USER MANUAL

On-Grid PV Inverter

HM10KT, HM12KT, HM15KT

EN

Table of Contents

Important Safety Instructions

Please keep this manual for future reference.

This manual contains instructions on safety, installation, and operation for HM10-15KT on-grid PV Inverter (hereinafter referred to as "inverter").

1. Explanation of symbols

To ensure the user's personal and property safety while using this product, relevant information is provided in the manual and highlighted with the following symbols. Please read the relevant texts carefully when you encounter the following symbols in the manual.

⚠ DANGER

Indicates a high-level hazard that, if not avoided, will result in serious injury or death.

⚠ WARNING

Indicates a medium-level hazard that, if not avoided, could result in death or serious injury.

⚠ CAUTION

Indicates a low-level hazard that, if not avoided, could result in minor or moderate injury.

NOTICE

Indicates an important reminder during the operation which, if ignored, may result in an equipment error alarm.

Tip	Indicates recommendation for reference.
	Read through the user manual before any operations.

2. Requirements for professional and technical personnel

- Professionally trained.
- Familiar with related safety regulations of the electrical system.
- Read this manual carefully and master the related safety instructions.

3. Operations for professional and technical personnel

- Install the inverter to a specified position.
- Conduct trial operations for the inverter.
- Operate and maintain the inverter.

4. Safety precautions before installation

DANGER

- When installing the inverter, please evaluate whether there is a risk of electric arc in the operation area.
- Keep the inverter out of reach of children.

NOTICE

- After receiving the inverter, please check if there is any damage during transportation. If you find any problem, please contact the transportation company, our local distributor or our company in time.
- When placing or moving the inverter, please follow the instructions in the manual.

5. Safety precautions for mechanical installation

DANGER

Before installation, make sure there is no electrical connection to the inverter.

NOTICE

- Ensure enough heat dissipation space for installing the inverter. Do not place flammable or explosive objects around the inverter, or install the inverter on the heat-intolerant buildings, avoid direct sunlight.
- The inverter must be placed horizontally on the level floor.

6. Safety precautions for electrical connection

⚠ DANGER

Electric shock hazard! High voltage at Utility input and AC output terminals. Do not touch wire connections.

⚠ WARNING

Check whether wiring is tight to avoid the danger of heat accumulation caused by loose connection.

NOTICE

The inverter shell should be connected to the ground, and the cross-sectional area of the wire connecting the ground terminal to the earth should not be less than 4mm2.

7. Safety precautions for inverter operation

⚠ WARNING

- The inverter generates much heat during operation with a high cabinet temperature. Do not touch the unit and keep it far away from the materials and devices that are sensitive to high temperature.
- When the inverter is working, do not open its shell for any operation.
- When troubleshooting faults that affect the safety performance of the inverter or disconnecting DC input, turn off the power switch of the inverter and wait until the indicator is completely off.

8. Dangerous operations causing an electric arc, fire, or explosion

- Touch the uninsulated ends of potentially live cables.
- Touch the wiring copper busbars, terminals or internal components of the inverter/charger that might be electriferous.
- Loose connection of power cables.
- Accidental dropping of screws or other components into the inverter.
- Improper operations by untrained non-professional or technical personnel.

DANGER

Once an accident occurs, it must be handled by professionals. Improper operation would cause a more serious accident.

9. Safety precautions for stopping the inverter

- Firstly, disconnect the circuit breakers of PV input and AC output, and then turn off the DC switch on the inverter.
- The internal conductive components should not be touched until the inverter has been disconnected from the input and output cables for 10 minutes.
- The inverter does not contain repair parts internally. If any maintenance service is required, please get in touch with our after-sales service personnel.

DANGER

Do not touch or open the shell after the inverter is powered off within ten minutes.

10. Safety precautions for inverter maintenance

- It is recommended to test the inverter with testing equipment to ensure there is no voltage or current.
- When conducting the electrical connection and maintenance, please post a temporary warning sign or put up barriers to prevent unrelated personnel from entering the electrical connection or maintenance area.
- Improper maintenance of the inverter may cause injury to personnel or damage to the equipment.
- It is recommended to wear an antistatic wrist strap or avoid unnecessary contact with the circuit board.

CAUTION

The safety mark, warning label and rating plate on the inverter should be clearly visible, not removed or covered.

Disclaimers

The warranty does not apply to the following conditions:

- Damage caused by improper use or inappropriate environments (Do not place flammable or explosive objects around the inverter, or install the inverter on the heat-intolerant buildings or under the direct sunlight).
- The actual current/voltage/power exceeds the limit value of the inverter.
- Damage caused by working temperature exceeding the rated temperature range.
- Electric arc, fire, explosion and other accidents caused by failure to follow the inverter labels or manual instructions.
- Unauthorized disassembly and maintenance of the inverter.
- Damage caused by force majeure.
- Damage occurred during transportation or loading/unloading the inverter.

1 General Information

1.1 Product overview

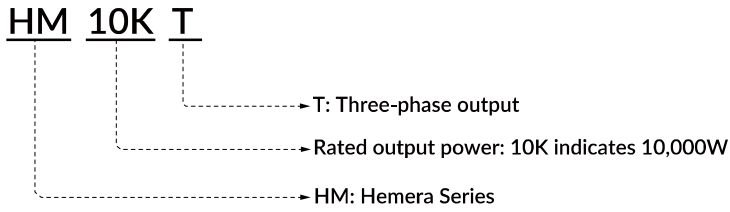
HM10-15KT series is a on-grid PV inverter that can directly convert DC generated by PV panel into AC and feed power back to grid. The PV input adopts advanced MPPT control algorithm, which can track the maximum power point of the PV array in real time. The inverter output can meet the grid requirements in different regions and directly realizes the on-grid PV power feeding.

The series selects key components of high power density and long service life, providing continuous, full and stable power output; with multiple human-machine interaction solutions available, it is convenient to control the real-time parameters. At the same time, its EMC characteristics make it suitable for applications with high power quality requirements.

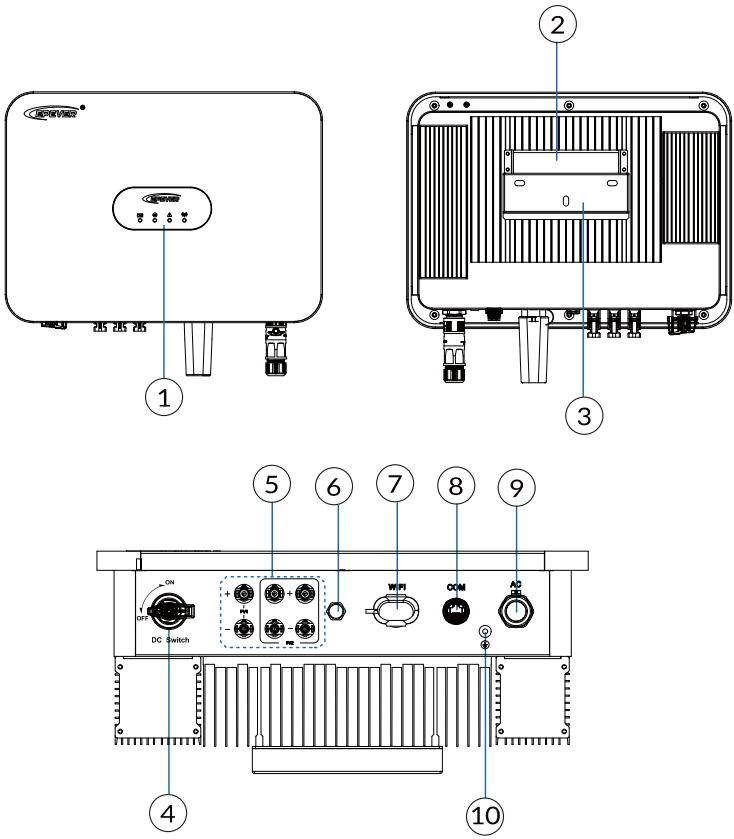
Features

- Fully digital voltage and current dual-loop control with fast response speed and high stability
- Excellent EMC characteristics, suitable for applications with high power quality requirements
- Selecting components of high power density and long service life to ensure the stability
- Supporting multiple PV inputs to improve PV utilization
- Equipped with circuit breakers at the PV input terminal to ensure the safe running of the equipment
- Maximum DC input voltage of 1,100VDC, string maximum input current of 20A
- 110% long term overload
- Equipped with circuit breakers at the AC output terminal to disconnect from the grid when in failure
- USB communication port with optional GPRS and WiFi modules to realize remote monitoring
- Full failure detection and protection functions to ensure the reliable and stable operation
- High protection level of IP65, suitable for harsh environments such as salt spray and humidity
- Operating temperature ranging from -30℃ to 60℃ to offer a wider scope of application
- Intelligent air cooling

