Ai-Logger

User Manual

Solplanet

Version 03

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1 General information

1.1 About this document

This document mainly contains the product information, as well as guidelines for installation, operation, and maintenance. The document does not include complete information about the photovoltaic (PV) system. The additional information can be got at www.solplanet.net.

You should understand the product features, functions, and safety precautions provided in this document before installing and operating the product.

You will find the latest version of this document and further information on the product in PDF format at www.solplanet.net.

It is recommended that this document is stored in an appropriate location and be available at all times.

1.2 Area of the validity

This document is valid for the following model:

- Ai-Logger 1000

1.3 Target group

This document is intended for professional technicians who are responsible for installation, operation, and maintenance of inverters, and users who need to check inverter parameters.

All installation work must be performed by appropriately trained and qualified persons.

Qualified persons must possess the following skills:

- Knowledge of electronic, electrical wiring and mechanical expertise, and be familiar with electrical and mechanical schematics.
- Training in the installation and commissioning of electrical devices .
- Knowledge of all applicable laws, standards and directives.
- Knowledge of and compliance with this document and all safety information.

1.4 Safety warning symbols guide

⚠ DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

⚠ NOTICE

Indicates a situation which, if not avoided, can result in property damage.

ℹ

Information that is important for a specific topic or goal, but is not safety-relevant.

2 Safety

2.1 Intended use

The product is a highly integrated device dedicated for monitoring and managing the PV power system. It converges ports, converts protocols, collects and stores data, and centrally monitors and maintains devices in the PV power system.

The product is only suitable for indoor use.

The product can be used to data collection from various environment sensors, Smart Energy Meters, inverters, and other equipment.

The type label must remain permanently attached to the product.

This document does not replace any regional, state, provincial, federal or national laws, regulations or standards that apply to the installation, electrical safety and use of the product.

2.2 Important safety instructions

Before installing, operating, and maintaining the equipment, read this document and observe all the safety instructions on the equipment and in this document.

⚠ DANGER

Damage to cable lines can cause personal injury!

- The walls may be covered with power cords or other lines (for example, gas or water).
- Make sure that no lines on the wall are damaged when drilling.

⚠ NOTICE

Damage to the product due to electrostatic discharge.

Internal components of the product can be irreparably damaged by electrostatic discharge.

- Ground yourself before touching any component .

2.3 Symbols on the label

	WEEE designation Do not dispose of the product together with the household waste but in accordance with the disposal regulations for electronic waste applicable at the installation site.
	CE marking The product complies with the requirements of the applicable EU directives.
	Observe the documentation Observe all documentation supplied with the product.

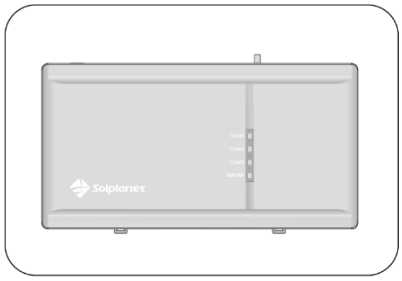
In door equipment

The product can be only used in door.

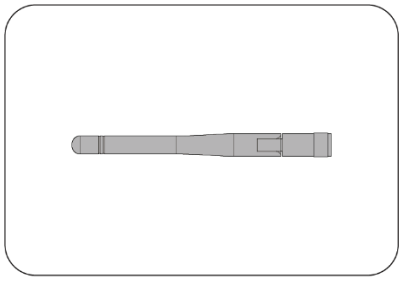
3 Unpacking and storage

3.1 Scope of delivery

Check the scope of delivery for completeness according to the packing list.The following items should be included.



A



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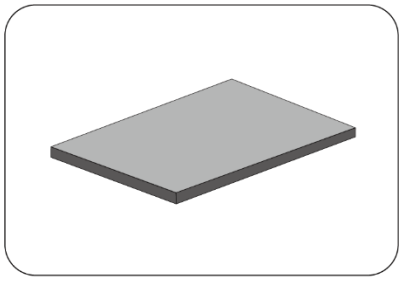

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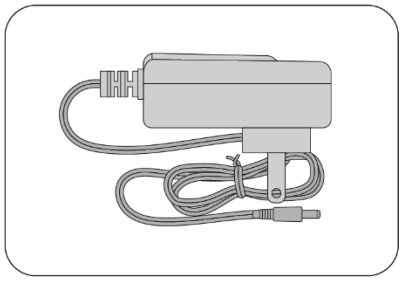

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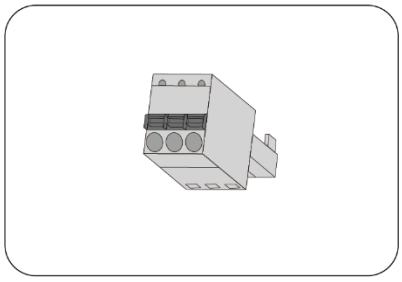

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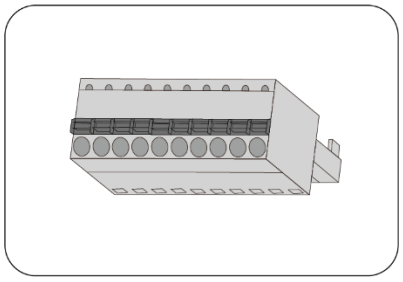


F

NO.	Name	Number
A	Ai-Logger 1000	1
B	Antenna	1
C	Document package	1
D	Power adapter	1 (optional)
E	Terminal (3 pin)	2
F	Terminal (10 pin)	1

3.2 Product storage

Suitable storage is required if the product is not installed immediately:

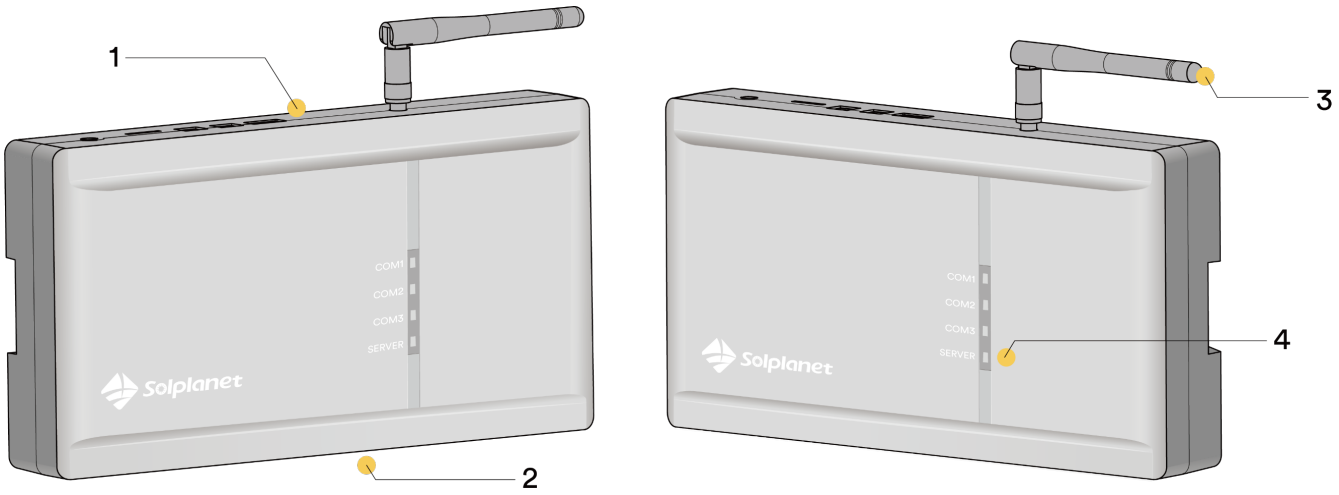
- Store the product in the original packing case and placed in a wellventilated, dry, and tidy room.
- The storage environment should be well ventilated, dry, and without any accumulated water.

- The storage temperature must be between -40°C to +85°C, and the storage relative humidity must be between 0 and 95%, non-condensing.
- Take precautions to protect the device against damage due to harsh environment such as shock cooling, shock heating, and collision.

4 Product Description

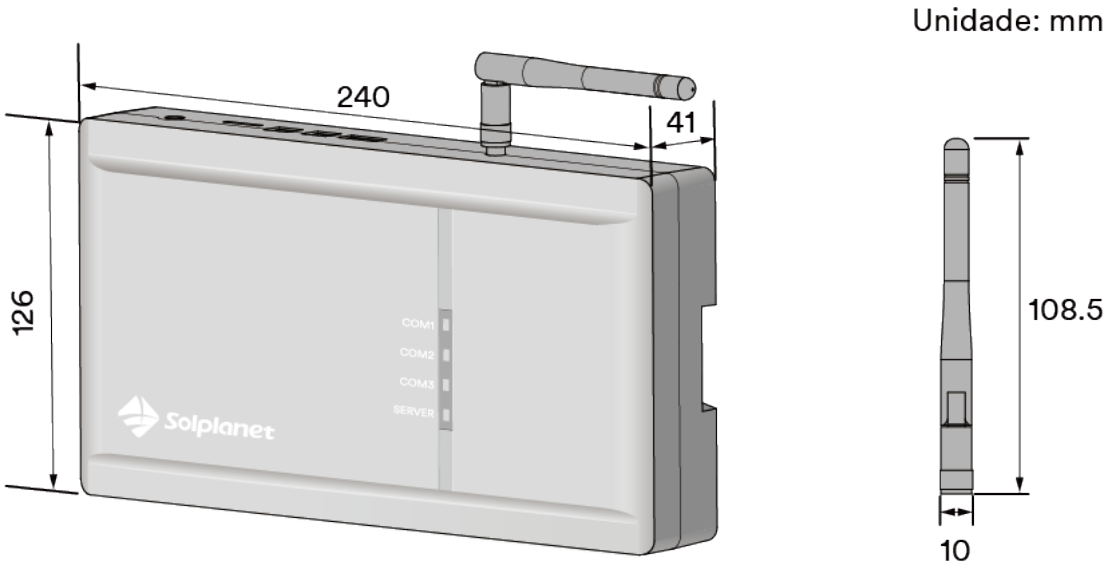
4.1 Appearance

Ai-Logger 1000 is a special device for PV system monitoring and management platform, with functions such as interface aggregation, protocol conversion, data acquisition, data storage, centralized monitoring and centralized maintenance for each PV system device.



NO.	Name	Description
1	Upper wiring area	Connect digital output signal.
2	Under wiring area	Connect power supply, RS485, Ethernet and digital input signal.
3	Antenna connection area	Connect 2.4G WLAN antenna.
4	LED indicator	Indicate the present working state of the Ai-Logger.

4.2 Dimensions



4.3 LED indicator

The LED indicator can indicate the operation state of the product.

LED indicator	LED state	Description
COM1	Solid on	The communication of the devices connecting to COM1 port is operating normally.
	Blinking	The communication of the devices connecting to COM1 port is interruption, or there isn't any device connecting to COM1.
COM2	Solid on	The communication of the devices connecting to COM2 port is operating normally.
	Blinking	The communication of the devices connecting to COM2 port is interruption, or there isn't any device connecting to COM2.
COM3	Solid on	The communication of the devices connecting to COM3 port is operating normally.
	Blinking	The communication of the devices connecting to COM3 port is interruption, or there isn't any device connecting to COM3.
SERVER	Solid on	The communication between Ai-Logger 1000 and the Cloud Server is operating normally.
	Blinking	The communication between Ai-Logger 1000 and the Cloud Server is interruption.

4.4 Interfaces and functions

WLAN

The product is equipped with a WLAN function as standard. WALN function can only be used for near-field communication to set parameter.

RS485 Interface

The product is equipped with three RS485 port. Those ports can be used to connect PV inverter, Smart meter, Weather satation and the other third party device. The product can centrally manage up to 80 PV inverters and automatically assign RS485 addresses to connect inverters and supports changing names according to device serial numbers for easy remote configuration and maintenance.

Ethernet interface

The product is equipped with a 10/100M Ethernet port. The Ethernet port can be used as northbound ports to connect to an Network Management System(NMS) or connect to a computer directly.

Digital signal input port

The product is equipped with a digital signal input port. This port can be used to connect a DRMs device for Australia market or a ripple control receiver for Germany market.

Digital signal output port

The product is equipped with two digital signal output port. Those ports can be used to provide a control signal to the external device.

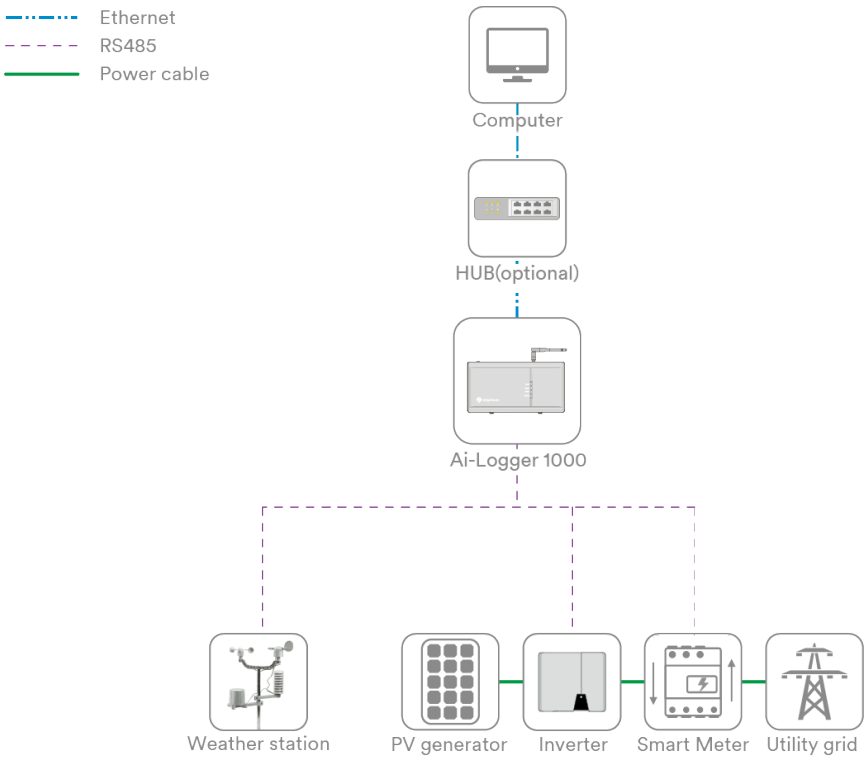
USB port

The product is equipped with a USB port. This port can be used to upgrade firmware and export data of Ai-Logger 1000 or inverter by inserting a USB stick.

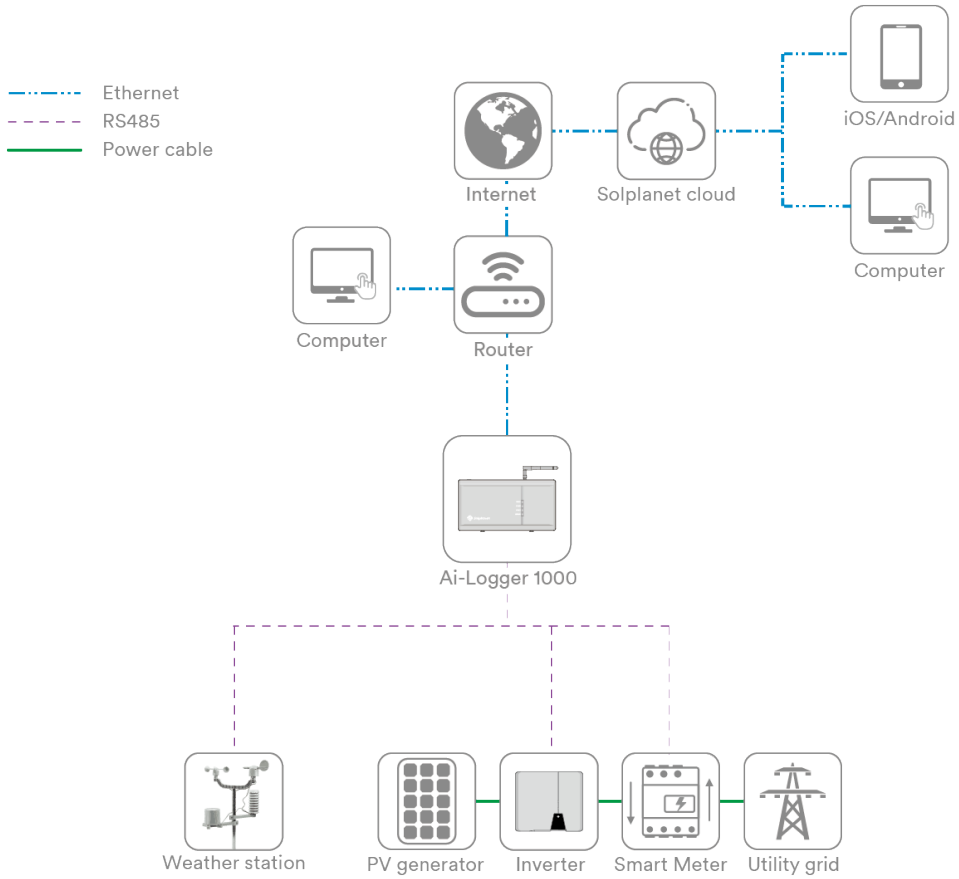
- The USB stick must be compatible with USB 2.0 and should have only one partition formatted as FAT32.
- A folder named as “system” need be created in the root directory of the USB Stick, and then place the updated firmware inside this folder.
- A folder named as “plant” need be created in the root directory of the USB Stick for the exporting data

4.5 Communication overview

Ai-Logger 1000 is connected to computer directly:



Ai-Logger 1000 is connected to Internet through the router:



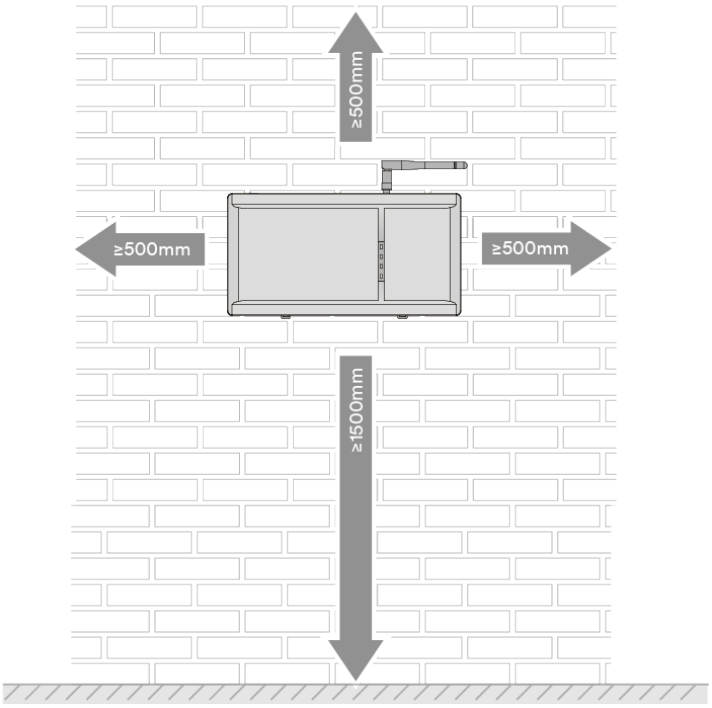
5 Device installation

5.1 Choose an installation location

Choose an appropriate location and install Ai-Logger 1000 to ensure that Ai-Logger 1000 can work normally and efficiently.

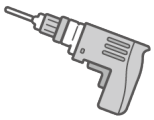
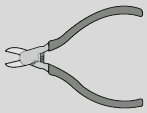
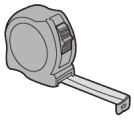
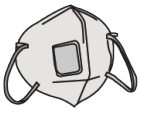
Please take the following into consideration when selecting an installation location:

- With the ingress of protection IP20, the Ai-Logger 1000 can be installed only indoors.
- The mounting location must be inaccessible to children and at a proper height to facilitate operation and maintenance.
- The ambient temperature should be kept at -20℃~+60℃, and avoid direct sunlight.
- The ambient humidity of the installation location cannot exceed 95%. Excessive humidity may cause damage to internal components.
- Make sure the RS485 and Ethernet cables connection area is facing down when mounting on walls or rails.
- Ensure that enough space is reserved around the Ai-Logger 1000. The installation location should be 1,500mm above the ground surface, and maintenance clearance of at least 500mm should be reserved. Minimum clearances are shown in the figure below.



5.2 Installation tools

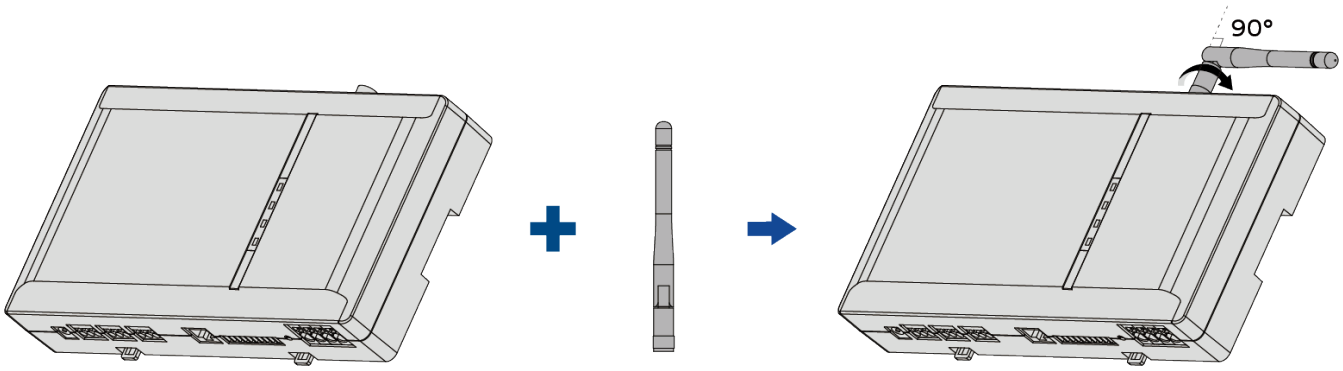
Installation tools include but are not limited to the following recommended ones. If necessary, use other auxiliary tools on site.

Tools	Reference picture	User
Impact drill		When wall-mounted, it is used to punch holes in the wall.
Diagonal plier		Cut the cable ties.
Wire stripper		Strip off the cable skin.
Rubber hammer		Tap the expansion bolts into the holes.
Utility knife		Unpacking etc.
Wire cutter		Cut the cable.
Marker		Making marks.
Vacuum cleaner		After drilling holes in the wall, clean the dust on the site.
Steel tape		Measure distance.
Safety goggles		It is worn by the operator when punching.
Dust mask		It is worn by the operator when punching.

5.3 Install Ai-Logger 1000

5.3.1 Installing antenna

Install the antenna on the thread of the Ai-Logger and screw it in clockwise. After installation, the antenna can be bent 90° and rotated 360°.



