
Steps 1. Time Zone Setting



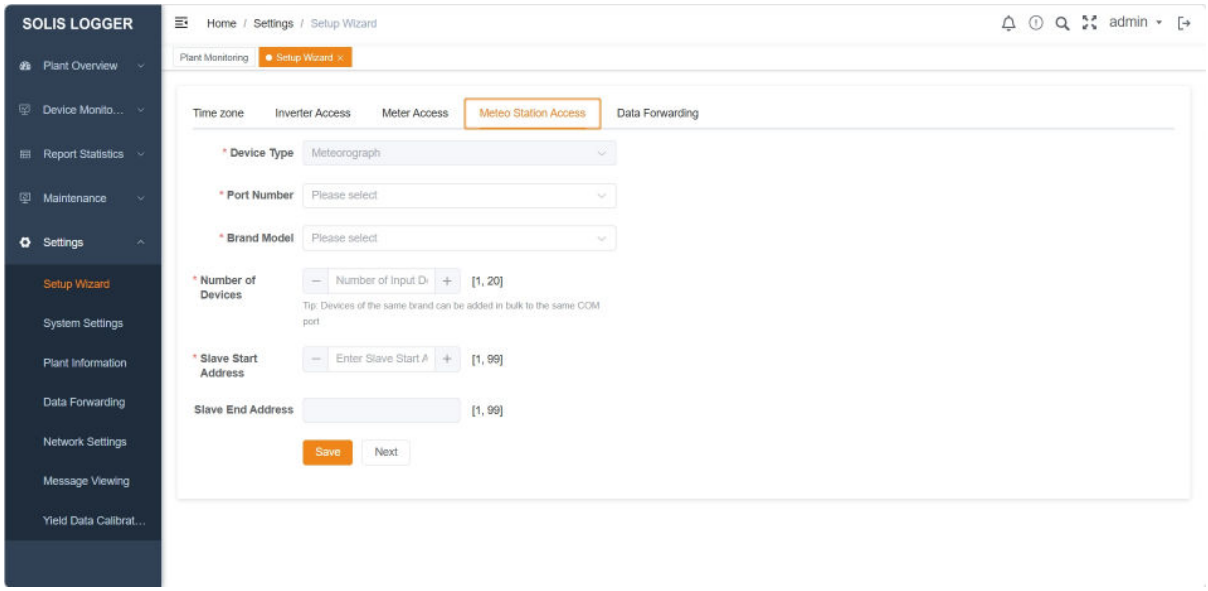
Steps 2. Inverter Access, the parameter setting instructions can be found in the 5.6.1.1 section on Manually Add Devices.



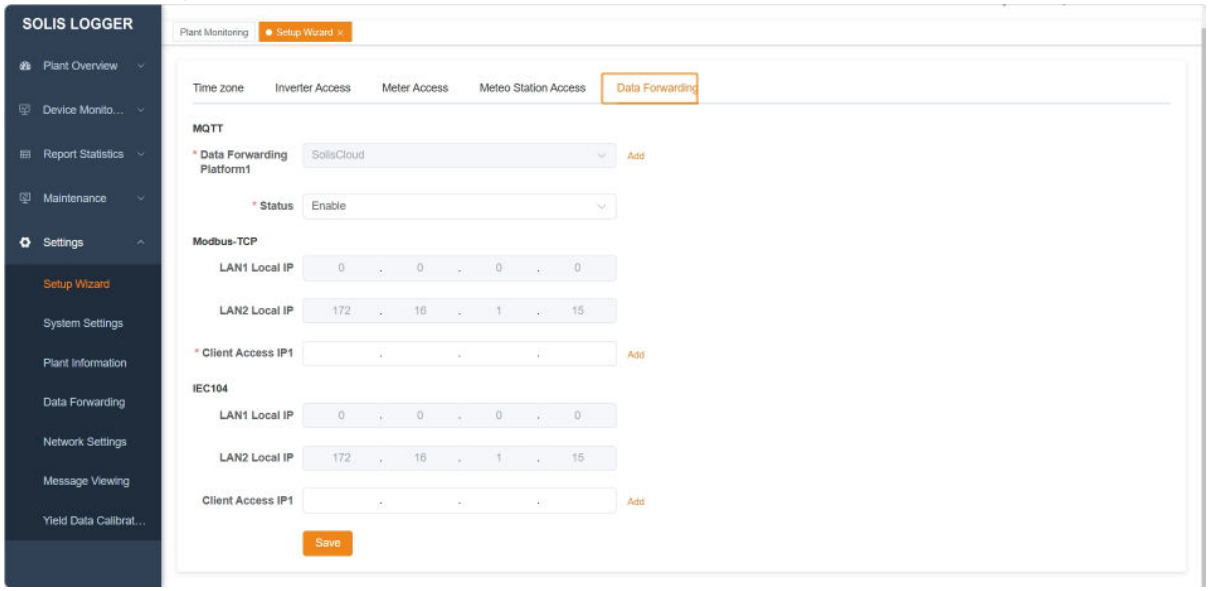
Steps 3. Meter Access, the parameter setting instructions can be found in the 5.6.2 section on Add Meter.



Steps 4. Meteo Station Access, the parameter setting instructions can be found in the 5.6.3 section on Add Meteorograph.



Steps 5. Data Forwarding, the parameter setting instructions can be found in the 5.7 section on Set Forwarding Parameters.



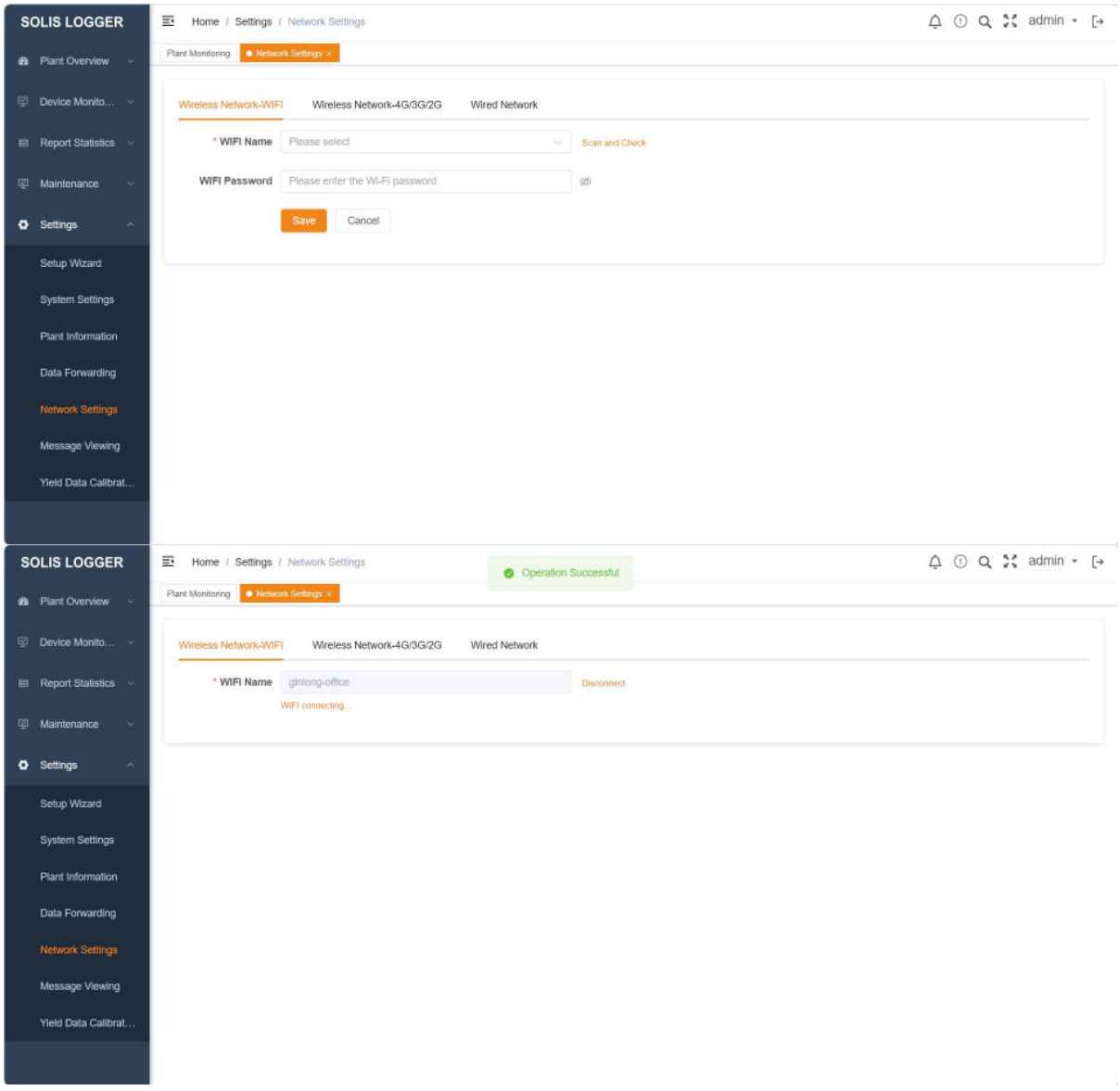
Steps 6. Configuration Completed

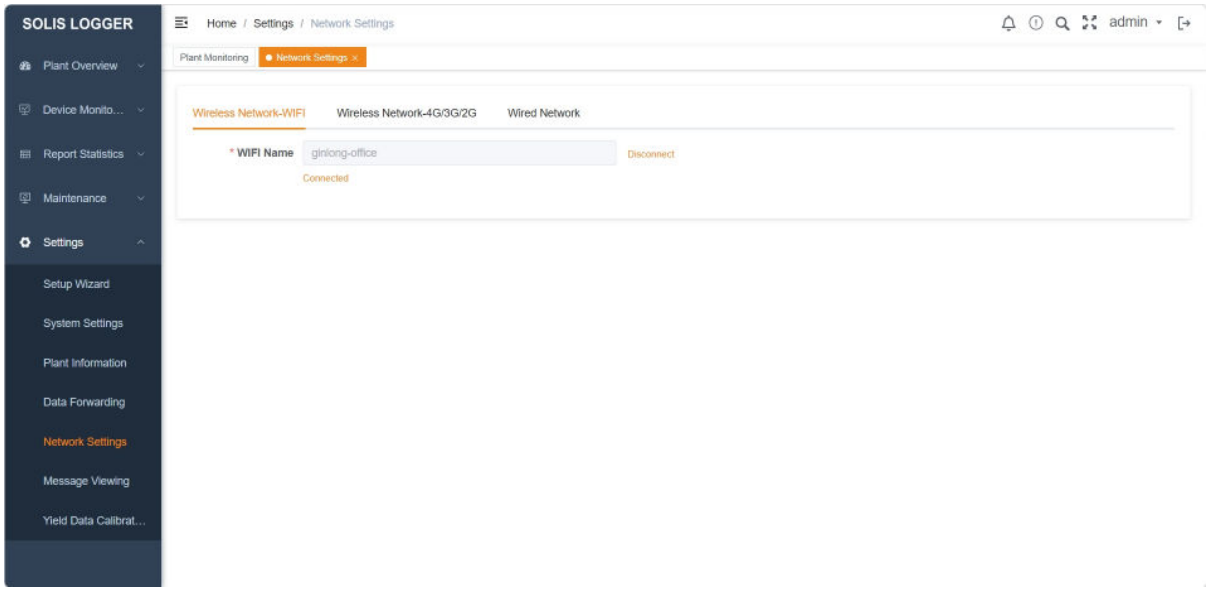
5.4. Set Network Parameters

When the monitoring box needs to connect to the monitoring platform via wired/wireless network, one or more of the following network parameters can be set according to actual needs.

5.4.1. Set Wireless Network - WIFI Parameters

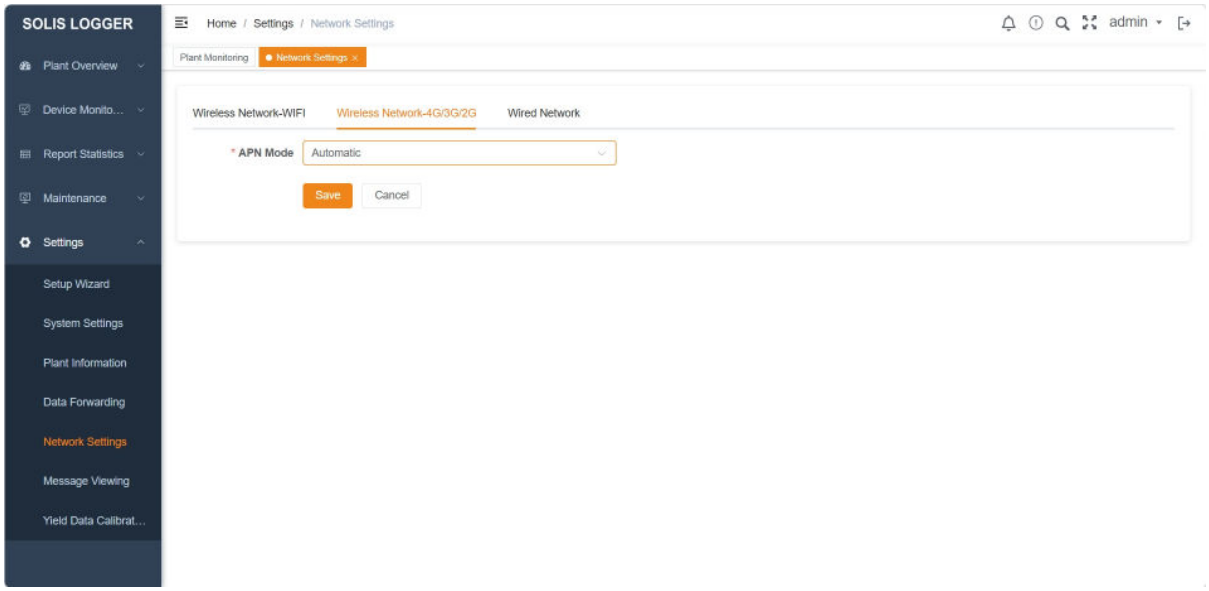
Click Settings > Network Settings > Wireless Network - WIFI, set the Wi-Fi information to be connected by the device, click Scan to check and search for available Wi-Fi hotspots, enter the corresponding Wi-Fi password and establish the connection.