Naming rules



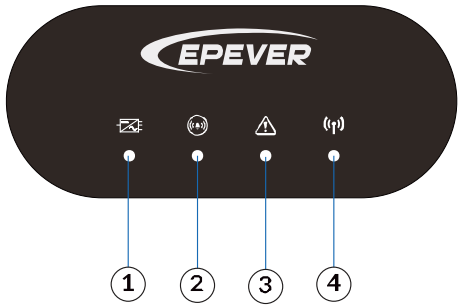
1.2 Appearance



No.	Description	No.	Description
1	Indicator	6	Air valve
2	Wall mounting plate	7	USB communication port(1) (See 3.2 Communication connection)
3	Wall mounting bracket	8	RJ45 port (See 3.2 Communication connection)
4	DC Switch	9	AC output terminal
5	PV input terminals	10	Grounding terminal

(1) Remote monitoring can be realized by connecting the WiFi modules with the USB communication port.

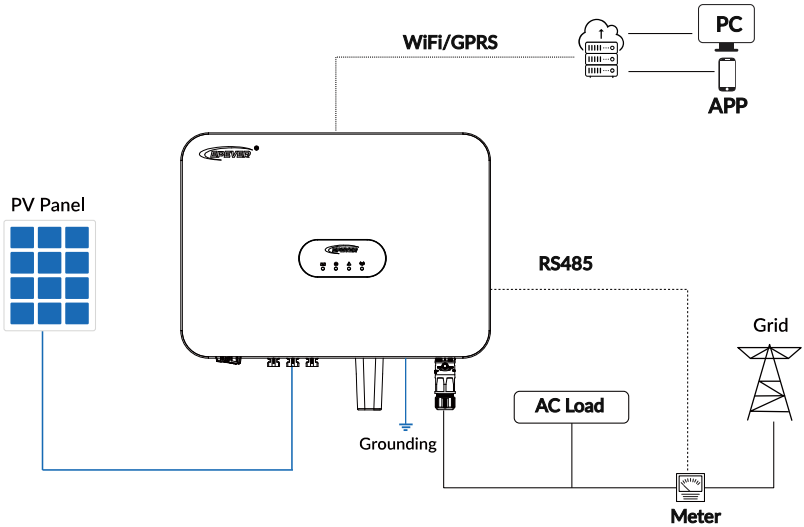
1.2.1 Indicator



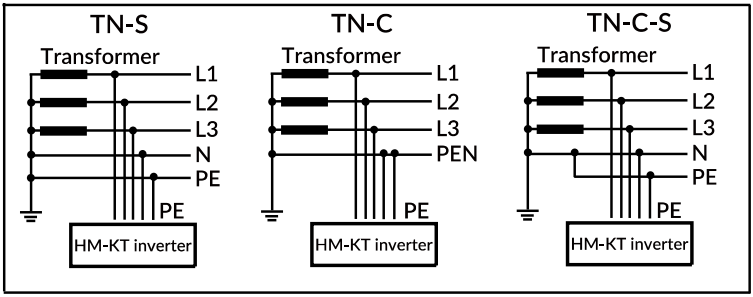
No.	Indicator	Status	Description
1	Power/Operating	Solid green	Grid-connected power generation
		Flashing green for 0.5s	Grid-connected power generation is stopped, indicating the system should be powered on.
2	Alarm	Flashing yellow for 0.5s	System alarm
		OFF	Alarm is cleared.
3	Fault	Solid red	System fault

		OFF	Fault is cleared.
4	Communication	Solid green	Normal external communication
		OFF	Interrupted external communication
		Flashing green for 0.5s	Program upgrade

1.3 System schematic diagram



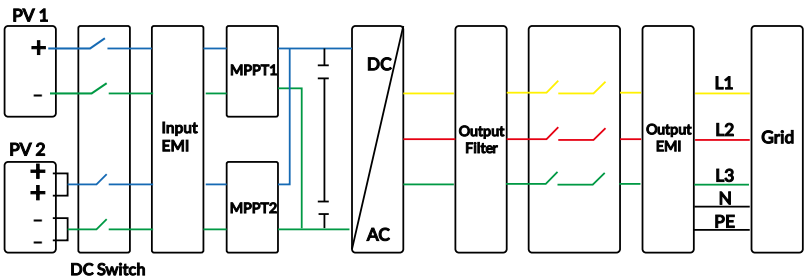
- **Supported grids**



NOTICE

The DC input for this inverter series must be PV panel. It is strictly prohibited to use DC source or battery for replacement, and the company shall not be held liable for any equipment damage, product failure, or personal injury resulting from this.

1.4 Electrical block diagram



2 Installation

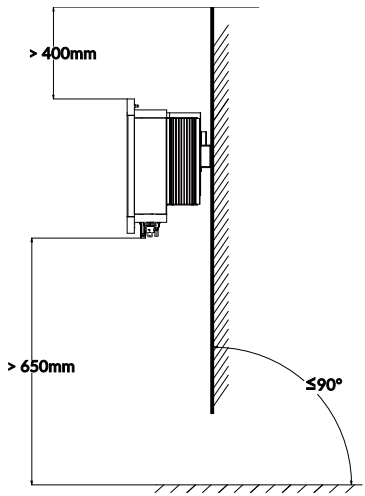
2.1 Precautions

Prohibited installation environments

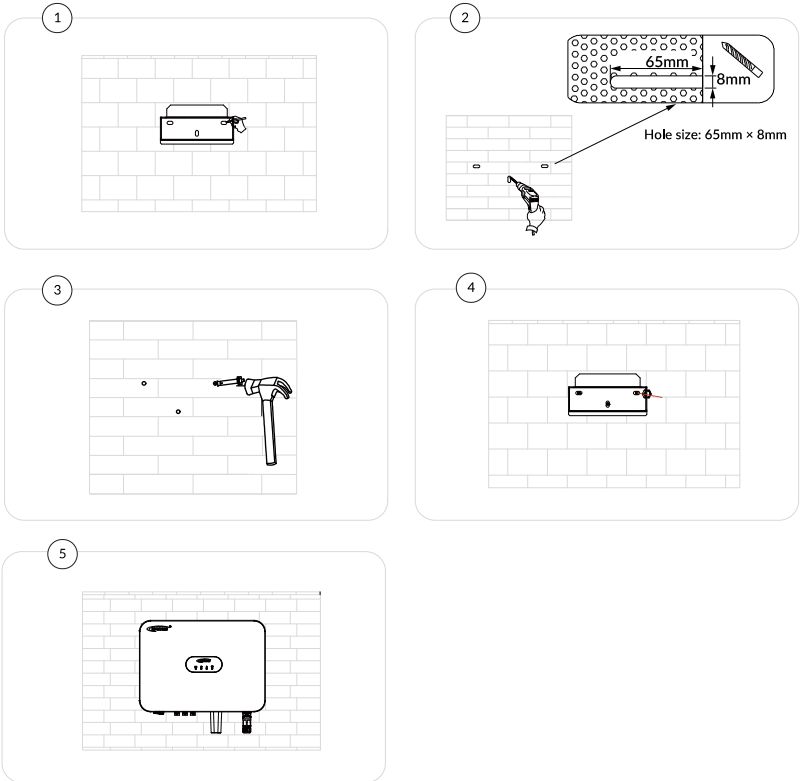
- Do not install the inverter in the flammable, explosive, dust accumulative or other harsh environments.
- Do not install the inverter on a hollow brick wall.
- Do not place the inverter close to flammable materials or gases.