5.3.2 Wall-mounted installation

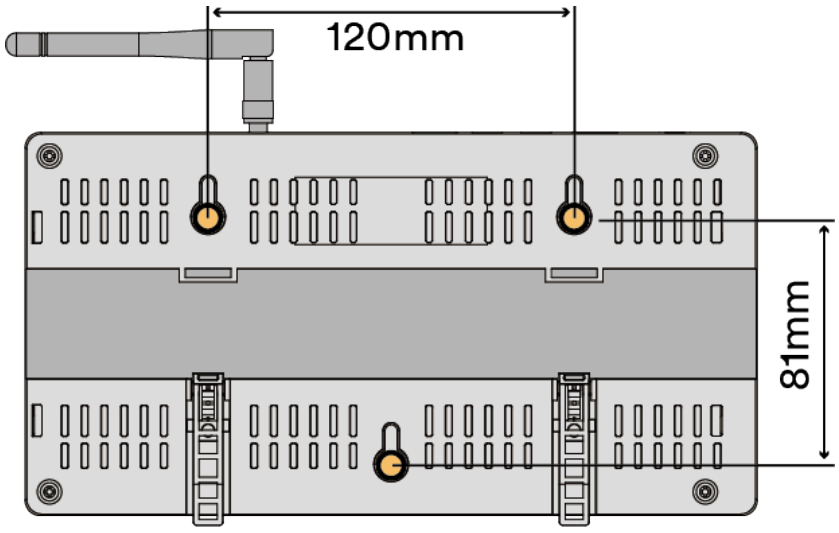
⚠ DANGER

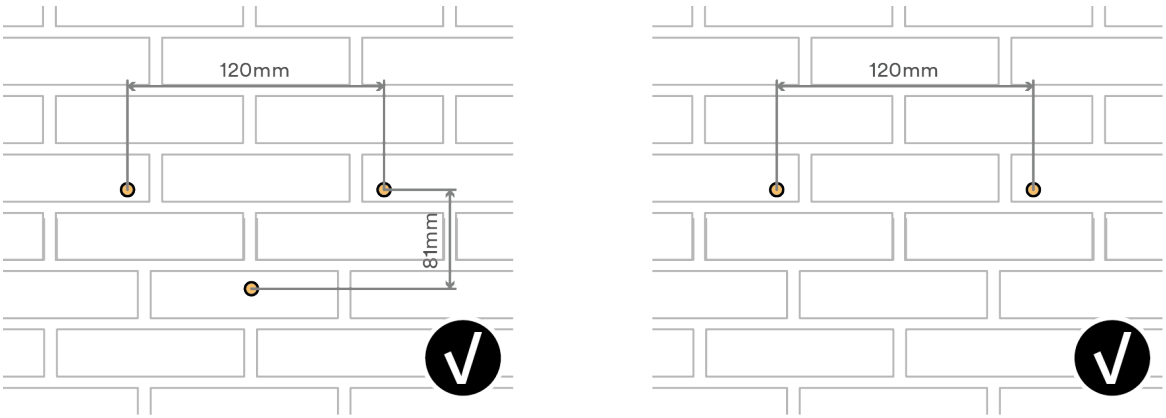
Damage to cable lines can cause personal injury!

The walls may be covered with power cords or other lines (for example, gas or water).

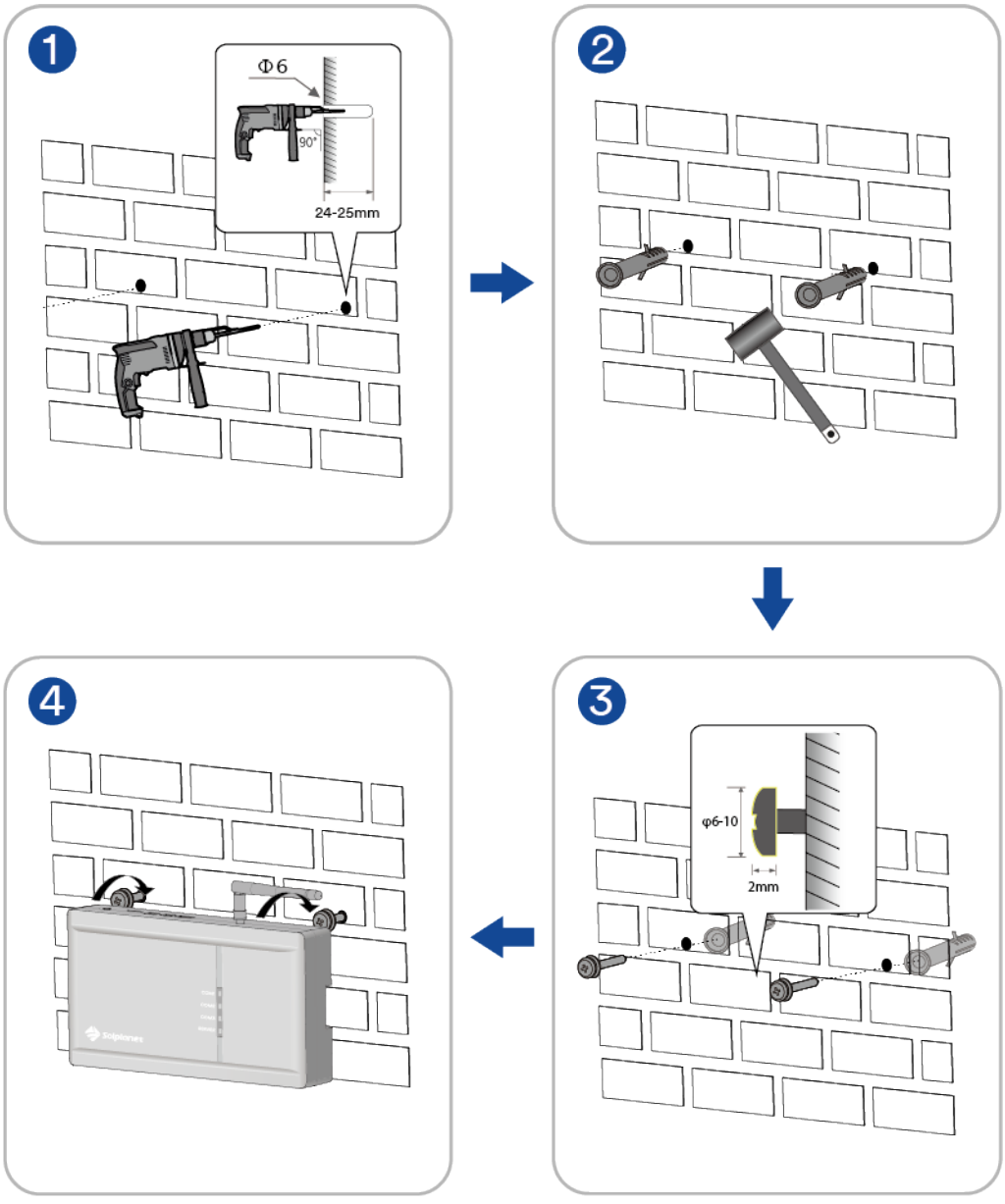
- Make sure that no lines on the wall are damaged when drilling.

Step 1: Please choose a solid and flat wall to install Ai-Logger 1000 and make sure Ai-Logger 1000 is steadily fixed to the wall. Measure out the following dimensions on the wall and mark them well. Ai-Logger 1000 can be hung on the wall with three screws to make it more steady, or it can be hung on the wall with only two screws on the top.



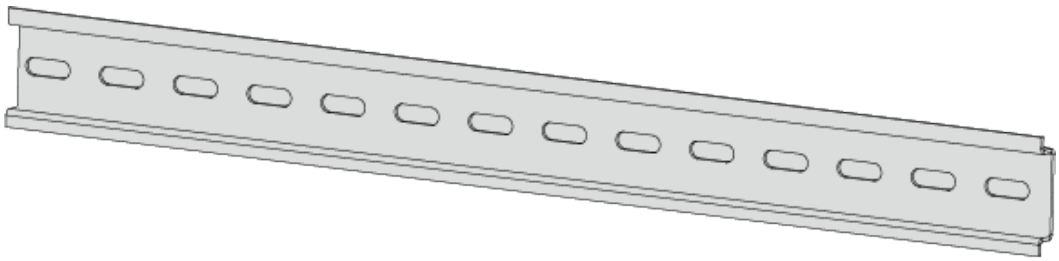


Step 2: Use a pistol drill (φ6 drill bit is recommended) at the marked place to drill a depth of 24-25mm. Clean up the debris in the hole, then install the expansion coil and screw on the wall. The screw requirements are as follows. The thickness of the head is 2mm, and the diameter is φ6-10. Finally, hang the Ai-Logger 1000 on the screw.

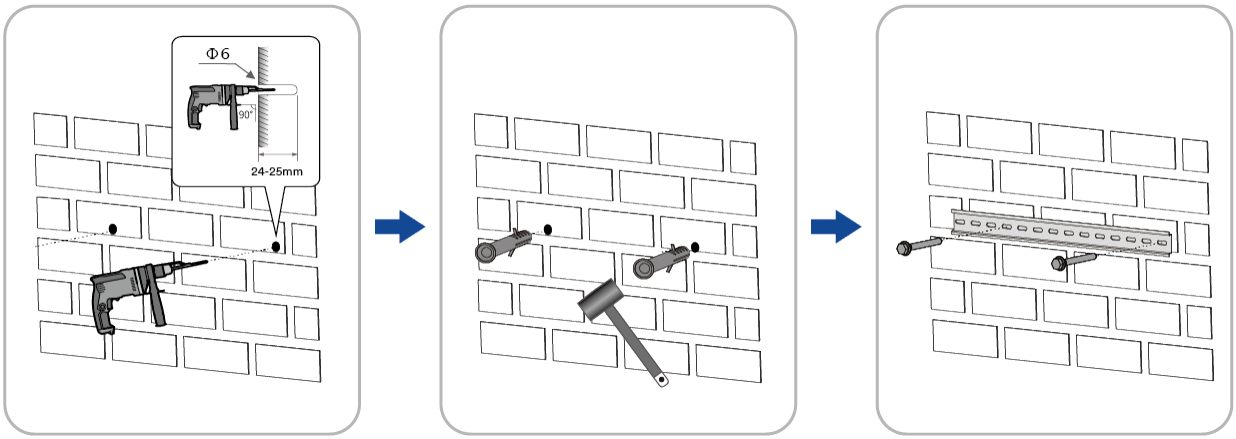


5.3.3 Rail installation

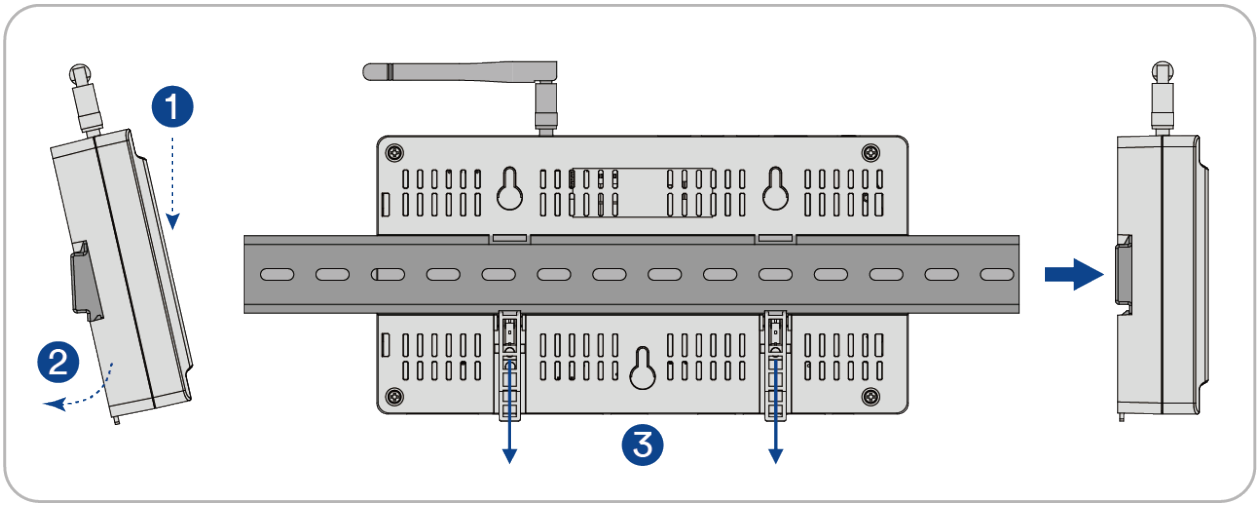
Step 1: Choose a standard DIN35mm rail with a thickness of 1mm and a rail length of not less than 280mm.



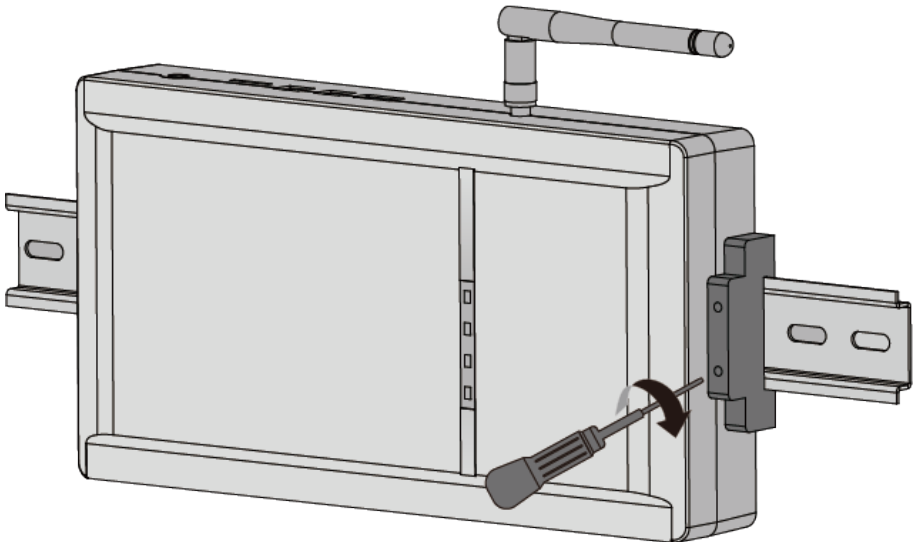
Step 2: Fix the guide rail to the selected cabinet or wall. The way of fixing on the wall is similar to wall mounting.



Step 3: Mount the Ai-Logger 1000 on the rail. Hold the Ai-Logger 1000 to clamp the upper grove on the upper edge of the rail, rotate the Ai-Logger 1000 to make the rail contact the two rail clips on the Ai-Logger 1000, then press the Ai-Logger 1000 to make the rail completely snap into the rail clips. If it is difficult to snap into place, use a flat-blade screwdriver and gently move the clip down through the hole, then the rail can be easily snapped into place.



Step 4: Fix the end brackets on the rail at both ends to prevent the Ai-Logger 1000 from moving on the rail.



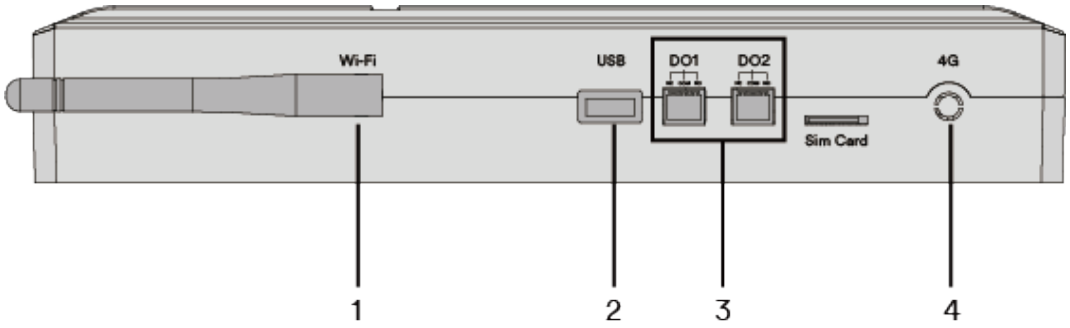
Step 5: Check to make sure the Ai-Logger 1000 is securely installed.

6 Electrical connection

- When making electrical connections, make sure all cables are securely connected to prevent loosening.
- Ai-Logger 1000 does not have a power-on button, please do not connect the power adapter until the electrical connection is completed.

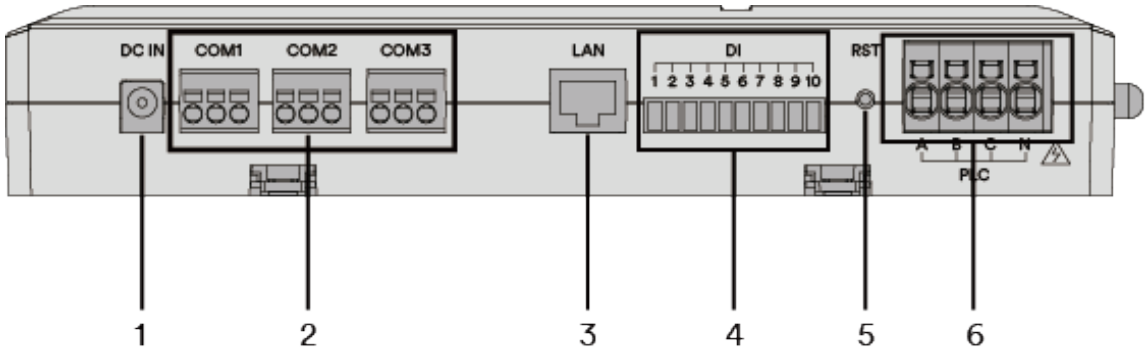
6.1 Overview of the connection area

- **Top view**



NO.	Name	Description
1	Wi-Fi	External WLAN antenna.
2	USB	Updating the firmware through the USB stick.
3	DO1, DO2	Digital signal output (Dry contact).
4	4G	Reserved port.

- **Bottom view**



NO.	Name	Description
1	DC IN	Power supply socket, connect to 12V power adapter.

2	COM 1, COM 2, COM 3	Three sepearate RS485 interfaces, connect to PV inverter, Smart merter, Weather station and the other third party device.
3	LAN	Ethernet port, connect to Ethernet switch or router.
4	DI	Digital signal input, connect to Ripple Control Receiver or Demand Response Enabling Device (DRED).
5	RST	Press it for 3s to restart. Press and hold until all lights flash to reset (about 10 seconds)
6	PLC	Reserved port

6.2 COM ports connection

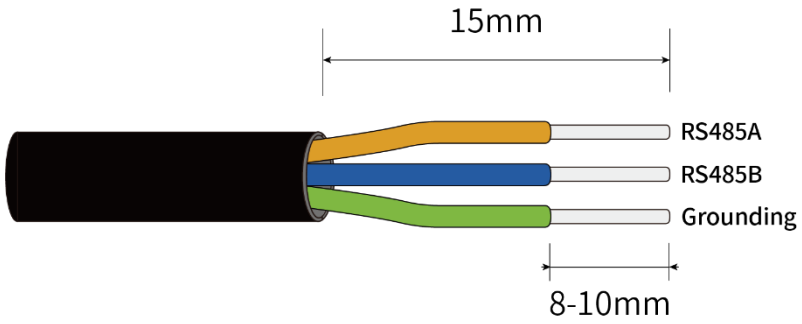
6.2.1 RS485 cable connection

Ai-Logger 1000 is equipped with three seperate RS485 interfaces. They are marked as COM 1, COM 2 and COM 3. Those ports can connect to Solplanet inverter and the other third party device with the standard MODBUS-RTU protocol.

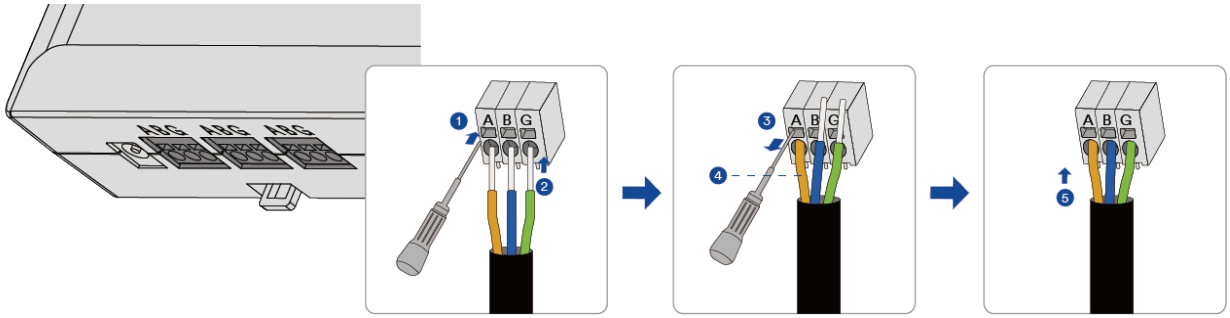
- Two-core or multi-core outdoor shielded cable with a cross-sectional area of 0.2–2.5 mm² or 24–14 AWG.
- When a multi-core multi-strand copper wire cable is used, crimp an appropriate euro style terminal at the communication cable head and then connect it to the RS485 port of the Ai-Logger 1000.

Procedure:

Step 1: Strip the cable jacket and insulation layer with a wire stripper by about 15mm and 8mm to 10mm respectively.

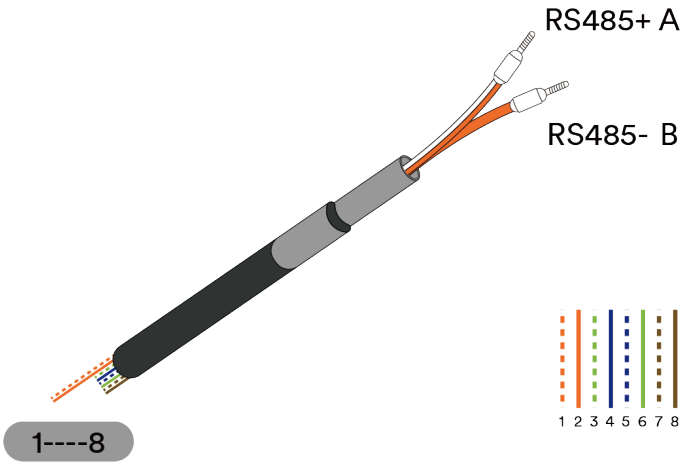


Step 2: Use a slotted screwdriver inserting the auxiliary hole, and then insert the conductors into the hole, pull up the screwdriver and then the conductor is locked.



It is recommended to choose 3-core twisted wire to improve the anti-interference ability of RS485 communication. The ground wire of the 3-core twisted wire can be connected to terminal G.

If the communication cable is Shielded Straight through Ethernet cable, white-orange wire 1 is defined as RS485- A wire and the orange wire 2 as RS485+ B wire.



