



THOR 40DD-P US
DC charging equipment user manual

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Thank you for choosing our charging equipment

THOR series intelligent DC charging equipment is a device that provides high-efficiency, safe and stable DC power supply for electric vehicles, which has a friendly man-machine interface and integrates corresponding functions of control, billing, communication and security protection. The charging equipment uses OCPP 1.6JJSON open protocol for communication with back-office server, thus to realize functions such as reservation and network payment via mobile APP. Diversified communication options, including wired Ethernet, WIFI, 4G, wireless, are provided for customers to conveniently connect the device to a charging network. This product supports CCS1. Each connector works independently. Up to 2 EV could be charged at the same time. All the above features make it most suitable for outdoor charging.

We sincerely hope that this product can meet your needs, and we welcome and value your feedback and suggestions on the performance and function of the product. We will continuously improve the quality of our products and services.

"IMPORTANT SAFETY INSTRUCTIONS" and "SAVE THESE INSTRUCTIONS".

INSTRUCTIONS IMPORTANTES CONCERNANT LA SÉCURITÉ CONSERVER CES INSTRUCTIONS.

INSTRUCTIONS PERTAINING TO A RISK OF FIRE OR ELECTRIC SHOCK. INSTRUCTIONS AYANT TRAIT À UN RISQUE D'INCENDIE OU DE CHOC ÉLECTRIQUE

For use with Electric Vehicles.

Pour utilisation avec des véhicules électriques.

Ventilation Not Required.

Aucune ventilation requise.

WARNING To avoid a risk of fire or electric shock, do not use this device with an extension cord.

AVERTISSEMENT Pour réduire le risque de choc électrique ou d'incendie, ne pas utiliser de rallonge avec cet appareil.

CAUTION: Do not use this product if there is any damage to the unit.

ATTENTION Ne pas utiliser ce produit si l'appareil est endommagé.

CAUTION "Risk of electric shock. Do not remove cover or attempt to open the enclosure. No user serviceable parts inside. Refer servicing to qualified service personnel."

ATTENTION Risque de choc électrique. Ne pas retirer le couvercle ni essayer d'ouvrir le boîtier. Aucune pièce interne réparable par l'utilisateur. Confier tout travail d'entretien ou de réparation à un technicien qualifié.

"WARNING" "Risk of explosion. This equipment has arcing or sparking parts that should not be exposed to flammable vapors. This equipment should be located at least 460 mm (18 inches) above the floor."

AVERTISSEMENT Risque d'explosion. L'appareil comporte des pièces pouvant produire des arcs électriques ou des étincelles qui ne devraient pas être exposées aux vapeurs inflammables. Cet appareil devrait être installé à au moins 460 mm (18 pouces) au-dessus du plancher.

"WARNING": "This device is intended only for charging vehicles not requiring ventilation during charging." AVERTISSEMENT Ce dispositif est destiné au chargement des véhicules ne nécessitant pas de ventilation au cours du chargement.

automatic reset feature is provided. AVERTISSEMENT - Caractéristique de réarmement automatique incluse.

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Safety precautions

This document contains important safety information about your THOR DC charger. Please keep this file for future reference.

Please read this document thoroughly before installing and using the THOR DC charger. Failure to follow safety instructions may result in electric shock, fire, serious injury or death.



Check the charger cable and case regularly for damage. If the product is defective or damaged, suspend use and contact Growatt for advice.



Do not open, repair, tamper or modify the charger in any way without authorization.



We recommend that the charger installation, inspection, etc. be carried out by qualified electricians who have obtained relevant certificates, and the installation should comply with local wiring regulations to ensure safe use.



Ensure that the charger is in the working temperature. Do not touch the surface of the charger in high temperature environment to avoid burns.



Do not expose any part of the equipment or cable to strong force, impact, or sharp objects.



There may be power left within 5 minutes after the charger is powered off. Please ensure that it is completely disconnected before operating.

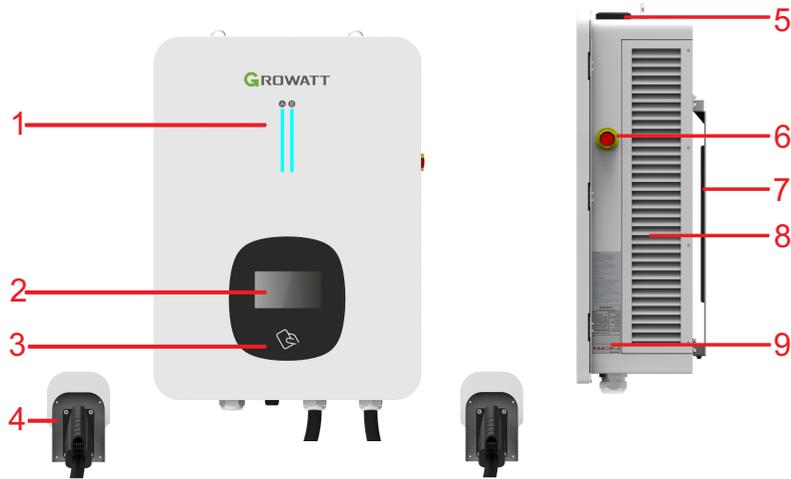


You can clean the surface of the THOR charger with a soft, damp cloth without using solvents or abrasives. Power must be off before cleaning.



This symbol on products and accompanying items indicates that used electrical appliances and other products should not be mixed with general domestic waste. For proper handling, recovery and recycling, please take this product to the designated collection point for disposal.

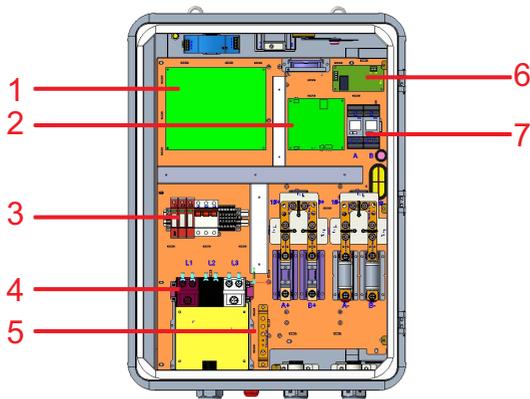
1. Product description



- | | |
|-------------------------------|-------------------------------------|
| 1. LED indicators; | 6. Emergency Stop button; |
| 2. LCD; | 7. Mounting bracket; |
| 3. RFID reader; | 8. Air outlet; |
| 4. Charging connector holder; | 9. Warning and safety marks Label.; |
| 5. WIFI/4G antenna. | (See chpt .15) |

Explanation of LED indicators behaviors:
 Blue - Standby(The charging equipment can only be used when the blue light lit);
 Red Steady on/Flashing - Fault;
 Green Steady on - Charging in process;
 Green Flashing - Establishing communication;
 Yellow Flashing - System initializing.

Internal view and terminal definition



1. Main board;
2. SECC communication;
3. SPD(Lightning protection);
4. AC input terminal block. Terminal definition is (①L1;②L2;③L3;)from left to right;
5. PE terminal;
6. Insulation testing;
7. Power meter.



Fig: AC Surge protection device

Note: The charging equipment will detect the current status of the lightning arrester module in real time. When the lightning protection module is damaged, the display will have an alarm indicating that the lightning protection device is faulty. When repairing and replacing the lightning protection module, the left side cover must be removed first. Then the maintenance person can operate the breaker in the surge protection circuit and replace the lightning protection module! (The red circle in the figure is the lightning protection status indicator. When the indication window indicates green, the lightning protection module is normal; when the indication window indicates red, the lightning protection module has been broken and damaged, and the lightning protection module needs to be replaced.)

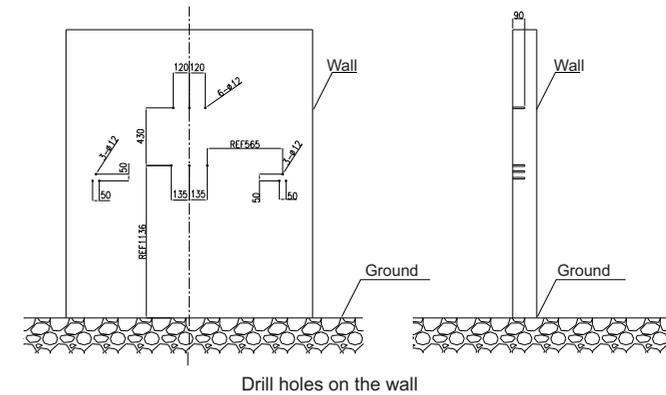
2. Packaging list

No.	Items	Qty	Remark
1	DC EV Charging station	1	
2	User manual	1	
3	Certificate of quality	1	
4	User card	2	
5	Mounting bracket	1	Already installed on the rear side of the charging equipment
6	Cable holder	2	
7	Cable socket	2	
8	Hex head expansion bolt, M8*80/304 stainless steel	12	
9	Hexagonal socket head screw, M6 * 16/304 stainless steel	8	
10	Standard spring washer, D6/304 stainless steel	8	
11	Flat washer, D6/304 stainless steel	8	
12	L-shaped Anti-theft Wrench for Plum Blossom Stud Screws, Size M6	1	
13	L-shaped Anti-theft Wrench for Plum Blossom Stud Screws, Size M4	1	