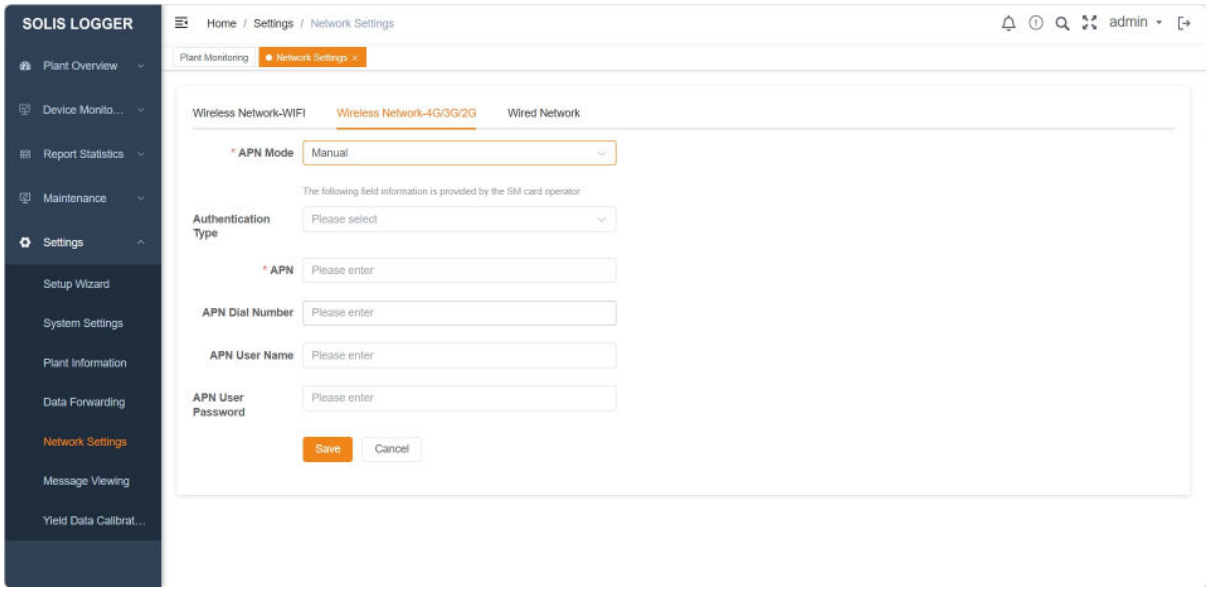




5.4.2. Set Wireless Network - 4G/3G/2G Parameters

- If user choose cellular network for internet connection and communication, a standard SIM card (Size: 25mm*15mm, Capacity ≥64KB) is recommended.
- The user needs to click Settings > Network Settings > Wireless Network - 4G/3G/2G, set the APN mode to "Manual", and set the relevant parameters of the SIM card.
- It is recommended to select the data plan: 100MB per month for a single inverter, 100MB + 40MB*n per month for n inverters.

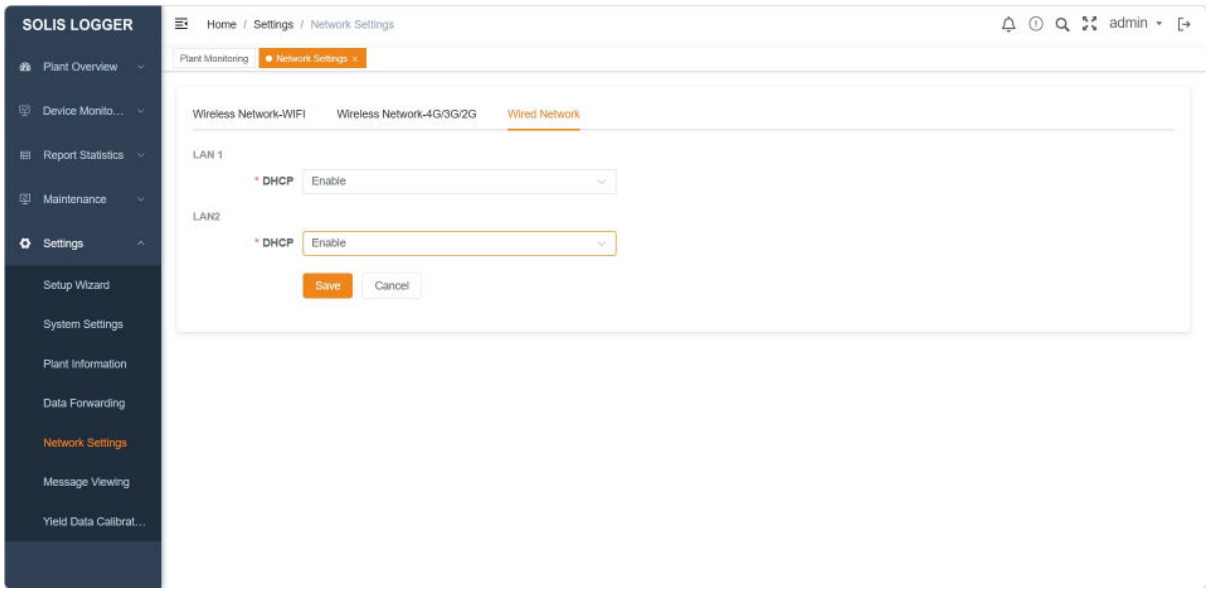


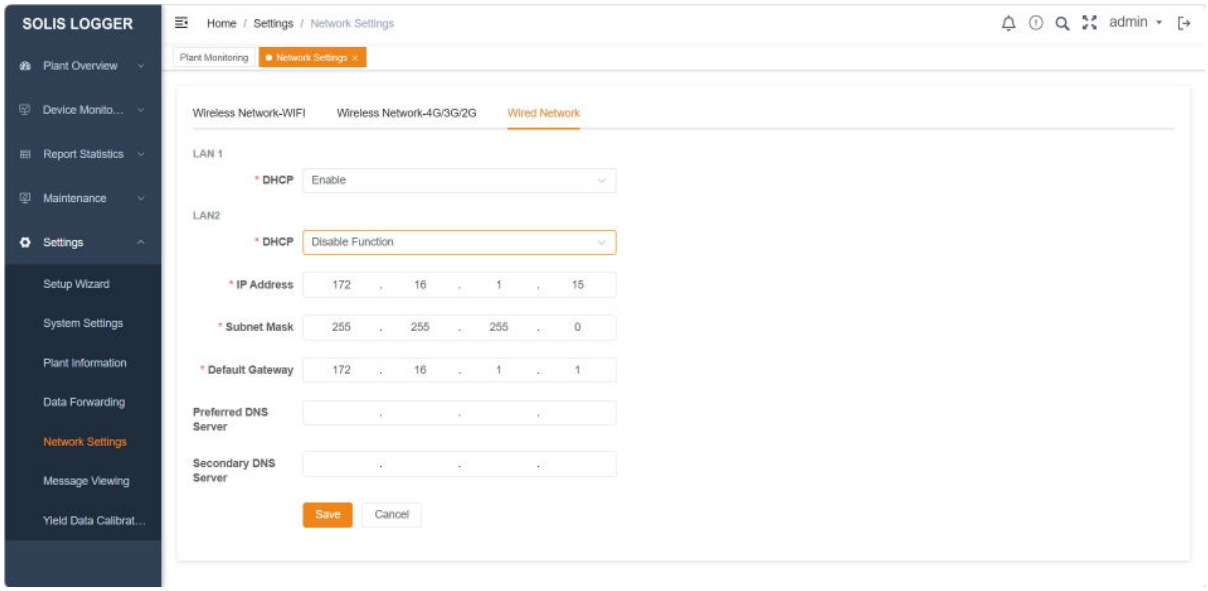


Parameter Name	Description
APN Mode	Default is "Auto". Set to "Manual" when the "Auto" mode cannot dial up to the internet.
Identity Authentication Type	When the APN mode is set to "Manual", the relevant parameters of the SIM card need to be set, and all parameter information is from the SIM card operator.
APN	
APN Dial Number	
APN User Name	
APN User Password	

5.4.3. Set Wired Network Parameter

Click Settings > Network Settings > Wired Network, set the network parameters as needed, and the settings will take effect after clicking "Save".



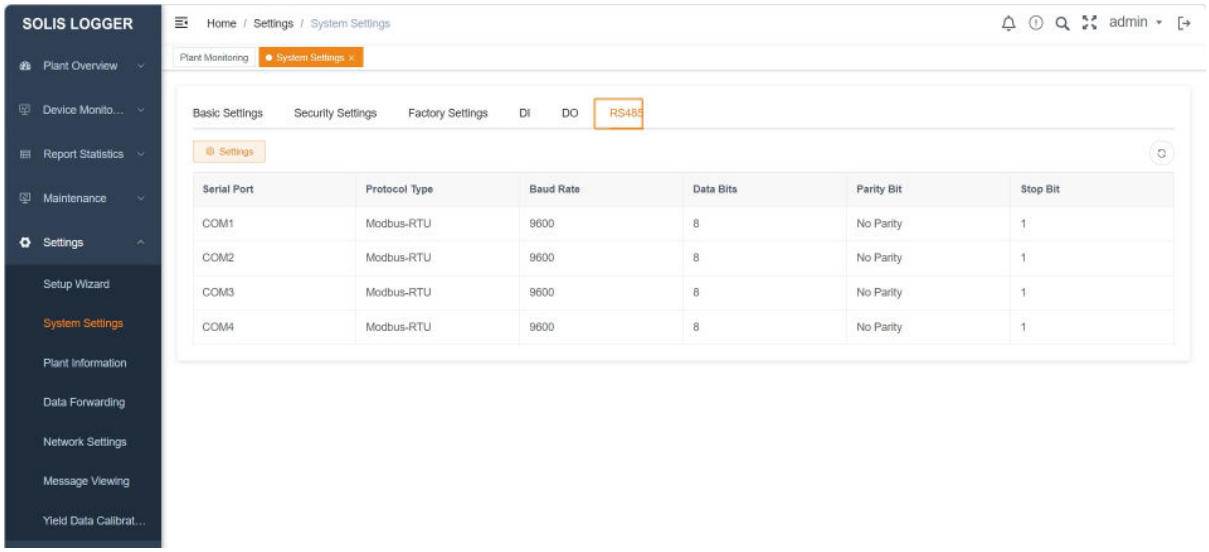


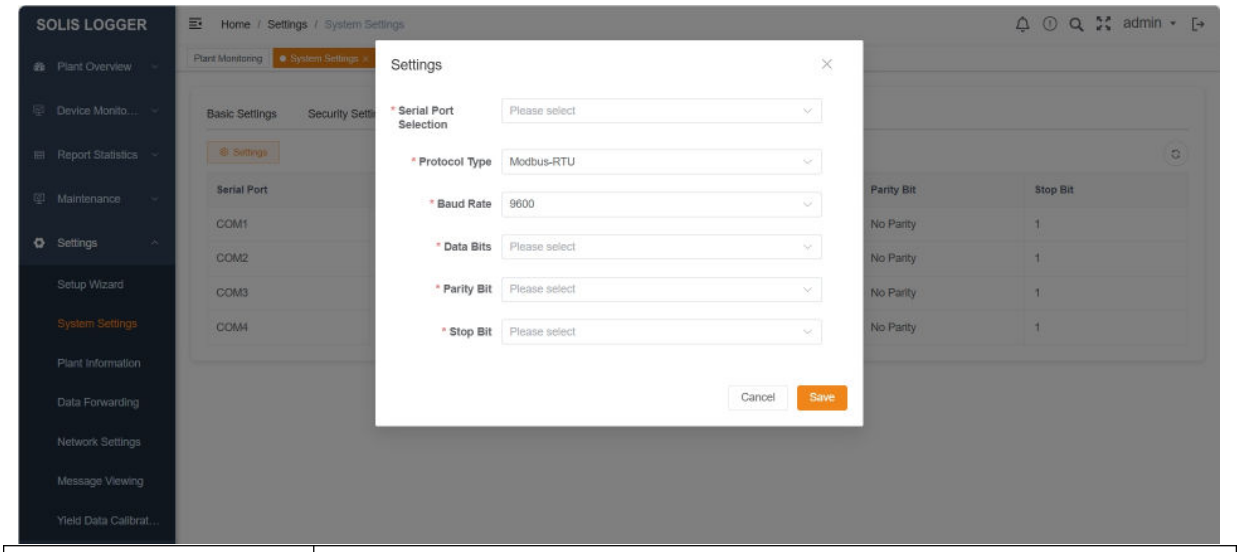
Parameter Name	Description
DHCP	When enabled, the IP address can be obtained automatically to complete registration.When disabled, the relevant network parameters are fixed parameters and need to be set manually according to the actual situation.
IP Address	Can be set to the IP in the same network segment as the router according to the Plantplanning.If the IP address is modified, you need to log in again with the new IP address.
Subnet Mask	Set according to the actual mask of the local area network where the monitoring box is located.
Default Gateway	Set according to the actual gateway of the local area network where the monitoring box is located.
Preferred DNS Server	The monitoring box has pre-set the DNS server address, and this parameter setting can be ignored under normal circumstances.If you need to specify a DNS server, it can be set to a general public DNS or the IP address of the connected router.
Secondary DNS Server	This parameter setting can be ignored under normal circumstances.If the preferred DNS server cannot resolve the domain name, the secondary DNS server will be used.

5.5. Set RS485 Communication Parameters

•Click Settings > System Settings > RS485, set the RS485 communication parameters, and the settings will take effect after clicking "Save".

•The protocol type, baud rate, parity mode and stop bit of devices connected to the same 485 port must be consistent.