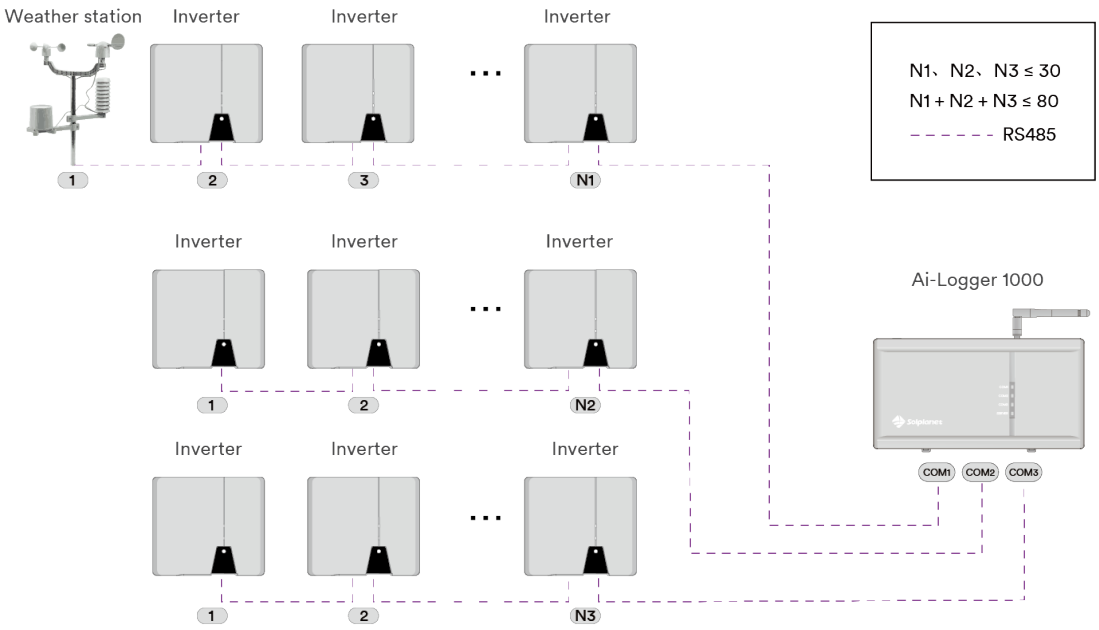
Corresponding Relationship Between Cables and Pins:

Pin 1: White-orange;
Pin 2: Orange;
Pin 3: White-green;
Pin 4: Blue;
Pin 5: White-blue;
Pin 6: Green;
Pin 7: White-brown;
Pin 8: Brown.

Pin 1 and Pin 2 are used for communication.
- Pin 1 to RS485+ A
- Pin 2 to RS485- B

6.2.2 Connect to multiple inverters or weather station.

Multiple inverters and Weather station are connected to the Ai-Logger 1000 in the RS485 daisy chain manner. There are three separate RS485 interfaces, each of RS485 interface can connect up to 30 devices, but the total devices can be connected is 80.

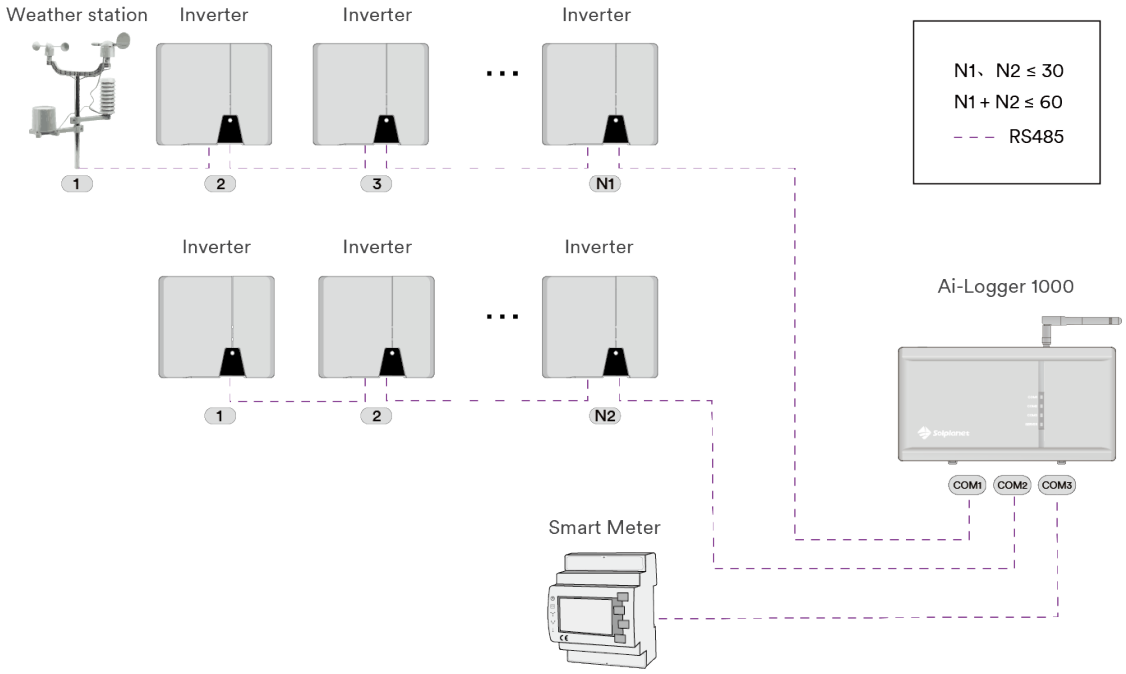


6.2.3 Connect to a Smart Meter

Ai-Logger 1000 can connect to Smart Meters that support standard MODBUS-RTU protocol or DL/T645 protocol. The Smart Meter can be used to limit the export active power.

The export active power control solution measures the active power at the point where the customer's installation is connected to the distribution system (point of grid connection) and then uses this information to control the inverter's output active power in order to prevent the export active power to the distribution system from exceeding the agreed export capacity.

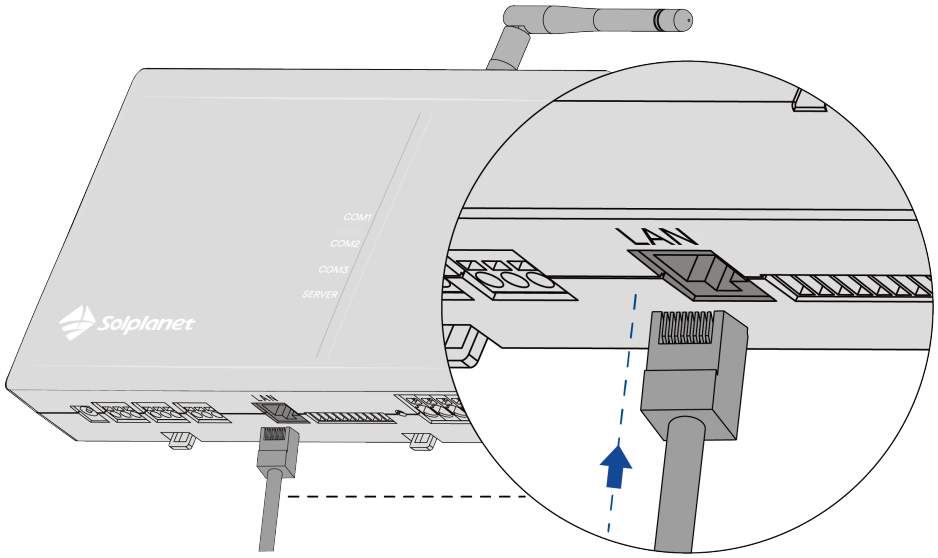
The Smart Meter must be connected to a separate RS485 interface to ensure the transmission speed of active power information.



6.3 Connect through Ethernet cable

- It is recommended to use a CAT 6E Ethernet cable with a cross-sectional area of 0.5mm² or more.
- It is recommended that the cable length should not exceed 100 meters.

Ai-Logger 1000 can be connected to Ethernet switches, routers and other devices through the standard Ethernet cable, and can also be connected to the Ethernet electrical port of a PC directly or through a Hub.



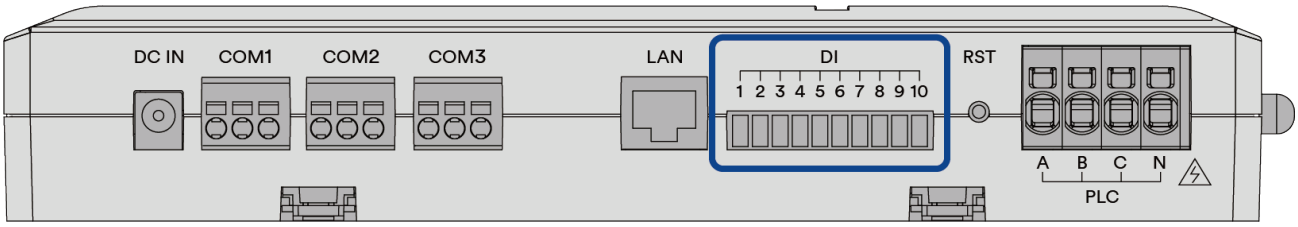
6.4 Digital signal input interface connection

6.4.1 Digital signal input terminal connection

In Germany and parts of Europe, grid companies use Ripple Control Receiver to convert grid dispatch signals to dry contact and need power plants to receive grid dispatch signals using dry contact communication.

In Australia, the inverter shall have a means of connecting to a Demand Response Enabling Device (DRED). The terminal block may be physically mounted in the inverter or in a separate device that remotely communicates with the inverter.

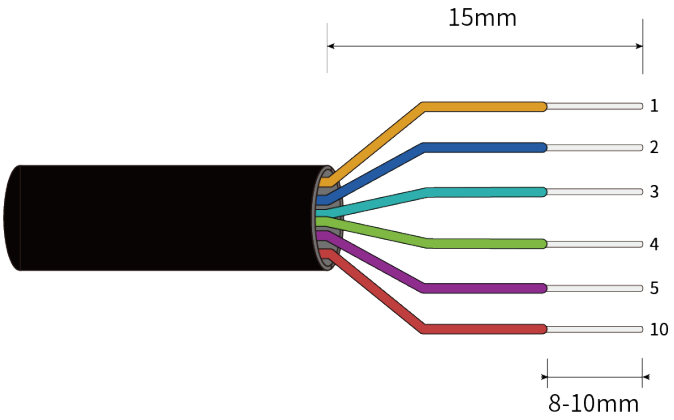
The digital input signal terminal of Ai-Logger 1000 can be used to connect the Ripple Control Receiver or Demand Response Enabling Device (DRED), as shown in the figure below.



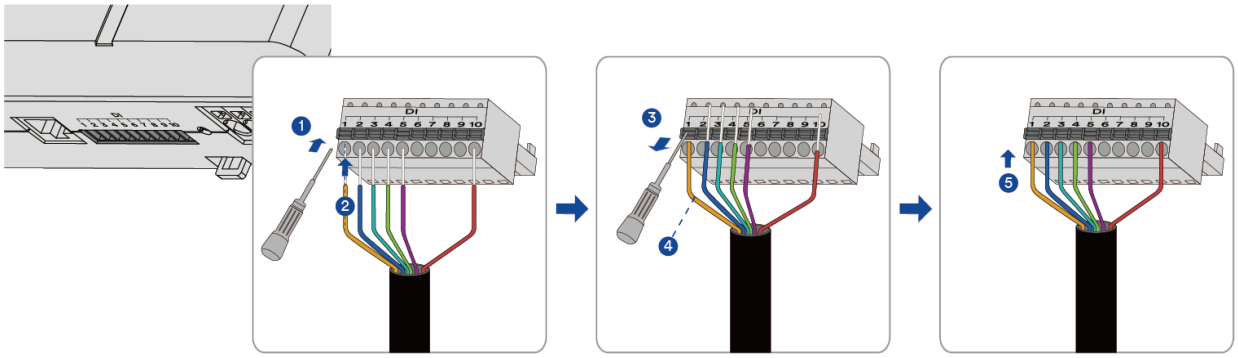
Port	Function	Descreption
1	VCC	“REF GEN/0” for DRED.
2	DI_1	“DRM1/5” for DRED or used for reactive power control “D1”.
3	DI_2	“DRM2/6” for DRED or used for reactive power control “D2”.
4	DI_3	“DRM3/7” for DRED or used for reactive power control “D3”.
5	DI_4	“DRM4/8” for DRED or used for reactive power control “D4”.
6	DI_5	“K1” for Ripple Control Receiver.
7	DI_6	“K2” for Ripple Control Receiver.
8	DI_7	“K3” for Ripple Control Receiver.
9	DI_8	“K4” for Ripple Control Receiver.
10	GND	“COM LOAD/0” for DRED or Common GND for Ripple Control Receiver.

Procedure:

Step 1: Strip the cable jacket and insulation layer with a wire stripper by about 15mm and 8mm to 10mm respectively.



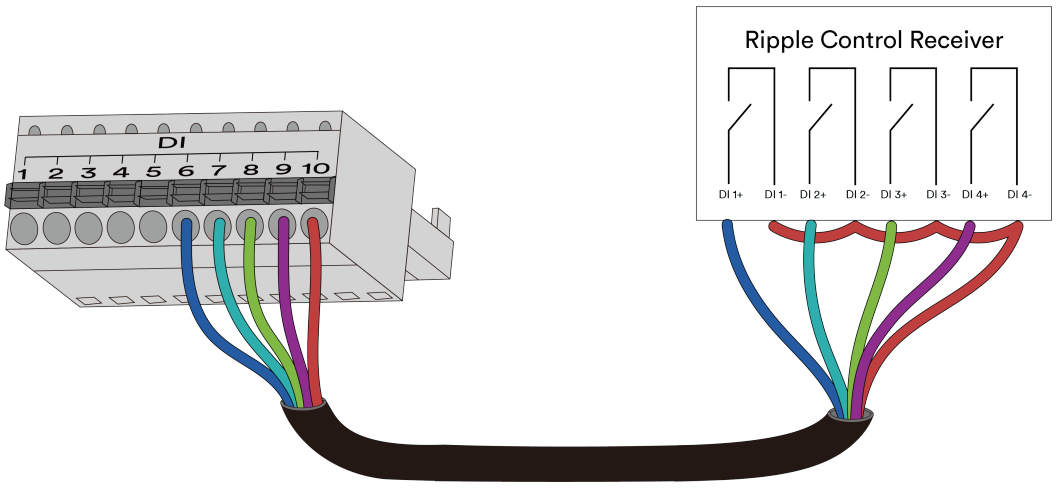
Step 2: Use a slotted screwdriver press the yellow button, and then insert the conductors into the hole, take out the screwdriver and then the conductor is locked.(For example, connect to DRED)



Step 3: Insert the terminal block into the digital signal input port.

6.4.2 Connect to Ripple Control Receiver

Ripple Control Receiver normally have four dry contacts. The digital input signal interface of the Ai-Logger 1000 can be connected to Ripple Control Receiver as shown in figure below.

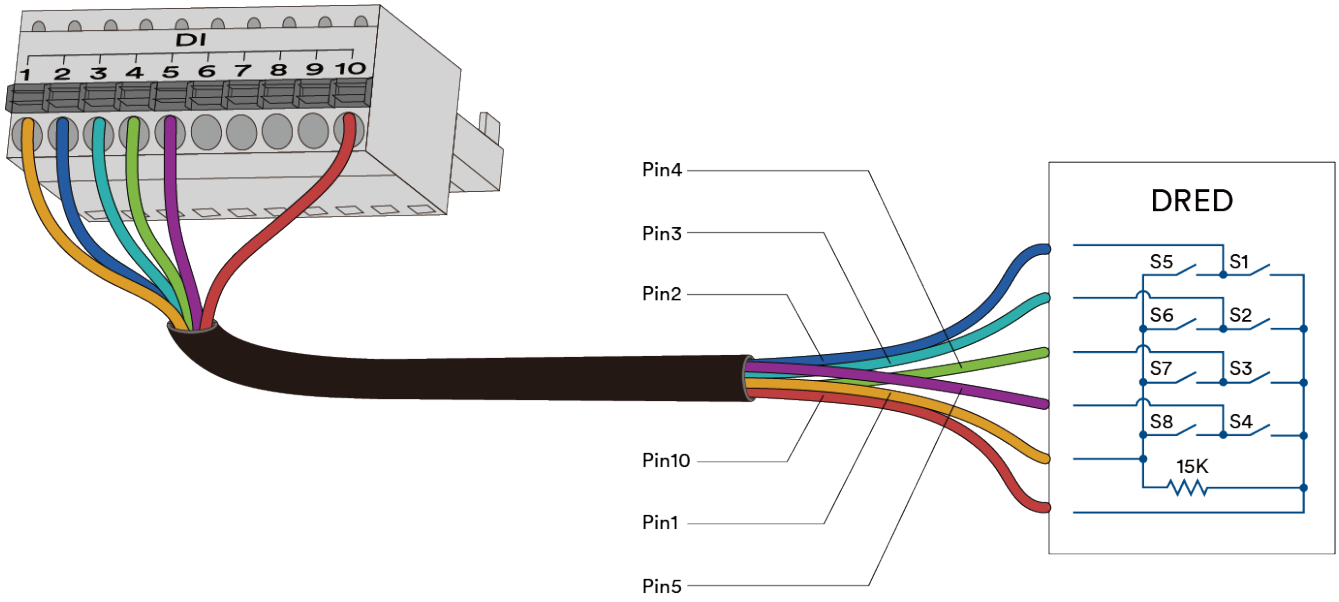


NOTICE

- In order to use the power grid dispatch function normally, after the cable is connected, you need to set up relevant settings (active power control or reactive power control) on the embedded WEB. For details, please refer to 8.5.3Grid dispatch.

6.4.3 Connect to Demand Response Enabling Device (DRED)

Demand Response Enabling Device (DRED) is a standard device with six terminal. The digital input signal interface of the Ai-Logger 1000 can be connected to Demand Response Enabling Device (DRED) as shown in figure below.



6.5 Dry contact output interface connection

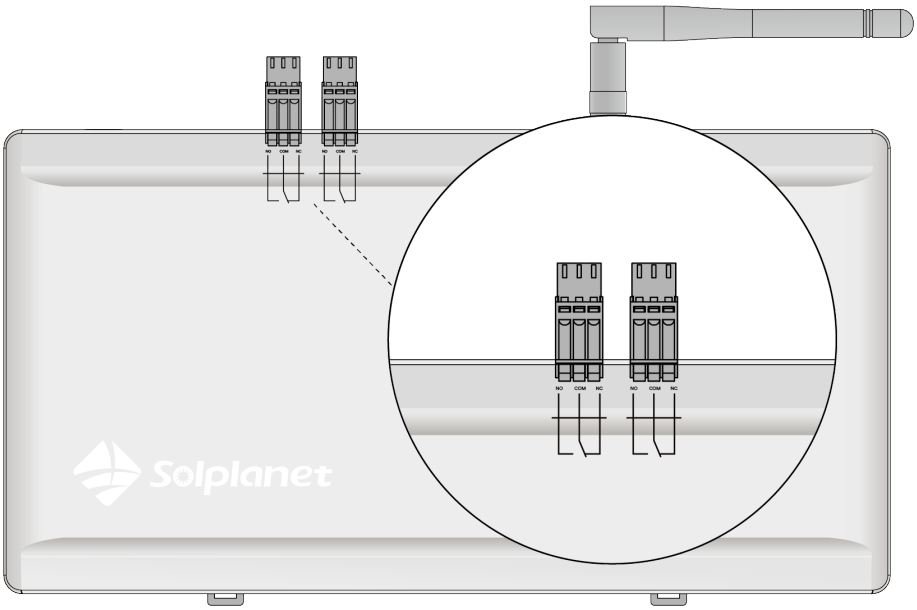
DANGER

Danger to life due to electric shock when the dry contact output interface is connected to a danger volatge !

When the dry contact output interface is connect to a danger voltage, the danger voltage will damage the product, and touch the live parts of the prodcut results in death or lethal injuries due to electric shock.

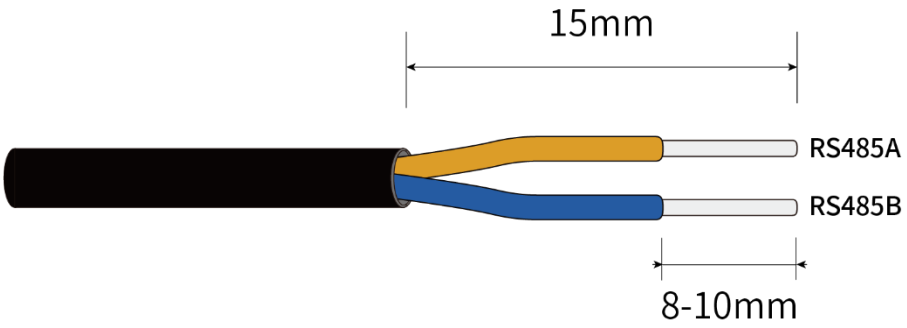
- Only connect the SELV circuit to the dry contact output interface.

Ai-logger 1000 is equipped with two dry contact output port. Those ports can be used to provide a control signal to the external device. Those ports can only be connected to a circuit that the voltage is lower than 24 Vdc and the current is lower than 2 Adc.

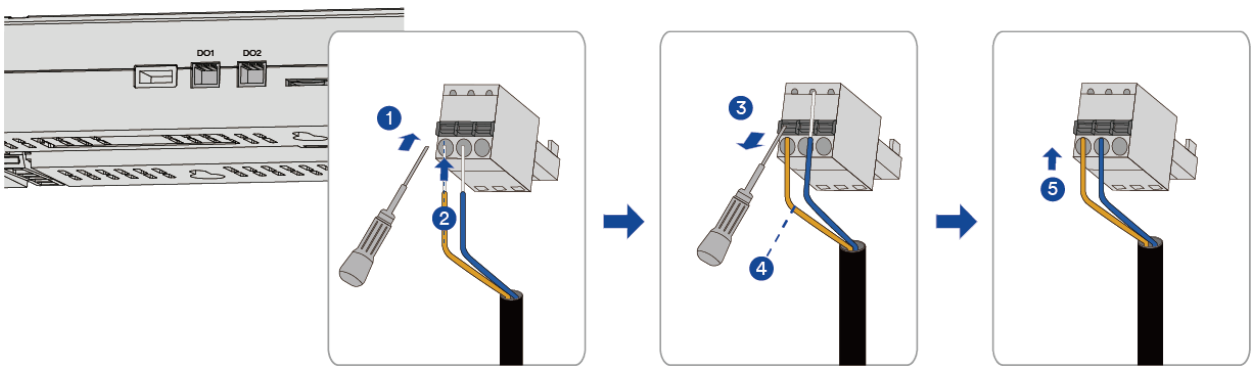


Procedure:

Step 1: Strip the cable jacket and insulation layer with a wire stripper by about 15mm and 8mm to 10mm respectively.



Step 2: Use a slotted screwdriver press the yellow button, and then insert the conductors into the hole, take out the screwdriver and then the conductor is locked.