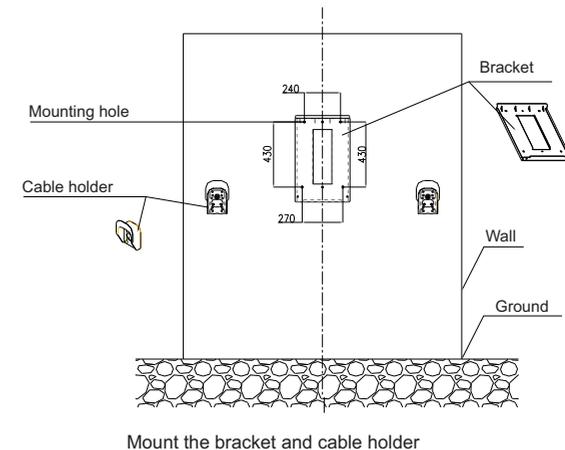
3. Installation and wiring

3.1 Installation on the wall

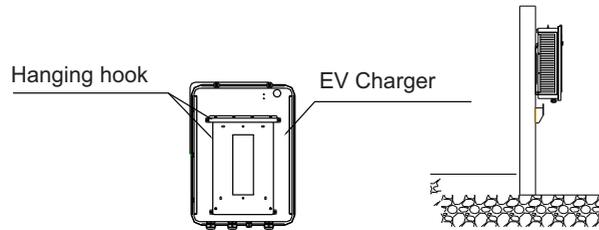
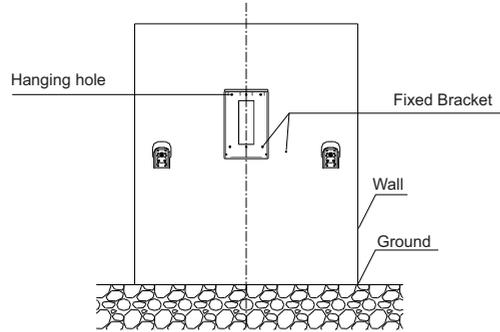
3.1.1 Firstly, according to the specific installation height requirement of the user, determine the installation height of the charging equipment and the installation height of the cable holder. According to the dimensions in the following drawings, drill 4 holes for bracket mounting and 3 holes for cable holder mounting on the wall. Take out the expansion bolts in the packing accessory bag, hammer the expansion bolts into the holes. Remove the nuts and washers for later use.



3.1.2 Loosen the 2 screws at the bottom of the charging equipment that fixes the mounting bracket, keep them properly for later use. Place the mounting bracket onto the bolts just installed and screw the nuts and washers. Take out the cable holder and fix it using the same procedure.



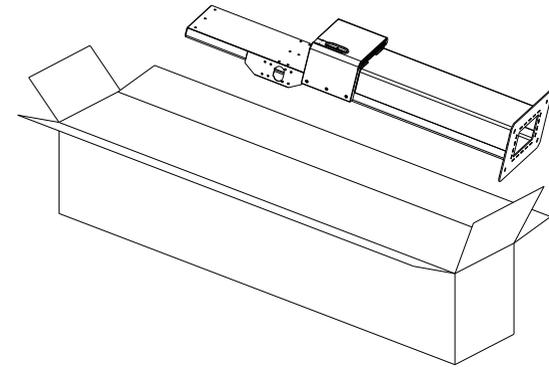
3.1.3 After the mounting bracket and cable holder is fixed, place the charging equipment onto the mounting bracket, with the outward bent part inserted to the slot on the rear side of the charging equipment. Lock the charging equipment onto the bracket at the bottom using the 2 screws. The installation is done.



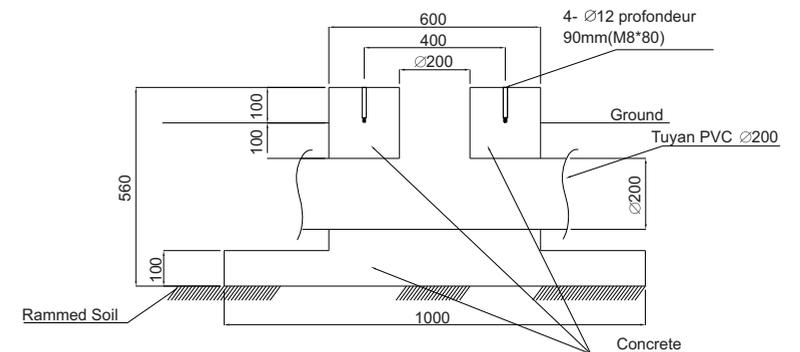
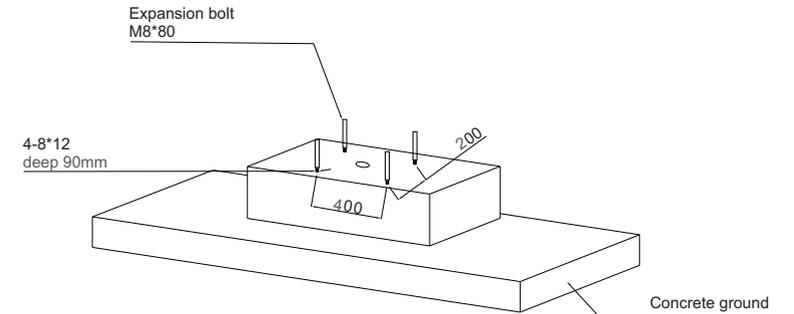
Insert the hanging hooks of the charging pile into the hanging holes and install in place

3.2 Installation on a pole

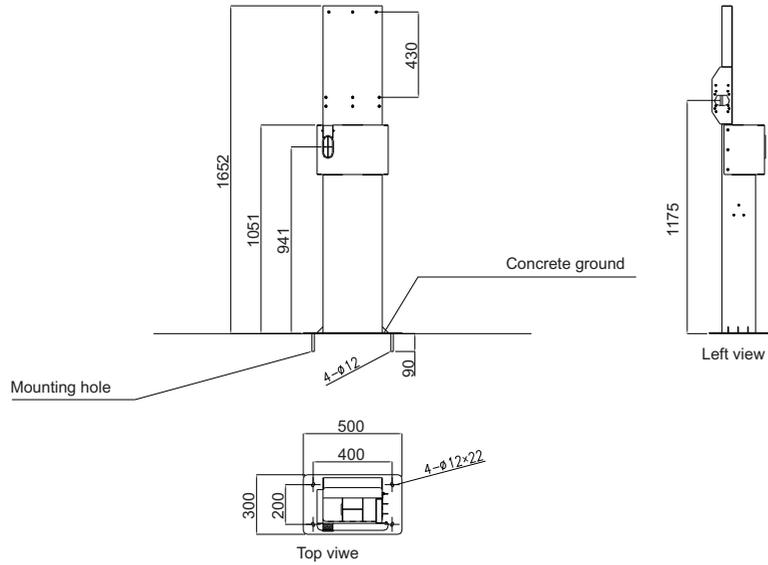
3.2.1 Open the packaging of the pole, take out the pole and mounting accessories.



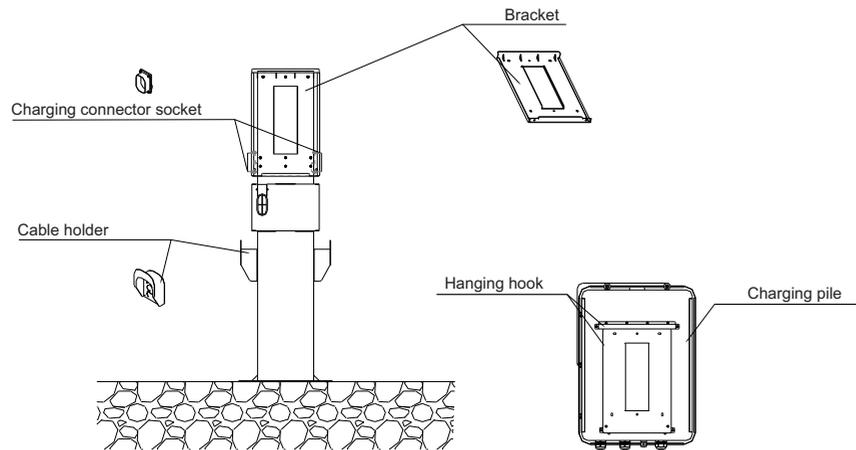
3.2.2 The pole must be installed on a hard surface, concrete surface is recommended, it can also be mounted on a solid ground. Drill holes according to the requirements marked on the illustration for fixing expansion bolts.