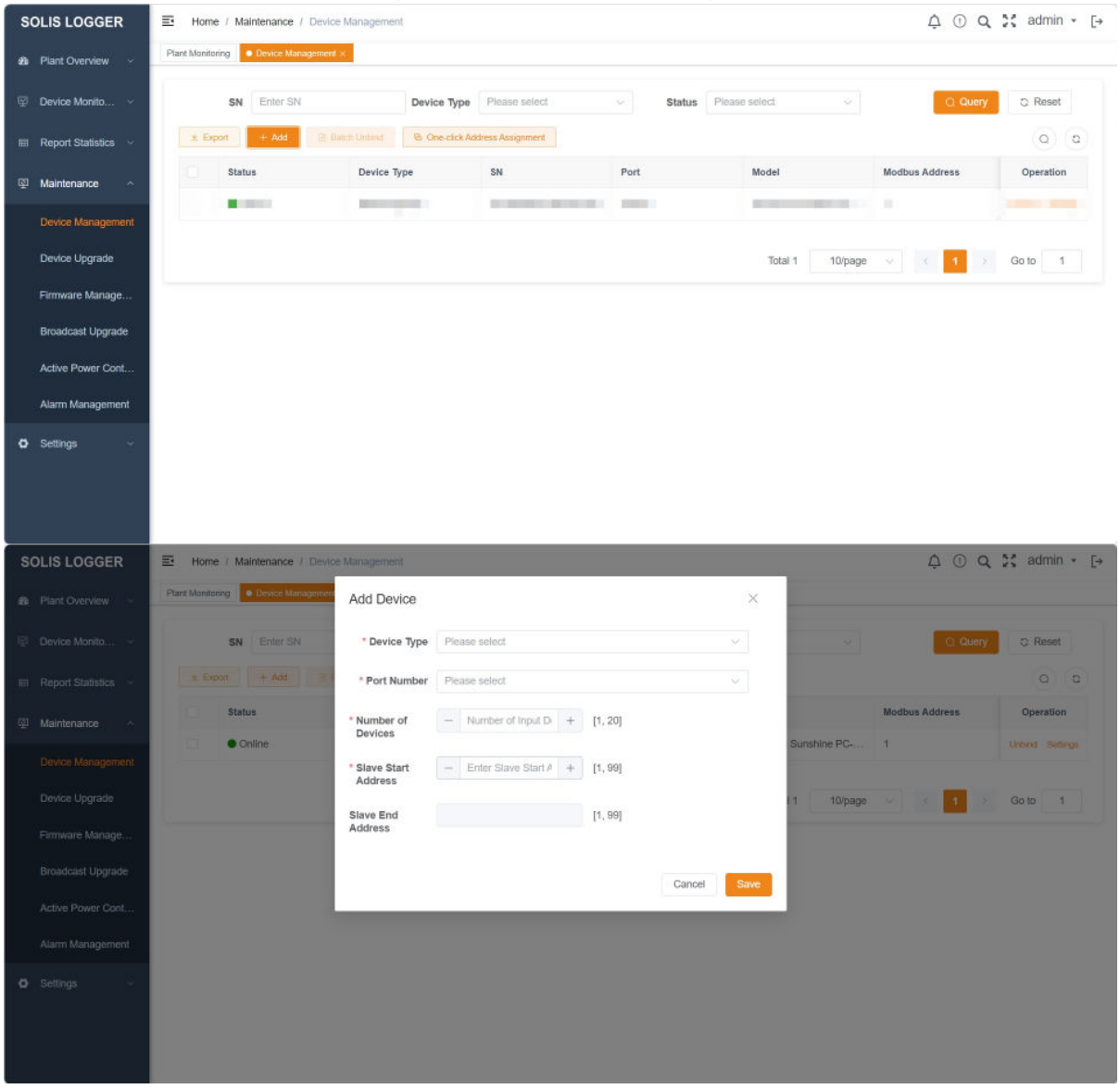




Parameter Name	Description
Serial Port Selection	Select according to the actual RS485 port accessed by the device.
Protocol Type	Only Modbus-RTU protocol is supported.
Baud Rate	Set according to the baud rate of the connected device.Supports 9600, 19200, 38400, 57600, 115200, default is 9600.
Data Bit	Supports 4, 5, 6, 7, 8, default is 8.
Parity Bit	Set according to the parity mode of the connected device.Supports None, Odd and Even, default is None.
Stop Bit	Set according to the stop bit of the connected device.Supports 1, 1.5 and 2, default is 1.

5.6. Device Management

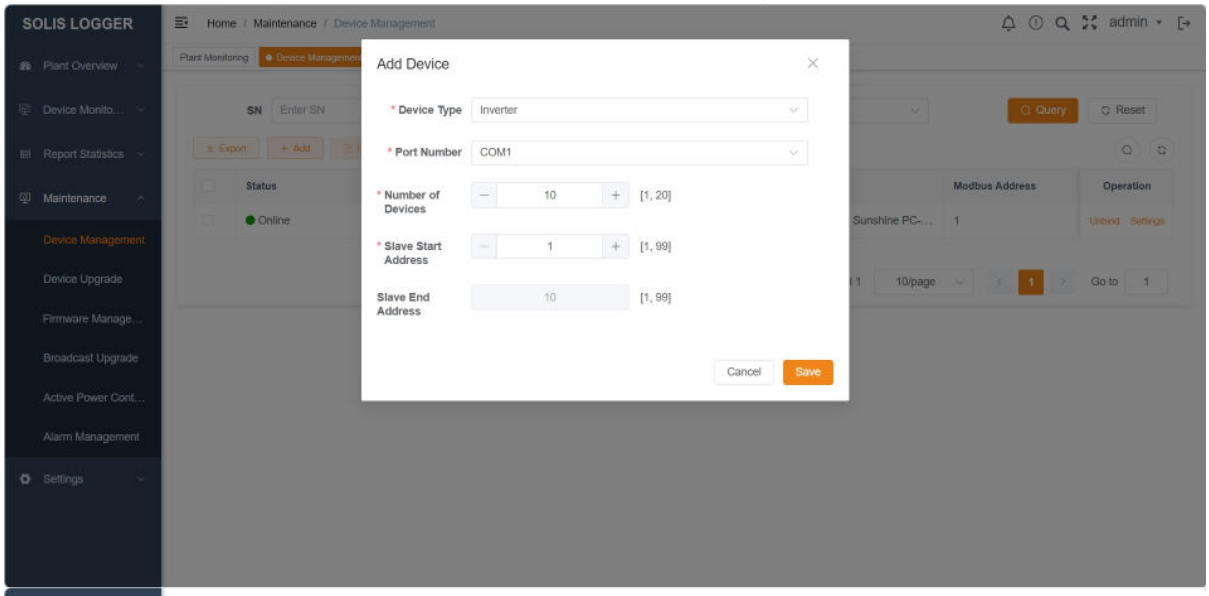
- If you have completed device access on the setup wizard page, you can ignore the steps in this chapter.
- Click Maintenance > Device Management to add or unbind devices.
- Please confirm the device model, 485 port accessed by the device and other information in advance, otherwise the device may not be connected normally.

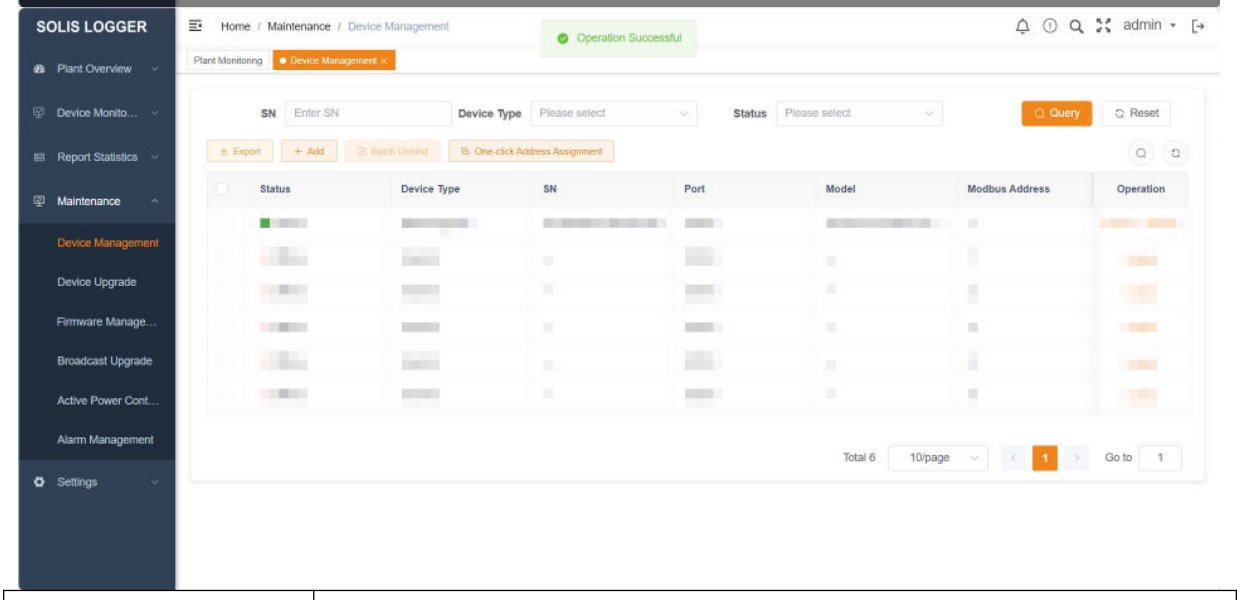


5.6.1. Add Inverter

5.6.1.1. Manually Add Device

Click Maintenance > Device Management > Add, select the device type as Inverter from the drop-down list, and the inverter device can be added manually.

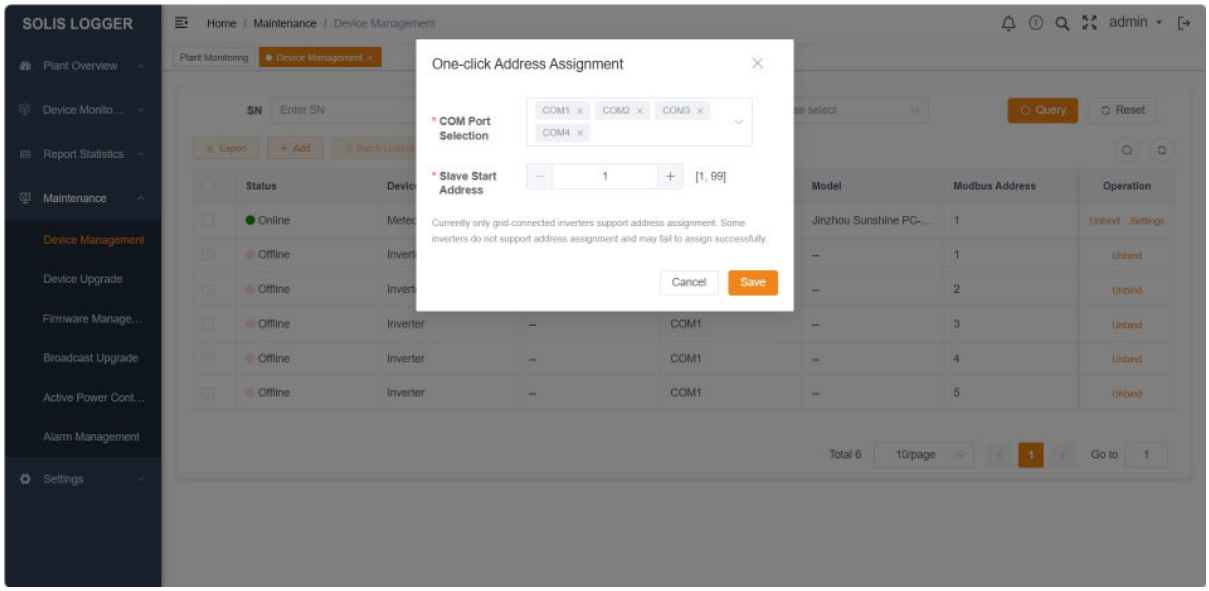




Parameter Name	Description
Device Type	Select Inverter from the drop-down list.
Port Number	Select according to the actual RS485 port accessed by the device.
Number of Device	Set according to the actual number of accessed devices.
Slave Start Address	Set the start communication address of the inverter.
Slave End Address	The end communication address of the inverter is generated automatically.

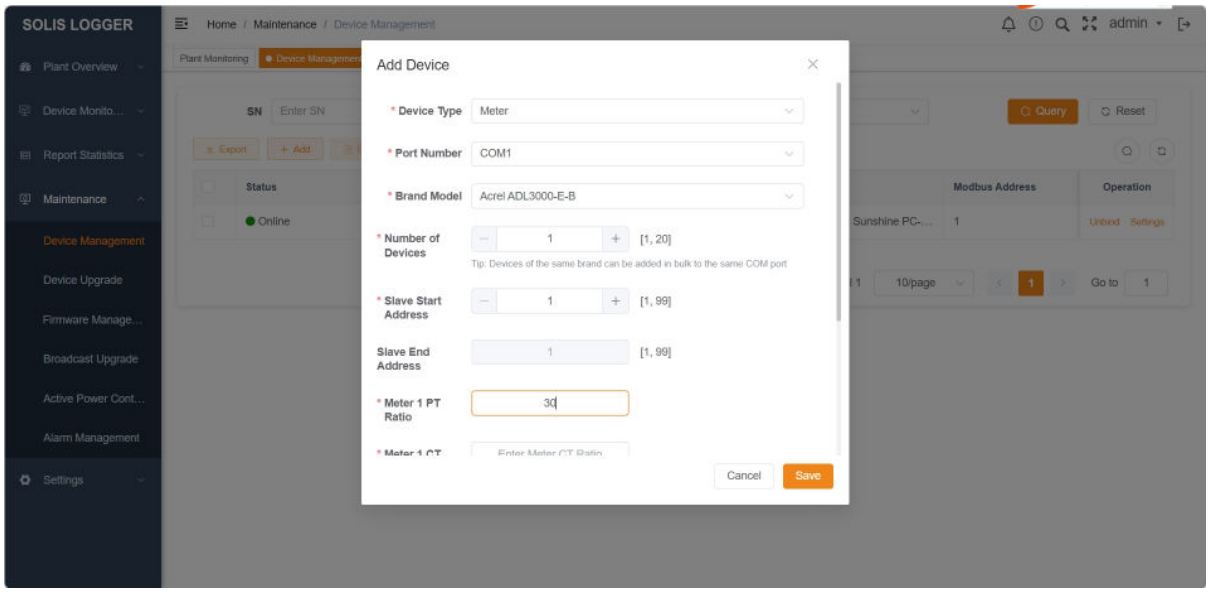
5.6.1.2. One-click Address Allocation

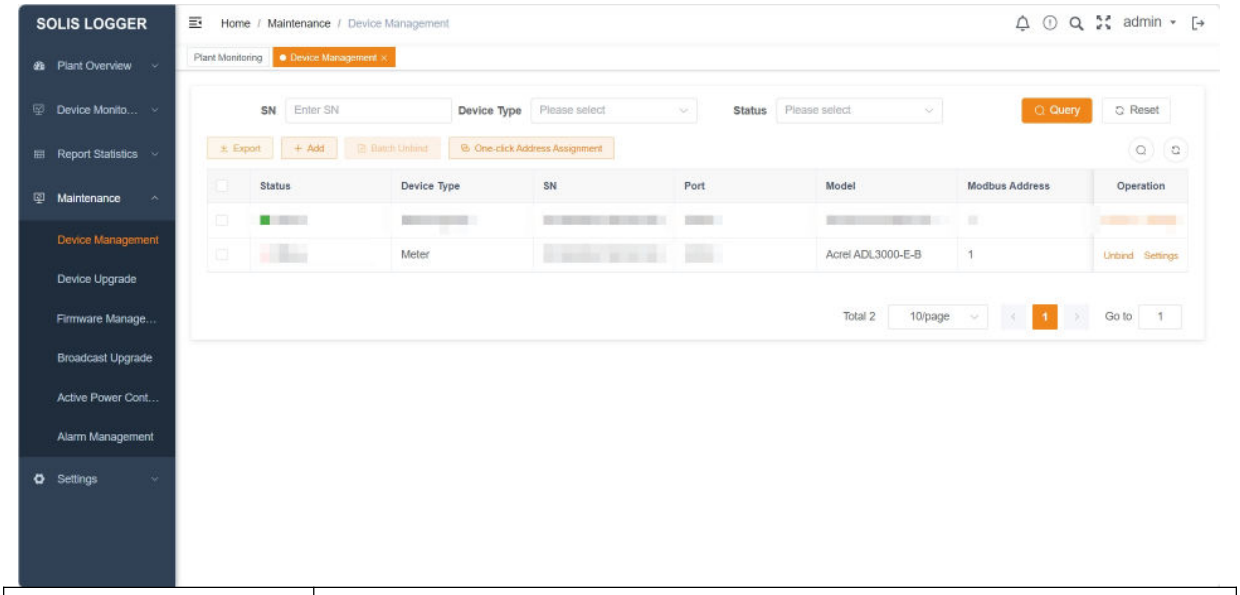
- Click Maintenance > Device Management > One-click Address Assignment to automatically scan inverters and assign addresses to them.
- Currently, only one-click address assignment is supported for Solis 6th generation grid-tied inverters. If the inverter does not support the address assignment function, the device needs to be added manually.
- Slave address automatic assignment usually takes 1-5 minutes to take effect, depending on the number of devices. If the setting takes effect, the newly added device list will be displayed on the device management page.