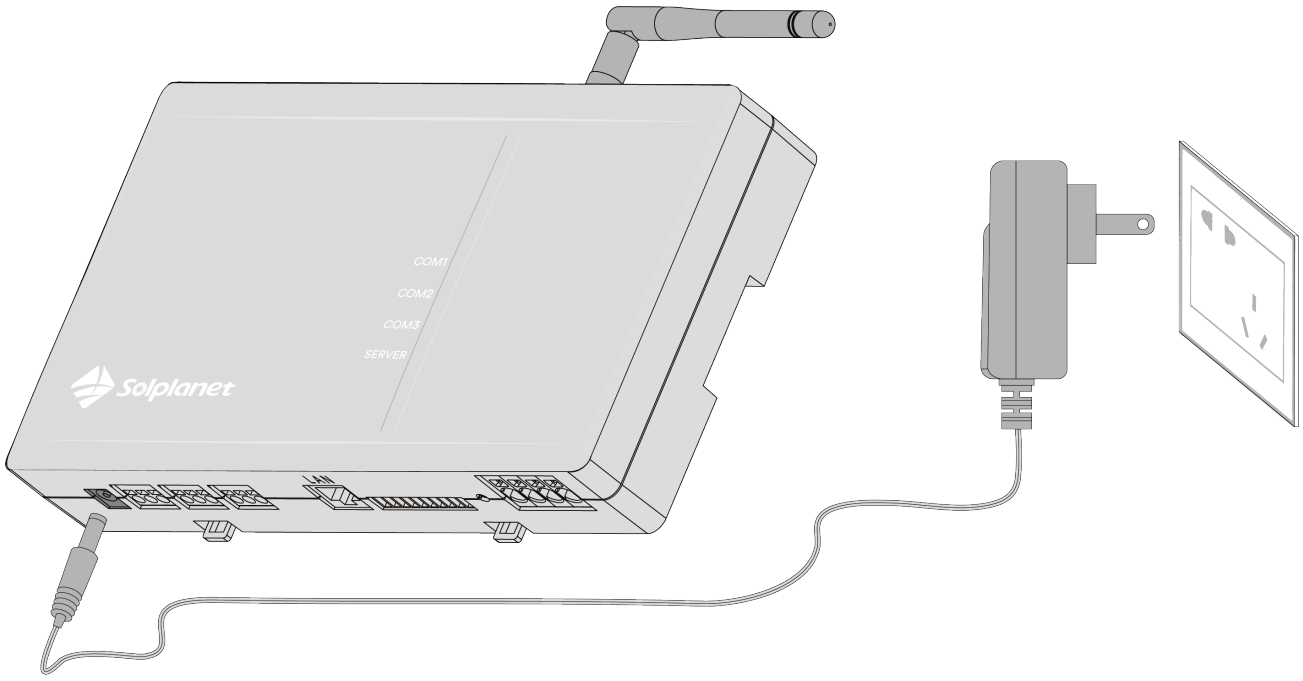


Step 3: Insert the terminal block into the digital signal output port.

6.6 Power supply connection

The recommended power-on sequence is: Inverter > Ai-Logger 1000 > Computer.

The power supply of the Ai-Logger 1000 is form the external power adapter. Plug the connector of the adapter to the soket, but don’t power on the adapter.



7 Commissioning

7.1 Inspection before commissioning

All cables are intact, well-insulated, and appropriately dimensioned.

All cables are connected correctly and securely.

The polarity or the line sequence of the cable is correct.

7.2 Commissioning procedure

Power on all inverters, Smart Meter and Weather Station.

Power on the power adapter, then the Ai-Logger 1000 will be turn on.

Log in to the embedded WEB of Ai-Logger 1000, set time and power plant parameters refer to 8.5.1 User parameters.

Set the address search range and baud rate of the RS485 communication port through the embedded WEB of Ai-Logger 1000. Please refer to 8.5.2.2 Set RS485 Parameters for details.

Wait for Ai-Logger 1000 to search for inverter devices, and then it will automatically connect to all inverter devices.

- If the MODBUS-RTU protocol Weather Station or Smart Meter is connected, the parameters need to be set manually through the embedded WEB of Ai-Logger 1000, please refer to 8.5.4.3 Device Management for details.
- If the Ripple Control Receiver is connected, the parameters need to be set manually through the embedded WEB of Ai-Logger 1000, please refer to 0 Active power schedule for details.
- If the Demand Response Enabling Device (DRED) is connected, the parameters need to be set manually through the embedded WEB of Ai-Logger 1000, please refer to 8.5.3.3 Set Demand Response Enabling Device (DRED) parameter for details.
- The addresses of all devices on each daisy chain must be within the address range set by Ai-Logger 1000, and there must be no duplication, otherwise the communication will be fail.
- If Ai-Logger detects a conflict between the RS485 addresses of the inverter, it will reassign a different address without the need of going to the inverter to modify it.
- All devices on each daisy chain must have baud rates set to 9600.

8 WEB interface

8.1 Operating Environment Requirements

Item	Description
Operating system	Windows 7 or later
Browser	Chrome 52 or later, Firefox 58 or later. IE browser is not recommended.
Minmum resolution	1024*768

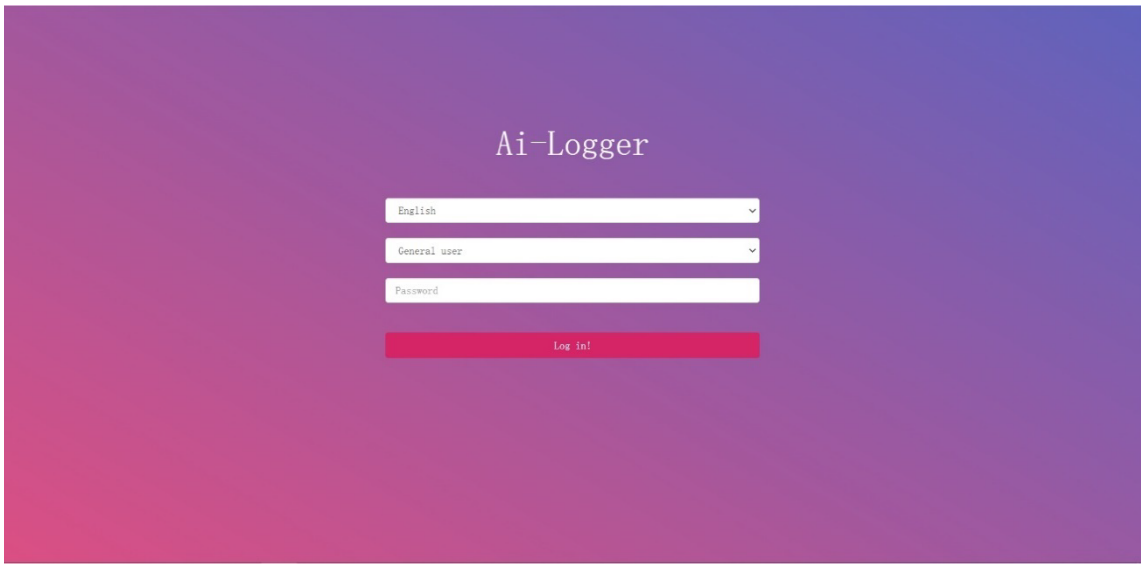
8.2 Log into the WEB

- If Ai-Logger 1000 is connected to a network device (such as a router), the IP address of the Ai-Logger 1000 is automatically assigned by the network device. Please query the IP address of the Ai-Logger 1000 through the network device. Both the IP address and the domain name cab be entered in the address bar of the browser in this case.
- If Ai-Logger 1000 is connected to a laptop through the Ai-logger's built-in WiFi hotspot, enter IP address http://192.168.10.1 to the address bar of the browser.
- The initial password is 12345. When powering on for the first time, please use the initial password. After logging in, you must change the initial password and log in again.
- Users of different types have different permissions. The general user can view basic information, real-time fault, and device monitoring information of the Ai-Logger 1000. The senior user has the permission to set and modify parameters of the Ai-Logger 1000 and devices connected to it.

Procedure:

Step 1: Enter http://XX.XX.XX.XX in the address bar of the browser (XX.XX.XX.XX is the IP address of Ai-Logger 1000) or http://ailogger-XXX.local（XXX is the last three digits of the serial number), and press " Enter " to enter the login interface.

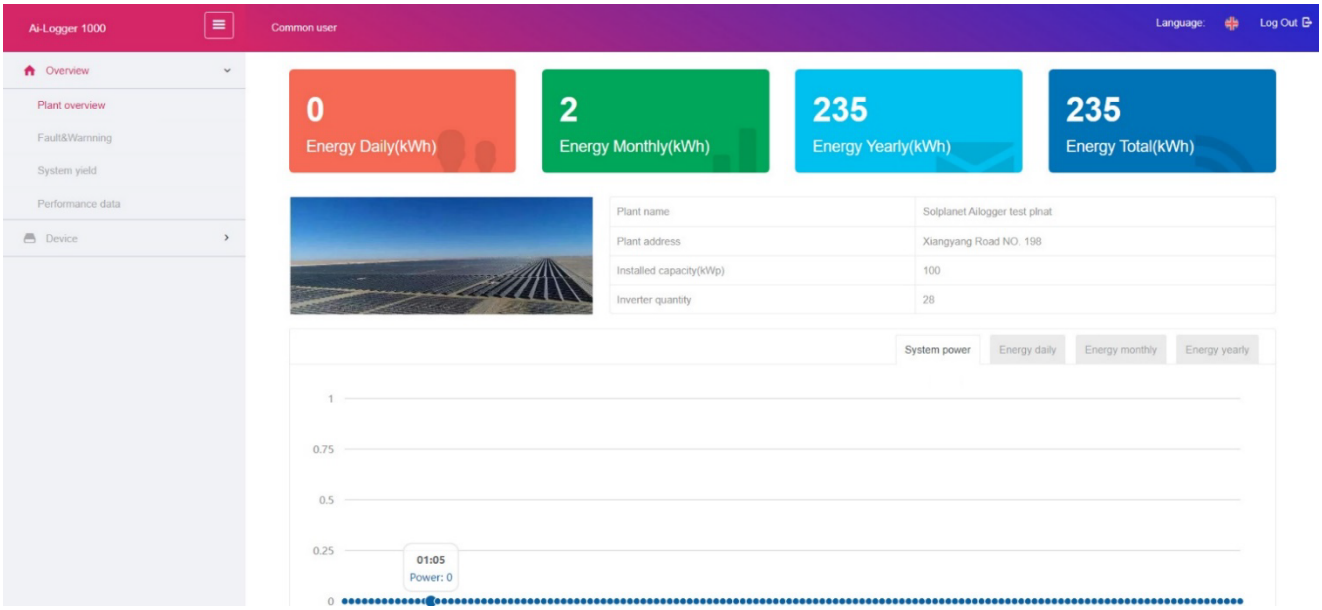
Step 2: Select “Language” and “Username”, enter “Password”, and click “Log in”.



After logging into the WEB interface, if the page is blank, or if you click any menu page without jumping, you can clear the cache, refresh the page or log in again to solve the problem.

It is recommended to update the password regularly and remember the changed password to keep your account safe. Long-term use of the password will increase the risk of theft and cracking. The device will need to be reset to factory setting if the password is lost, which may cause loss to the power plant, and the user shall be responsible for the resulting loss.

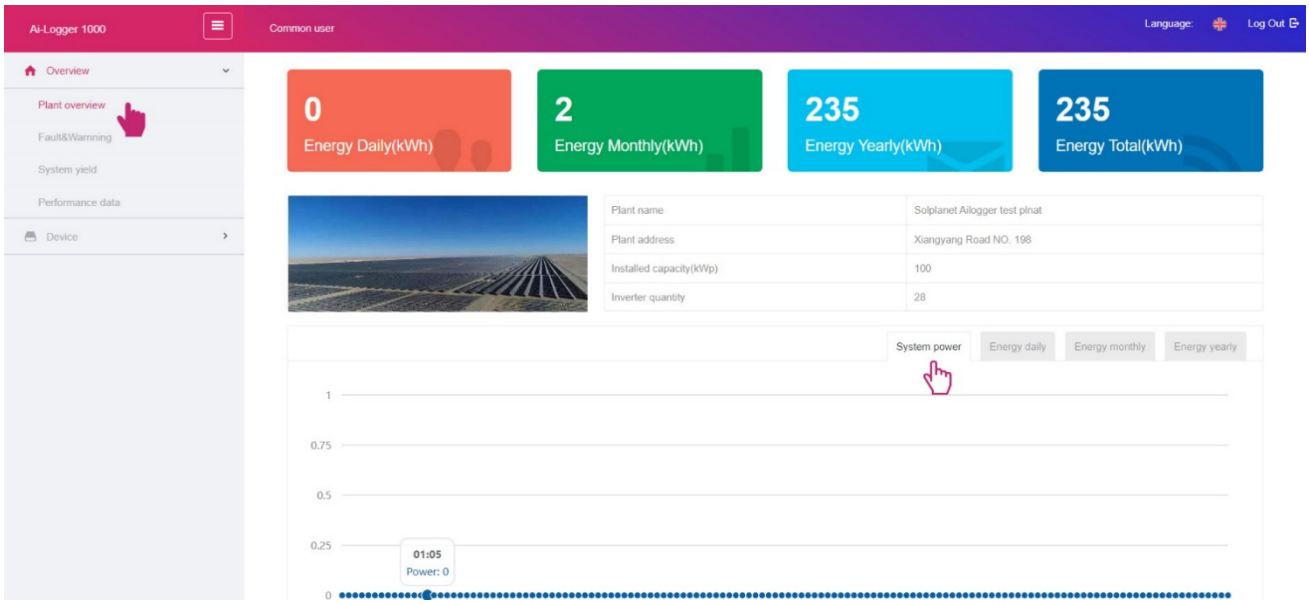
After login the web, the Web main interface is shown as follows:



8.3 Overview

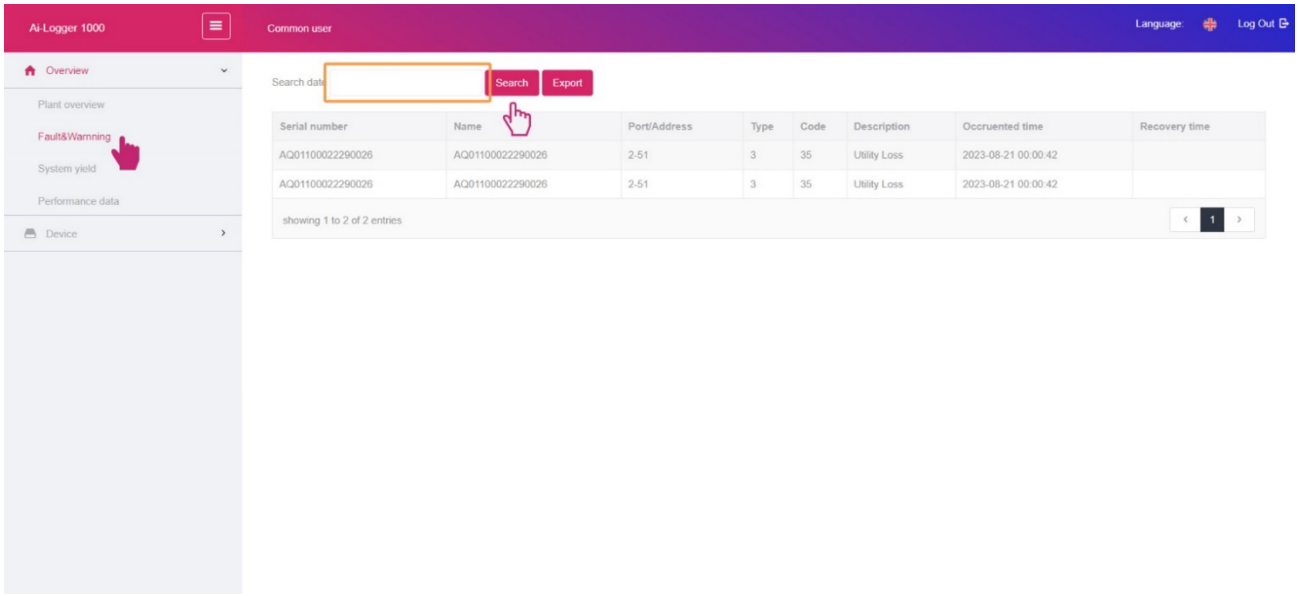
8.3.1 Plant operation information

Click “Overview > Plant Overview” to enter the overview information. And click “Systerm power”, “Energy daily”, “Energy monthly” and “Energy yearly” to find the more details.



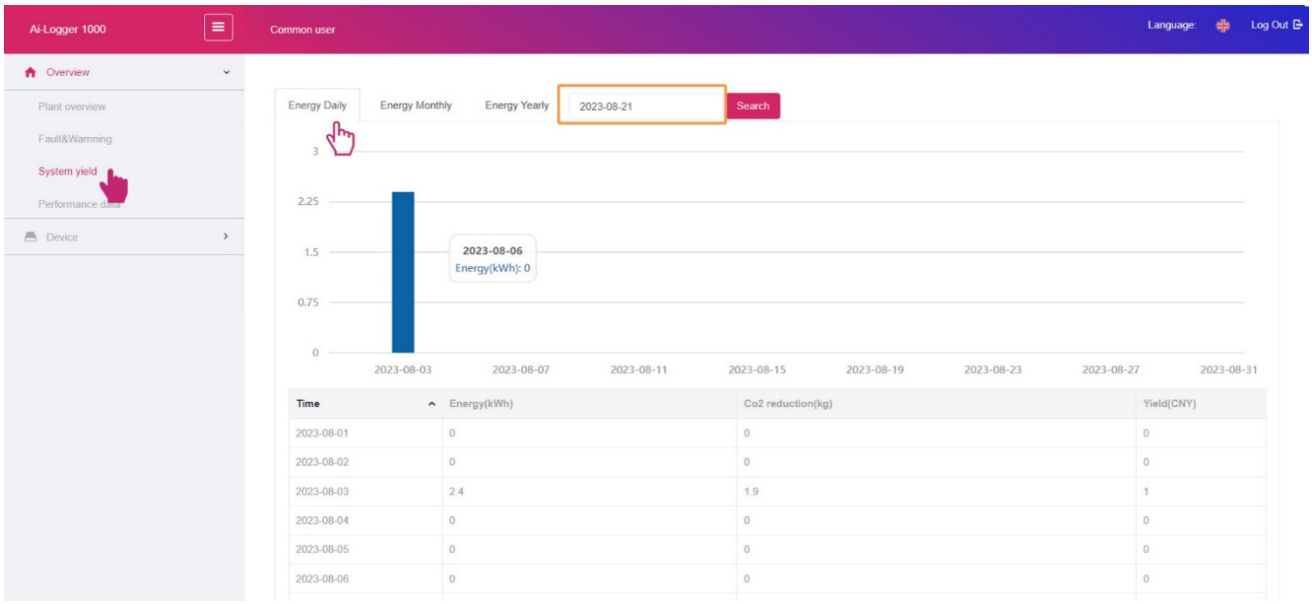
8.3.2 Fault warning

Click “Overview > Fault&Warning” to enter the fault information. The key words can be fill in to search the information.



8.3.3 System power generation

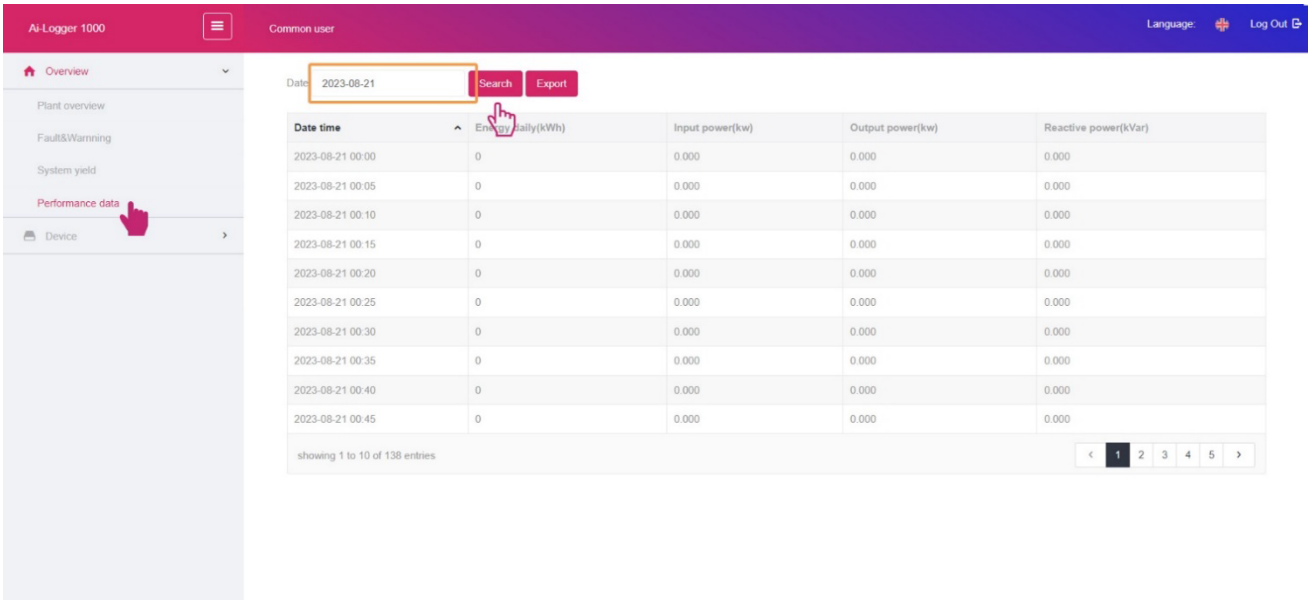
Click“Overview > System yield” to enter the power generation information. Click “Energy Daily”, “Energy Monthly” and “Energy Yearly” to find the the power generation for every day, every month and every year.



- According to the hourly storage (daily power generation), it can be stored for 30 days.
- According to the daily storage (monthly power generation), it can be stored for 1 year.
- According to the monthly storage (annual power generation), it can be stored for 10 years.