Recommended installation environments

- For wall mounting, it is recommended that the inverter be fixed to concrete and solid brick walls.
- When installing the inverter, please leave enough space around it for heat dissipation. The lower, left and right clearance is greater than 650mm and the upper clearance is greater than 400mm.
- The inclination angle between the inverter and the horizontal ground should be less than or equal to 90 degrees.
- When drilling holes in the wall, avoid plumbing pipelines and electrical wiring.



2.2 Installation steps



Step 1: Mark the installation position with the wall mounting bracket.

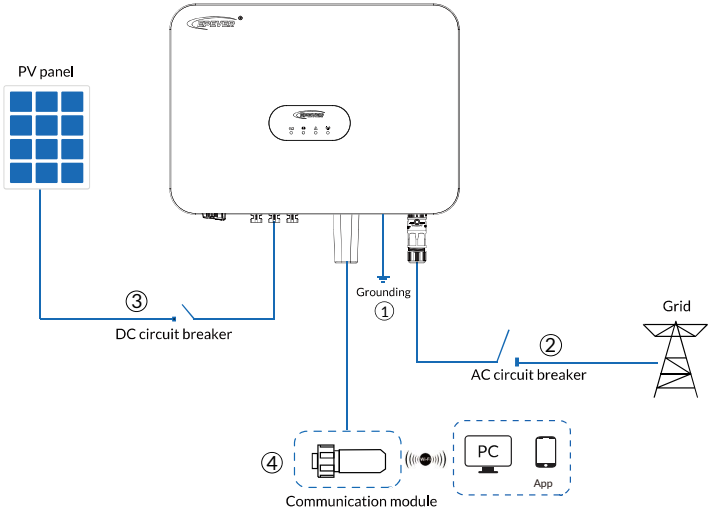
Step 2: Drill the holes in the marked positions with an electric drill.

Step 3: Insert the expansion bolts into the holes.

Step 4: Fix the wall mounting bracket with screws.

Step 5: Place the inverter on the wall mounting bracket.

3 Connection



1. Follow the wiring sequence of "1. Grounding > 2. Grid > 3. PV panel > 4. Communication modules".
2. Disconnect all the AC and DC switches before wiring.

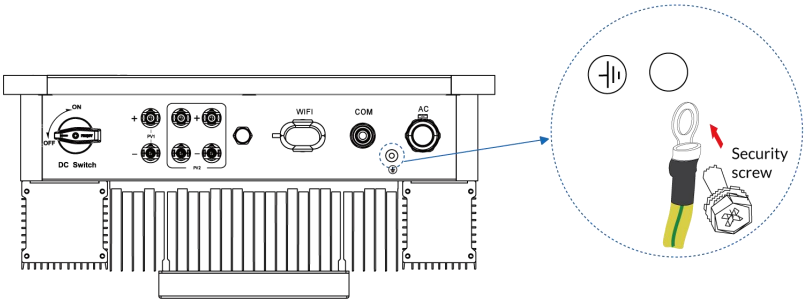
3.1 Cables connection

3.1.1 Connecting the ground protection cable

NOTICE

- The inverter is designed without a transformer. In this case, both the positive and negative terminals of the PV array on the inverter cannot be grounded; otherwise, the inverter failure will occur!
- Both the positive and negative terminals of the PV array on the inverter cannot be grounded, otherwise the inverter failure will occur.
- The ground terminal on the side of the inverter must be grounded correctly.

In the PV power generation system, all non-current-carrying metal components (e.g. brackets, shells of combiner box/distribution cabinet/inverter etc.) should be connected to the ground. Recommended ground cable specifications: ≥ 4mm^2, yellow-green cable.



3.1.2 Connecting the AC output cable

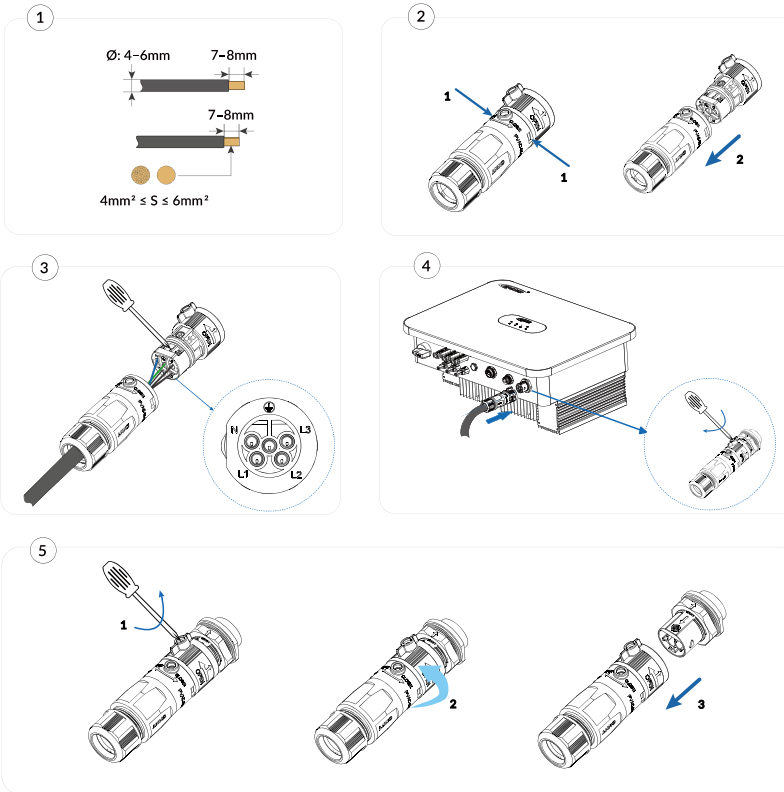
Connect the inverter with AC distribution cabinet or grid by AC output cable; the AC output cable connection must comply with the requirements of the local grid service provider. Recommended specifications for AC output cable and Earth-Leakage Circuit Breaker (ELCB):

Product Model	Cross-sectional Area of the Copper Core (mm^2)	ELCB
HM10KT	4–6	40A/400V/3P, leakage protection, 0.1A
HM12KT	4–6	40A/400V/3P, leakage protection, 0.1A
HM15KT	4–6	40A/400V/3P, leakage protection, 0.1A

NOTICE

- It is prohibited for multiple inverters to share the same circuit breaker.
- It is prohibited to connect the load between the inverter and the circuit breaker.The ground terminal on the side of the inverter must be grounded correctly.
- When using the smallest recommended cable specifications for each model, ensure that the transmission distance is less than 5 meters. If the transmission distance is greater than or equal to 5 meters, the cable specifications need to be appropriately increased to reduce the cable voltage drop and improve system performance.

The connection steps are as follows:



Step 1: Prepare the AC output cable. Strip 7mm–8mm of insulation from one end of the cable (as shown in Figure ①) for future use. The cable length should be determined based on actual requirements.

Step 2: Take the AC connector and disassembly tool from the packaging box. Use a screwdriver to press the latches on both sides of the connector housing inward in the direction marked as 1 in Figure ②, then pull the connector housing outward in the direction marked as 2.

Step 3: Thread the AC cable through the sleeve, then connect the L, N, and PE wires to the corresponding positions marked on the connector (as shown in Figure ③). Secure the wires using a Phillips or flat-head screwdriver (with a diameter of less than 3-5mm), and

finally close the housing and connector.

Step 4: Insert the assembled connector into the AC output terminal of the inverter in the direction shown in Figure ④, then tighten the screw clockwise using a screwdriver.

Step 5: To disconnect the AC cable from the inverter, follow the steps in Figure ⑤: First, loosen the screw counterclockwise using a screwdriver. Then, hold the front cover of the plug and rotate it to the left until it stops. Finally, pull the plug outward in the direction of the arrow to separate it from the inverter.

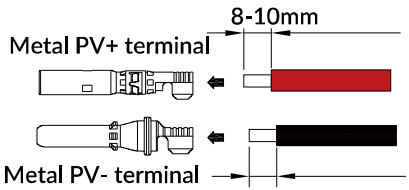
3.1.3 Connecting the PV input cable

The connection steps are as follows:

Step 1: Prepare PV input cable, the cable length and quantity are subject to actual situation.