5.6.2. Add Meter

Click Maintenance > Device Management > Add, select the device type as Meter from the drop-down list, and the meter device can be added manually.

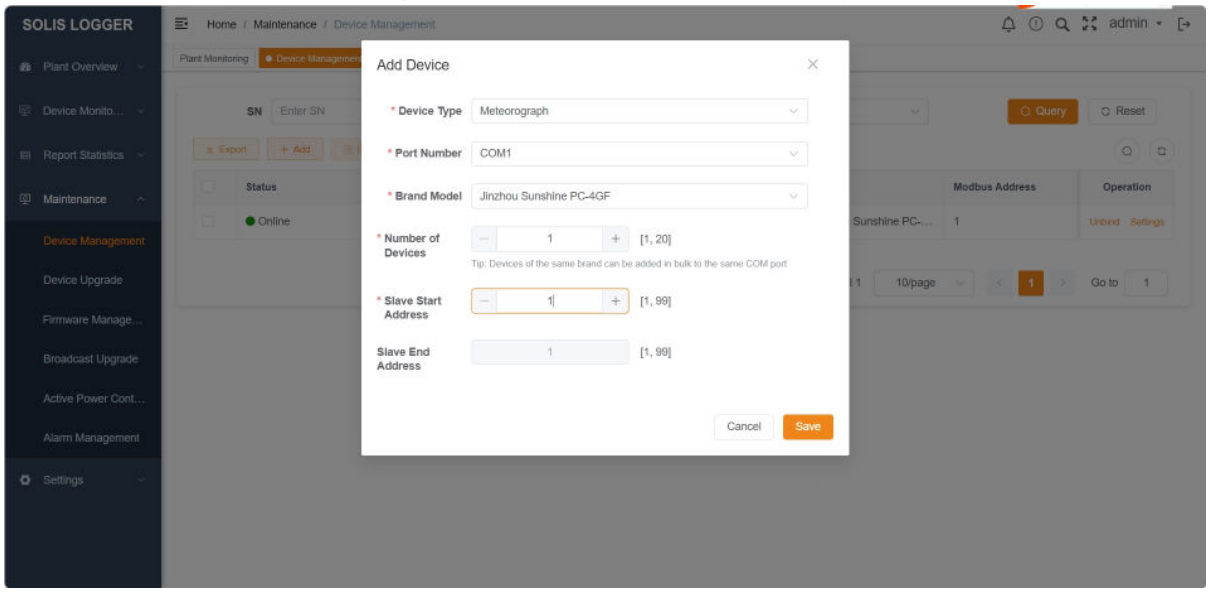


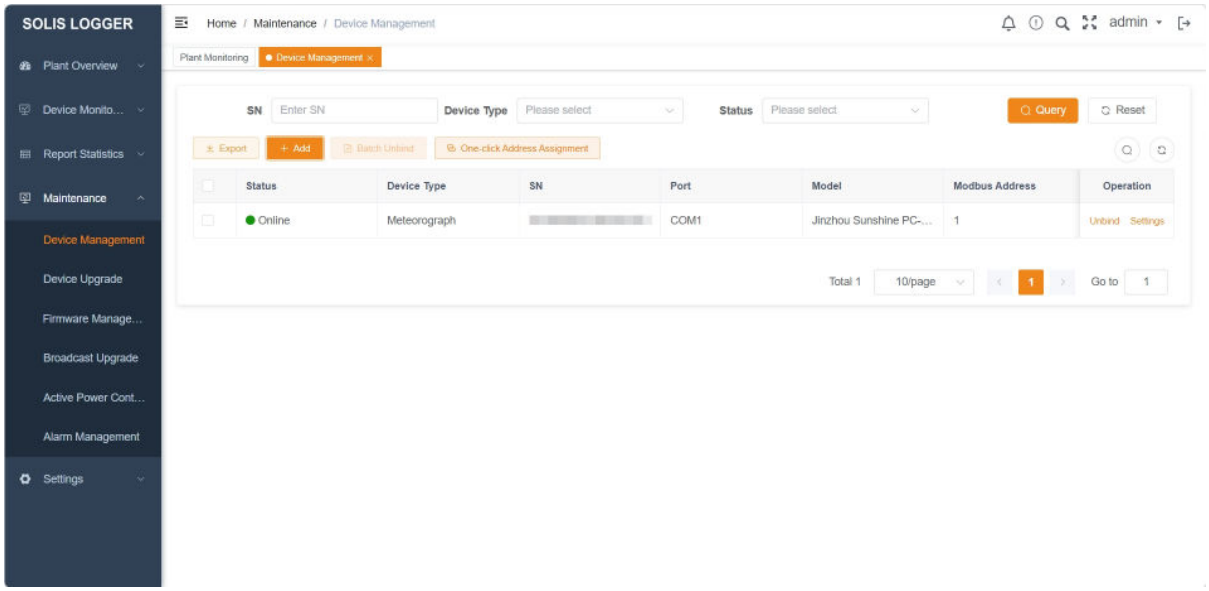


Parameter Name	Description
Device Type	Select Meter from the drop-down list.
Port Number	Select according to the actual RS485 port accessed by the device.
Brand Model	Select according to the actual model of the accessed meter.
Number of Device	Set according to the actual number of accessed devices.
Slave Start Address	Set the start communication address of the meter.
Slave End Address	The end communication address of the meter is generated automatically.
Meter 1 PT Ratio	Set according to the ratio of the actual PT primary voltage to the secondary voltage.For normal pressure 380V access, set to 1 here; for medium voltage 10kV or 35kV access, take PT ratio 10/0.1kV as an example, set to 100 here.
Meter 1 CT Ratio	Set according to the ratio of the actual CT primary side current to the secondary side current.For example, the ADL3000-E-B meter only supports CT with a secondary rated current of 5A. If the CT ratio is 150/5A, set to 30 here.
Meter 1 Wiring Method Setting	Set according to the actual wiring mode, select three-phase three-wire system or three-phase four-wire system from the drop-down list.
Meter 1 CT Direction	Select Positive or Negative from the drop-down list, it is agreed that the P1 side of the CT pointing to the grid is the positive direction.

5.6.3. Add Meteorograph

Click Maintenance > Device Management > Add, select the device type as Meteorograph from the drop-down list, and the Meteorograph device can be added manually.





Parameter Name	Description
Device Type	Select Meteorograph from the drop-down list.
Port Number	Select according to the actual RS485 port accessed by the device.
Brand Model	Select according to the actual model of the accessed Meteorograph.
Number of Device	Set according to the actual number of accessed devices.
Slave Start Address	Set the start communication address of the Meteorograph.
Slave End Address	The end communication address of the Meteorograph is generated automatically.

5.7. Set Forwarding Parameters

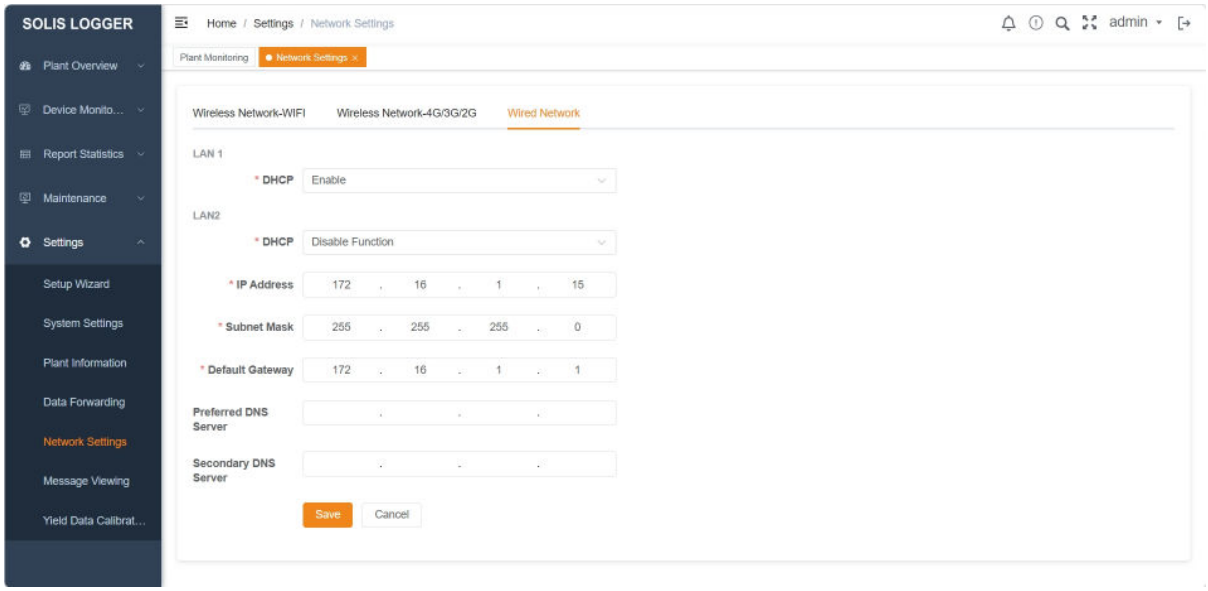
• If you have completed the data forwarding setting on the setup wizard page, you can ignore the steps in this chapter.

•Click Settings > Data Forwarding, set the forwarding parameters, and the data collected by the monitoring box can be forwarded to the third-party management system through the supported protocols.

5.7.1. Data Forwarding - Modbus-TCP

Modbus-TCP forwarding parameters need to be set when the monitoring box is connected to the management system through the Modbus-TCP protocol.

Steps 1. The default IP address of the monitoring box is 192.168.1.253. The user can click Settings > Network Settings > Wired Network to set the network parameters of the LAN2 port according to actual needs.

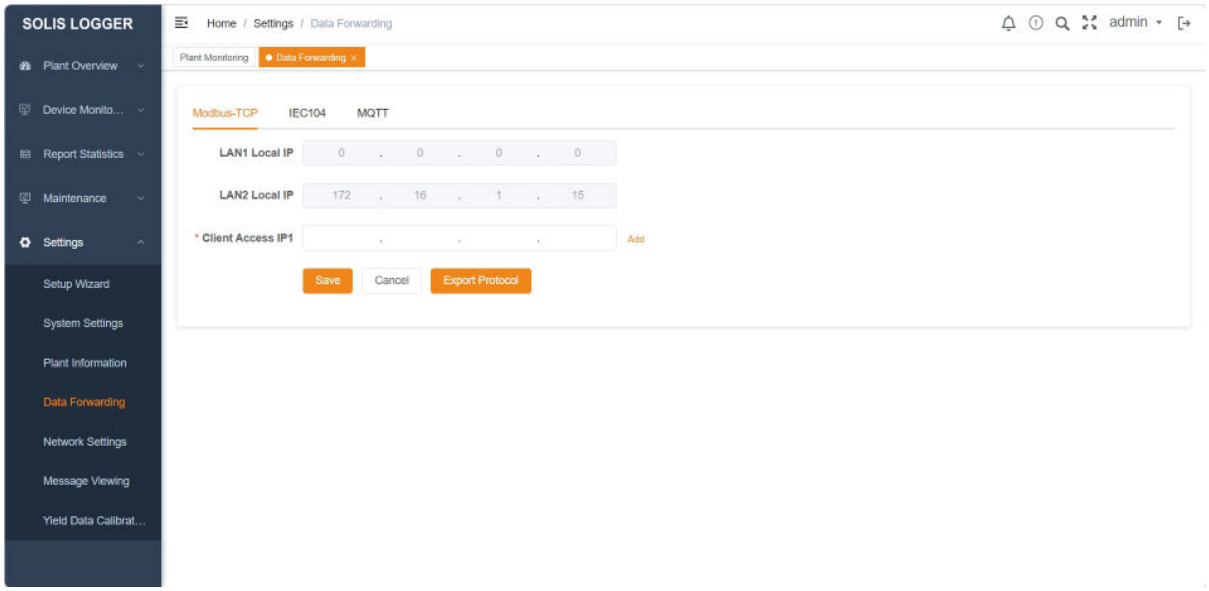


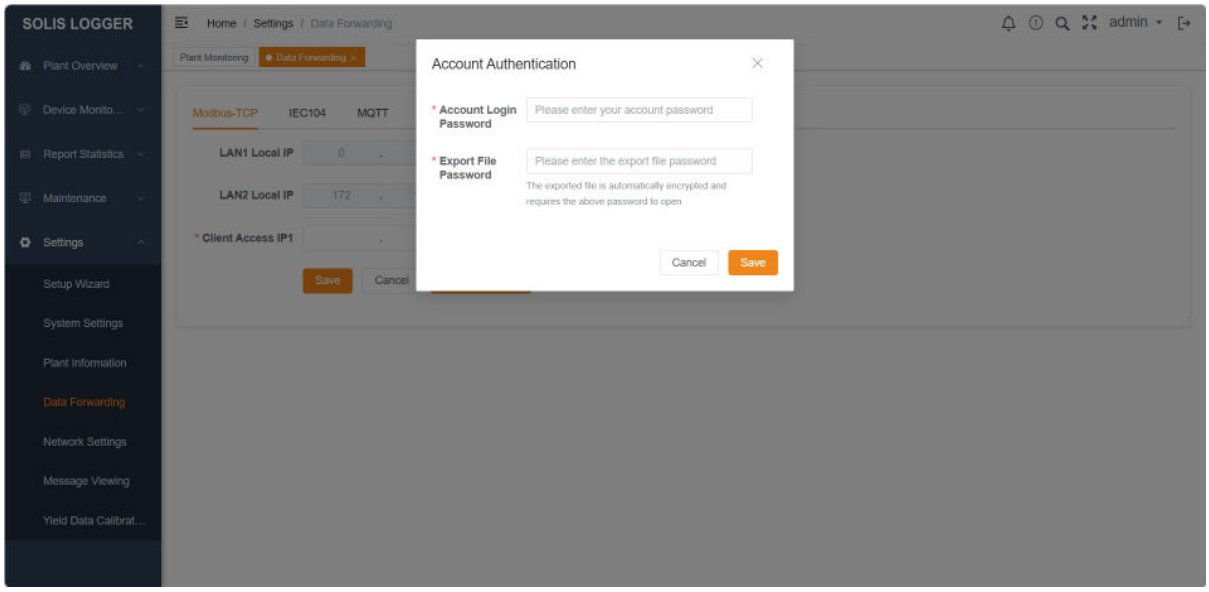
Steps 2.