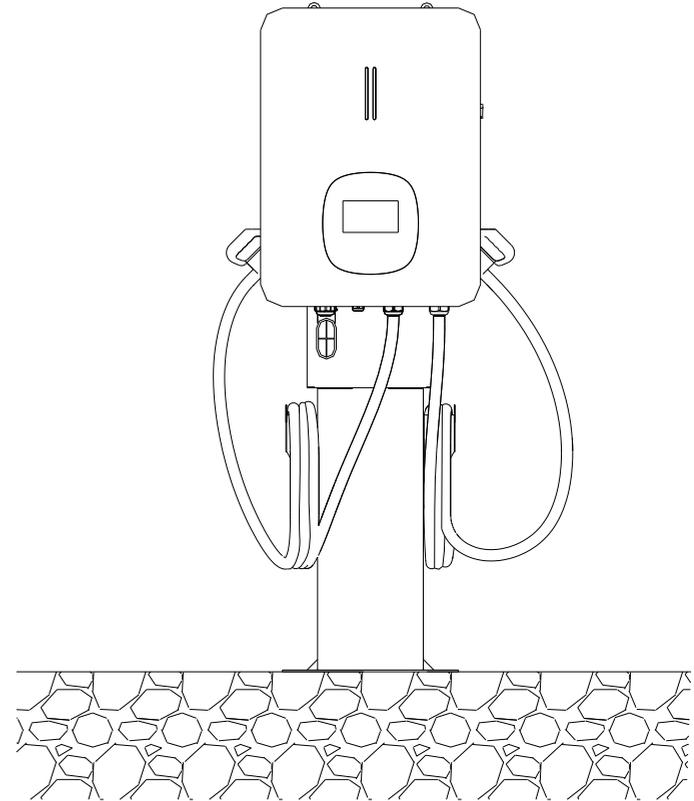
3.2.3 Fix the pole onto the holes with expansion bolts. The input cables shall go into the pole from the bottom middle area and come out of it from the area below the cable holder.



3.2.4 Fix the mounting bracket onto the pole.



3.2.5 Position the charger onto the bracket and secure it on the bracket with the 2 screws.

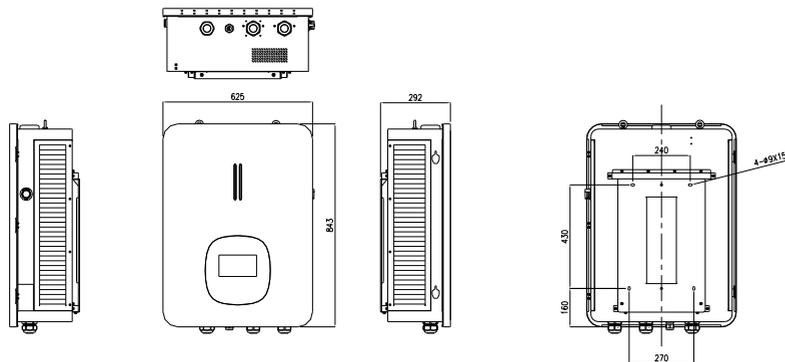


3.3 Wiring

Now prepare for wiring. Use 3 power cables and 1 PE cable, it is suggested to use a 4-core cable(with PE included) for the convenience of using the water-proof cable gland. The live wires shall be at least 50mm², PE shall be greater than 25mm². The PE wire shall be crimped to a M6 size ring terminal. Open the 2 locks at the left side of the upper front cover and open it. Connect the AC input cables into the corresponding terminals through the cable gland on the bottom left side and fasten them(Refer to the Internal view and terminal definition part for wire connection), put the transparent cover on the terminal block for safety purpose. Connect the network cable through the hole in front of the AC input cable gland to the RJ45 socket and fasten the water-proof gland. Turn on the MCB. Close and lock the upper cover after checking internal wiring and breaker position. The wiring is then finished.

In Canada, a power supply that is intended to be fixed in place to a structure and is provided with a supply cord in accordance with 12.1.1.1 shall be marked with the following or equivalent: "THE SUITABILITY OF THE USE OF FLEXIBLE CORD IN ACCORDANCE WITH CE CODE, PART I, RULE 4-012, IS TO BE DETERMINED BY THE LOCAL INSPECTION AUTHORITY HAVING JURISDICTION" C'EST À L'AUTORITÉ LOCALE COMPÉTENTE EN MATIÈRE D'INSPECTION QU'INCOMBE DE DÉTERMINER SI UN CORDON SOUPLE PEUT ÊTRE UTILISÉ CONFORMÉMENT À L'ARTICLE 4-012 DU CcÉ, PREMIÈRE PARTIE.

	L1	L2	L3	PE
Terminal				
Wire	≥50mm ² ≥AWG1/0	≥50mm ² ≥AWG1/0	≥50mm ² ≥AWG1/0	≥25mm ² ≥AWG3



Note:

1. Only professional personnel can do the wiring, connect the AC input wires in correct phase order according to the markings on the terminal block.
2. The PE terminal shall be connected to the Earth firmly and reliably!
3. No live work! Turn off the upstream breaker in the distribution panel and the breaker inside the charging equipment before repairing or maintaining.
4. It is recommended to install at least Type A circuit breaker protection at the front of the charger input.

Distribution end RCBO Selection Recommended:

Rated power P: 40kW(220V~528V), 32kW~40kW(180V~220V), 37.6kW(208V)

Rated voltage U_e: 208Vac/240Vac/480Vac

Working voltage U: 180Vac~528Vac

Efficiency η : 95%

Power factor PF: COSΦ≥0.99

Rated current:

480Vac: I_e=P/1.732η×U_eCOSΦ=51A, recommended RCBO rated current : ≥64A=1.25*I_e.

240Vac: I_e=P/1.732η×U_eCOSΦ=102A, recommended RCBO rated current : ≥128A=1.25*I_e.

208Vac: I_e=P/1.732η×U_eCOSΦ=110A, recommended RCBO rated current : ≥139A=1.25*I_e.

Maximum current: U=220Vac, I_{max}=P/1.732ηUCOSΦ=111A, recommended RCBO rated current : ≥140A=1.25*I_e.

5. adaptors of conversion adapters that are not allowed to be used.

6. extension cords that are not allowed be used.

7. Please do no disassemble the unit unless authorized!

4. APP download, register, and login

4.1 APP download.



Users can scan the QR code (Android and IOS) with the WeChat, or go to the App Store and Google Play to search for ShinePhone or log in to our monitoring website server.growatt.com or server-cn.growatt.com to download.

4.2 Register

Before using ShinePhone APP the first time, the user must register an account in advance.

There are two steps when users register the account:

(1) Fill in the account registration information

10:15 Register

Current server address:

* Country Choose country

* Username Enter username

* Password Enter password

* Repeat password Repeat password

Phone number Enter phone number without country co...

* Email address Enter email

Installer code Input installer code

User terms and privacy policy

Register

a) Fill in the account information. To fill in the account information, you need to select the account country (required), fill in the user name (required), password (required), confirm password (required), telephone (required in China, optional for other regions), email (optional in China, required for other regions), installer code(optional).

b) The user terms must be checked manually to agree before registering, all required fields must be filled in before registering.

(2) Add Plant

下午3:25 1.0.4K/s Add Plant Skip

* Plant name Enter the Plant name

* Installation date 2022-08-04

Plant address Automatic Manual

* Australia City

Please enter the full address

Longitude Latitude

* Time zone +08

* PV capacity(W) PV capacity

* Plant type Residential plant Commercial plant Ground-mounted plants
(Conversion is based on 1 kWh power generation)

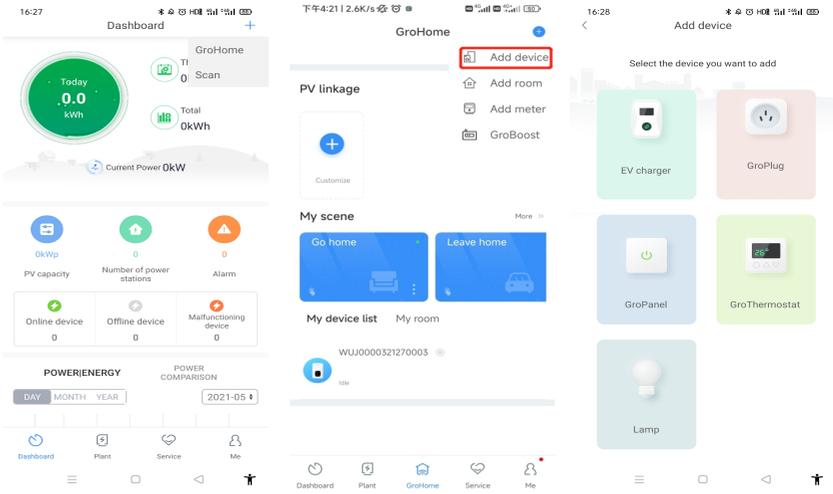
Fund Revenue DOLLAR

PV Plant picture Upload Picture

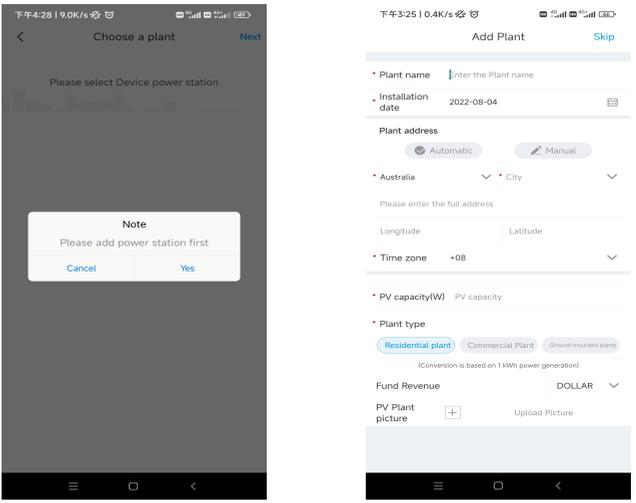
a) When customers add plant, they need to fill in the name of the plant (required), installation date (required), national city (required), detailed address (optional), time zone (required), PV capacity (required), plant type (required, Household plant/ Commercial plant/Ground plant), fund income (optional), plant picture (optional, when the user does not upload pictures, a default plant picture will be given).