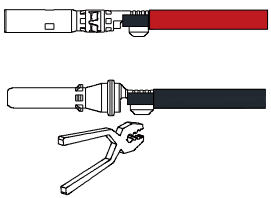
Step 2: Remove the insulation layer of 8–10mm at one end of the PV input cable.

Step 3: Install the stripped cable end to the metal PV positive/negative terminals respectively as illustrated below.



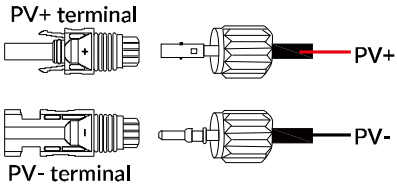
PV+	PV-
12AWG (Red)	12AWG (Black)

Step 4: Crimp the PV input cable with the metal terminals tightly with crimping pliers.

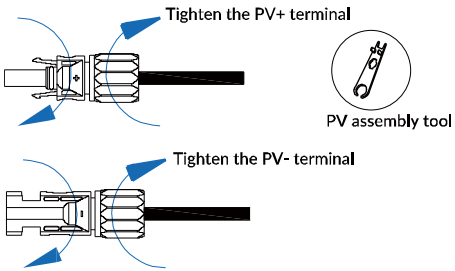


Step 5: Thread the crimped PV positive and negative cables through the locking nut and insert them into the corresponding plastic housings until you hear a "click" sound, which

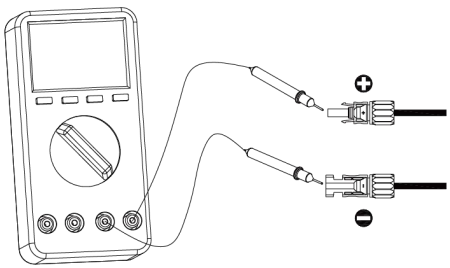
indicates that the metal cores have been snapped into place. Please pay attention to the positive and negative terminals.



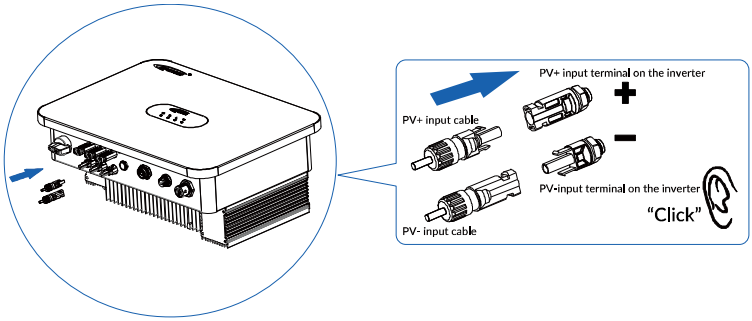
Step 6: Use the PV assembly/disassembly tool (optional accessory) to lock the nut tightly, pull the PV cables gently to ensure the terminal is not wobbly or disconnected.



Step 7: Please use multimeter to check the open-circuit voltage between the PV+ and PV- terminals to ensure the PV cable polarities are correct and the open-circuit voltage is less than or equal to 1,100VDC.



Step 8: Connect the PV input cable to the inverter terminal.



The recommended specifications of DC input cable: copper core cross-sectional area: 12AWG, maximum withstand voltage: ≥1,100VDC.

Note: When using the smallest recommended cable specifications for each model, ensure that the transmission distance is less than 5 meters. If the transmission distance is greater than or equal to 5 meters, the cable specifications need to be appropriately increased to reduce the cable voltage drop and improve system performance.

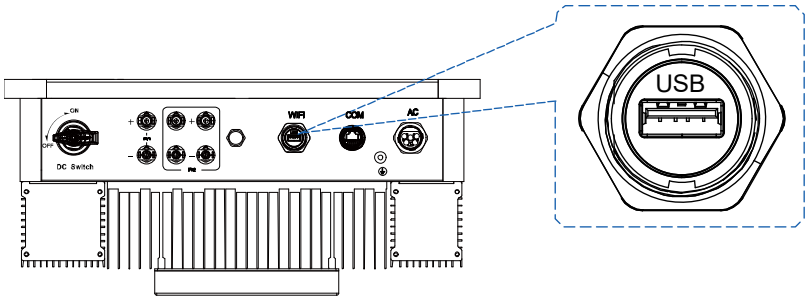
NOTICE

- Before installing the PV input terminals, ensure that the PV input voltage and current do not exceed the inverter limits.
- When installing the PV input terminals, pay attention to the positive and negative terminals.
- When the terminals are connected, you can hear the "click" sound, After terminals connection is completed, pull the PV cables gently to ensure the terminal is not wobbly or disconnected.

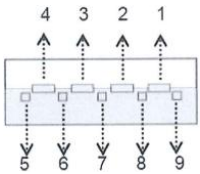
3.2 Communication connection

3.2.1 USB port

Remote monitoring can be realized on the APP by connecting the WiFi modules with the USB communication port, or the remote data collection can be realized by connecting the GPRS modules, which can also be used for inverter upgrades and data monitoring.



- **The pins definition of the USB communication port**

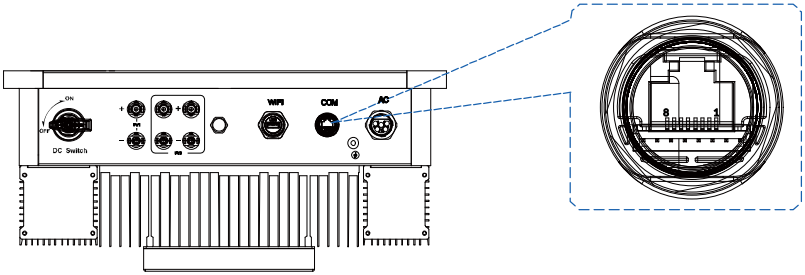


Pin	Definition	Color	Description
1	VBUS	Red	Power (5VDC/1.2A）
2/3/7/8/9	Reserved	Reserved	Reserved
4	GND	Black	GND
5	RS485-A1	Blue	RS485-A1 (to transfer data with cloud platform, APP, PC software, display screen etc.)
6	RS485-B1	Yellow	RS485-B1 (to transfer data with cloud platform, APP, PC software, display screen etc.)

3.2.2 COM port

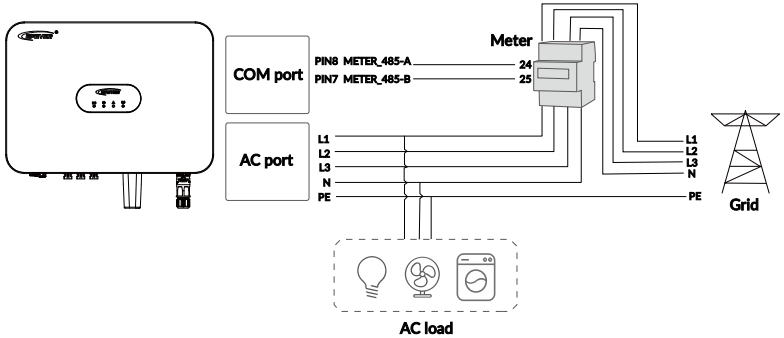
Remote monitoring can be realized by RJ45 communication port and monitoring software.

- **The pins definition of COM port (RJ45)**



Pin	Definition	Function
1	INV_OFF	Emergency shutdown signal (short-circuit with pin 4 to shut down)
2	DRM0	DRM0 function (If the impedance between pin 2 and pin 3 is greater than 20kΩ or short-circuited, the inverter stops running)
3	GND.S	Power supply for external communication equipment
4	+5V.S	
5	GND_OUT	Power supply for external communication equipment
6	+12V_OUT	
7	RS485-B	Local monitoring unit 485 communication
8	RS485-A	

The system schematic when connecting the Meter is as follows:



Note: The local communication 485B/485A (Pin 7/8) in COM port can also be configured for reverse-power prevention by connecting an external electric meter. For specific usage, please consult our technical personnel or refer to the manual "Anti-Reverse Power Flow Function Instructions".

4 Operation

4.1 Checking before powering on

- Whether the inverter is installed correctly and securely;
- Whether L1/L2/L3 (live wire), N (neutral wire) and PE (ground wire) of the AC grid are connected correctly;
- Whether PV input polarities are correct;
- Whether the communication or WiFi module is connected correctly and securely;
- Whether the "DC SWITCH" and all circuit breakers connected to the inverter are "OFF".