8.3.4 Performance data

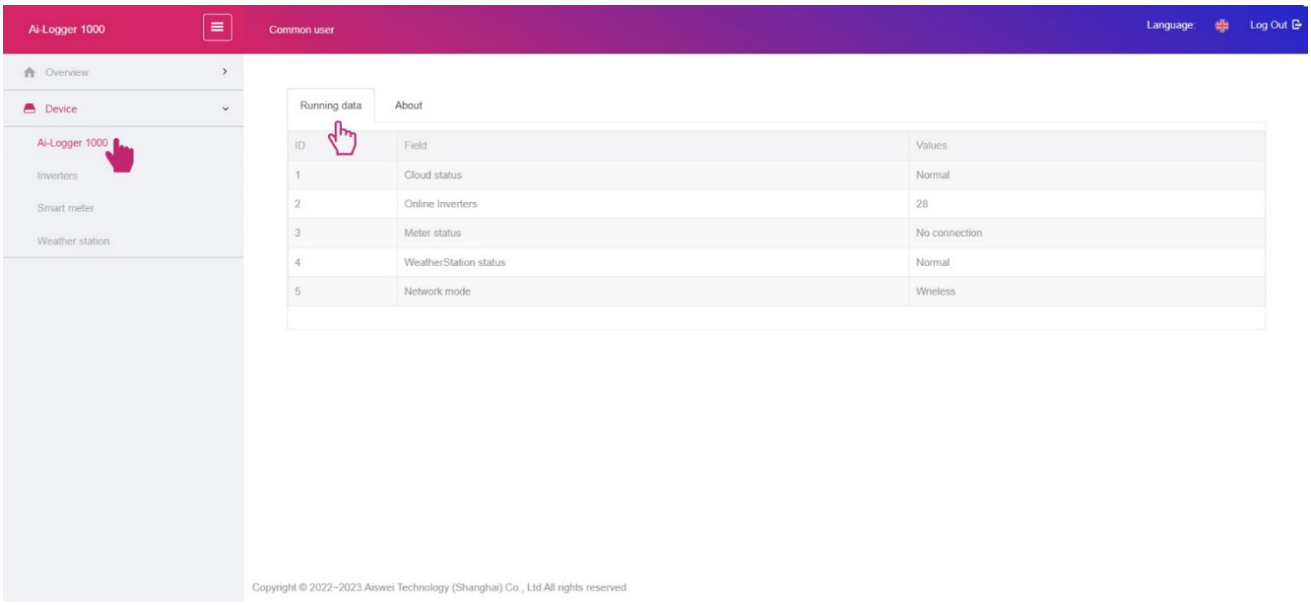
Click “Overview > Performance data” to enter the performance data information.



8.4 Device Monitoring

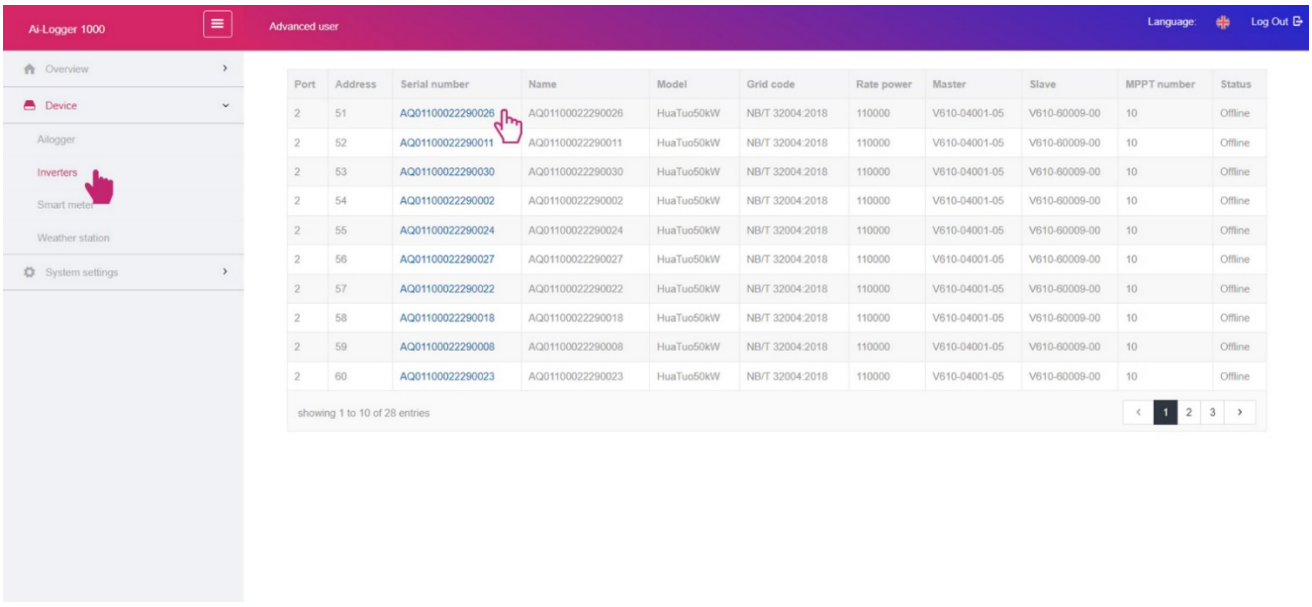
8.4.1 Ai-Logger

Click “Device > Ai-Logger” to enter the related information of Ai-Logger 1000.

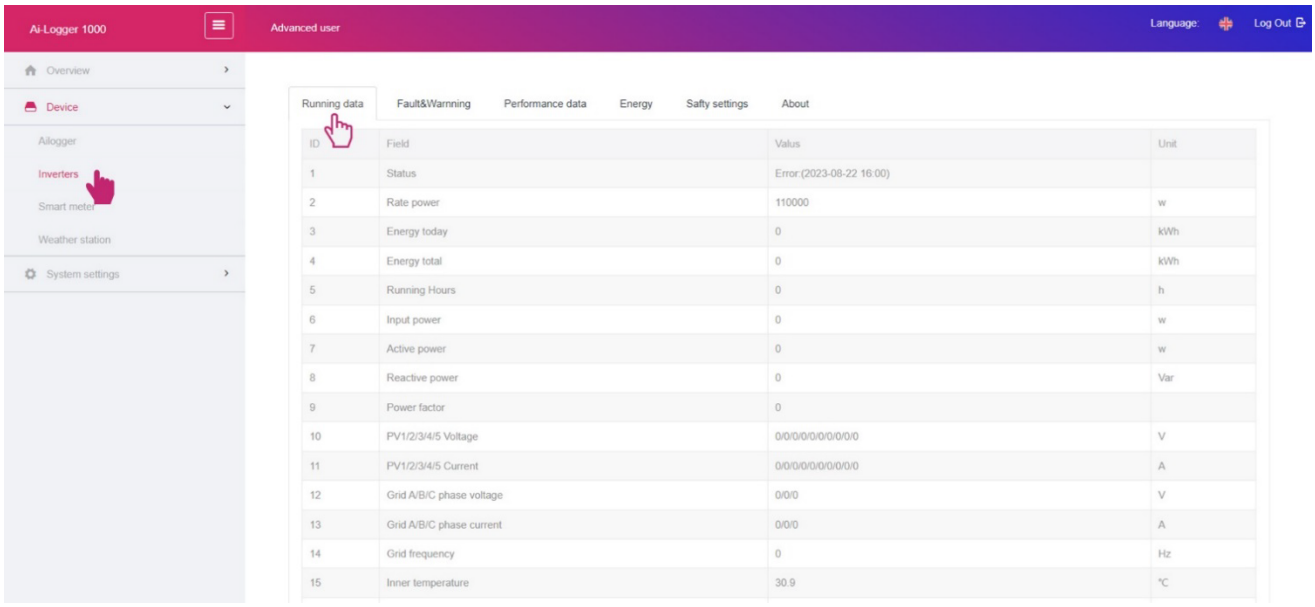


8.4.2 Inverter

Click “Device > Inverter” to enter the inverter list.



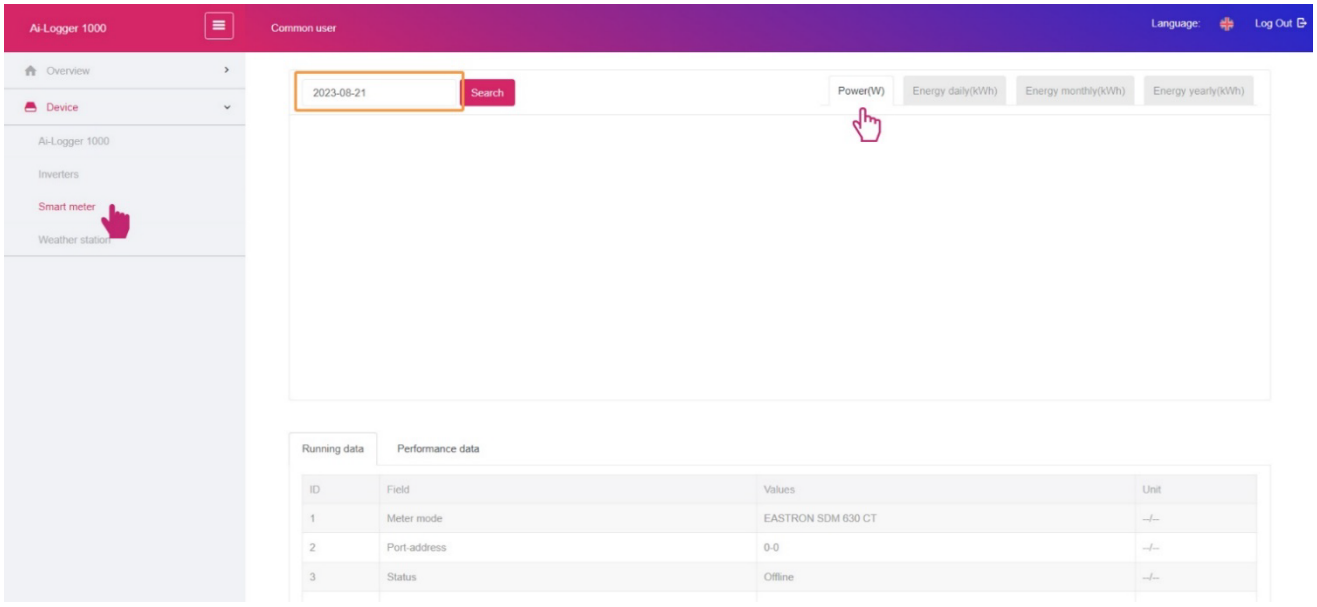
Click the series number in the list to enter the more details information of one of the inverters. Click “Running data”, “Fault&Warning”, “Performance data”, “Energy”, “Safety settings” or “About” to find the detail information for this inverter.



- The “Safety settings” only be shown when you login as the senior user.

8.4.3 Smart Meter

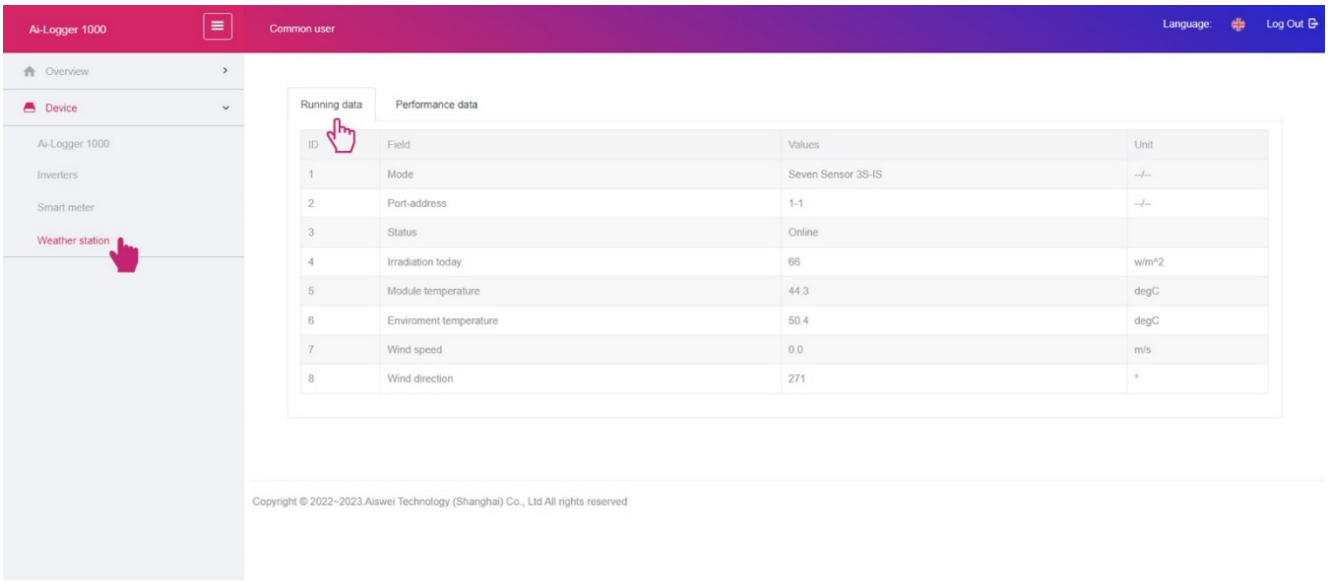
Click “Device > Smart Meter” to enter the related information of Smart Meter. Click “Power(W)”, “Energy Daily(KWh)”, “Energy Monthly(KWh)” and “Energy Yearly(KWh)” to find the the power generation information for this smart meter.



Since different vendors have different protocol points, the parameters must be properly configured on the WEB of Ai-Logger 1000 according to the protocol points provided by the vender in order to get smart meter information properly. The parameters need to be set manually through the embedded WEB of Ai-Logger 1000, please refer to 8.5.4.3 Device Management.

8.4.4 Weather station

Click “Device > Weather Station” to enter the related information of Weather Station.



Since different vendors have different protocol points, the parameters must be properly configured on the WEB of Ai-Logger 1000 according to the protocol points provided by the vender in order to get Weather Station information properly. The parameters need to be set manually through the embedded WEB of Ai-Logger 1000, please refer to 8.5.4.3 Device Management.

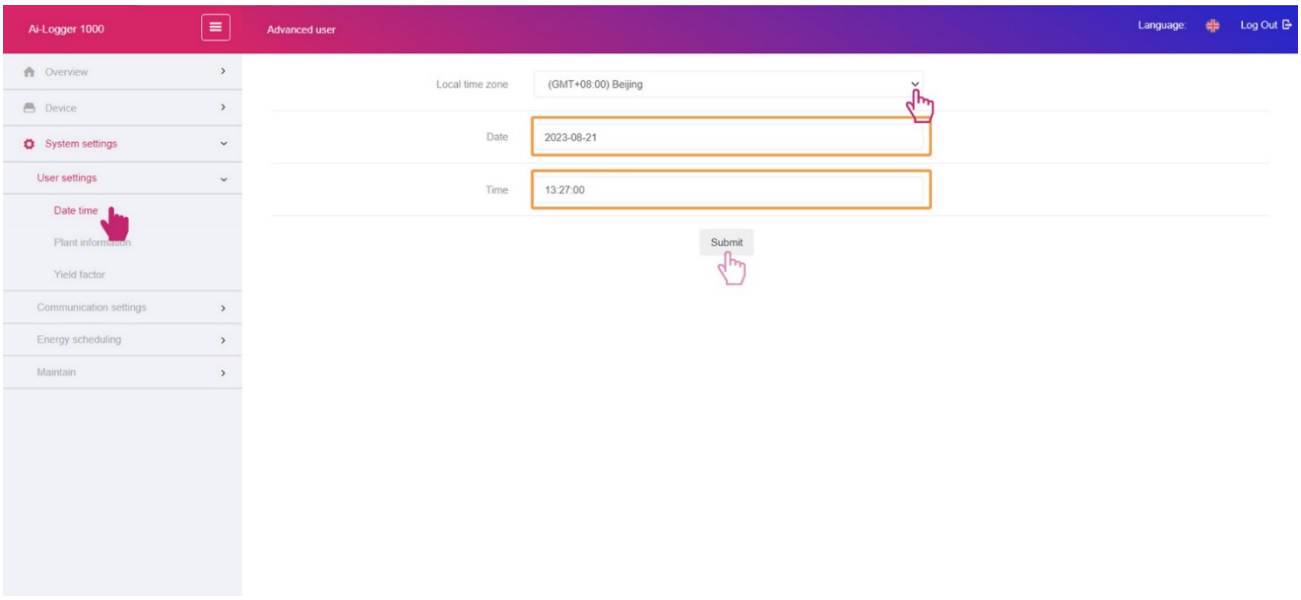
8.5 System settings

The “System setting” only be shown when you login as the senior user. All the parameter only be set by the senior user.

8.5.1 User Parameters

8.5.1.1 Set date and time

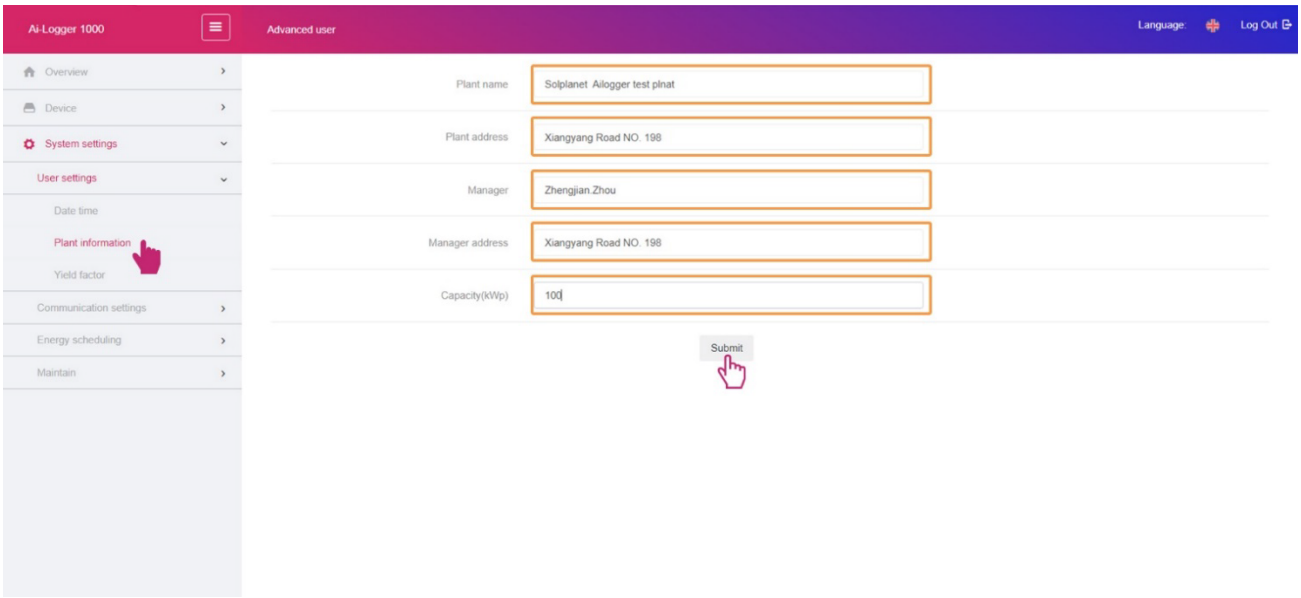
Click “System settings > User settings > Date time” to set the time of the plant. Click “Local time zone” to choose the time zone according to the local place, and then fill in the right date and time information, and then click “Submit” to finish setting.



- There is no “Daylight Saving Time Enable” option in regions that do not involve daylight saving time.
- All inverters connected to the Ai-Logger 1000 will be modified to this time synchronously after the "Date and Time" is set, please make sure the setting is accurate.
- Modifying the “date and time” will affect the integrity of the system's power generation and performance data records. Please do not arbitrarily change the time zone and system time.
- If Ai-Logger 1000 is connected to the Internet, it will automatically synchronize with the cloud server. So there is no need to set the “Date and Time".

8.5.1.2 Set plant information

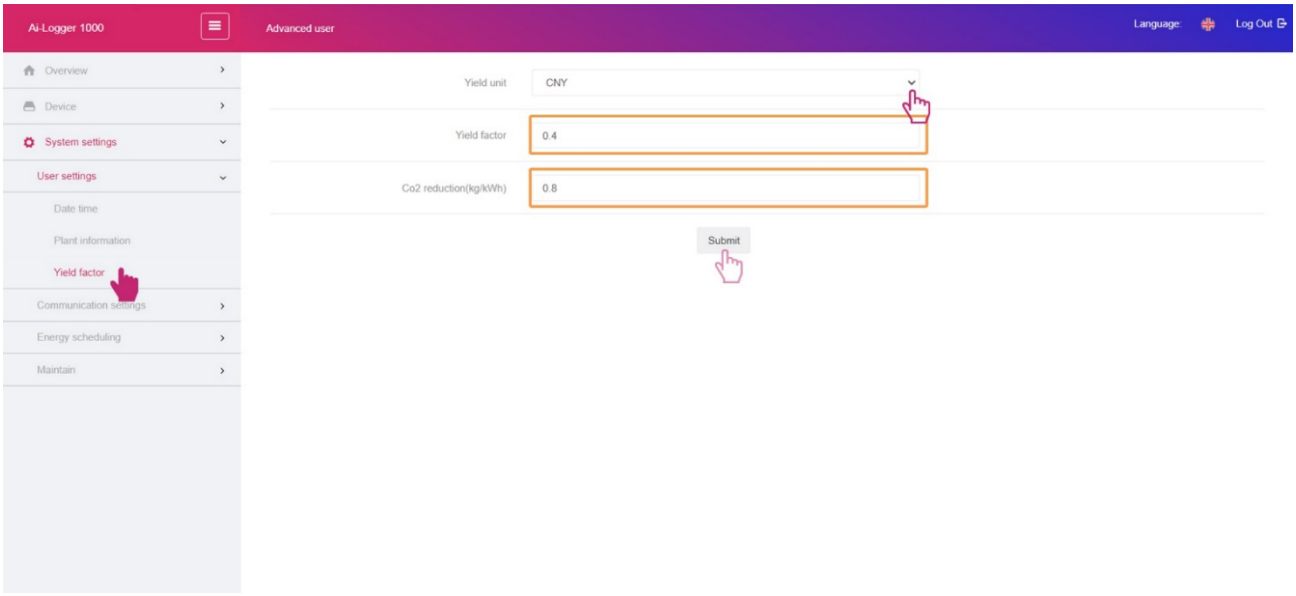
Click “System settings > User settings > Plant information” to set the general information of the plant. Fill in the right information, and then click “Submit” to finish setting.



- All information can only be composed of capital letters, small letters, numerals and dots.