5. EV Charger Internet Configuration

For new users, please click the "+" in the upper right corner of the overview, select "GroHome" and add device (EV Charger), for users who already have had "GroHome" page, go to the "GroHome" page directly and click the "+" in the upper right corner to add device (EV Charger)



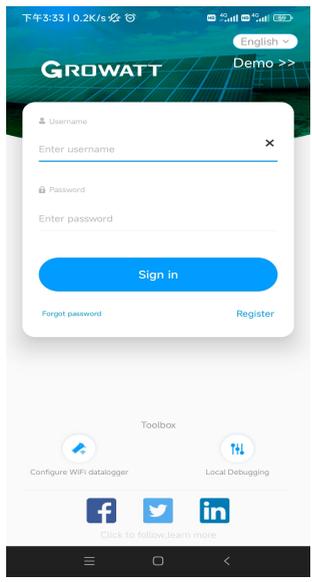
If the users haven't build the "power plant" before and click "add device", the app will remind you to add a plant firstly, and the app will allow to "add device" after finishing filling the information of the plant .



b) There are two ways to fill in the plant address, automatic acquisition, and manual input. Automatic acquisition, through satellite positioning, obtain the current location of the user, then the detailed location will be filled automatically of the country .Manual input, the user manually input the country, city and detailed address.

c) This page can be skipped. After skipping, the user registration account will be logged directly, enter the APP plant page. Skipping the process of adding plant, the default plant will not be generated. When enter the APP plant page, the system will remind the user to add the plant.

4.3 Sign in and log out

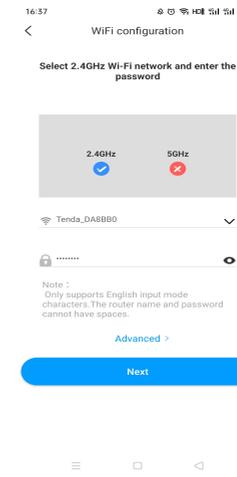


The user can log in the APP through the existing account and password. The system automatically determines the account's attributes and distributes the server. The ShinePhone system is divided into China and Worldwide servers. After the users log in successfully, for the next time log in, you can directly select the account number from the information of the phone remembered.

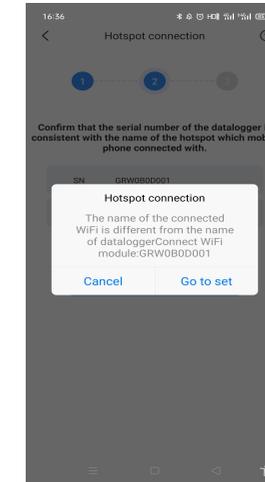
5.1 WiFi Configuration

- Choose a related power plant after adding the device (Note: a power plant is required to build before adding the EV Charger)
- Enter the serial number of the EV charger or scan the Bar/QR code to add the EV charger
- Select "WiFi" for network configuration
- Enable the "WLAN" in the setting and connect to the "WIFI" whose name is consistent with the serial number of the EV charger, then enter the WiFi password (default WiFi password is: 12345678) and click "next"
- Enter the WiFi name and password of your router (the connected WiFi is required 2.4GHz WiFi, and the network should be available), and then click "Next"
- Please wait 2-5 minutes and refresh the EV charger status to confirm whether the communication is successful

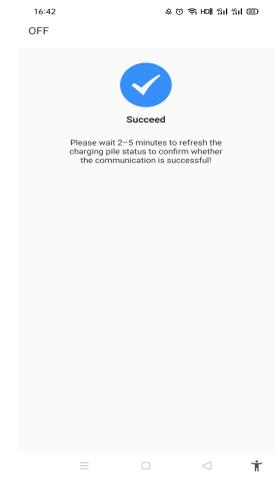
Note: If the EV charger has been configured before, then don't need to configure the network again.



(d)



(e)



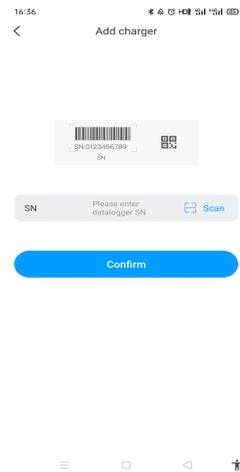
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Advanced Setting

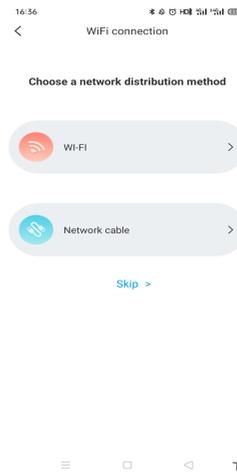
If the EV charger has an external current sensing device, then click the "advanced" in the WiFi configuration page, and choose the corresponding configuration (Choose the right brand of the meter type, Acrel or Easton)



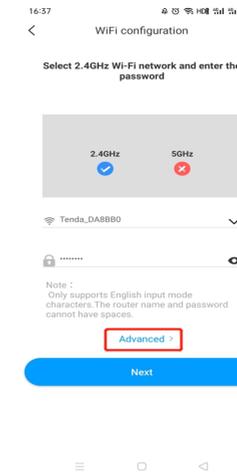
(a)



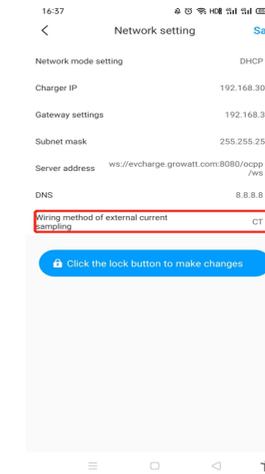
(b)



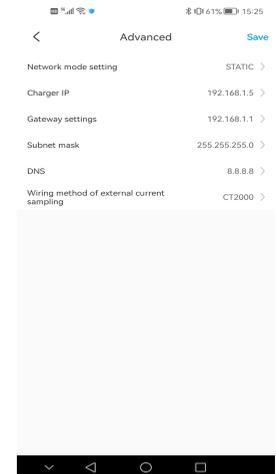
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(a)



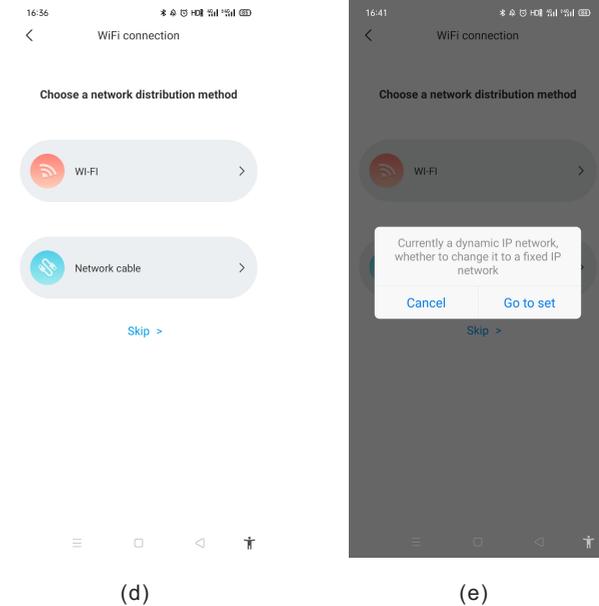
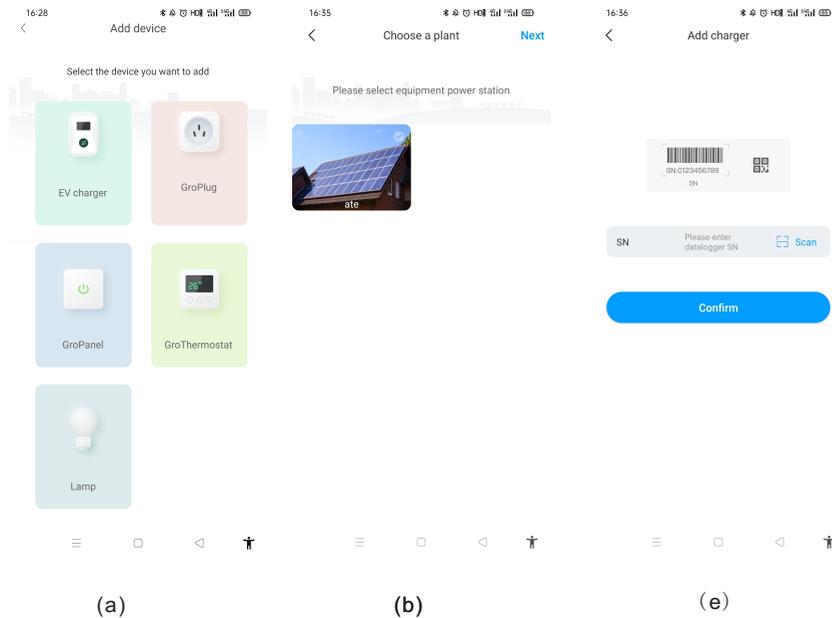
(b)