• Click Settings > Data Forwarding > Modbus-TCP to view the set IP address of the monitoring box, the port number is 502.

• If the user does not need to view the IP address of the accessed management system, the "Client Access IP" parameter can be ignored. A maximum of 5 client access IPs can be added.

•Click Export Protocol, enter the login password according to the pop-up prompt, set an export file password (the exported file is automatically encrypted, and the above password is required to open it), and download to view the Modbus-TCP protocol.



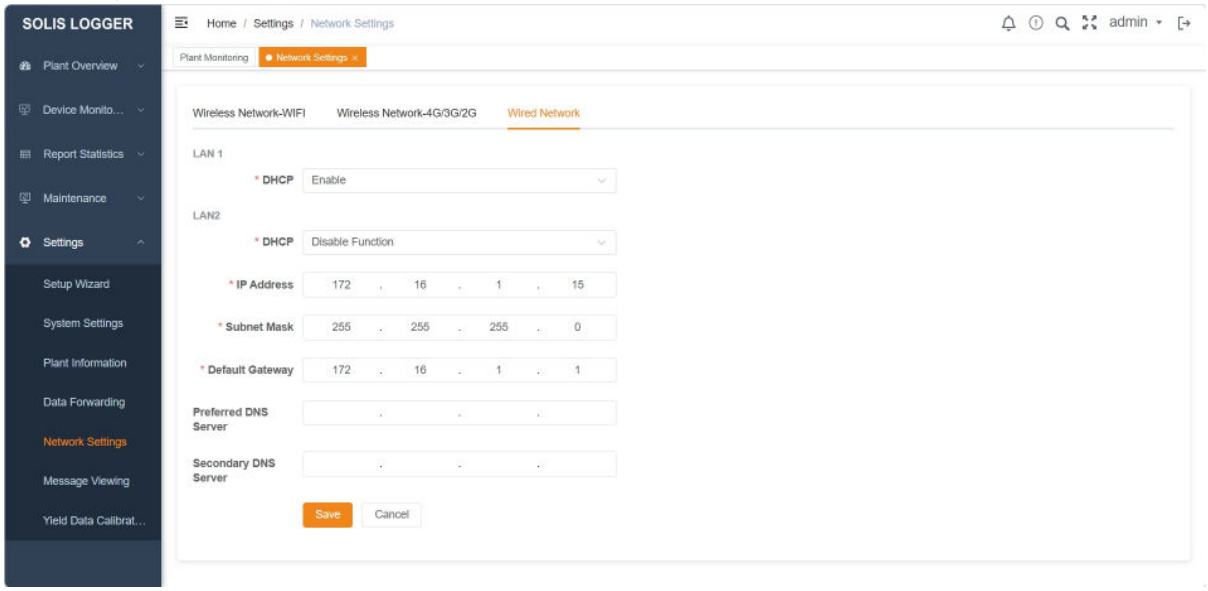


Steps 3. Commission and test the management system software according to actual needs to establish a connection with the monitoring box.

5.7.2. Data Forwarding - IEC104

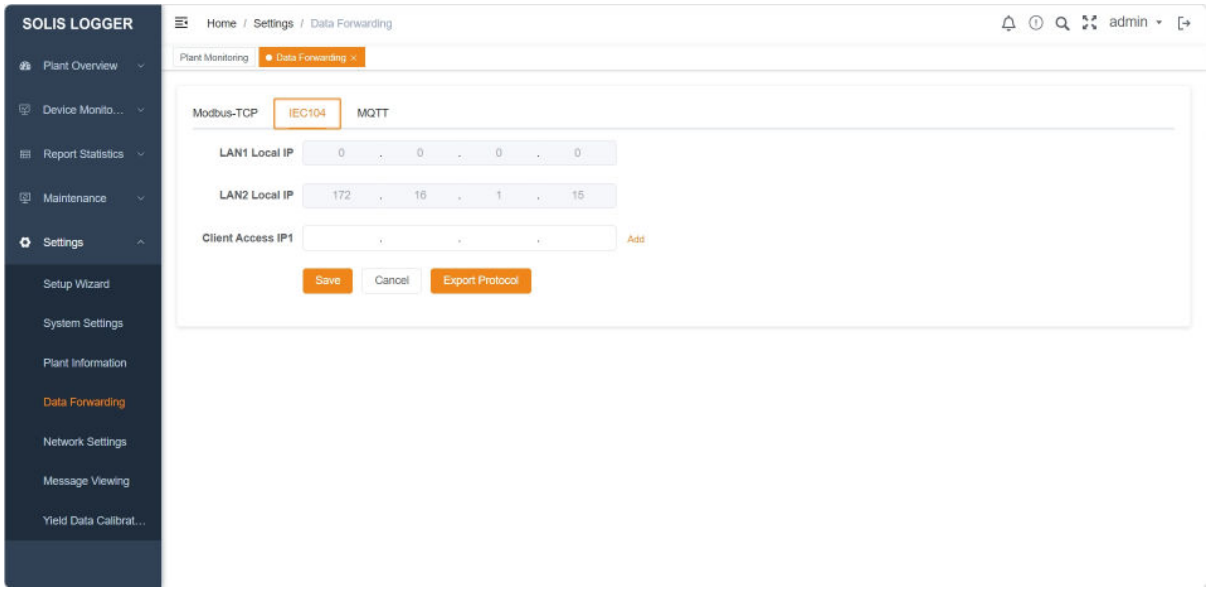
IEC104 forwarding parameters need to be set when the monitoring box is connected to the management system through the IEC104 protocol.

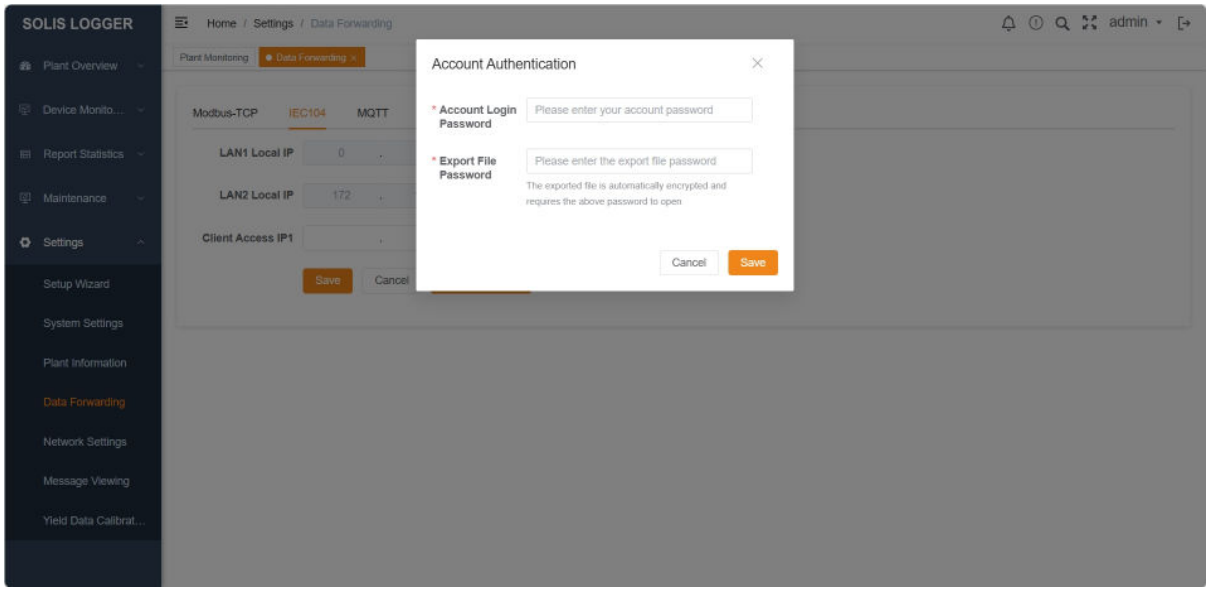
Steps 1. The default IP address of the monitoring box is 192.168.1.253. The user can click Settings > Network Settings > Wired Network to set the network parameters of the LAN2 port according to actual needs.



Steps 2.

- Click Settings > Data Forwarding > IEC104 to view the set IP address of the monitoring box, the port number is 2404
- If the user does not need to view the IP address of the accessed management system, the "Client Access IP" parameter can be ignored. A maximum of 5 client access IPs can be added.
- Click Export Protocol, enter the login password according to the pop-up prompt, set an export file password (the exported file is automatically encrypted, and the above password is required to open it), and download to view the IEC104 protocol.



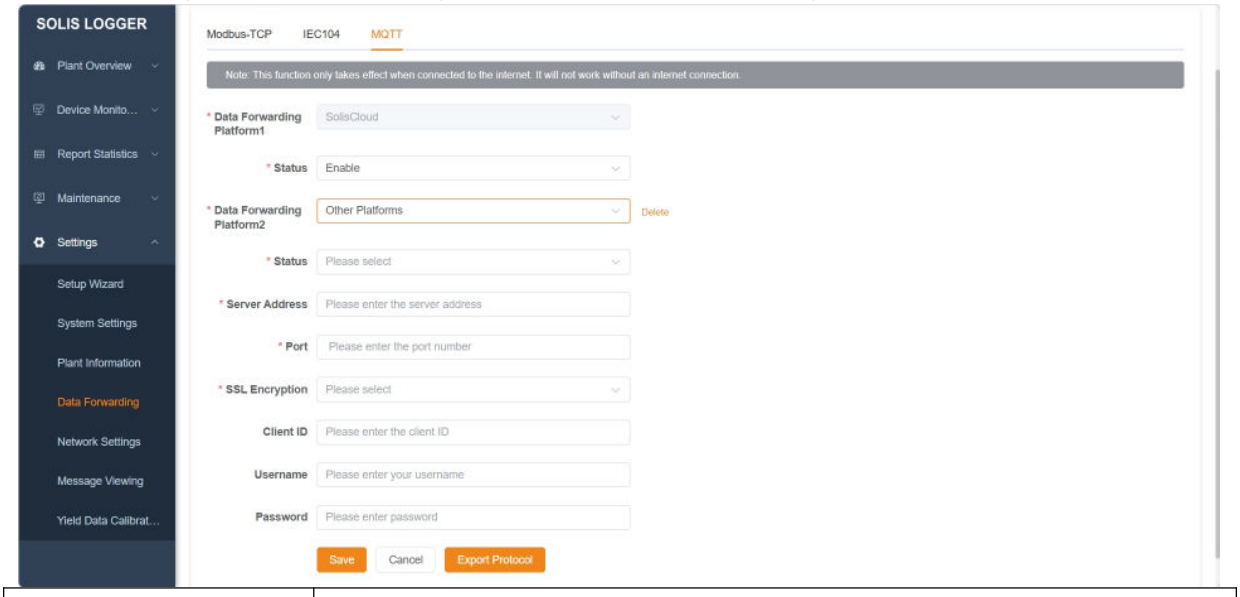


Steps 3. Commission and test the management system software according to actual needs to establish a connection with the monitoring box.

5.7.3. Data Forwarding - MQTT

• After the device is connected to the network, the data is uploaded to the Solis Cloud platform by default. If there is a third-party platform forwarding requirement, fill in the parameters according to the setting instructions below.

• Click Settings > Data Forwarding > MQTT to set the forwarding parameters.



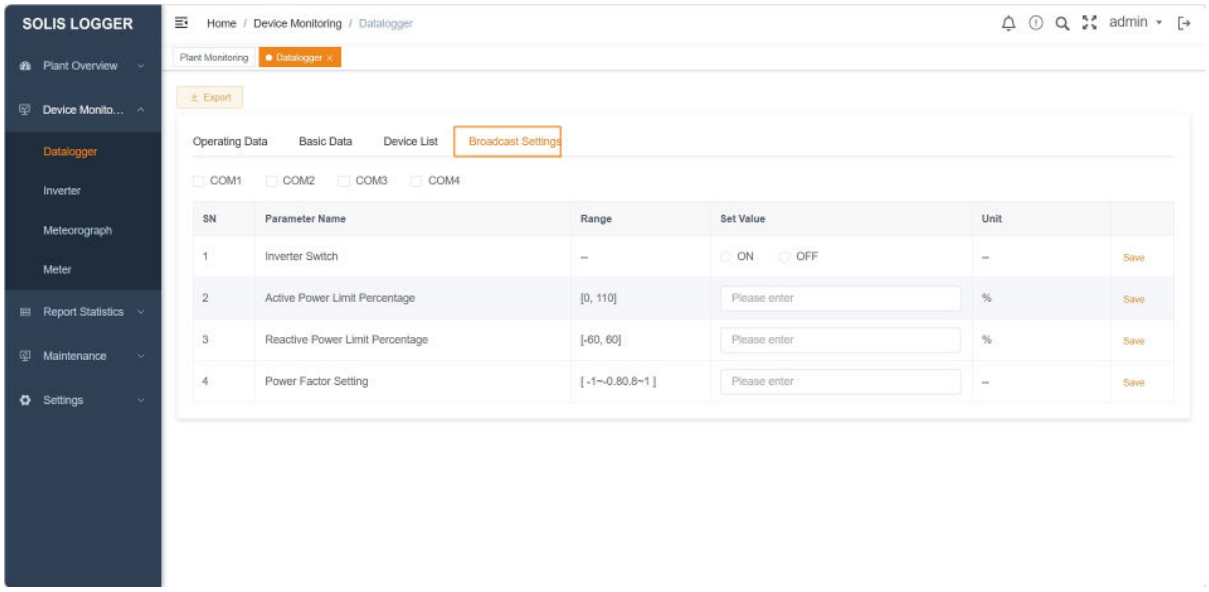
Parameter Name	Description
Data Forwarding Platform	Solis Cloud/Other Platforms, only Data Forwarding Platform 1 is displayed by default. Click the "Add" button to add only 1 other platform.
Status	Select Enable or Disable from the drop-down list, Solis Cloud is enabled by default.
Server Address	Set the address of the third-party cloud platform.
Port	Set the port of the third-party cloud platform.
SSL Encryption	Select Enable or Disable as needed.