4.2 Inverter operating

NOTICE

Before powering on the inverter, please check whether the DC terminal voltage and AC terminal voltage are within the specified range of the inverter.

Operation steps:

Step 1: Connect the DC circuit breaker between the PV module and the inverter.

Step 2: Connect the AC circuit breaker between the AC grid and the inverter.

Step 3: Turn the "DC SWITCH" on the inverter to "ON".

Step 4: Check the running status of the inverter by its LED indicators.

Note: Please refer to Subsection 1.2.1 Indicator in the manual for LED indicator status.

4.3 APP setting

After adding the HM10-15KT series to the cloud platform through APP or Web, users can remotely monitor and set parameters for the onsite equipment by APP. It is convenient for users to keep track of the working status of the equipment at anytime and anywhere to improve work efficiency. The following is an example of connecting HM10-15KT series to WiFi module and remote monitoring by APP.

4.3.1 Download APP

iOS: Scan the QR code or search for "Solar Guardian" in the APP Store to download the APP.

Apple App Store

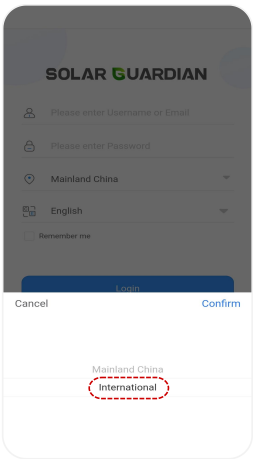
Android platform: Scan the QR code to download the APP.

Google Play

4.3.2 Node selection, Sign up & Log in

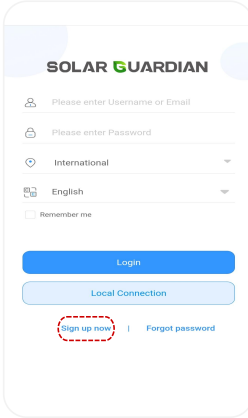
- **Node selection**

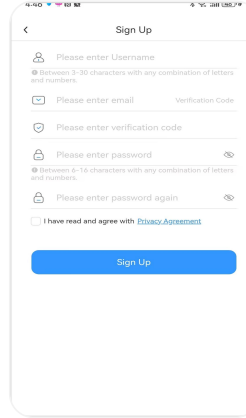
Solar Guardian provides both Mainland China and international node options. Users may switch to international nodes by selecting "International" at login interface and confirming. After node selection, complete registration and login (refer to the instructions below) to access the international platform.



- **Sign up**

End users can register a new account for free on the cell phone.

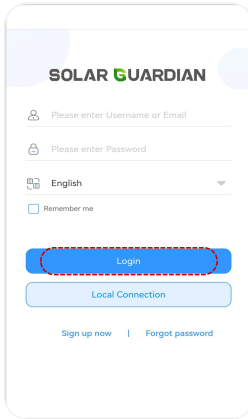


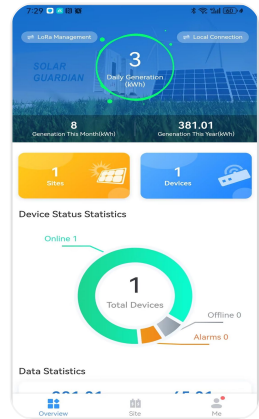


Step 1: Click “Sign up now” on the initial login interface of the APP.

Step 2: Enter your username, email address or mobile phone number, verification code, password and reconfirm password; check and agree to the registration of the new account.

- **Log in**





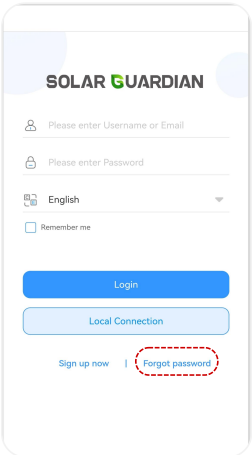
Step 1: Open the APP, enter your account name and password; select the language, check "Remember me" (so that you can log in quickly next time), and click "Login" to enter the APP main interface.

Step 2: The main interface of the APP includes "Overview, Site, Me".

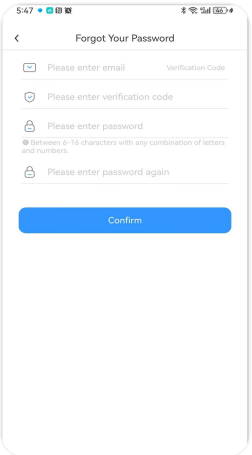
Note: The APP data and the WEB data are synchronized in real time, and the operations performed through the APP will also be synchronized to the WEB.

4.3.3 Reset password

If you forget your login password for your account, you can reset your password by the following steps.

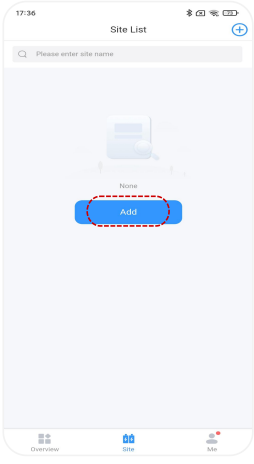


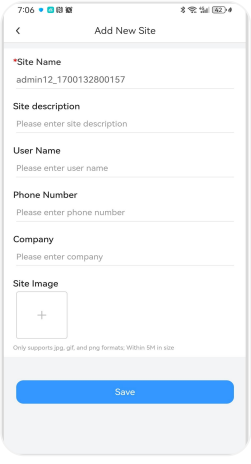
Step 1: Click the "Forgot password" in the initial interface.



Step 2: Enter the new password, mobile phone number or email address, click "Verification Code", then enter the verification code received in your phone or email , click "Confirm ", and the new password is set successfully.

4.3.4 Add new site

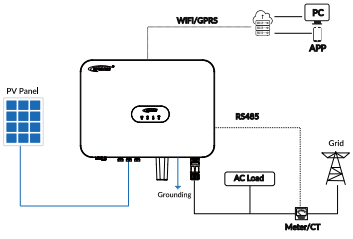


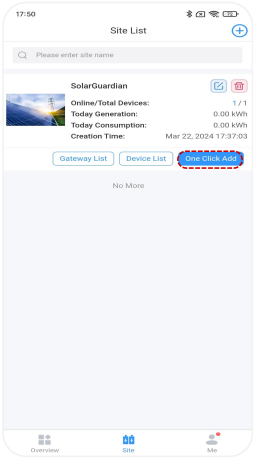


Step 1: After logging in, enter “Site” interface, click “Add” or ⊕ icon to enter “Add New Site” interface.

Step 2: Fill in the “Site Name” (or use the default site name of the APP) and click "Save" to complete the creation of the site after filling in the remaining site information (optional).

Note: Items marked with “*****” must be filled in. Items not marked with“*****”are optional. If you do not upload the site picture, it will be displayed as the default picture. Otherwise, it will be displayed as your uploaded picture.

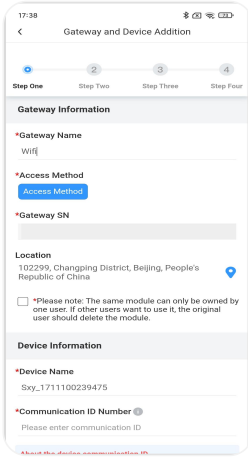




Step 3: Connect the WiFi module to the USB communication port on the inverter (the USB-A 3.0 WiFi module can connect with the inverter directly, for other communication modules, please purchase the appropriate communication cables according to the communication port type).

Step 4: Click “One Click Add” in the site interface to add devices under this site.