(e)

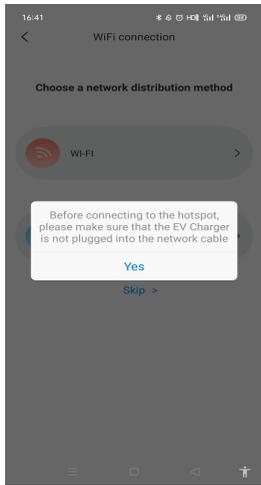
5.2 Network Cable Connection Configuration

- Choose a related power plant after adding the device (Note: a power plant is required to build before adding the EV Charger)
- Enter the serial number of the EV charger or scan the Bar/QR code to add the EV charger
- Select "Network Cable" for network configuration
- Click "cancel" and the network will be connected dynamically based on the dynamic IP mode.
- Waiting for 2-5 minutes which EV charger will refresh its status, and confirm whether the communication is successful

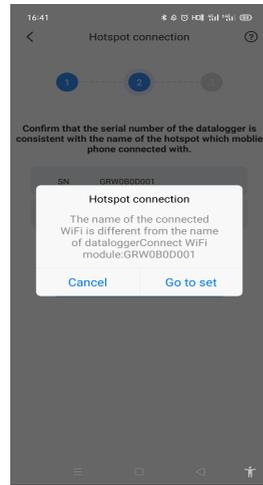


Note: If the users want to set the static IP mode

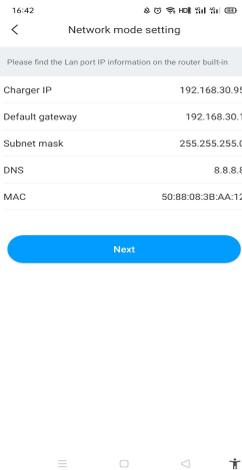
- Click "go to set" during (d) step and make sure the network cable is disconnected
- Do the hotspot connection, connect to the WiFi whose name is consistent with the series number of EV charger, and enter the default password:12345678
- Make sure the parameters of IP and gateway are the same as that of the router and click "next"
- Connect the network cable and wait for 2-5 minutes which EV charger will refresh its status, and confirm whether the communication is successful



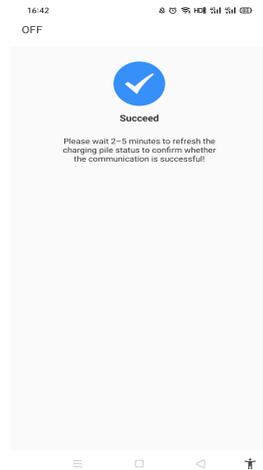
(a)



(b)



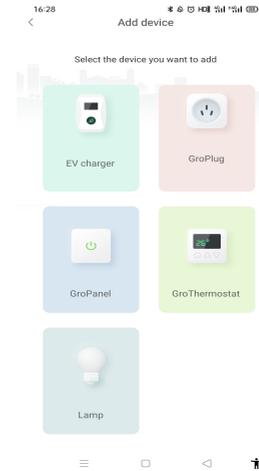
(c)



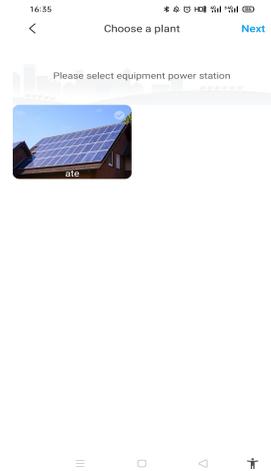
(d)

5.3 4G Configuration

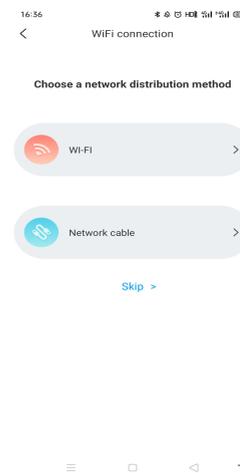
If the EV charger is a 4G model, then the user can click the “skip” directly during the page of network configuration methods.



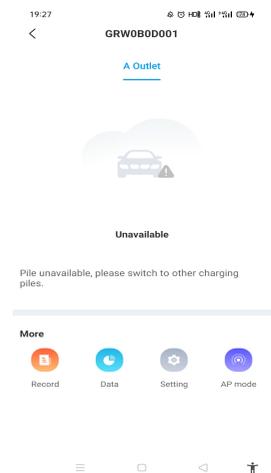
(a)



(b)



(c)

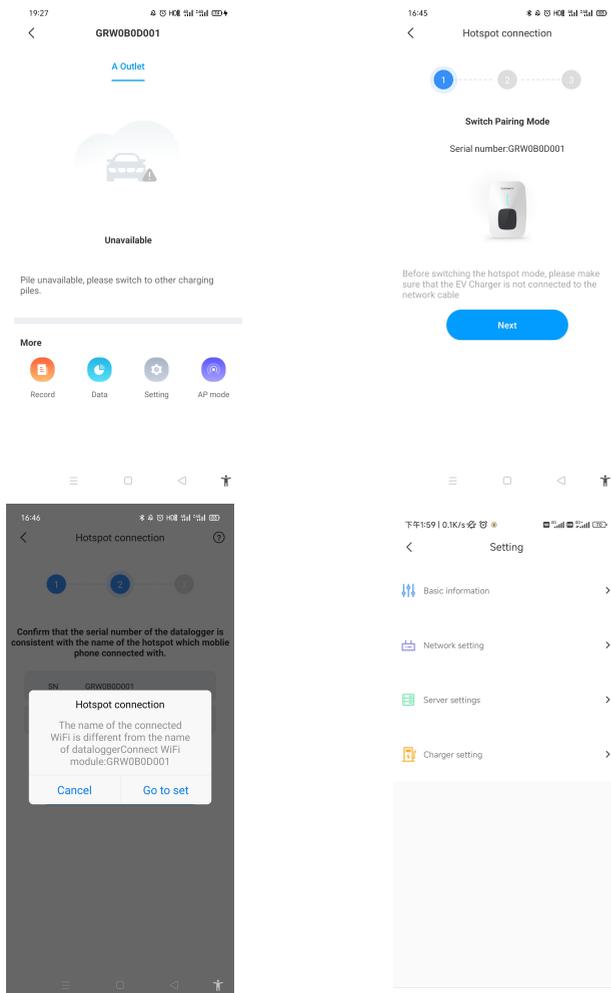


(d)

5.4 AP Mode Configuration

If the network connection is abnormal, the users can use the AP mode to reset the network or do some basic setting.

- Click the AP mode, and enter the hotspot connection, click "next" to switch to other pairing mode;
- Connect the WiFi whose name is consistent with the series number of the EV charger and click next;
- User can check the basic information, and do some basic parameters setting like network setting, server setting and EV charger setting
- After that, waiting for 2-5 minutes which the EV charger will refresh its status.



Note: Network setting; connect to wifi;
The wifi name and wifi password should be entered manually. Before entering the wifi name or wifi password, users should enter "000000" first and choose the item again to input the name or password of the wifi.

6. Parameter configuration

After installed and connected, the charging equipment must first be configured according to the actual needs of the user. The parameters are configured through the LCD touch screen. Save the change and exit then the charging equipment can be used normally.

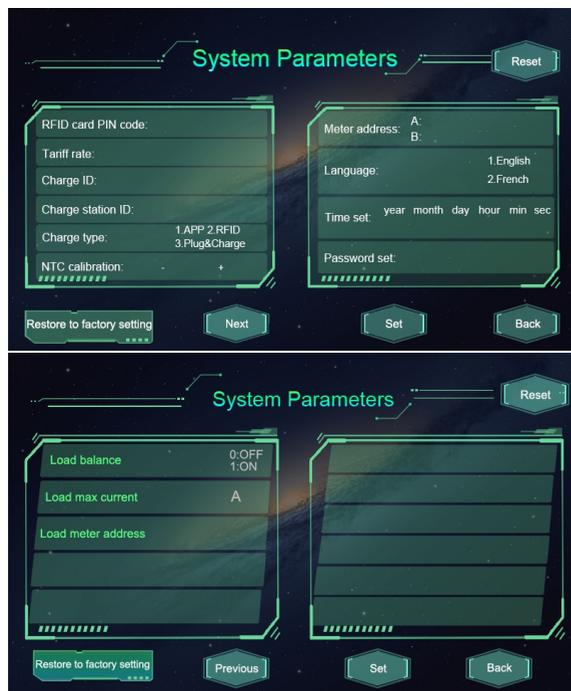


After the system enters standby, click the button marked by the red rectangle in the above figure to enter the system management page, as shown below.