Client ID	Enter Client ID, Username, and Password.
User Name	
Password	
CA Certificate	Import CA certificate, client certificate, and key if SSL is enabled.
Client Certificate	
Client Key File	

5.8. Inverter Control

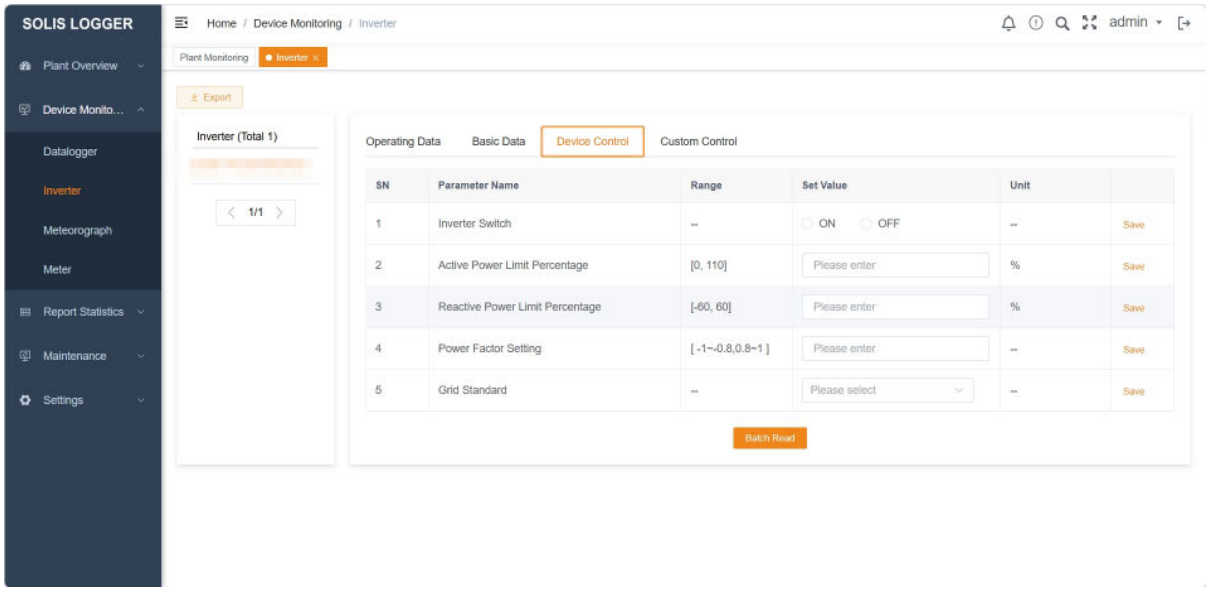
5.8.1. Broadcast Control

Click Device Monitoring > Datalogger > Broadcast Settings to support broadcast control of inverters connected to multiple 485 ports.



5.8.2. Single Device Control

- Click Device Monitoring > Inverter > Device Control to support parameter setting for a single inverter.



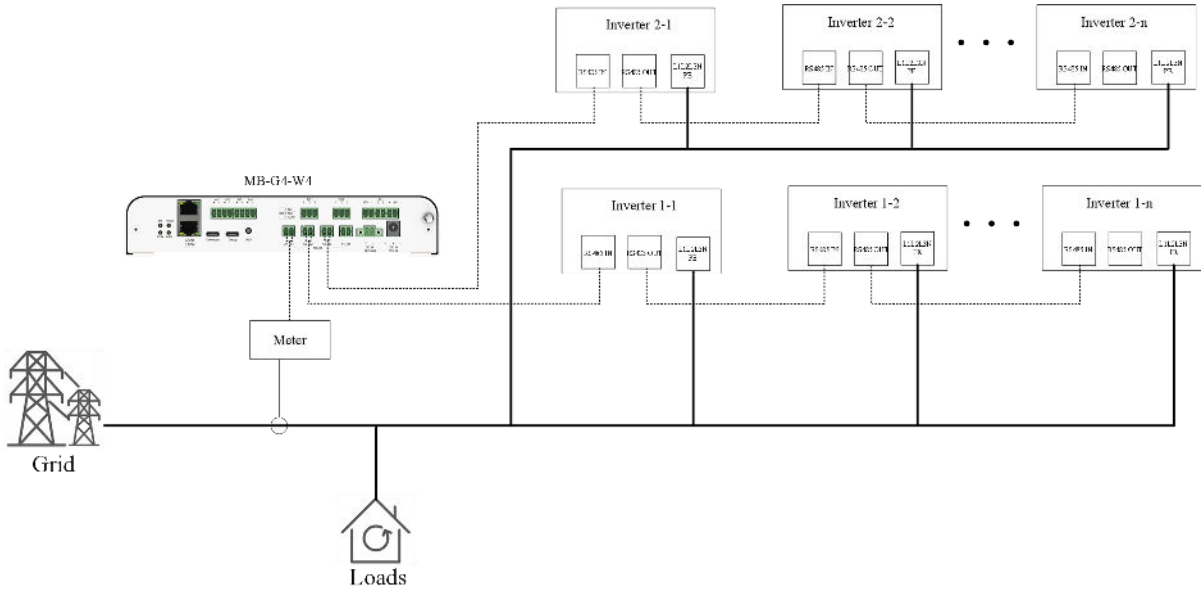
- Click Device Monitoring > Inverter > Custom Control to support issuing custom command control for a single inverter.

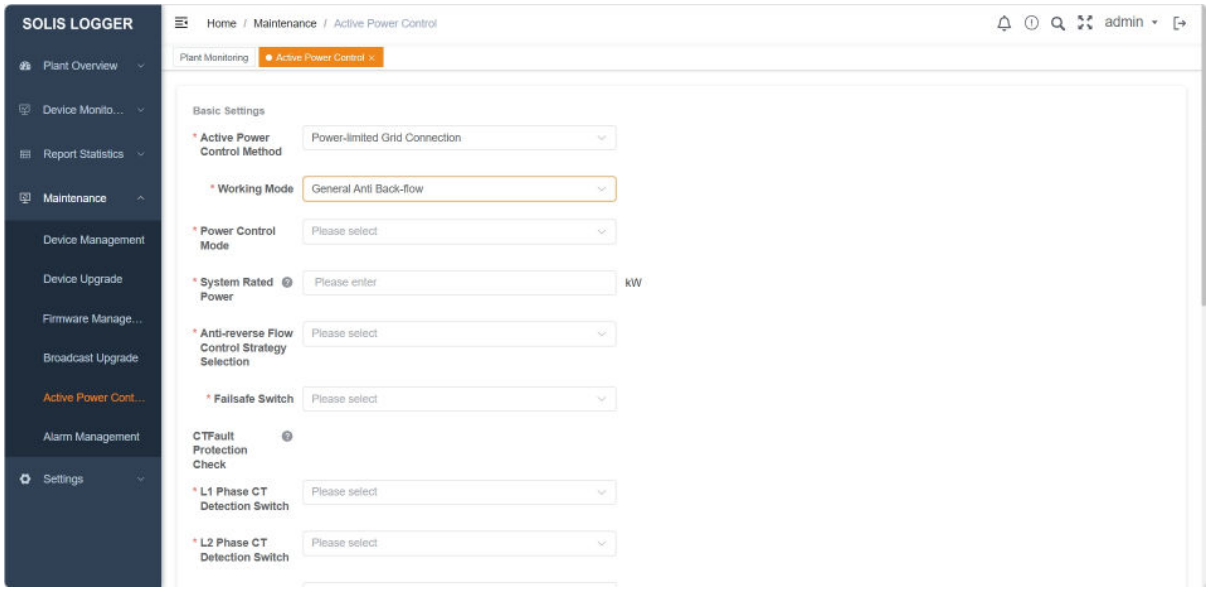
5.9. Active Power Control

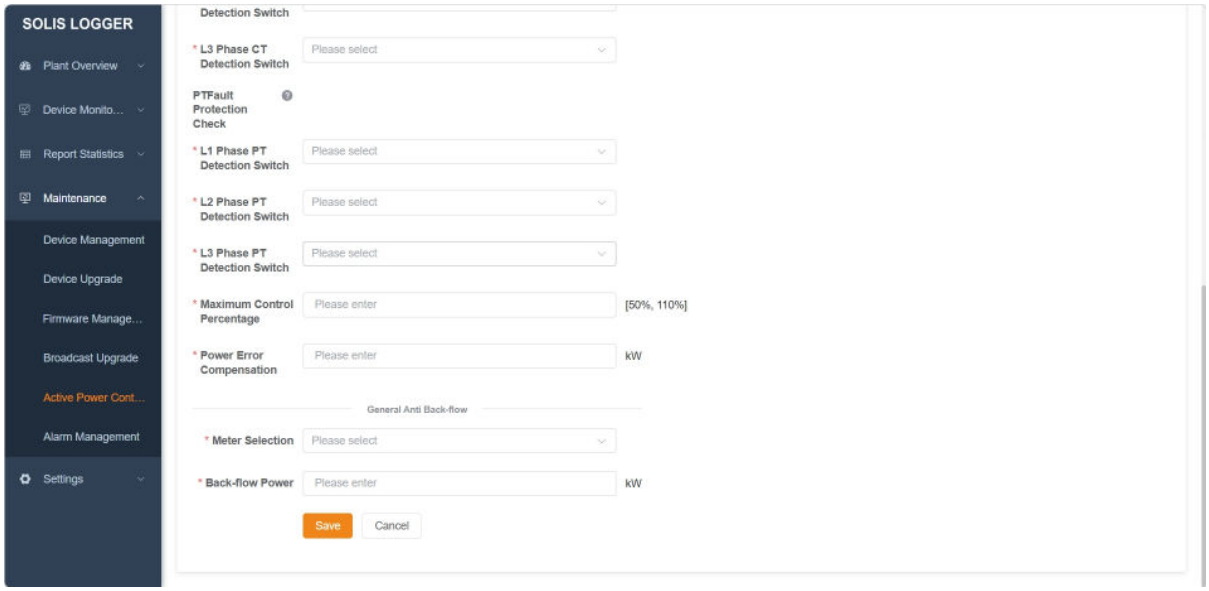
• When the load in the photovoltaic system cannot consume the power generated by the system, the remaining power will be fed into the grid. The power fed into the grid can be controlled by setting the active power control parameters.

• Click Maintenance > Active Power Control to set the parameters according to the following instructions.

• This chapter takes general anti-backflow as an example for setting introduction. For more detailed system solutions or setting other anti-backflow working modes, please contact Solis official customer service for technical guidance. The system connection mode is shown in the figure below.







Parameter Name	Description
Active Power Control Method	—Select the power control mode according to the actual situation. —This chapter takes grid connection with power limitation as an example for setting introduction.
Working Mode	—Select the working mode according to the actual situation. —This chapter takes general anti-backflow as an example for setting introduction.
Power Control Mode	Select the mode of controlling the output power of the device according to the actual situation. —3P Total Power: The inverter output power will be controlled according to the average value of the three-phase load total power. In this case, if the three-phase load power is unbalanced, grid-export power will occur. —Minimum Phase Mode: The inverter output power will be controlled according to the minimum value of the three-phase load power.
System Rated Power	The sum of the rated power of all inverters in the system.
Anti-reverse Flow Control Strategy Selection	The difference between the three control strategies is that the control speed after backflow over-limit is from fast to slow in turn. The control strategy can be selected according to actual needs. RD244: Response time 2s, mainly applicable to Spain and other regions with strict standards. G100 V1: Response time 5s, mainly applicable to the UK region. Others: Response time 15s, mainly applicable to China and other regions without special requirements.
Failsafe Switch	When enabled, it can detect the communication with the inverter. If the communication fails, an alarm prompt will be generated in the Alarm Center at the upper right corner of the WEB.
L1 Phase CT Detection Switch	When enabled, when the phase current is detected to be 0, an alarm prompt will be generated in the Alarm Center at the upper right corner of the embedded WEB, and the inverter output power will be controlled to 0
L2 Phase CT	

Detection Switch	by broadcast.
L3 Phase CT Detection Switch	
L1 Phase PT Detection Switch	When enabled, when the phase voltage is detected to be 0, an alarm prompt will be generated in the Alarm Center at the upper right corner of the embedded WEB, and the inverter output power will be controlled to 0 by broadcast.
L2 Phase PT Detection Switch	
L3 Phase PT Detection Switch	
Maximum Control Percentage	Restrict the inverter to operate according to the percentage of the rated power.
Power Error Compensation	–Set the adjustable range of the maximum power that the device can actually input to the grid. –Maximum power transmitted to the grid = Backflow power - Power error compensation.
Meter Selection	Add the Meter in [Device Maintenance] first, then select the Meter used for anti-backflow control from the drop-down list.
Backflow Power	Set the maximum power that the device can actually input to the grid.

6. Device Maintenance

6.1. Routine Maintenance

- Check whether electrical connections are loose and whether the cable surface is damaged.
- Check whether there are strong electromagnetic interference devices or heat sources placed around the equipment.

6.2. Troubleshooting

Please troubleshoot according to the following methods. If the troubleshooting methods cannot help you, please contact Solis official customer service.

No.	Phenomenon	Cause Analysis	Processing Suggestions
1	unable to power-on, Power light does not illuminate	1. The power adapter is not properly connected to the port or socket of the monitoring box. 1. The power adapter is faulty. 2. The monitoring box is faulty.	1. Check the power adapter to ensure it is properly connected. 2. Replace the power adapter. 3. Contact the distributor or Solis customer service.
2	Unable to log in to the local WEB interface via Ethernet or Wi-Fi	1. Computer operating system or browser version is too low. 2. Incorrect IP address configuration of the computer. 3. Weak wireless signal. 4. Incorrect WEB service address. 5. Browser abnormal. 6. The monitoring box is faulty.	1. Ensure the computer operating system is Windows 7 or later, and the browser is Chrome 80+, Firefox 74+, or equivalent. 2. If using Ethernet, verify that the computer and monitoring control box are on the same subnet. 3. If using Wi-Fi, check that the Wi-Fi antenna in the package is correctly installed, and that the monitoring box and computer are within 10 meters of each other for optimal signal. 4. Confirm the WEB service address is correct. 5. Clear browser history and cache. 6. Power off the device, wait 2 minutes, then restart and retry.