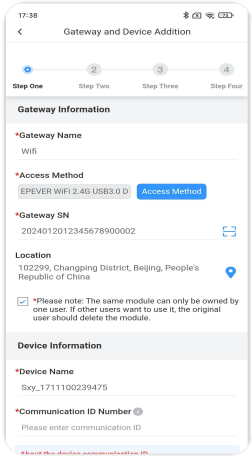
4.3.5 Add gateway

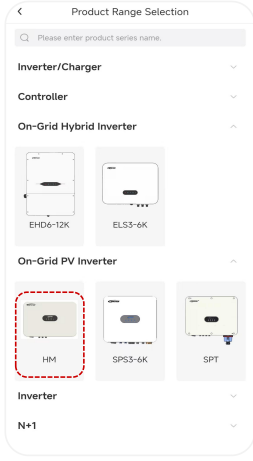


Step 1: Enter “Gateway and Device Addition” interface, fill in the “Gateway Name” (or use default name of the APP), click “Access Method” to enter “Internet Gateway Select” interface.

Step 2: Select “EPEVER WiFi 2.4G USB3.0 D”, it will automatically return to the “Gateway and Device Addition” interface in **Step 5**. Scan the QR code(1) on the gateway label or manually enter the 22-digit gateway SN; Select the “Location” (optional), check the information prompt.

(1) If you enter the “Gateway SN” by scanning the QR code, please allow the APP to access camera on your phone to scan the QR code on the gateway. The system will verify the gateway SN automatically and only the gateway that have been added to the production management system can be added to the cloud platform successfully. If you are prompted with "Gateway already exists", please contact technical support for assistance.

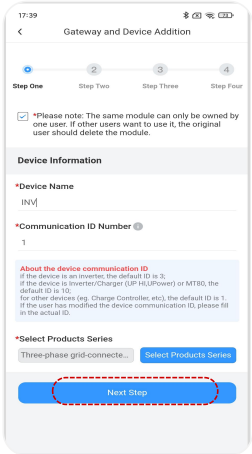




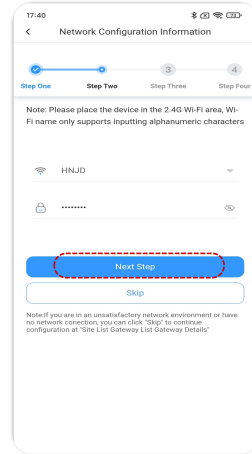
Step 3: On the “Gateway and Device Addition” interface, fill in the “Device Name” (or use default name of the APP) and “Communication ID Number(2)”, click “Select Products Series” to enter the device selection interface.

Step 4: Select the current connected device, it will automatically return to the “Gateway and Device Addition” interface in **Step 7**. If the "Next" button is grayed out and cannot be clicked. Please check whether the information filled in is correct or whether the required fields are completed.

(2) For device communication ID, the default ID is 3 for inverter, 10 for UP-HI or UPower, 1 for other devices. Please fill in the actual ID value if you have modified the device communication ID.

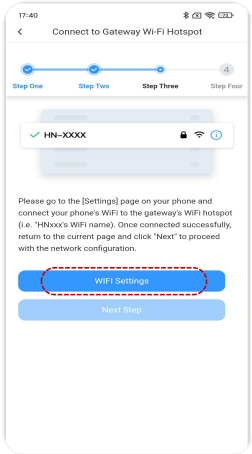


Step 5: When you have filled all the information, click “Next Step” to finish adding the gateway and devices, and enter the “Network Configuration Information” interface.

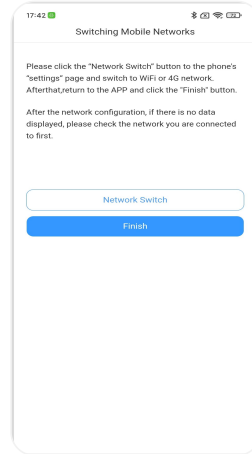


Step 6: Enter your local WiFi account and password and click "Next Step".

- If you are using an Android phone, click the WiFi icon to display the WiFi searched by the phone. If you are using an iPhone, you need to enter the WiFi name manually.
- If you need to check or verify if the WiFi password is correct, click to enter the password in plain text.
- If the WiFi signal in the environment is weak or there is no network, you can click "Skip" to complete the network configuration in the gateway details later. Please refer to 4.3.6 Gateway details for more details. If the network configuration of the WiFi module has not completed and cannot establish a connection with the cloud platform, the WiFi module will not be able to go online.

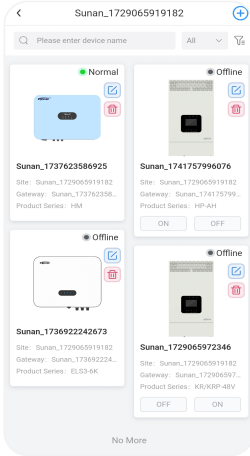


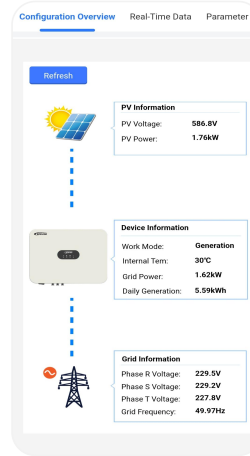
Step 7: Click “WIFI Settings” to connect your phone to the gateway WiFi (Name: HN_EPxxx, password: 12345678), return to the APP when connection is successful. Click “Next Step” for network connection.



Step 8: Click “Network Switch” to return to the “Settings” interface of your phone, switch the phone to a WiFi network or 4G network that can access the Internet, and then click "Finish" to enter the device list.

- Ensure the phone GPS positioning is turned on and the APP is allowed to access the location, otherwise the phone cannot search for the hotspot of the WiFi module.
- The hotspot network name of EPEVER WIFI RJ45 A/B/C is HN_xxxxxx, and the hotspot network name of EPEVER WIFI RJ45 D is HN_EPxxxxxx. When connecting to the hotspot of the WiFi module for the first time, the default password is 12345678.
- The WiFi hotspot network does not have access to the Internet. When the phone asks whether to allow or trust the network, please allow or trust it. Otherwise, the connection to the WiFi hotspot will fail and you will be unable to proceed to the next step.

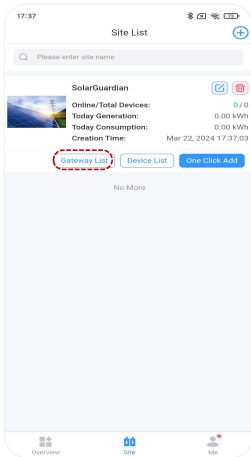


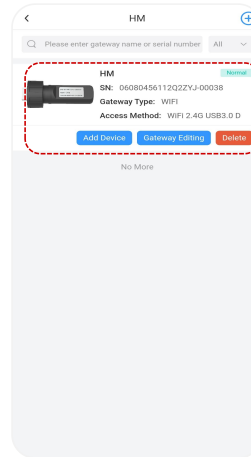


Step 9: When it is added, it will automatically switch to the "Device List", click the device to view its real-time data.

Step 10: Enter the device interface to view the real-time device data. The default interface is " Configuration Overview".

4.3.6 Gateway details





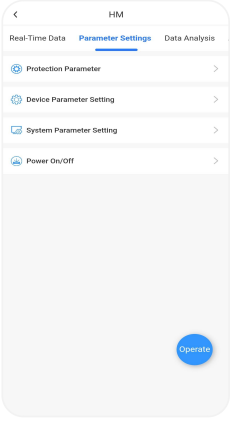
Step 1: Enter the "Site List" interface and click on the "Gateway List" of a certain power station.

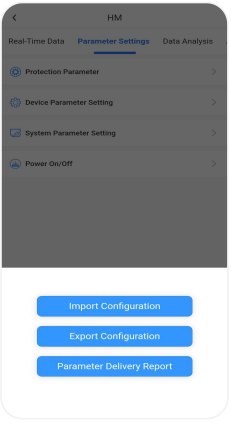
Step 2: Enter the “Gateway List” interface, click the gateway that you want to view.

Step 3: Enter the “Gateway Details” interface to view the related gateway information. After the network configuration of the WiFi module is completed, the WiFi name and password of the router are displayed. Click the icon to switch to displaying the password in plain text to verify the correctness. Click "Configure Gateway WiFi" to enter the network configuration process, the network configuration of the WiFi module is completed or corrected.