System management page

6.1 System Parameters



System Parameters page

No.	Parameters	Function description
6	Meter address	DC meter's modbus address(already preset in factory, it is not allowed to modify)
7	Language set	Screen language Settings, integrated English and French
8	Time set	System time setting. Format is Y, M, D, H, M, S. The Year setting can only set the last 2 digits, e.g. use 19 for 2019.
9	Password set	Password of management page. It's a 4-digit fixed length password, default is "1234".
10	Load balance	Set the corresponding number, 1 means active, 0 means inactive.
11	Load max current	The value must be less than or equal to the total single-phase power of the grid.For example, set 10A, then the total power is 10A*230V*3=6.9kw.
12	Load meter address	The address of the external sampled power meter, check the address of the meter display.

After changing parameters, click the "Set" button to save the setting, then click the "Reset" button for the setting to take effect.

6.2 Network parameters

Network parameters need to be configured when the charging station needs to be connected to back office server for operation and management. Network parameters include server parameters and charger parameters. You can choose one of LAN, WiFi or 4G to connect to the network. 4G connectivity depends on your charger version.



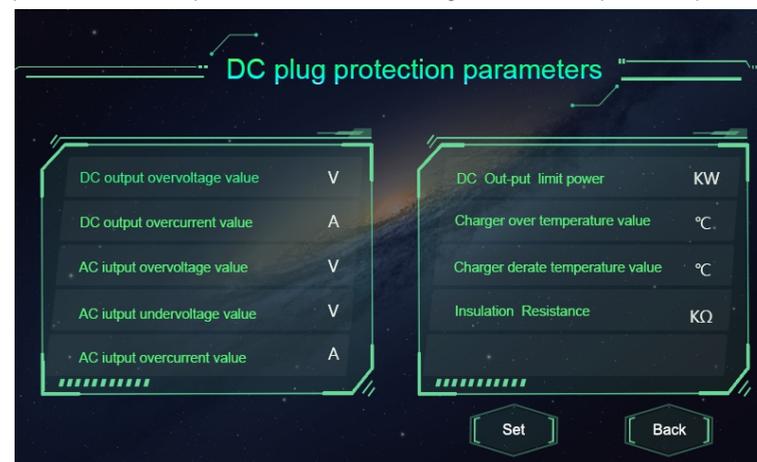
No.	Parameters	Function description
1	RFID Card PIN Code	PIN code setting of RFID reader, a 6-digit code, the default setting is 242007. It must be the same with the PIN code of user card. Users can also use other PIN code if they have card writer to change PIN code of user card.
2	Tariff rate	Charging tariff setting, used to set the price per kWh.
3	Charge ID	Charger ID, suggested touse serial number as charger ID.
4	Charge	Identification number of charging station. (one charging station may consist of multiple charging equipment).
5	NTC Calibration	Plug sensor temperature calibraPlug

6.1 System Parameters

No.	Parameters	Function description
1	Server URL1	Server address setting, used to set domain or IP address of back-office server.
2	Server URL2	Address of backup server. This parameter is not available now, reserved for future use.
3	Charger IP	The default IP address of the charger. You can change the IP address if you want to connect to an Ethernet network
4	Subnet mask	Subnet mask setting
5	Gateway	Gateway setting
6	DNS	DNS server address
7	MAC Addr	MAC address
8	WIFI SSID	WIFI SSID setting, to set the name of the wireless network to which the charging equipment is to be connected. A reserved function for future use
9	WIFI Key	WiFi password setting. A reserved function for future use
10	Authentication Key	OCP login authentication setting
11	4G APN	SIM card APN
12	4G user name	SIM card username
13	4G user pwd	SIM card password

6.3 Protection parameters

The protection-related parameters, such as voltage, current, temperature, power, etc.



No.	Parameters	Function description
1	DC output overvoltage	Over voltage limit setting of DC output
2	DC output overcurrent	Over current limit setting of DC output
3	AC input overvoltage	Over voltage limit setting of AC input
4	AC input undervoltage	Under voltage limit setting of AC input
5	AC input overcurrent	Over current limit setting of AC input
6	DC output limit power	Power limitation setting of DC output
7	Charger over temperature	Over temperature limit setting of charging connector
8	Charger derate temperature	Charging connector's temperature at which the charging equipment starts decreasing output power
9	Insulation Resistance	The min value of insulation resistance
10	Fan starting temperature	When the internal fan of the charger detects that the internal ring temperature is greater than the set temperature, the charger will start the fan, and when it detects that the temperature is less than the set temperature, the fan will not start.

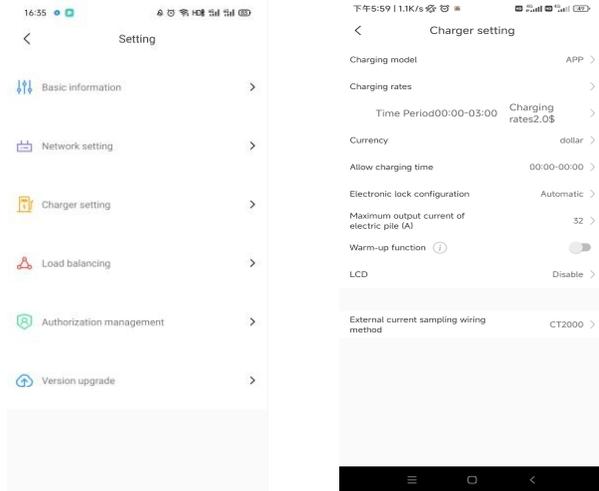
Note:

1. Do not modify the protection parameters without authorization.
2. To limit the output power, just set "DC output power".

7. Operation instruction and LCD description

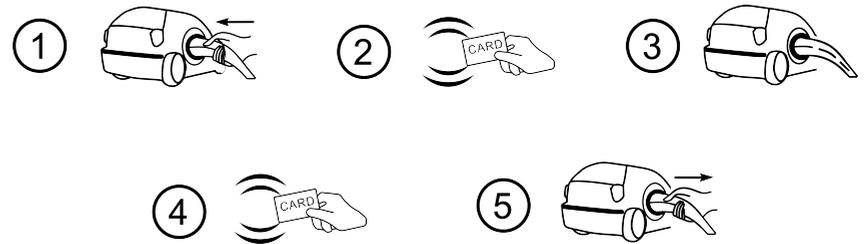
7.1 Charging mode and Operation

User can go to the "setting" page and click the "Charger setting", to set the charging activation way like APP, RFID, plug and charge.



RFIDmode:

Charging can only be initiated or ceased by swiping RFID card.



RFID mode operation process flow

Plug&Charge:

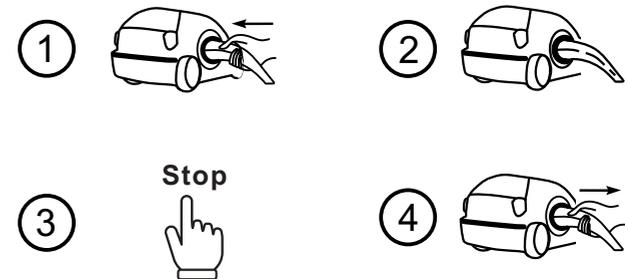
Charging will start automatically after EV plugged in.If you want to stop the charging,just press the forced on/off button on the side of the charger.

APP mode:

Initiate or cease charging by using APP. You can also use APP for reservations and choose the work mode you need.



APP mode operation process flow

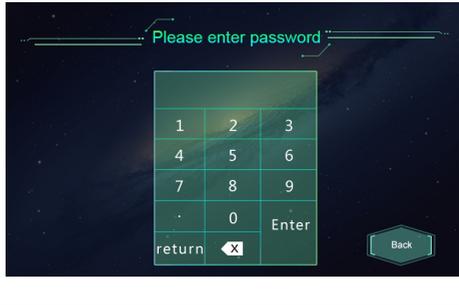
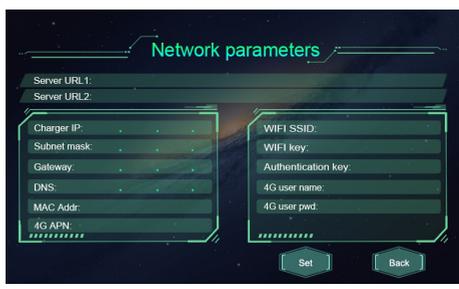


Plug&Charge mode operation process flow

7.2 LCD interface introduction

The charging equipment is equipped with a 7 inch industrial-grade resistor type touch panel. The display content is as below,

	<p>When powered up, the charging equipment will show this display</p>
	<p>Charging information, which will show the status of the charging equipment, such as standby, charging, fault, etc.</p>
	<p>Management page, user can set different kinds of parameters here. Password authentication is required when entering each parameter setting page.</p>

	<p>Password window. Before entering numeric, please first press the text display field to move the cursor there, then you can type in the 4-digit password. A wrong password will cause no response and action.</p>
	<p>System parameters page.</p>
	<p>Network parameters page, used to set network related parameters of back-office server and the charging equipment.</p>
	<p>Protection parameters page of DC output, used to set limit value of voltage, current, power, temperature, etc.</p>