8.5.1.3 Set Yield Parameters

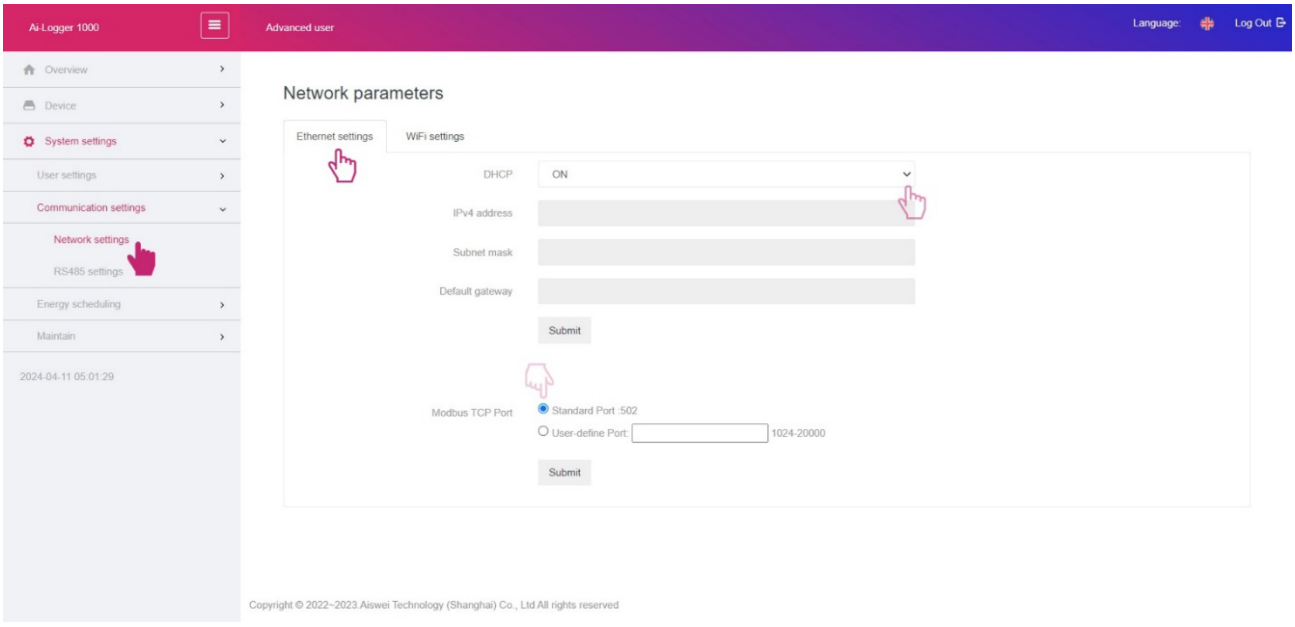
Click “System settings > User settings > Yield factor” to set the yield factor of the plant. Click “Yield unit” to choose your local currency. Then fill in the yield factor as the revenue per kilowatt-hour and the CO2 reduction factor, and then click “Submit” to finish setting.



8.5.2 Communication parameters

8.5.2.1 Set network parameter

Click “System settings > Communication settings > Network settings” to set IP address of the Ai-Logger 1000.



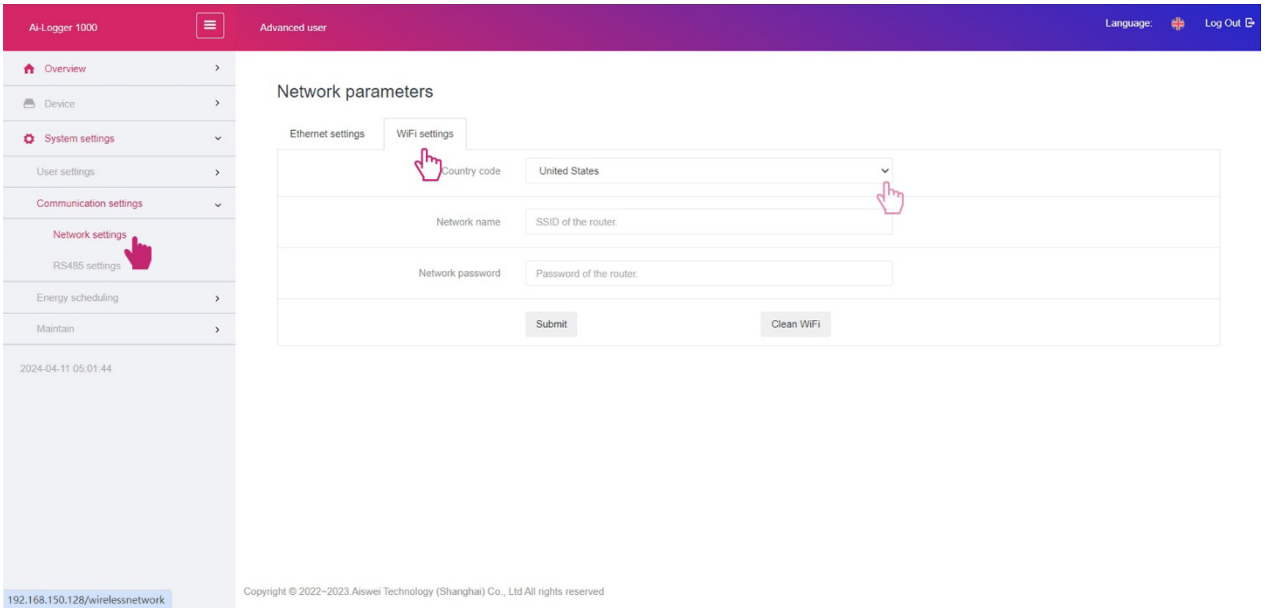
If the Ai-Logger 1000 is connected to Internet through a router, attention to the follow information:

- The IP address of the Ai-Logger 1000 must be in the same network segment as the gateway.
- The gateway address is set same as the IP address of the router.
- The DNS address is usually set to the IP address of the router, or obtained from the network provider.

The Ai-Logger can support ModBus TCP/IP protocol. The port can be set by the user at “User-define Port”, the standard port is 502 (default value).

8.5.2.2 Set WiFi parameter

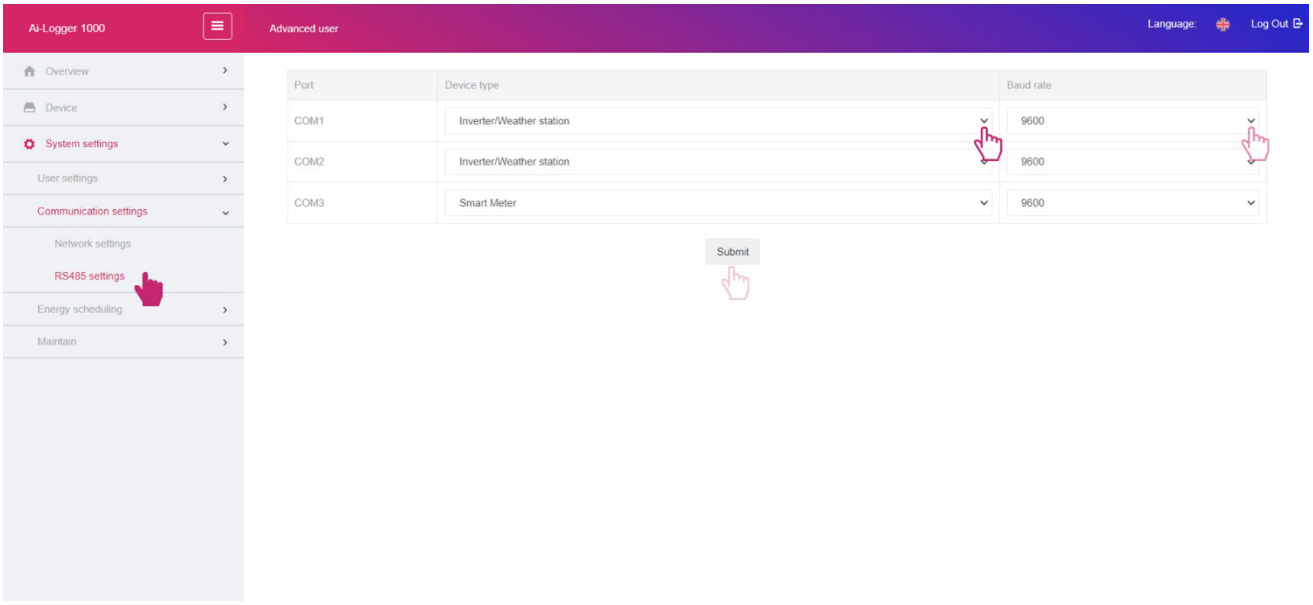
Click “System settings > Communication settings > WiFi settings” to set WiFi ssid and password of the Ai-Logger 1000. Choose the country, set the WiFi ssid and password, then the Ai-Logger 1000 can connect to the WiFi network.



If the user want to clear the information for WLAN, click the “Clean WiFi” button to forget this WiFi.

8.5.2.3 Set RS485 parameter

Click “System settings > Communication settings > RS485 settings” to set the RS485 ports of the Ai-Logger 1000. Click the drop-down menu for the device type to choose the device that will be connected to this port. Click the drop-down menu for the baud rate to choose the baud rate. And then click “Submit” to finish setting.



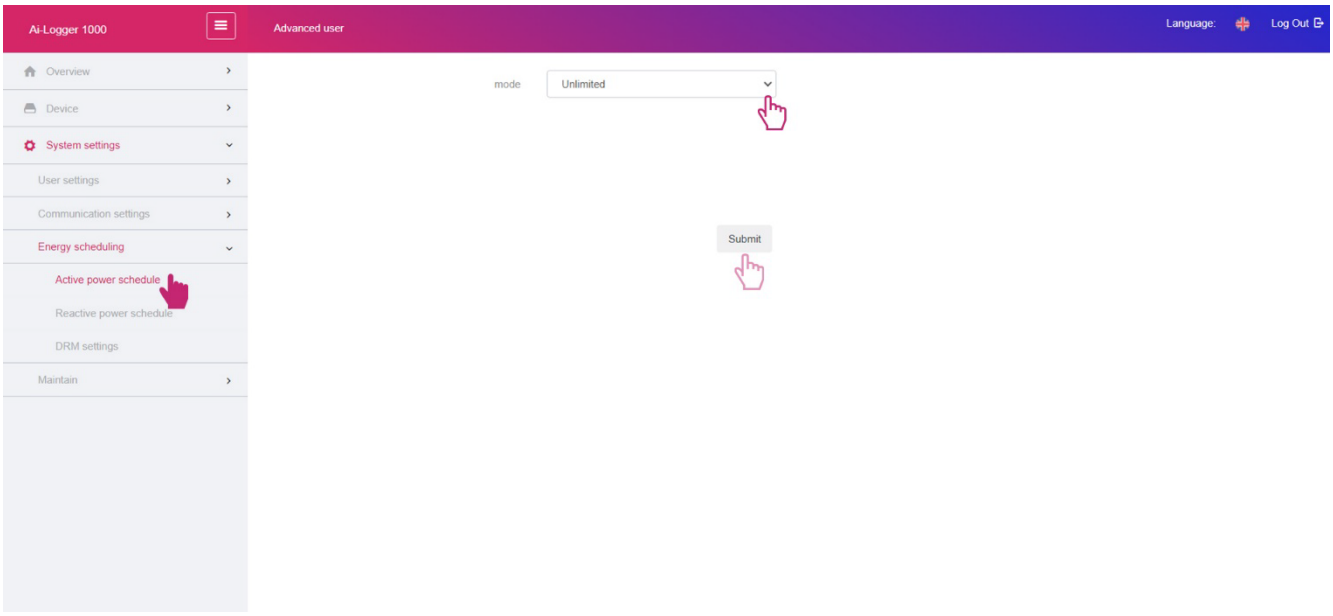
- COM1, COM2 and COM3 correspond to three seperate RS485 interfaces. The baud rates of devices connected to the same RS485 interface must be same.
- Only the device that is approved by Solplanet can be connected to the RS485 interface.

8.5.3 Energy scheduling

If the active power or reactive power of the plant need be limited according to the grid company requirement, the active power control function and the reactive power control function of the inverter shall be enabled firstly.

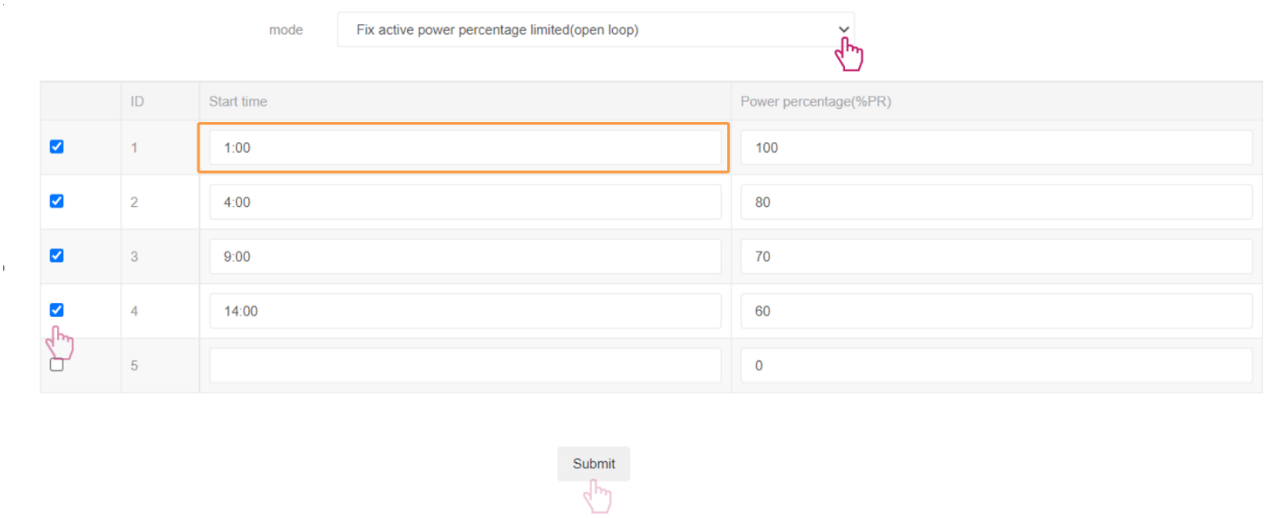
8.5.3.1 Active power schedule

Click “System settings > Energy scheduling > Active power schedule” to set the active control method. Click the drop-down menu for mode to choose the different method.



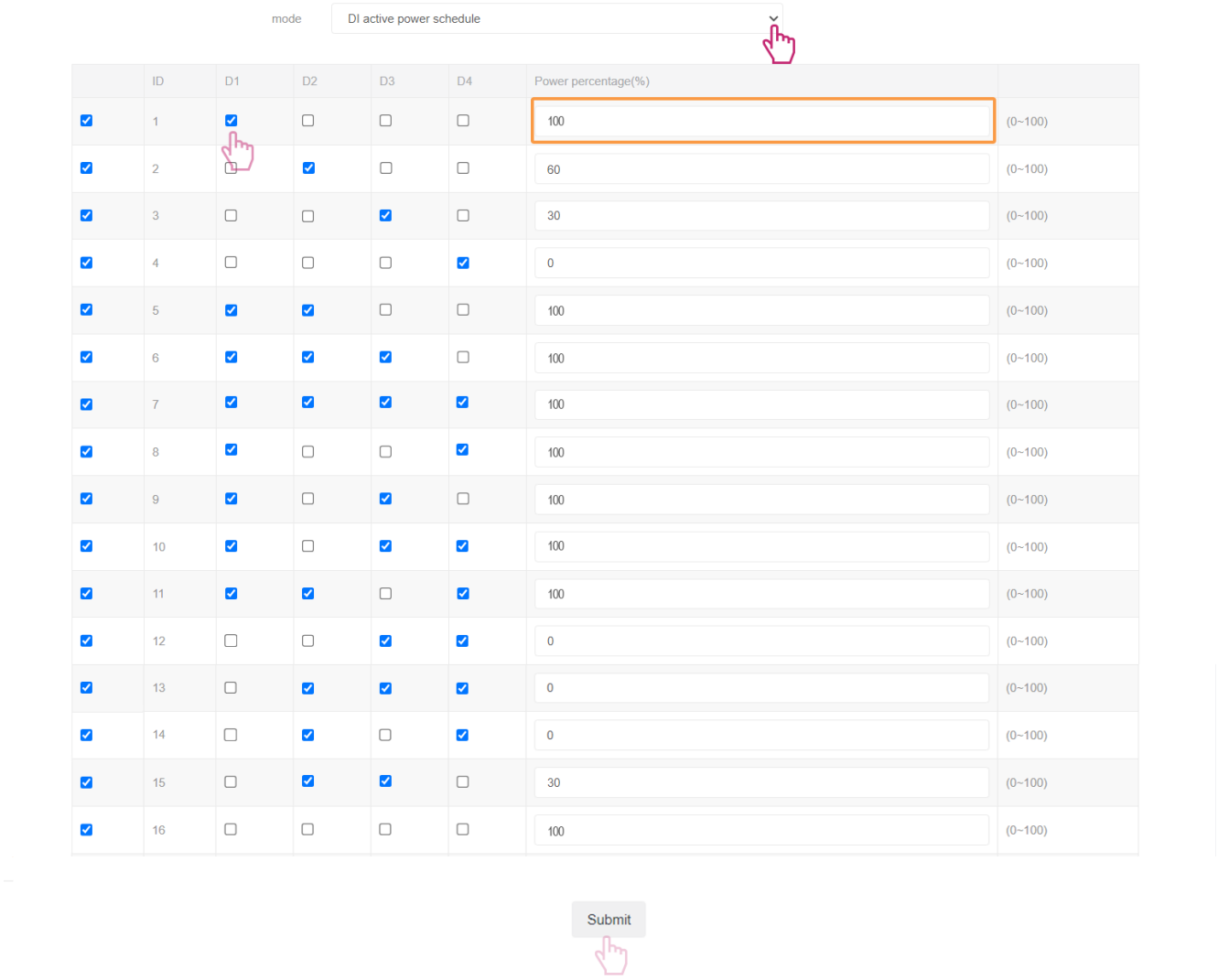
- **Fix active power percentage limited (open loop)**

Ai-Logger 1000 provides a simple active power limited method according to the grid company plan. The time period and the power generation as the percent of the plant rated power can be set here. And then click “Submit” to finish setting. The active power will be limited automatically according to different time periods of the day.



- **Ripple Control Receiver**

When a Ripple Control Receiver is connected to the digital signal input port, the parameter should be set here. And then click “Submit” to finish setting.

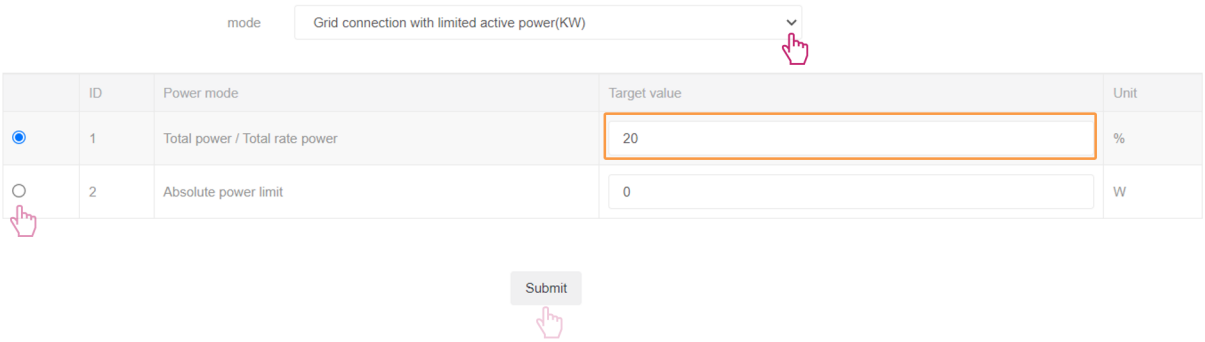


- **Export active power limit**

The export active power control solution measures the active power at the point where the customer's installation is connected to the distribution system (point of grid connection) and then uses this information to control the inverter's output active power in order to prevent the export active power to the distribution system from exceeding the agreed export capacity.

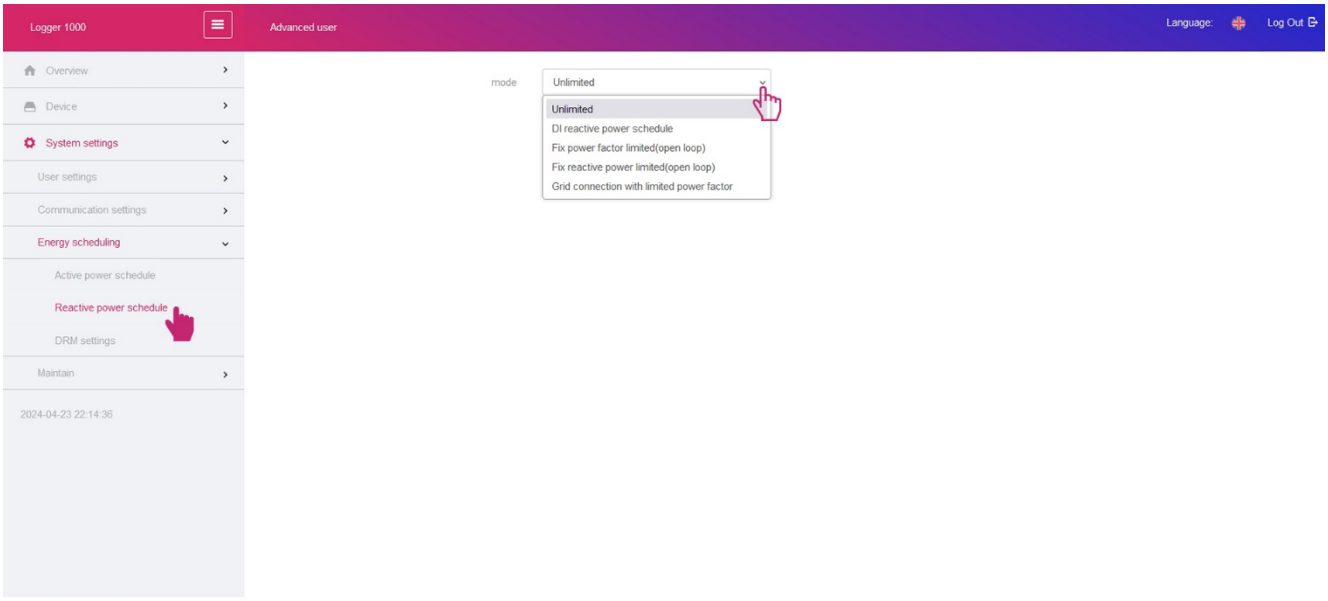
When the smart meter is connected to one of the RS485 interfaces, the export active power parameter should be set here. And then click "Submit" to finish setting.

The limited value can be chosen as the percent of the rated power of the plant or the absolute active power.