4.3.7 Parameter setting

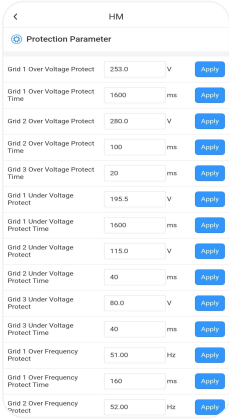
In the parameter configuration interface, users are able to configure protection parameters, device parameters, system parameters, and power on/off commands separately. Moreover, by clicking the "Operate" button, options including import configuration, export configuration, and parameter delivery report are accessible.

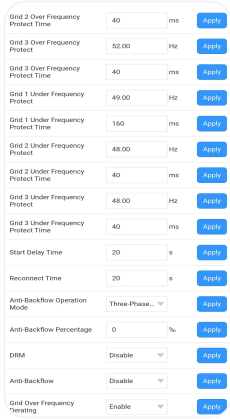


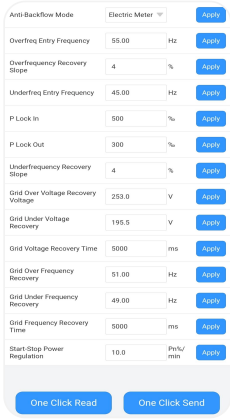


- **Protection parameters**

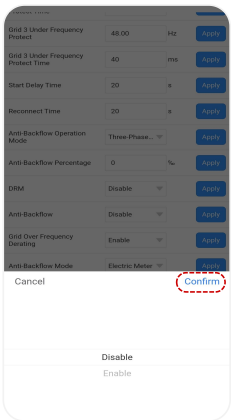
A total of 41 parameters can be configured within the protection parameter settings, including "Grid 1 Over Voltage Protect", "Grid 1 Over Voltage Protect Time", "Grid 2 Over Voltage Protect", and "Grid 2 Over Voltage Protect Time".

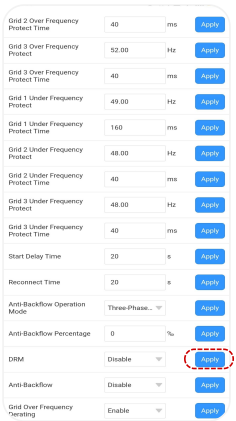






Set the relevant parameters in the setting box. After the configuration is completed, click the "Apply" button to send the current parameter values to the device. Take the setting of disabling the DRM function as an example as follows:

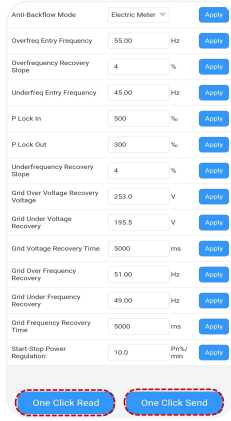




Step 1: Click the drop-down menu on the right side of the DRM function parameter, select "Disable", and then click "Confirm".

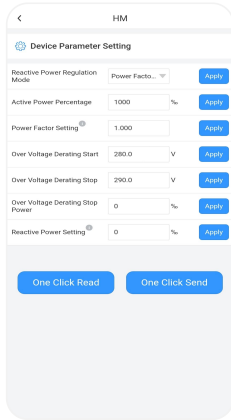
Step 2: Click the "Apply" button on the right side of the DRM function.

At the bottom of the drop-down operation page, there are "One Click Read" and "One Click Send" buttons. After completing the settings of multiple parameters, clicking the "One Click Send" button will apply all parameter values to the device. Clicking the "One Click Read" button allows to retrieve all current parameter values of the device.



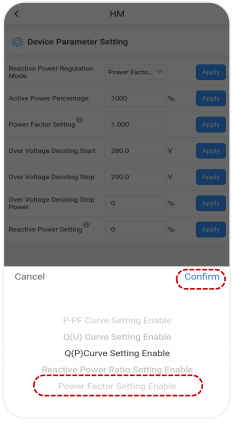
- **Device parameters**

Among the device parameters, the following can be set: "Reactive Power Regulation Mode", "Active Power Percentage", "Power Factor Setting", "Over Voltage Derating Start", "Over Voltage Derating Stop", "Over Voltage Derating Stop Power", and "Reactive Power Setting".

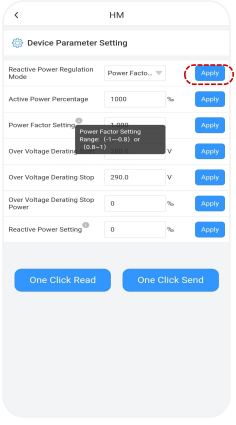


Set the relevant parameters in the setting box. After the configuration is completed, click the

"Apply" button to send the current parameter values to the device. Take setting the reactive power regulation mode to power factor setting enable as an example:



Step 1: Click the drop-down menu on the right side of the “Reactive Power Regulation Mode”, select "Power Factor Setting Enable", and then click "Confirm".

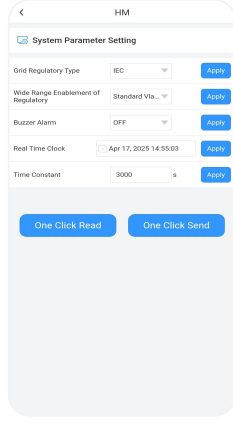


Step 2: Click the "Apply" button on the right side of the “Reactive Power Regulation Mode”.

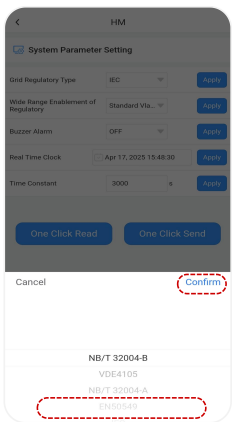
At the bottom of the drop-down operation page, there are "One Click Read" and "One Click Send" buttons. After completing the settings of multiple parameters, clicking the "One Click Send" button will apply all parameter values to the device. Clicking the "One Click Read" button allows to retrieve all current parameter values of the device

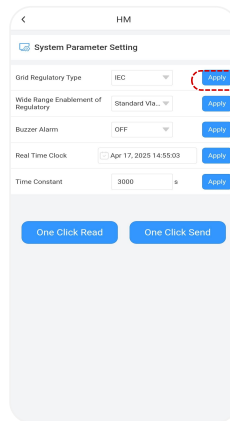
- **System parameters**

The system parameter settings include five functional options: "Grid Regulatory Type", "Enable Wide-Range Enablement of Regulatory", "Buzzer Alarm", "Real Time Clock", and "Time Constant".



Set the relevant parameters in the setting box. After the configuration is completed, click the "Apply" button to send the current parameter values to the device. Take setting the regulation to EN50549 as an example:





Step 1: Click the drop-down menu on the

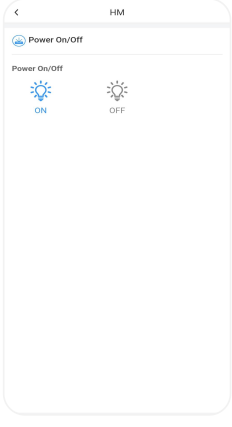
Step 2: Click the "Apply" button on the right side

right side of the “Grid Regulatory Type”, select "EN50549", and then click "Confirm".

of the “Grid Regulatory Type”.

- **Power On/Off**

The power on/off commands can be used to control the startup and shutdown of the inverter. Clicking "On" can turn on the inverter, and clicking "Off" can turn off the inverter.



5 Maintenance

To maintain long-term working performance, it is recommended to have the following items inspected twice a year.

- Make sure the airflow around the inverter is not blocked, and remove dirt or debris from the fan.
- Check whether the exposed cables have been damaged by sunlight, friction with other surrounding objects, dryness, insects or rodents, etc., repair or replace the cables if necessary.
- Verify whether the indicator and display are consistent with the actual operation of the equipment,and note that corrective action should be taken in case of inconsistency or error.
- Check terminals for signs of corrosion, insulation damage, high temperature or burning/discoloration, tighten terminal screws.
- Check for signs of dirt, insect nesting and corrosion and clean up as required.
- This inverter is not equipped with a lightning arrester, if it is equipped with a failed lightning arrester, replace the failed lightning arrester in time to avoid lightning strikes' damage to the inverter or even other equipment.

⚠ DANGER

Risk of electric shock! Make sure that the power supply of the inverter is disconnected when performing the above operations, and wait for 10 minutes for the power in the capacitor to be discharged before performing the corresponding checks or operations!