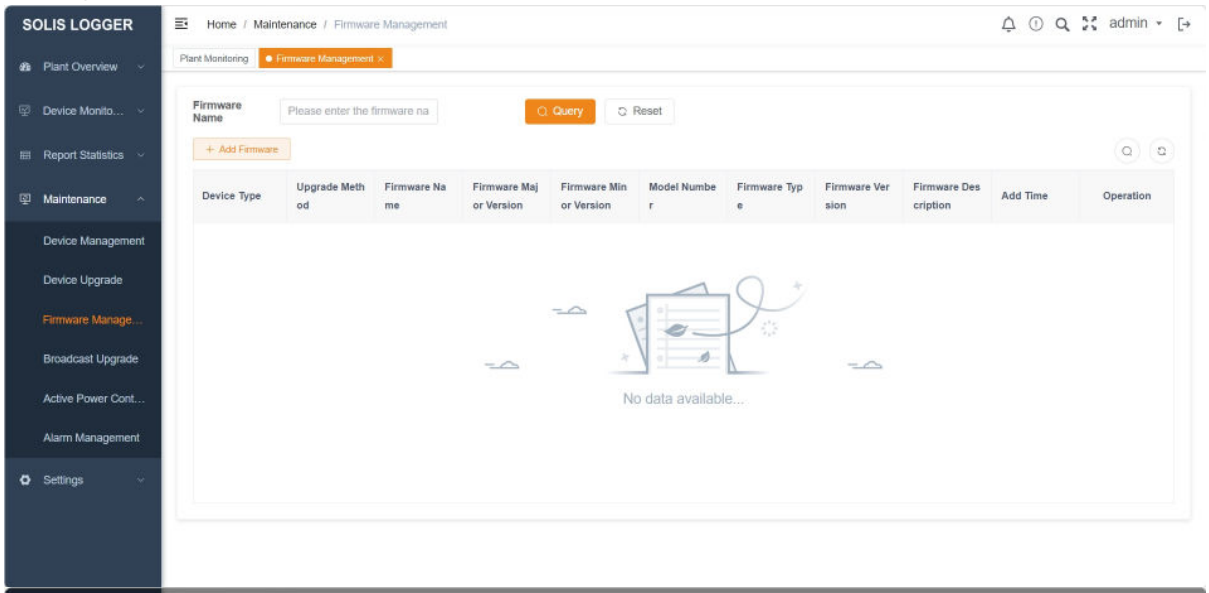
			If login still fails after 3 attempts, contact the distributor or Solis customer service.
3	Failed to successfully add a device	1. The device is not powered on. 2. Incorrect wiring of RS485, AI interfaces, etc. 3. Incorrect communication parameter configuration. 4. When accessing meters or Meteorographs, confirm that the monitoring box supports the specific model 5. The monitoring box is faulty.	1. Check if the device is powered on normally. 2. Verify RS485 and AI interface connections are correct, secure, and meet technical requirements. 3. Confirm communication parameters (e.g., baud rate, parity, address) are configured correctly. 4. Verify the supported meter and Meteorograph models (see product specifications). 5. Power off the device, wait 2 minutes, then restart and retry. If the issue persists after 3 attempts, contact the distributor or Solis customer service.
4	Unable to upload data to the cloud platform via wired network or Wi-Fi	1. The router or switch connected to the monitoring box is faulty. 2. Incorrect network configuration, such as IP address, Wi-Fi password, etc. 3. The router has a firewall enabled 4. The monitoring box is faulty.	1. Check the status of the router or switch. 2. Reconfigure network parameters. 3. Add the monitoring box to the router's whitelist (see "Cloud Domain Name and Port Configuration" in Section 8). 4. Power off the device, wait 2 minutes, then restart and retry. If the issue persists after 3 attempts, contact the distributor or Solis customer service.
5	Unable to upload data to the cloud platform via 4G communication	1. 4G antenna not installed or installed incorrectly. 2. Poor contact of SIM card or the SIM card has run out of data. 3. Incorrect configuration of	1. Check if the 4G antenna included in the accessories is installed correctly. 2. Check if the SIM card is properly installed and if the data is sufficient.

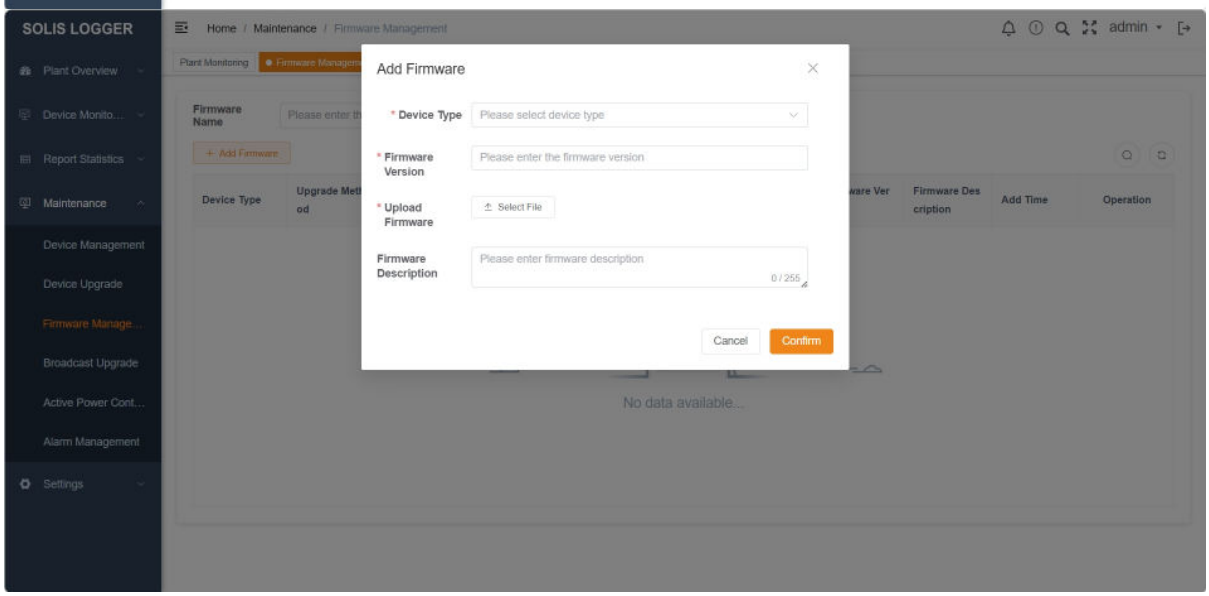
		4G APN parameters. 4. LAN port of monitoring control box still connected from the network cable connected to the router. 5. The monitoring box is faulty.	3. Configure the SIM card APN correctly in the WEB page under Network Settings. 4. When communicating via 4G, network cable between the monitoring box LAN port and the router need to be disconnected; otherwise, Ethernet communication will be enabled by default, and 4G communication will not be activated. 5. Power off the device, wait 2 minutes, then restart and retry. If the issue persists after 3 attempts, contact the distributor or Solis customer service.

6.3. WEB System Maintenance

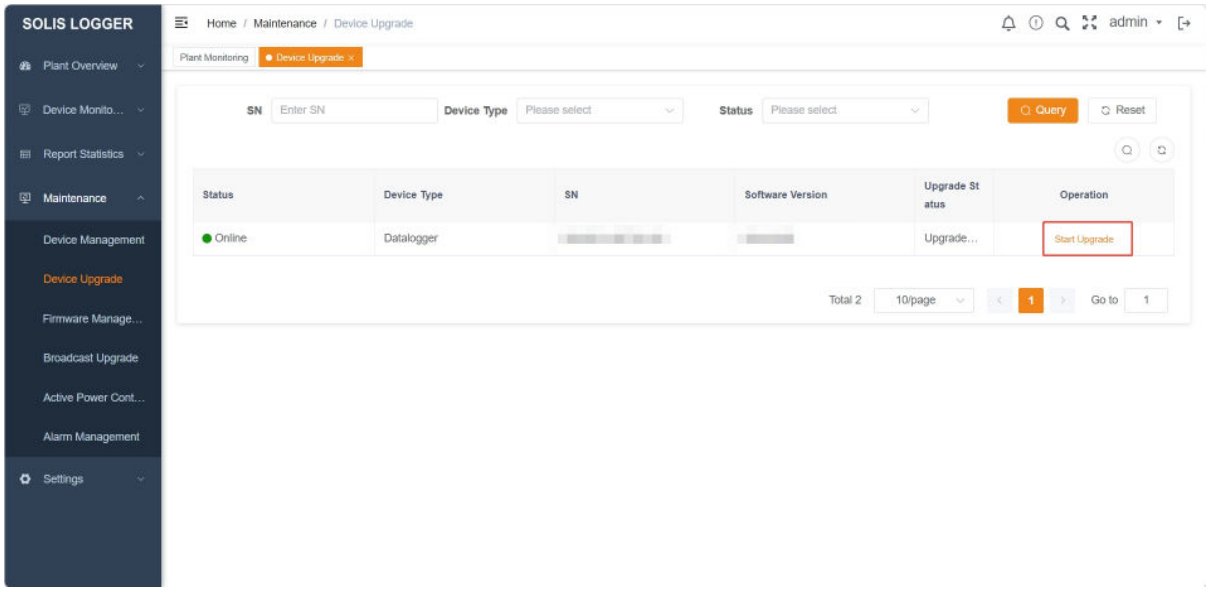
6.3.1. Device Upgrade

◦ Step 1: Click Maintenance > Firmware Management > Add Firmware to add the firmware of the monitoring box or inverter. Please contact Solis official customer service to obtain the firmware package.

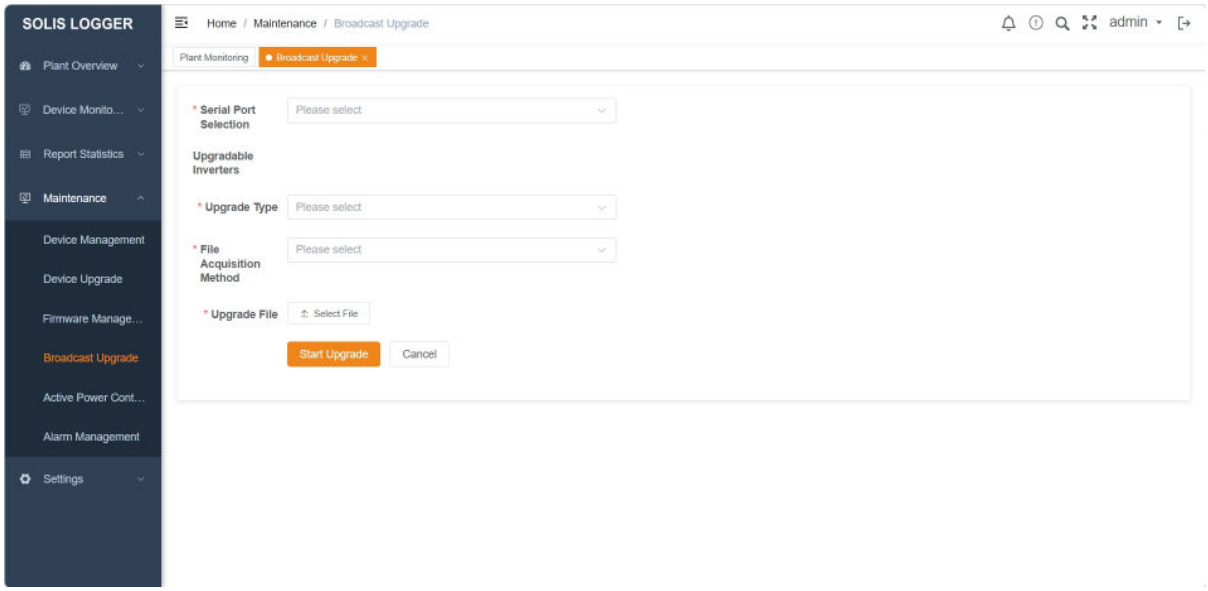




Step 2 (Optional): Click Maintenance > Device Upgrade to view upgradable devices. Click Start Upgrade to upgrade a single monitoring box or inverter, and check whether the version number changes after the upgrade is completed.



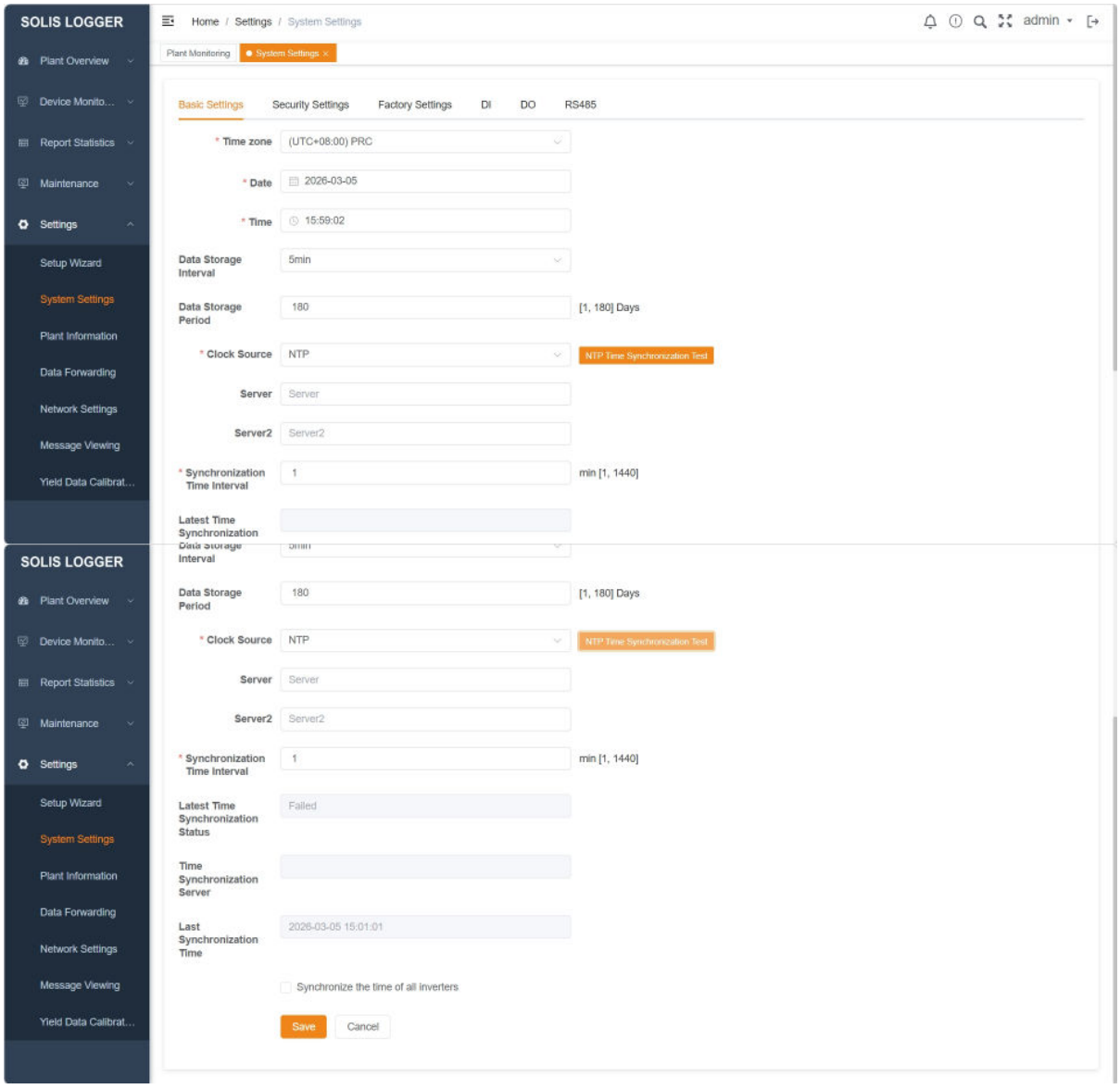
Step 3 (Optional): Click Maintenance > Broadcast Upgrade to perform broadcast upgrade for the connected inverters.