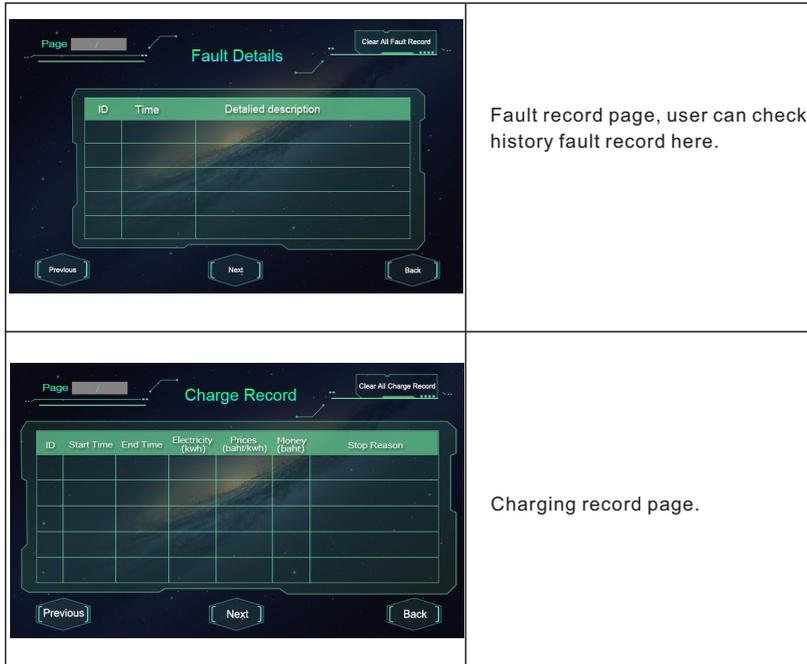
8. EV Charger WorkModes

8.1 Fast Mode

Plug & Charge

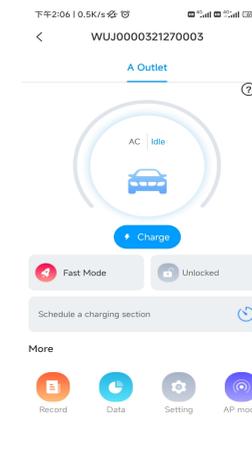
Click “charge” directly and the EV will be charged at maximum power coming from a renewable energy source or simply from the grid, especially quick if you’re in a hurry, and support multiple control strategies of timer, charging capacity, charging budget.

Note: the reservation function can only be set when the EV charger is in idle status



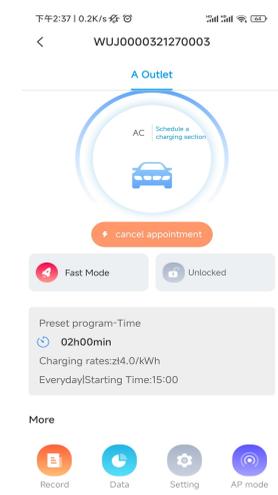
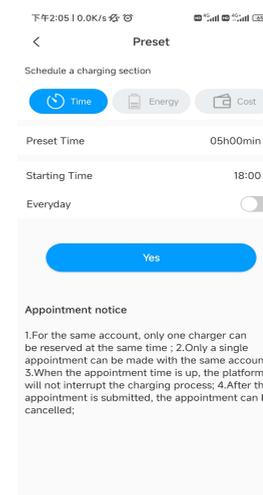
Fault record page, user can check history fault record here.

Charging record page.



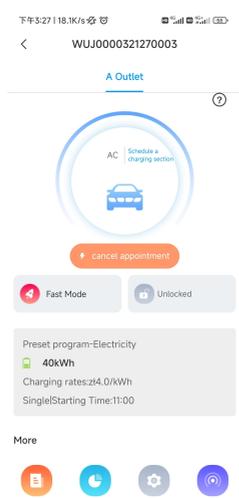
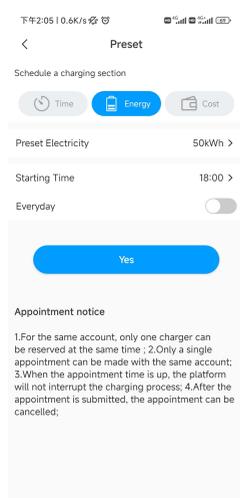
Time Reservation

It can be divided into charging time and charging period reservation, users can set when it will start to charge and how long the charging will continue, also can enable “every day” to make it work following that strategy to work all the time



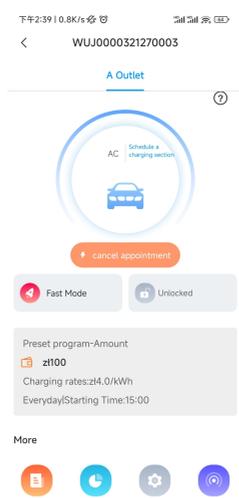
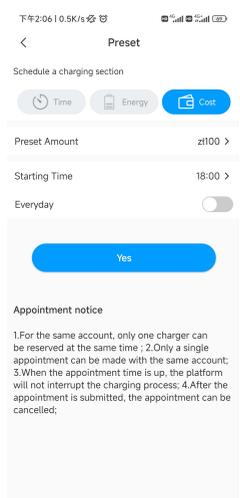
Charging Capacity Reservation

Users can set the target charging capacity(kWh) and the start time through clicking “energy”, and also can enable “every day” to make it to work following that strategy to work all the time



Charging Budget Reservation

Users can set the target charging budget and the start time through clicking the“cost”, and also can enable “every day” to make it to work following that strategy to work all the time



8.2 PV Linkage Mode

Introduction

Driven by solar, charge your car with renewable energy, the EV will be charged by the surplus solar power dynamically, combining PV and EV charger together to maximize the solar self-consumption rate and cut your bill.

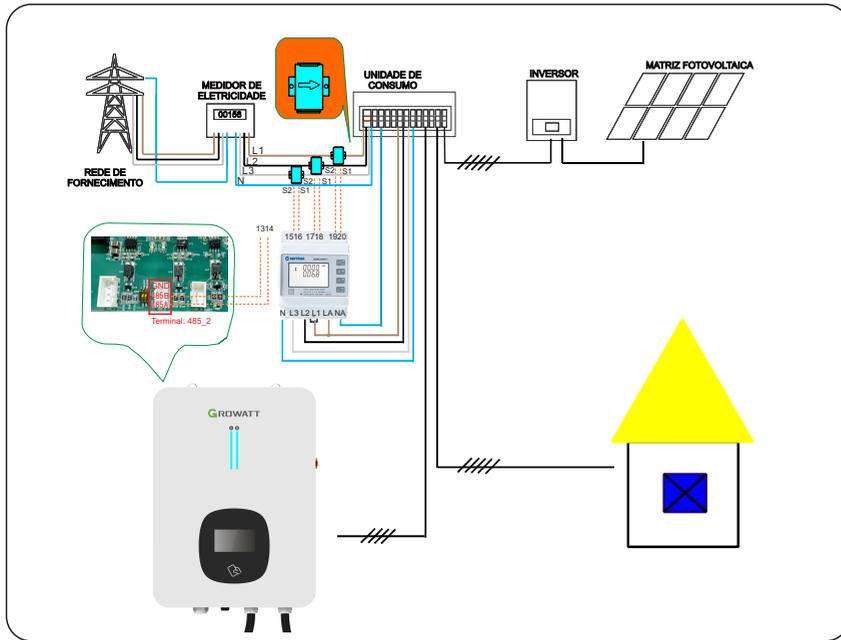
Note: Under the PV-Linkage mode, the EV charger will automatically start charging when the surplus solar power is sufficient.



Wiring

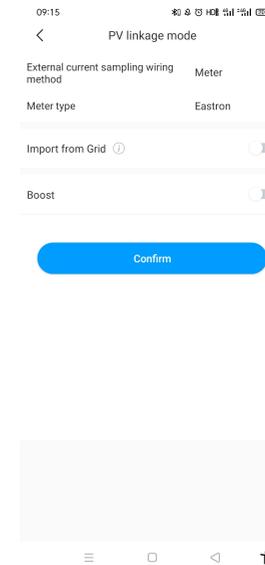
To monitor the real-time power import and export from the grid, meter is required for this function to work properly

The SDM630MCT ETL meter is used, please wire it as below.



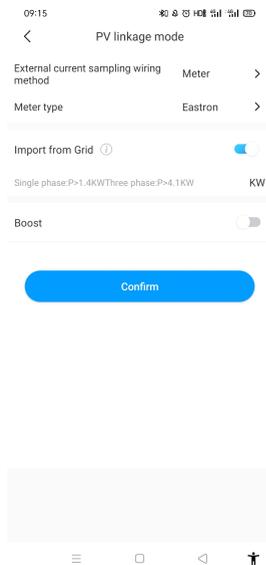
APP Operation

The PV linkage mode require the EV charger to connect with an external current sensing device, and choose the corresponding configuration *(Meter type, choose the right brand of the meter type, SDM630MCT ETL)



Function of importing from the grid

Enabling this function will require users to set a P value. When the surplus solar power is greater than the P value, then the charging power is equal to the surplus solar power. When the surplus solar power is less than the P value, then the charging power is equal to the P value, and grid power will offset the shortage part.