6 Troubleshooting

6.1 Faults

No.	Faults	Causes and measures
1	Inverter Over Temperature	Check whether there is any foreign object blocking the inverter fan inlet; check whether the ambient temperature of the inverter installation position exceeds the maximum ambient temperature. If the ambient temperature of the inverter installation position exceeds the maximum ambient temperature, please improve the ventilation and heat dissipation.
2	Boost Over Temperature	
3	Radiator Over Temperature	
4	Chassis Over Temperature	
5	DC Bus Voltage Imbalance	It is the internal fault of the inverter. Please disconnect the “DC Switch” of the inverter, wait for 5 minutes, then connect the “DC Switch” again, and check whether the fault has been cleared after restarting the inverter; if it is still not cleared, please contact the manufacturer.
6	DC Bus Over Voltage	
7	DC Component Fault	
8	DC Bus Under Voltage	
9	Relays Fault	
10	Hardware DC Bus Over Voltage	
11	Inverter Hardware Over Current	
12	COM Error (DSP with ARM)	
13	Output Current Imbalance	
14	PV Hardware Over Current	
15	Grid Over Voltage Fault	If it occurs occasionally, it might be a temporary grid failure, the fault will be automatically cleared after the grid resumes normal without manual intervention. If it occurs frequently, please check the grid voltage and frequency are within the specified range of the inverter. If not, please contact the manufacturer; if yes, please check if the connection between the AC circuit breaker and output cable is normal.
16	Grid Under Voltage Fault	
17	Grid Over Frequency Fault	

18	Grid Under Frequency Fault	If the grid voltage and frequency are within the specified range of the inverter, and the AC wiring is correct, the alarms still occurs frequently, please contact the manufacturer to modify the grid undervoltage and overvoltage protection value of the inverter after getting the approval from the local grid service provider.
19	Inverter Software Over Current	It is the internal fault of the inverter. Please disconnect the "DC Switch" of the inverter, wait for 5 minutes, then connect the "DC Switch" again, and check whether the fault has been cleared after restarting the inverter; if it is still not cleared, please contact the manufacturer.
20	Inverter SelfCheck Error	
21	Boost SelfCheck Error	
22	Param Config Failure	
23	Islanding Fault	
24	Inverter Over Voltage Fault	
25	Leakage Current Fault	1. If it occurs occasionally, it may be caused by an accidental error of the external circuit, the inverter will automatically resume normal operation after the fault is cleared, without manual intervention. 2. If it occurs frequently or the inverter cannot resume normal operation for a long time, please check whether the ground impedance of the PV string is too low and whether the insulation of the PV cable is damaged.
26	Leakage Current Sensor Fault	It is the internal fault of the inverter. Please disconnect the "DC Switch" of the inverter, wait for 5 minutes, then connect the "DC Switch" again, and check whether the fault has been cleared after restarting the inverter; if it is still not cleared, please contact the manufacturer.
27	Leakage Current Consistency Error	
28	Voltage Consistency Error	
29	Insulation Resistance Low	Please check whether the ground impedance of the PV string is too low and whether the insulation of the PV cable is damaged. If it is still not cleared, please contact the manufacturer.
30	Grounding Warning	
31	PV1 Over Voltage	The PV array is misconfigured, with too many strings connected in series, and the open-circuit voltage is higher than the maximum operating voltage of the equipment.
32	PV2 Over Voltage	

33	COM Error (DSP with DSP)	It is the internal fault of the inverter. Please disconnect the "DC Switch" of the inverter, wait for 5 minutes, then connect the "DC Switch" again, and check whether the fault has been cleared after restarting the inverter; if it is still not cleared, please contact the manufacturer.
34	I2C EPROM (DSP)	
35	AFCI Error	Please check whether there is arcing or poor contact in the PV string wiring.
36	PV1 Reverse Connected	Please power off the equipment completely first before conducting the following operations: Check whether the PV polarities are connected in reverse, if yes, correct the PV polarities connection.
37	PV2 Reverse Connected	
28	PV1 Over Current	It is the internal fault of the inverter. Please disconnect the DC switch of the inverter, wait for 5 minutes, then connect the DC switch again, and check whether the fault has been cleared after restarting the inverter; if it is still not cleared, please contact the manufacturer.
39	PV2 Over Current	

6.2 Alarms

No.	Alarms	Causes and measures
1	PV1 Short Circuit	Please power off the equipment completely first before conducting the following operations: Check whether the PV polarities are short circuited or connected in reverse, if yes, correct the PV polarities connection.
2	PV2 Short Circuit	
3	Surge Protection: DC SPD Warning	--
4	Surge Protection: AC SPD Warning	
5	User Shutdown	
6	Device Locking	
7	Out Fan 1 Stopped	Check whether there accumulated dust or dust on the inverter, and whether there are foreign objects blocking the fan at the fan inlet, if so, please improve the ambient ventilation and heat dissipation.
8	Out Fan 2 Stopped	
9	Out Fan 3 Stopped	

10	Out Fan 4 Stopped	
11	Out Fan 5 Stopped	
12	Inner Fan Stopped	

7 Technical Specifications

7.1 Parameters

Product Model	HM10KT	HM12KT	HM15KT
PV Input (DC)			
Maximum Input Power	15,000W	18,000W	22,500W
Maximum Input Voltage	1,100V		
Start-up Voltage	250V		
Rated Input Voltage	620V		
Maximum Input Current	20A/20A		20A/40A
Maximum Short-circuit Current	25A		25A/50A
MPPT Voltage Range	180–1,000V		
MPPT Voltage Range (Full Load)	480V–850V		
Number of MPPTs	2		
Number of Strings	1/1		1/2
AC Output			
Rated Output Power	10,000W	12,000W	15,000W
Maximum Output Apparent Power	11,000VA	13,200VA	16,500VA
Rated Output Current	14.5A	17.4A	21.7A
Maximum Output Current	16A	20A	25A
Rated Grid Voltage	230V/400V		
Rated Grid Frequency[1]	50Hz/60Hz		
THDi	< 3%		
Power Factor	≈1 (Adjustable from 0.8 leading to 0.8 lagging)		

Efficiency			
Maximum Efficiency	98.20%	98.20%	98.20%
European Efficiency	98%	98%	98%
Protection			
Basic Protection	PV reverse polarity PV insulation resistance PV string current monitoring	AC output overvoltage AC output overcurrent AC output short circuit	Anti-islanding Grid monitoring Residual Current (RCD) Detection
AFCI	Optional		
DC switch	Integrated		
SPD	DC Type II/AC Type III		
Environment Parameters			
Operating Temperature	-30℃ to +60℃		
Relative Humidity	0–100% (N.C.)		
Altitude	≤ 4,000m		
Ingress Protection	IP65		
Pollution Degree	III		
Mechanical Parameters			
Dimensions (L × W × H)	490mm × 357mm × 195mm		
Weight	17kg		
Others			
Self-consumption (Night)	< 1W		
Topology	Transformer-less		
Cooling Method	Natural		
Display	LED/WIFI+APP		
PV Input Connector	H4/MC4 (Optional)		
AC Output Connector	Plug-in connector		

Grid Wring Method	3W+N+PE

(1) The frequency requirements of different countries or regions are different, please confirm before purchasing.

7.2 Declaration

This inverter is classified as a Class B inverter. The grid voltage and frequency ranges are specified in the tables below.

Grid Voltage Range Specifications (U = Operating voltage; U_N = Rated voltage)

Grid Voltage	Requirements
$U < 50\%U_N$	Shut down within 0.1 seconds
$50\%U_N \le U < 85\%U_N$	Shut down within 2 seconds
$85\%U_N \le U < 110\%U_N$	Normal operation
$110\%U_N \le U < 135\%U_N$	Shut down within 2 seconds
$U \ge 135\%U_N$	Shut down within 0.05 seconds

Grid Frequency Range Specifications

Grid Frequency	Requirements
49Hz < F ≤ 51Hz	Normal operation
F > 51Hz/F < 49Hz	Stop operation within 0.2 seconds; the inverter must not reconnect to the grid while in shutdown state

Any changes without prior notice! Version number: V1.0

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