6.3.2. System Settings

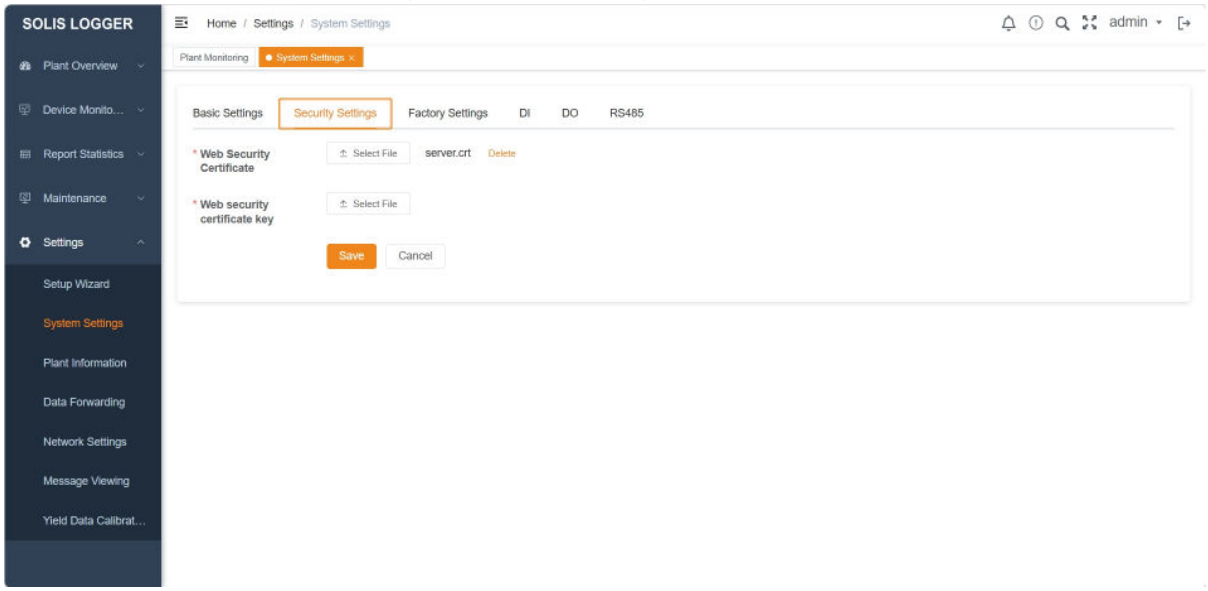
6.3.2.1. Basic Settings

- Set the time zone, system time and inverter time calibration.
- Modifying the date and time will affect the integrity of system power generation and performance data records; do not change the time zone and system time at will.



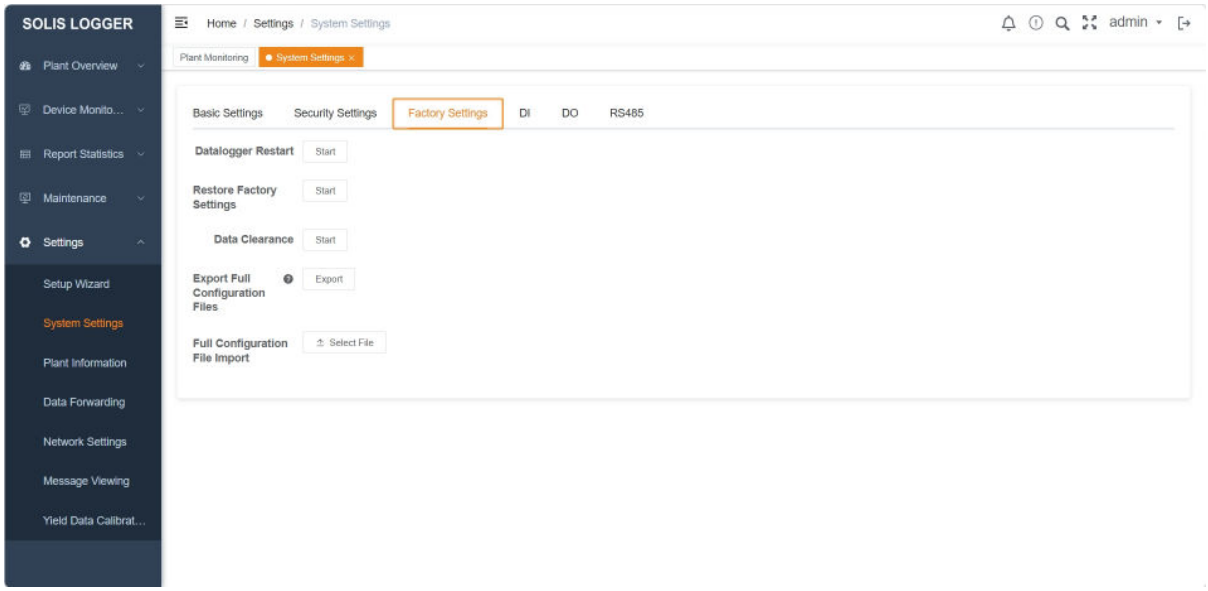
6.3.2.2. Security Settings

Upload the WEB network security certificate and key.



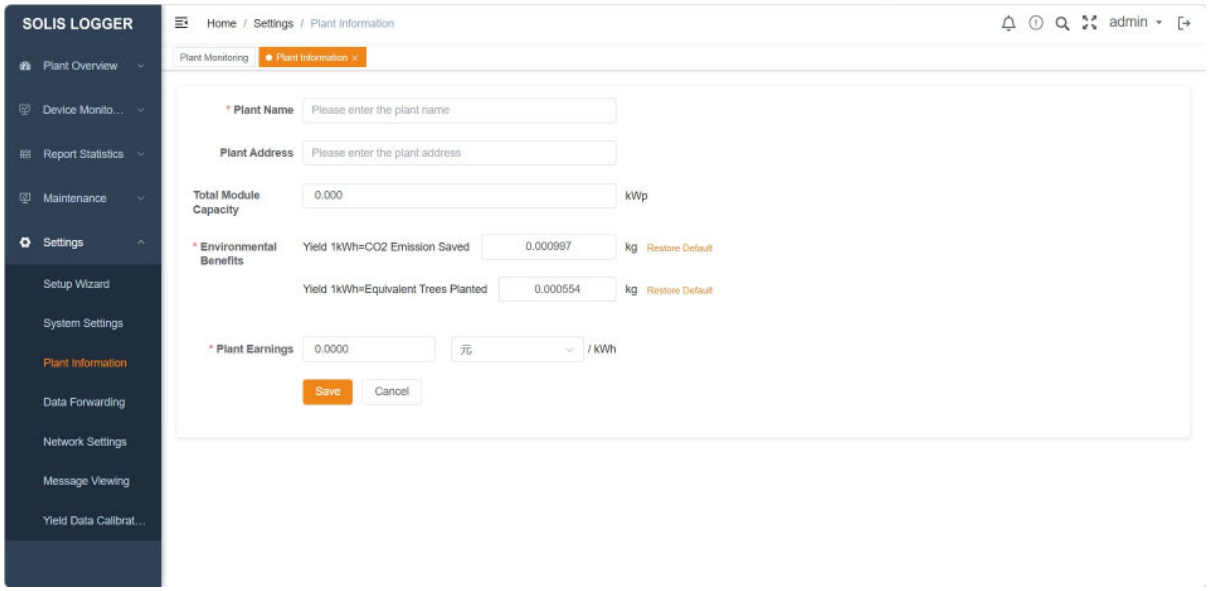
6.3.2.3. Factory Settings

Perform operations such as restarting the monitoring box or restoring factory settings.



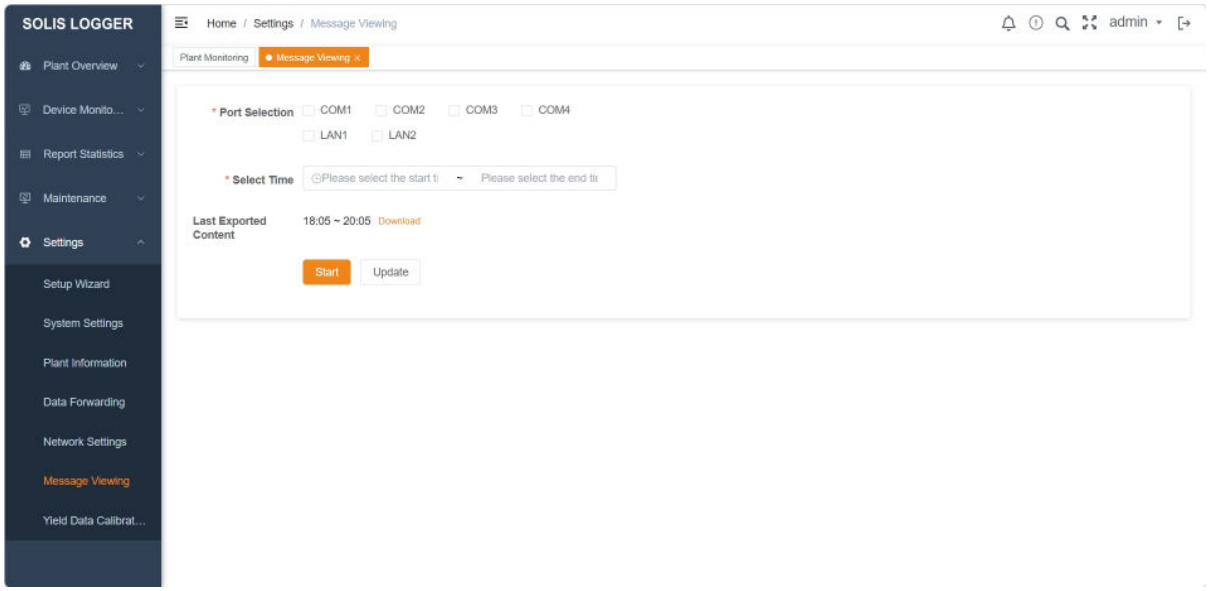
6.3.3. Plant Information Settings

Set basic information such as Plant name, address and module capacity.



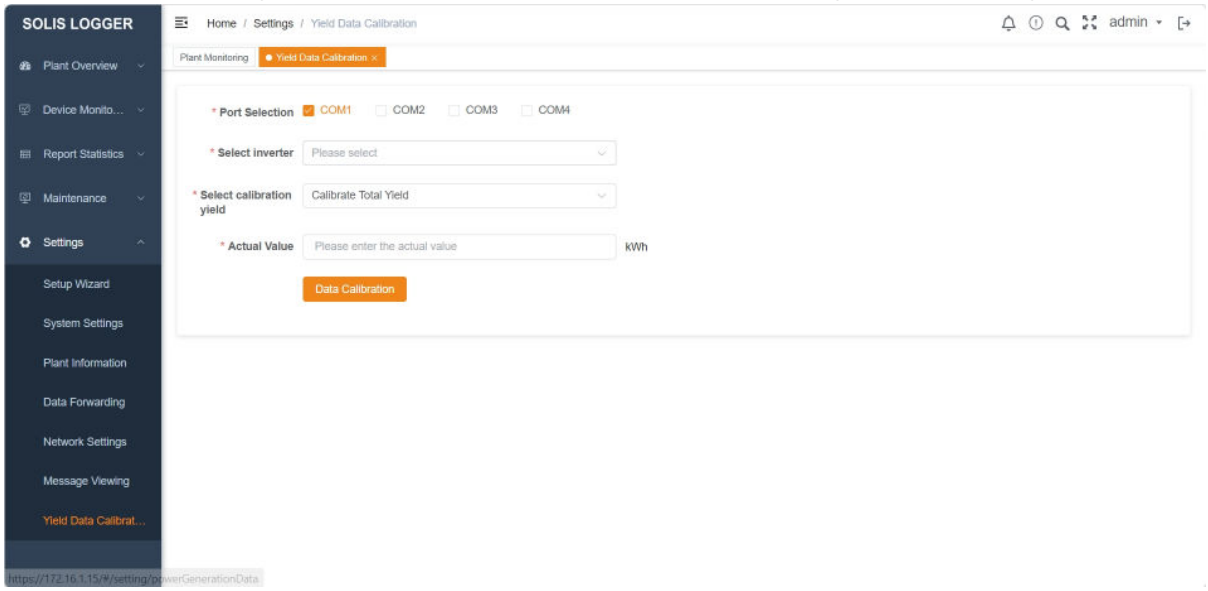
6.3.4. Message Viewing

View the communication messages of the corresponding port according to the following operations.



6.3.5. Yield Data Calibration

Calibrate the power generation of the connected inverters according to the following operations.



6.4. Device Disposal

When the equipment can no longer be used and needs to be scrapped, it shall be disposed of in accordance with the electrical waste disposal requirements of the laws and regulations of the country/region where the equipment is located, and shall not be treated as domestic waste.

7. Technical Parameters

Model	MB-S4-W4
Communication	
Max.manageable device	80,Each RS485 port≤20
Status indicator	LED×4
WEB	Embedded Web
RS485	COM×4, communication distance≤1000m
Ethernet communication	LAN×2，10 / 100 Mbps adaptive, communication distance ≤ 100 m
Wireless communication	Wi-Fi:802.11b/g/n(2.4G) 802.11a/n(5G) Cellular network：4G/3G/2G
Digital / Analog	DI×4，DO×2，AI×4
Communication Protocol	
RS485	Modbus-RTU
Ethernet	Modbus-TCP，IEC60870-5-104
Electrical	
Power Adapter	AC input:100～240V，50/60Hz DC output:12V,4A
DC input	input1:12V,1A input2:24V,0.8A
Power consumption	≤12W
Environment	
Operating temperature range	-40℃～+60℃
Storage temperature range	-40℃～+70℃
Relative humidity	5%～95%(Non-condensing)
Max.operating altitude	4000m
Mechanical	
Dimensions (W×H×D)	225×156×44mm
Weight	1.25kg
Ingress protection	IP20
Installation method	Ear hanging installation, Desktop installation
Others	
Certification	CE、RoHS

8. Network Domain Names and Ports

Domain Name	Description
iot-060a70qf.mqtt.iothub.aliyuncs.com	Ginlong Cloud (China) Domain Name
iot-600a7sx5.mqtt.iothub.aliyuncs.com	Solis Cloud (International) Domain Name

Name	Port Number	Description	Ports to be Opened on Router (Firewall)
Ginlong Cloud	1883、8883	For data interaction with Solis Cloud	1883、8883、2404、502
Solis Cloud	1883、8883		
Modbus-TCP	502	Data interaction between Modbus-TCP and SCADA	
IEC104	2404	Data interaction between IEC104 and SCADA	
SSH	22	For secure remote login, file transfer and command execution	Open when needed
HTTP	80	For unencrypted web page transmission service	Open when needed
HTTPS	443	For encrypted web page transmission service	Open when needed
Systemd	5355	Realize automatic mapping of device name and IP through port 5355 in a local area network without a DNS server	Open when needed

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Please adhere to the actual products in case of any discrepancies in this user manual.
If you encounter any problem on the inverter, please find out the inverter S/N
and contact us, we will try to respond to your question ASAP.