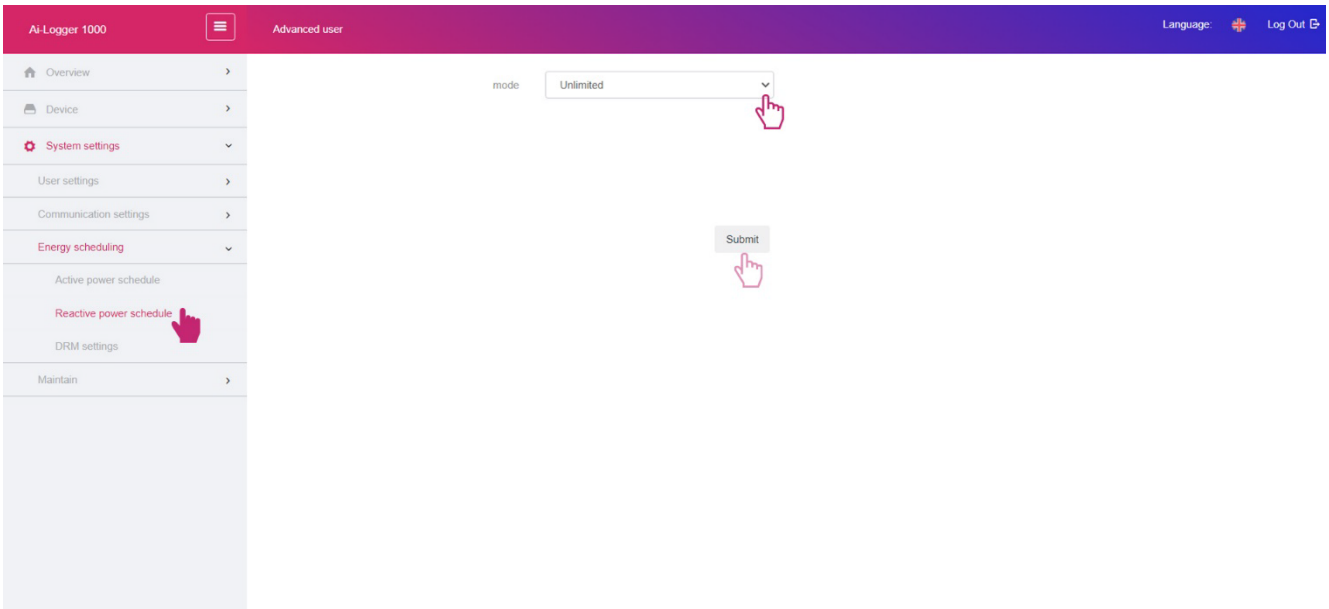
8.5.3.2 Reactive power schedule

Click “System settings > Energy scheduling > Reactive power schedule” to set the reactive control method. Click the drop-down menu for mode to choose the different method.



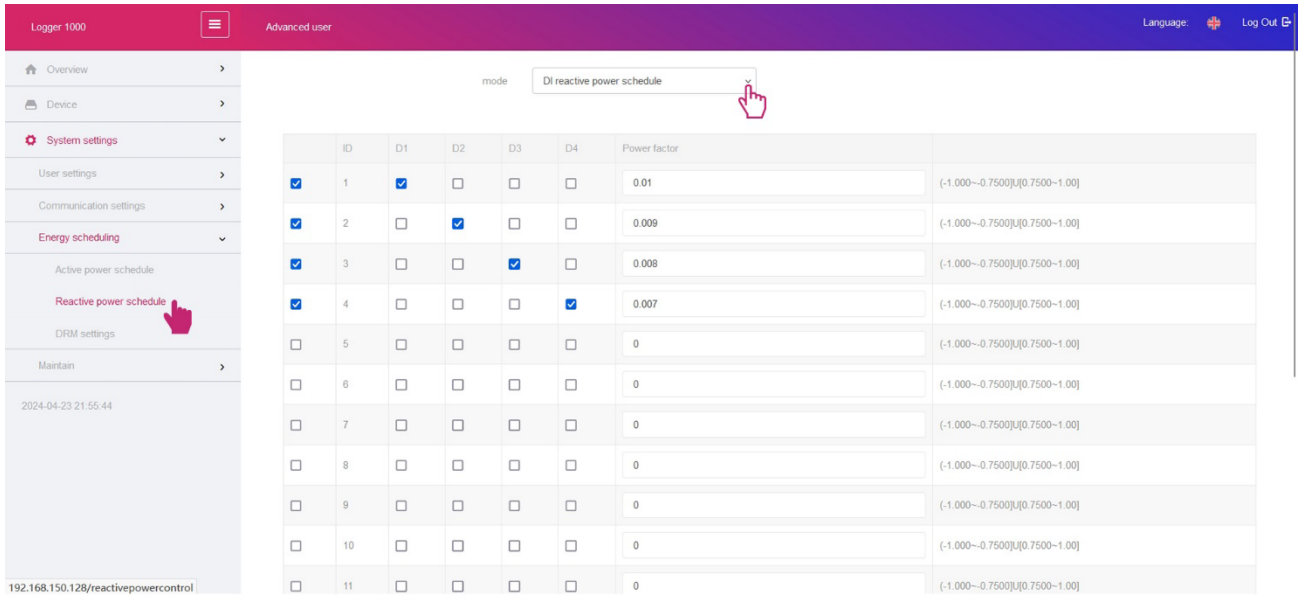
- **Unlimited**

There is not any requirement for the reactive power. The “Unlimited” can be chosen.



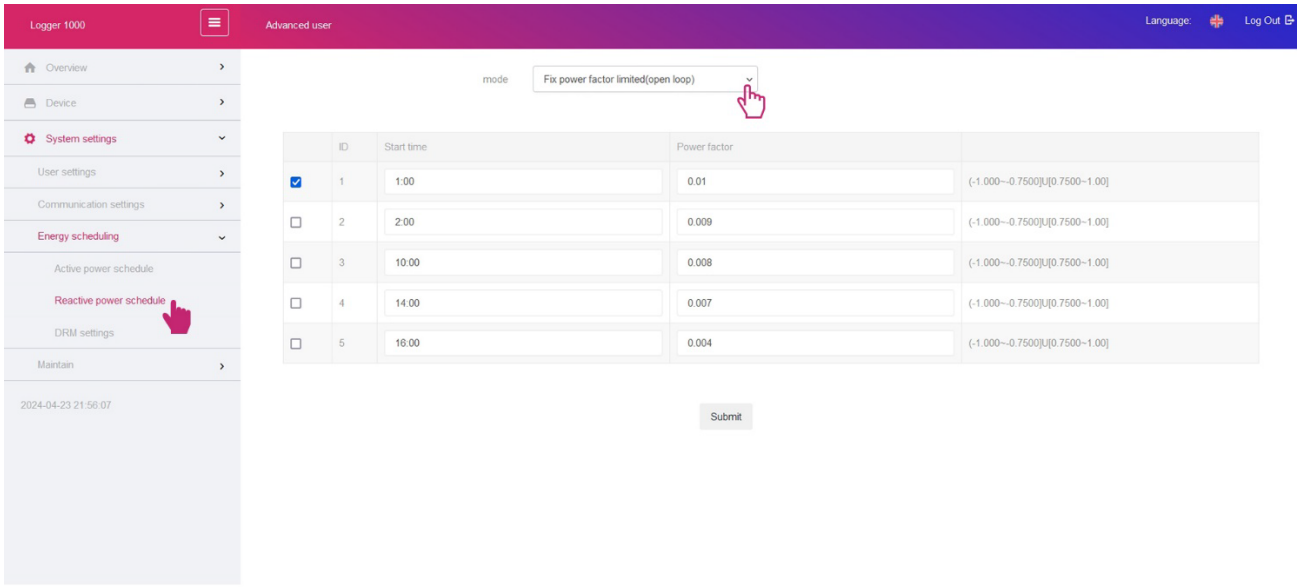
- **Digital signal input for reactive power control**

When a external device is connected to the digital signal input port for the reactive power control, the parameter should be set here. And then click “Submit” to finish setting.



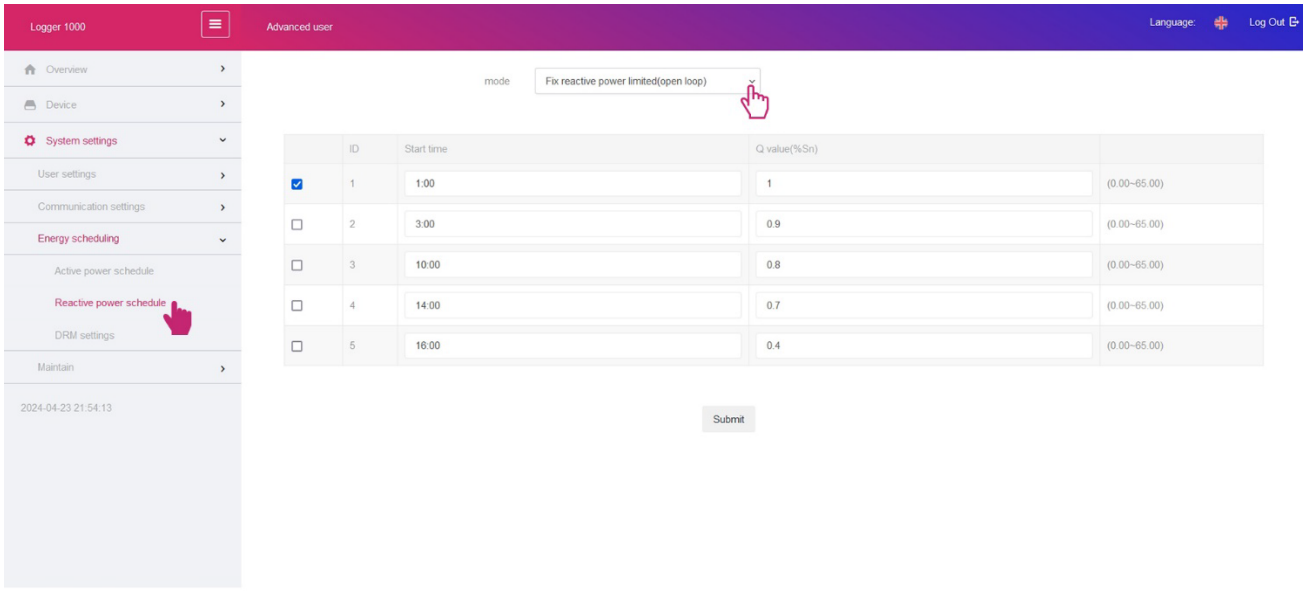
- **Fix power factor configure**

The fix power factor can be configured based on time plan.



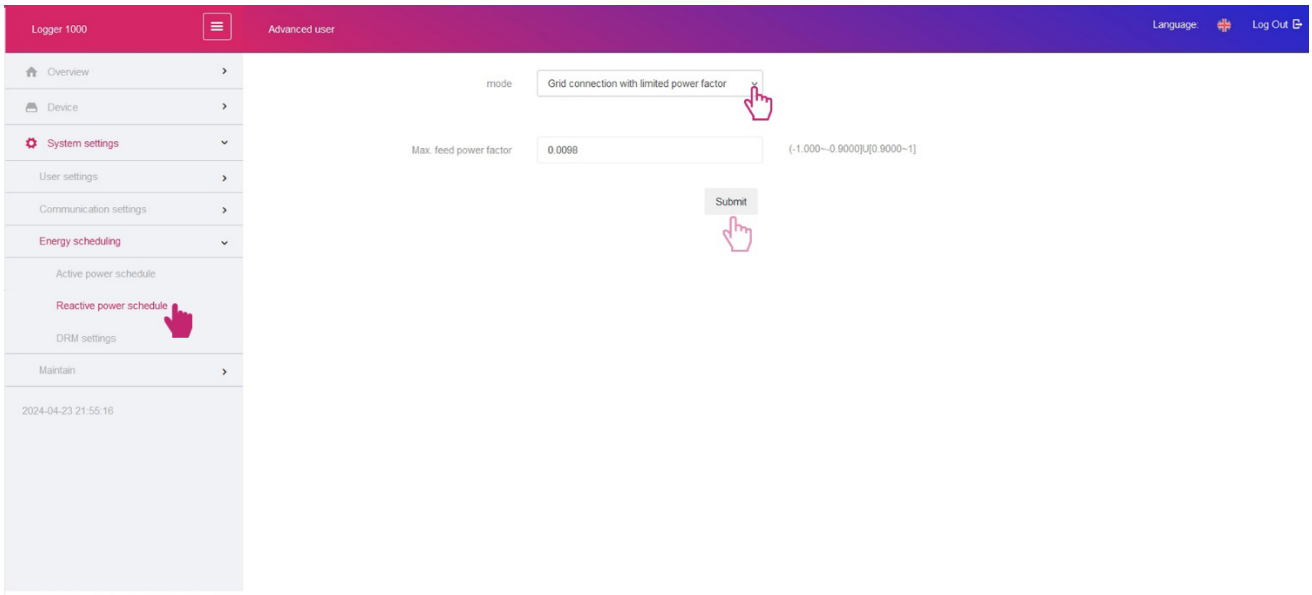
- **Fix reactive power configure**

The fix reactive power can be configured based on time plan.



- **The constant power factor**

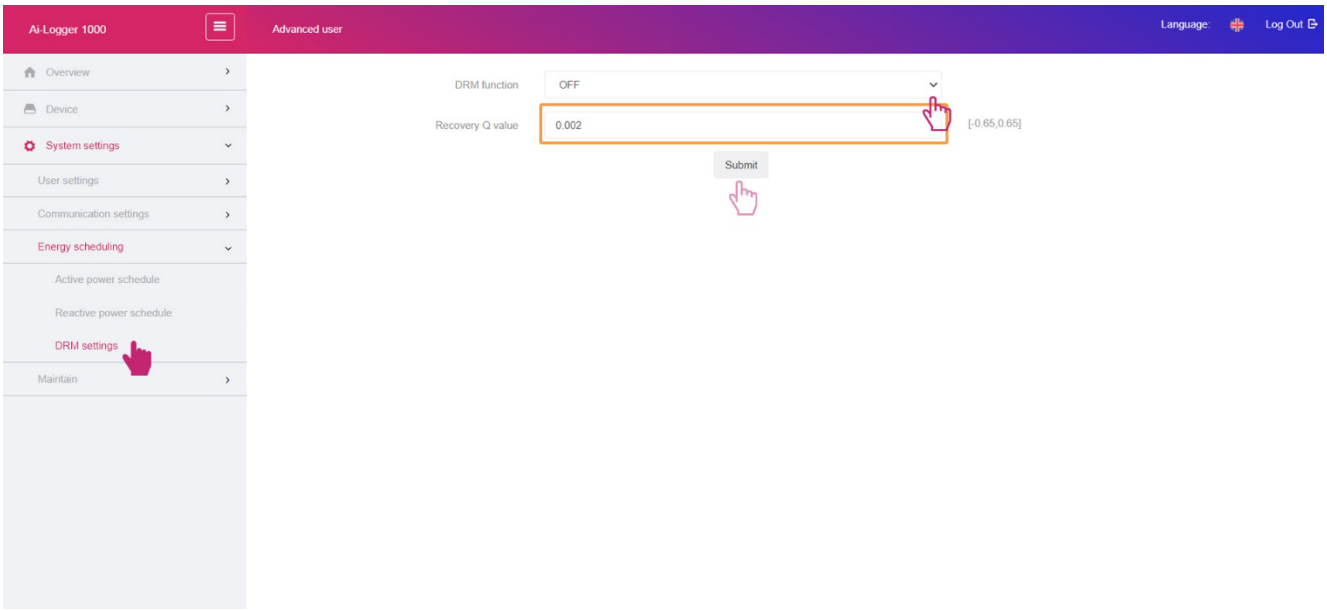
The constant power factor can be set here.



8.5.3.3 Set Demand Response Enabling Device (DRED) parameter

Click “System settings > Energy scheduling > DRMs settings” to set the parameter for DRED.

When the Demand Response Enabling Device (DRED) is connected to the digital signal input port, the DRM function should be chosen to “ON” and fill in the maxmum reactive power. And then click “Submit” to finish setting.



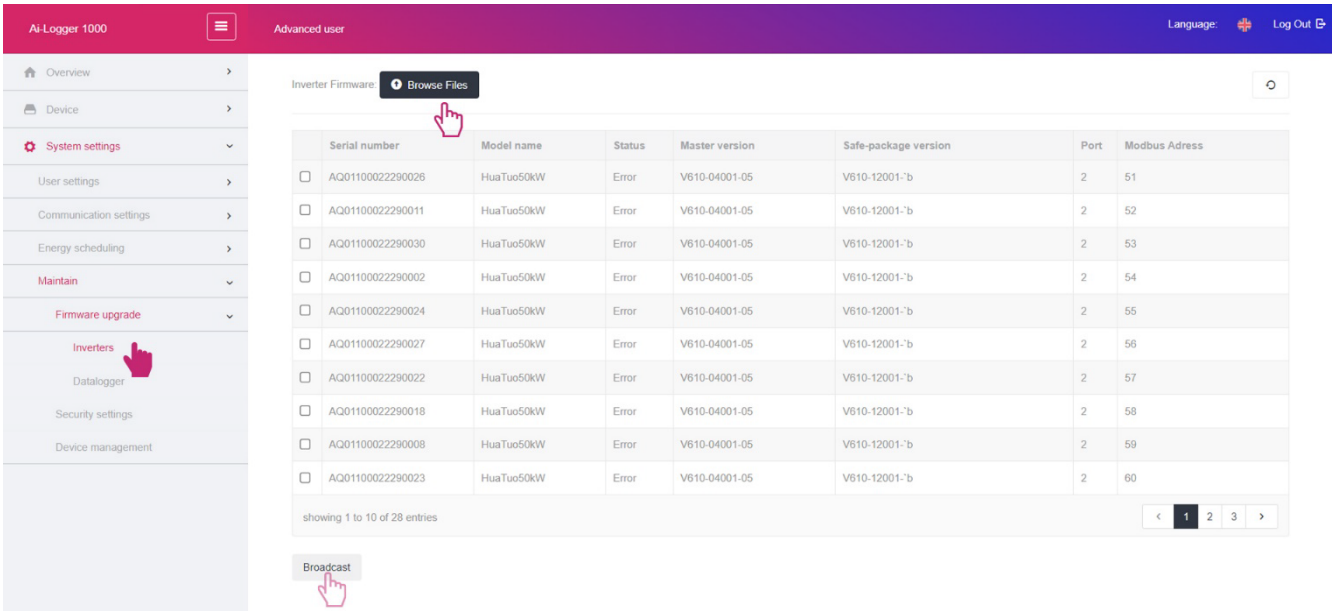
8.5.4 Maintenance

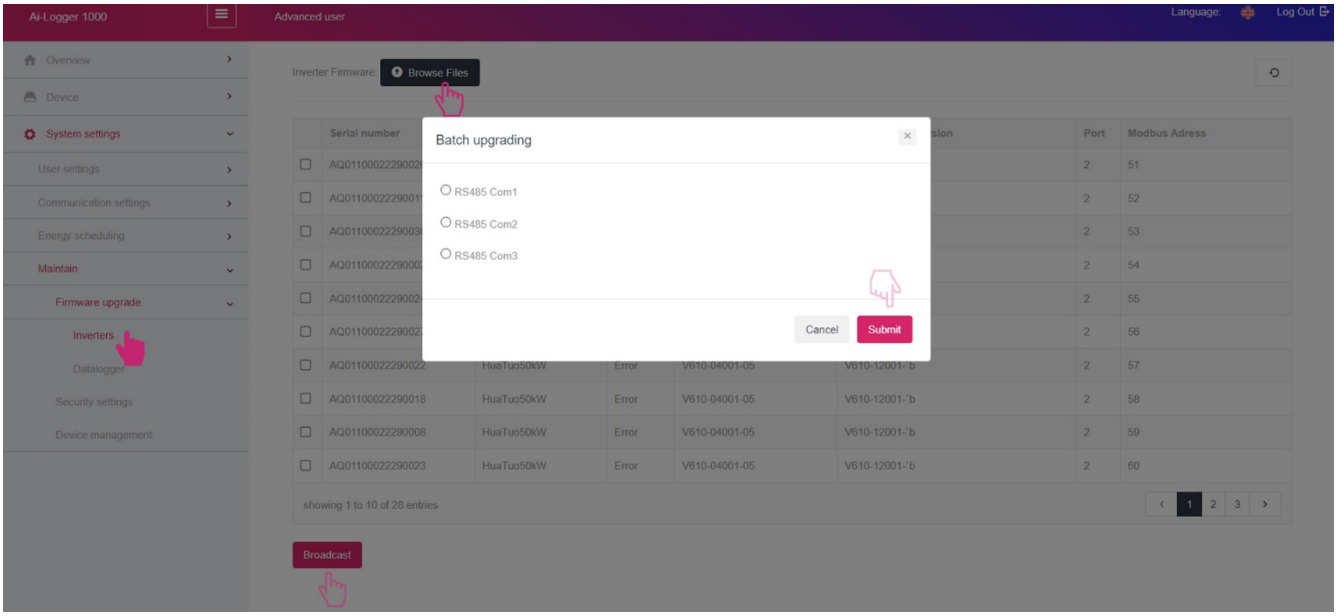
8.5.4.1 Firmware upgrade

- **Inverter firmware upgrade**

Click “Maintain > Firmware upgrade > Inverters” to update the firmware of the inverters that are connected to the Ai-Logger 1000.

Click “Browse Files” to upload the firmware document, and then click “Broadcast” to choose the RS485 port, and then click “Submit” to start update the firmware of the inverters.

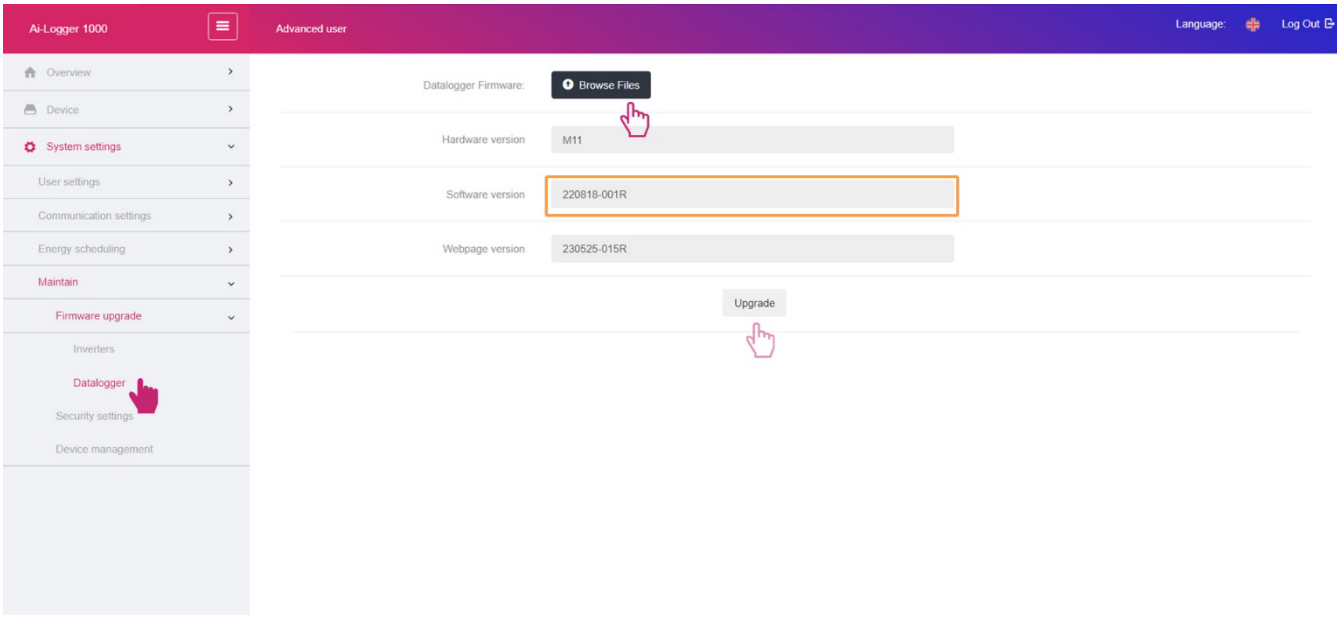




- **Ai-Logger 1000 firmware upgrade**

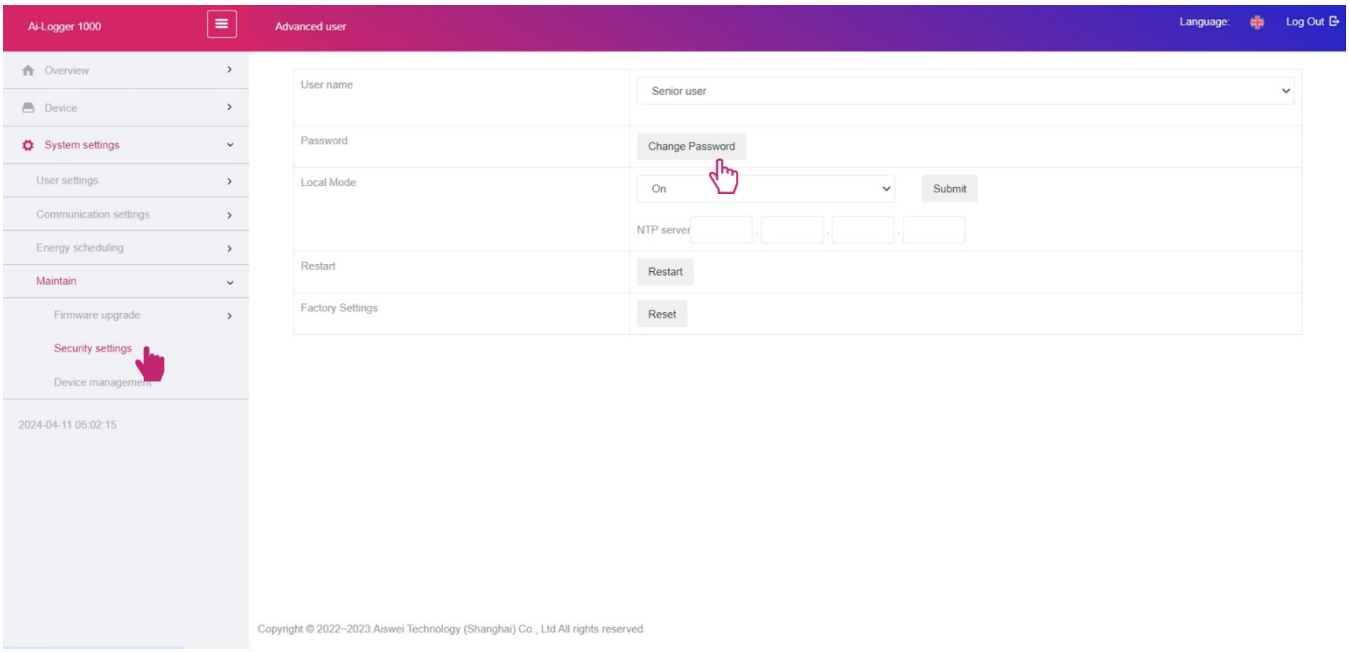
Click “Maintain > Firmware upgrade > Datalogger” to update the firmware of the Ai-Logger 1000.

Click “Browse Files” to upload the firmware document, and then click “Upgrade” to start update the firmware of the Ai-Logger 1000.



8.5.4.2 Security Settings

Click “Maintain > Security settings” to change the login password.



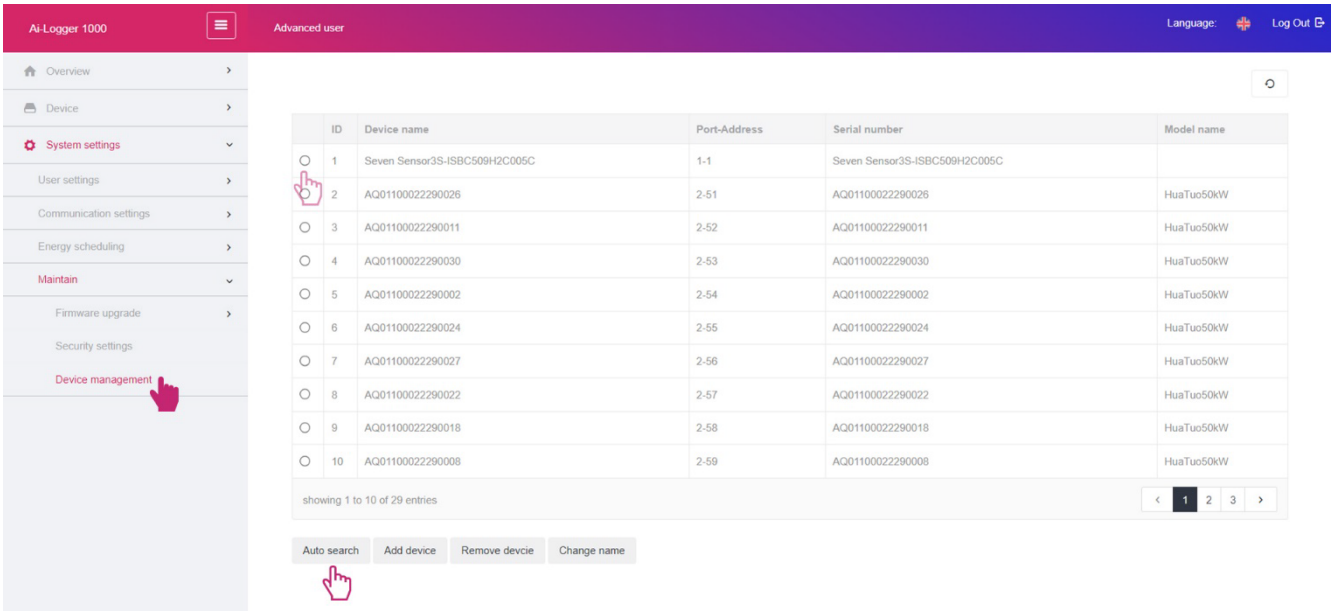
If the user don't want the data sent to cloud service,the Local Mode should be "on" and NTP server IP address should be set, then the data will send to NTP service.

If the user wants to reboot the device,, can click on "Reset" so that all the data will be cleared.

If the user wants to restore the factory Settings, can click on "Reset" so that all the data will be cleared.

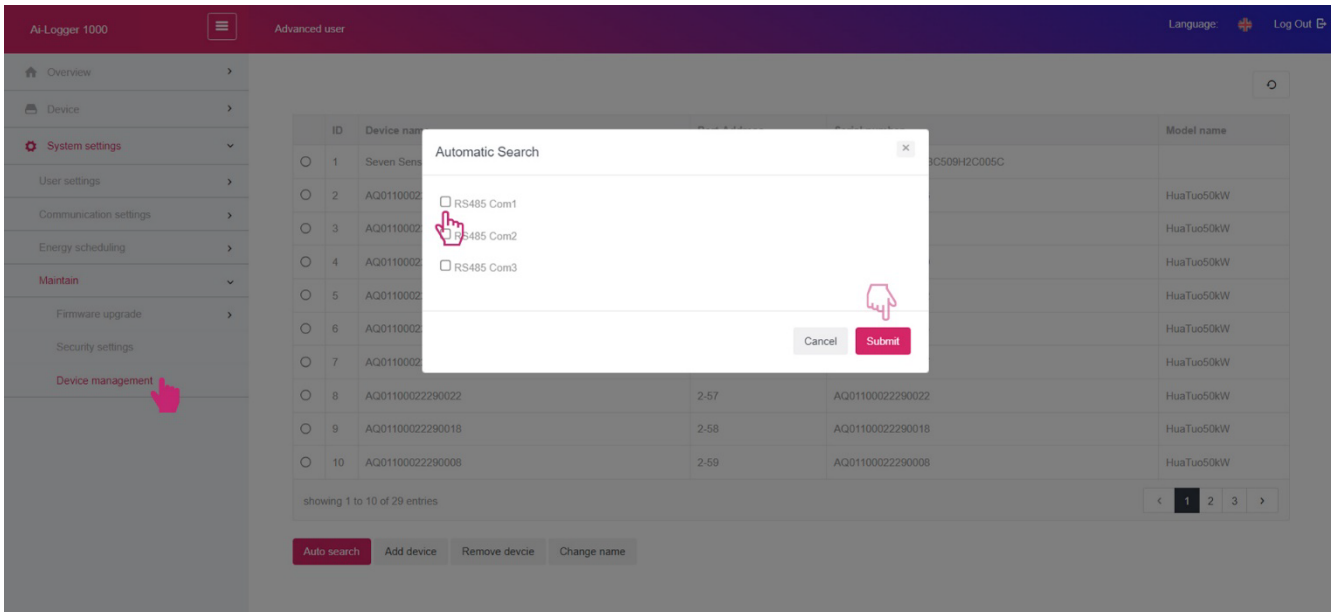
8.5.4.3 Device Management

Click "Maintain > Device management" to manage the devices that are connected to the Ai-Logger 1000.



- **Automatic search for inverters**

Click “Auto search” to choose the RS485 port, and then click “Submit” to automatically search the devices that are connected to the Ai-Logger 1000.

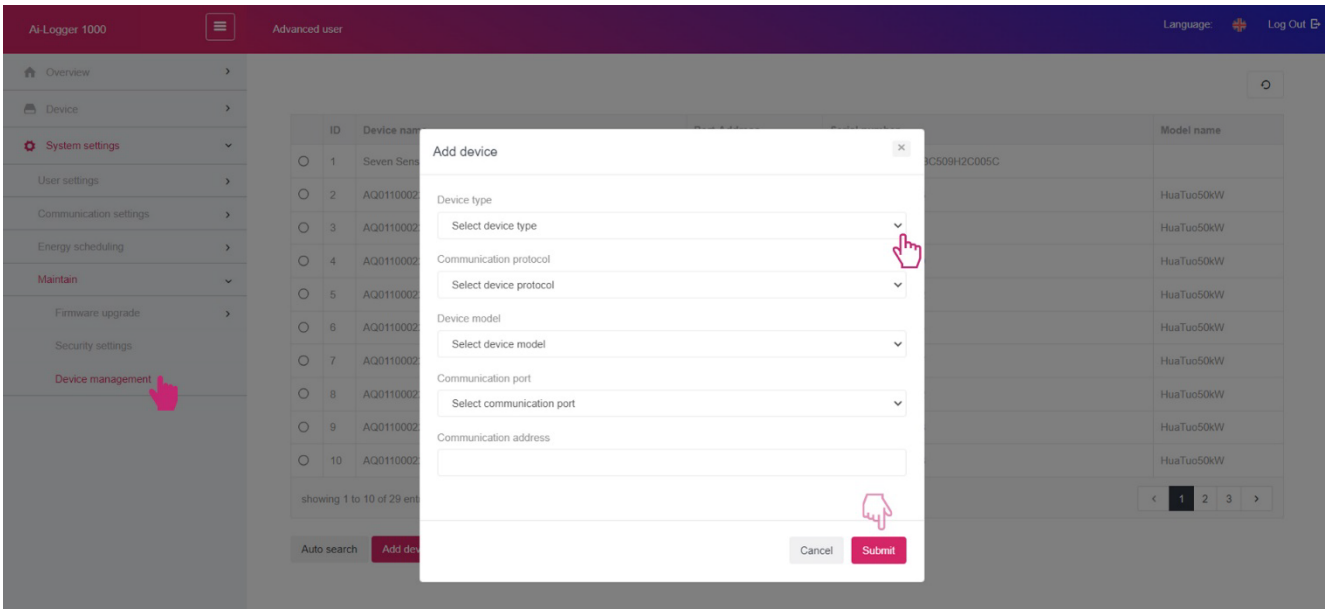


- Solplanet devices can be accessed through automatic search or added manually; weather stations and smart meters do not support automatic search and need to be added manually.
- The connected device can be manually removed, and the removed device can still be added again.
- The device address can be adjusted according to the serial number through “Automatic Address Assignment” . For example, when the device cannot be accessed due to address conflict, you can perform this operation to reassign the device address and access the device.
- After the device is scanned/added, Ai-Logger 1000 will automatically remember the address without rescanning after startup.

- **Add the Weather Station or Smart Meter**

If the Weather Station or the Smart Meter is connected to the Ai-Logger 1000, the device should be added by manual.

Click “Add device” to choose the information for the Weather Station or Smarter Meter. Fill in the communication address and click “Submit” to add the device.



Only the types that are approved by Solplanet can be connected to Ai-Logger 1000 and can be chosen from the drop-menu for device type.

Before manually adding a Modbus meter or DL/T645 meter, you need to set the RS485 parameters correctly on the meter.

9 Decommissioning the product

9.1 Disconnecting all the communication cable

Procedure:

Step 1: Disconnect the external power adapter of the Ai-Logger 1000.

Step 2: Pull out the Micro-SIM card.

Step 3: Disconnect the dry contact output interface connection.

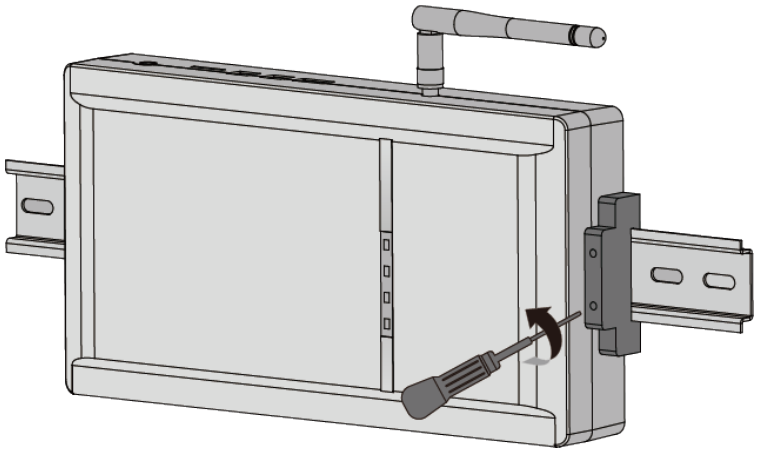
Step 4: Disconnect the digital signal input interface connection.

Step 5: Disconnect the ethernet cable.

Step 6: Disconnect the RS485 connection .

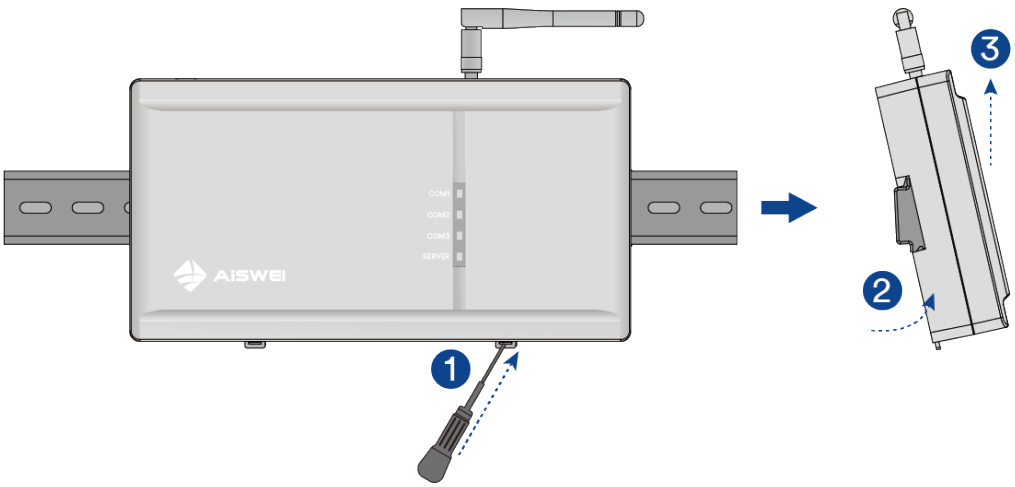
9.2 Remove the rail from the wall

Step 1: Loosen the brackets at both ends fixed on the rail.



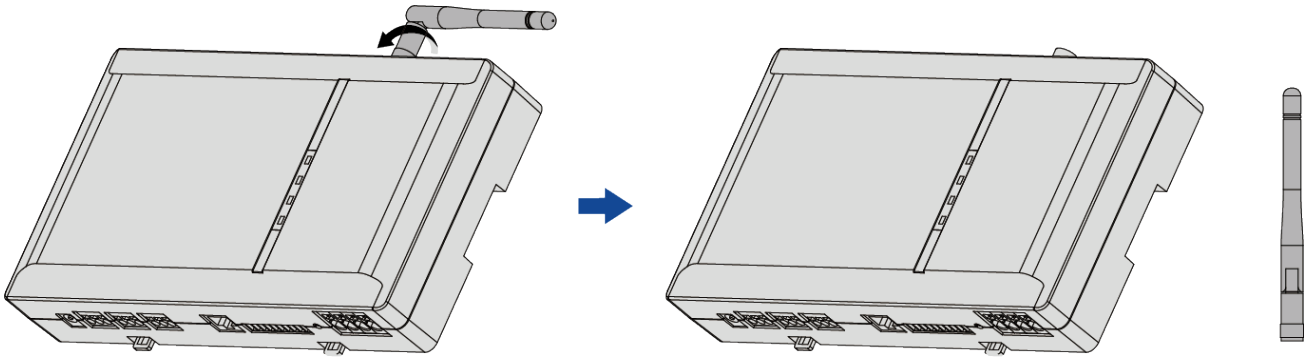
Step 2: Remove the Ai-Logger from the rail.

Method:



9.3 Remove the antenna

Rotate the antenna counterclockwise and remove.



10 Technical data

Ai-Logger 1000	
Communication	
Number of devices managed	80
Communication ports	
RS 485 interface	3, Modbus-RTU
Ethernet	1×RJ45, 10/100Mbps
Digital input	8, max. 24V
Digital output	2, max. 24V
USB	1
Wireless communication	
WLAN communication	802.11 b/g/n, 2.400 GHz ~ 2.497 GHz
Power supply	
DC input	12-24Vdc, 2Adc
Power consuption	<10W
General parameters	
Weight	About 450g
Operating temperature	-20°C～+60°C
Storage temperature	-40°C～+85°C
Relative humidity (non-condensing)	<95%
Altitude	2000m
Ingress protection class	IP20
Installation method	Wall, rail

11 Troubleshooting

When the Ai-Logger 1000 does not operate normally, we recommend the following solution for quick troubleshooting.

Item number	Fault	Possible causes	Suggested solutions
1	Can't power up	1. The DC output of the power adapter is not plugged into The " Power " port of the Ai-Logger. 2. The AC input of the power adapter is not plugged into the AC outlet. 3. Ower adapter failure. 4. Ai-Logger failure.	1. Check the power adapter, plug the DC output into the " Power " port of the Ai-Logger. 2. Check the power adapter, plug the AC input into the AC outlet. 3. Replace the power adapter. If you are purchasing the power adapter yourself, please purchase one that meets the standard. Ai-Logger supports a 12V/2A direct current (DC) power supply. 4. Please contact the supplier or Solplanet Customer Service Center.
2	Device not found	1. There is no device connected to the COM port, or the cable connection is loose, disconnected, or reversed. 2. The RS485 communication parameters are not set correctly. 3. Weather stations are not added manually.	1. Check the connection of the RS485 communication cable. If it is loose, dropped, or reversely connected, it needs to be reconnected and tightened. 2. Check the RS485 communication parameter settings to ensure that the baud rate and communication address are set correctly. 3. Manually add environmental monitors.
3	Ai-Logger shows that the device status is disconnected	1. The cable connection between the device and the Ai-Logger is loose or disconnected. 2. The device is powered off. 3. The baud rate or RS485 address of the device was modified. 4. Device was replaced. 5. The device has been removed and is no longer connected.	1. Check the cable connection between the device and the Ai-Logger . If it is loose or falls off, reconnect and tighten it. 2. After checking that the device is connected correctly, power on the device. 3. Check if the baud rate and RS485 address of the device are set correctly. 4. Check if there is a replaced device, and if so, search again or add the device manually.

			5. If the device has been removed, please perform the “Remove Device” operation through “Device Management”.
4	Failed to add weather station	1. The RS485 communication cable between the weather station and the Ai-Logger is incorrectly connected, or the cable connection is loose or falls off. 2. The weather station is not powered on. 3. 3. The baud rate of the weather station is not set to 9600	1. Check whether the cable connection is correct. If it is loose or falls off, it needs to be reconnected and tightened. 2. Power up the weather station. 3. Check that the baud rate of the weather station is set correctly.
5	able to communicate with the management system on the PC	1. The Ai-Logger is not connected to the PC , or the cable connection is loose or dropped. 2. The Ethernet parameters are not set correctly.	1. Check whether the Ethernet port of the Ai-Logger is properly connected to the PC or router. 2. Check that the Ethernet parameters are set correctly.

- **LED light status description**

Serial number	Fault	Possible causes	Suggested solutions
COM1, COM2, COM3	Blinking	In the case of multiple inverters, one inverter cannot communicate.	1. Check if the inverter is turned on. 2. Check whether the RS485 communication cable is damaged. 3. Rescan the inverter.
SERVER	Blinking	Not connected to cloud server	1. Check if the Ethernet cable is connected properly. 2. Check whether the enterprise routing restricts the server domain name. 3. Check if the enterprise router assigns an IP address.

12 Maintenance

To ensure the Ai-Logger 1000 can run well for a long time, it is recommended to perform routine maintenance according to the descriptions in this document.

- Make sure that no strong electromagnetic interference devices are placed around the Ai-Logger 1000.
- Make sure there are no heat sources placed around the Ai-Logger 1000.
- Make sure the cooling holes are not blocked.
- Wipe down dirt regularly.
- Periodically check for signs of loose cable connections.
- Device Maintenance
- Technical data

13 Recycling and disposal

Dispose of the packaging and replaced parts according to the rules applicable in the country where the device is installed.

Do not dispose of the product together with the household waste but in accordance with the disposal regulations for electronic waste applicable at the installation site.

14 EU declaration of conformity

Within the scope of the EU directives

- Radio Equipment Directive 2014/53/EU(L 153/62-106. May 22. 2014) (RED)
- Restriction of the use of certain hazardous substances 2011/65/EU (L 174/88, June 8, 2011) and 2015/863/EU (L 137/10, March 31,2015) (RoHS) AISWEI Technology Co., Ltd. confirms herewith that the product described in this manual are in compliance with the fundamental requirements and other relevant provisions of the above mentioned directives.

The entire EU Declaration of Conformity can be found at www.solplanet.net.

15 Service and warranty

If you have any technical problems concerning our products, please contact Solplanet service.

Warranty terms and conditions can be downloaded at www.solplanet.net. When the customer needs warranty service during the warranty period, the customer must provide a copy of the invoice, factory warranty card, and ensure the electrical label of the inverter is legible. If these conditions are not met, Solplanet has the right to refuse to provide with the relevant warranty service.

16 Contact Us

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LATAM

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