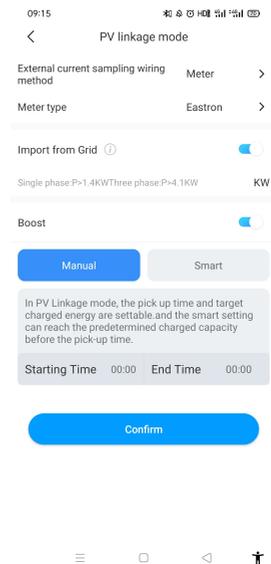


Boost Function

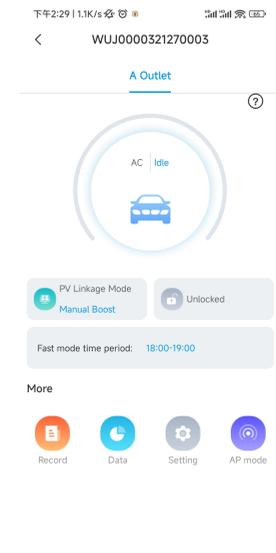
●Manual Boost Function

It is useful if users arrive home with an almost empty battery and users want to charge the EV quickly to ensure enough energy for a short trip when the solar energy is insufficient.

While users enable the manual boost function and set “start time” and “end time”, the EV charger will charge the EV at its max. power during a set period even drawing the power from the grid, after that, it will recover back to the normal PV linkage mode.



(a)



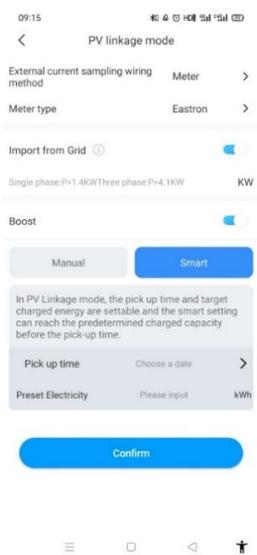
(b)

●Smart Boost Function

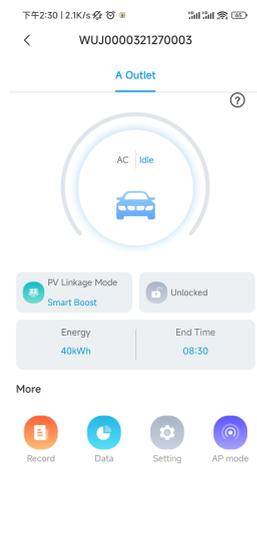
It's useful to guarantee EV's battery capacity before a set time when the solar energy is insufficient.

While users enable the smart boost function and set “Pick-up time” and “Preset electricity”, the EV charger will charge the EV with a target kWh figured by a set time, it may draw the power from the grid to guarantee the EV's battery capacity when the solar energy is insufficient.

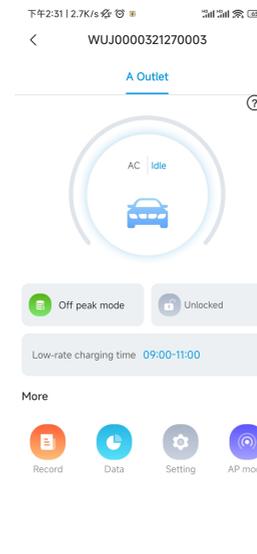
Example: if the users enable smart boost and set the “pick-up time” is 22:00, and “preset electricity” is 20kWh. In sunlight hours, the EV has been charged by surplus solar energy with the only 10kWh of charge accumulated, because users activated the smart boost, then the THOR EV Charger will automatically boost the charge to the required 20kWh by 22:00 even taking power from the grid.



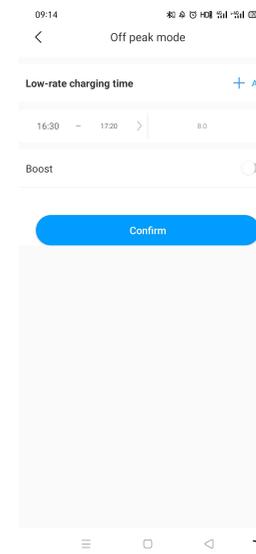
(a)



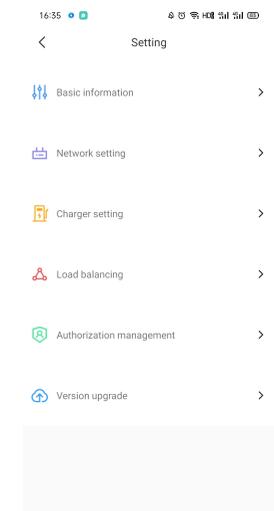
(b)



(a)



(b)



(c)

8.3 Off-peak modes

Introduction

Once enable the Off-Peak mode, the EV charger will automatically charge the EV when it's at off-peak time to reduce the electricity bill. Users also can customize their low-rate charging time in the off-peak mode page

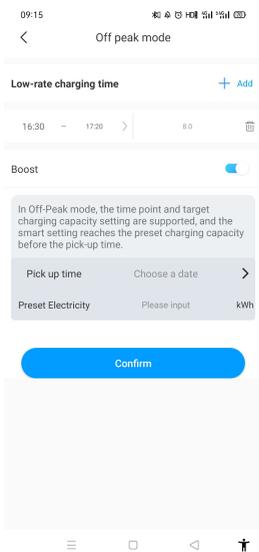
Note: Users need to input the charging rates in the setting page manually before enabling off-peak modes

Note: Under the Off-peak mode, the EV charger will automatically start charging at the low-rate charging time.

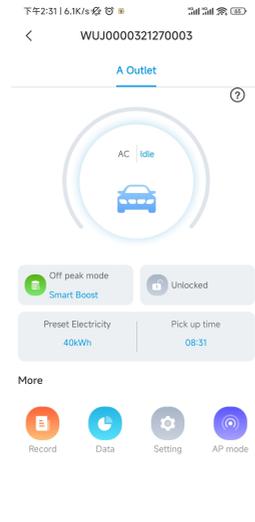
Smart Boost Function

It's useful to guarantees EV's battery capacity before a set time when the off-peak time is not long enough.

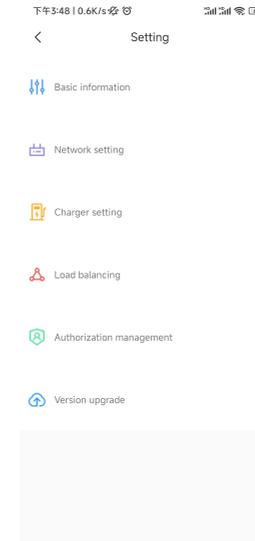
While users enable the smart boost function and set "pick-up time" and "preset electricity", the EV charger will charge the EV with a target kWh figured by a set time, it may draw the power from the grid to guarantee the EV's battery capacity when the off-peak time is not long enough.



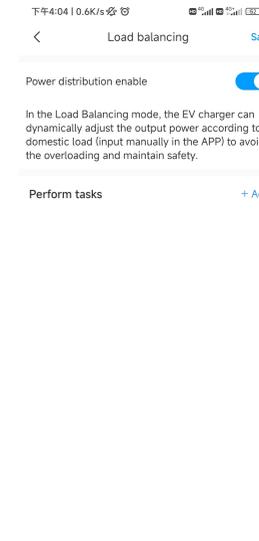
(a)



(b)



(a)

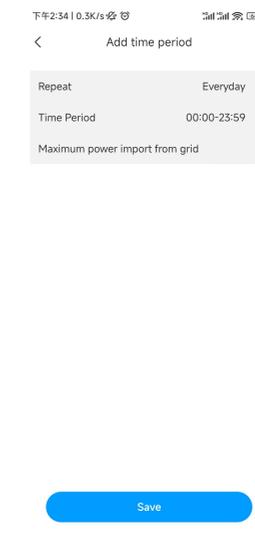


(b)

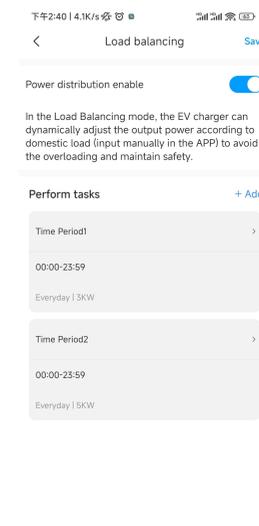
8.4 Load balancing function

The EV charger can read the incoming power to the house with an additional CT/Meter. Then the EV charger will adjust its charging power dynamically according to the home power to avoid exceeding the limited point, always charge your car at the maximum charging speed without triggering the power limitation.

Note: The load balancing function requires an external Meter, and please follow the wiring method of PV linkage mode.



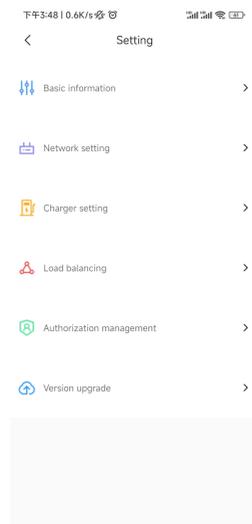
(d)



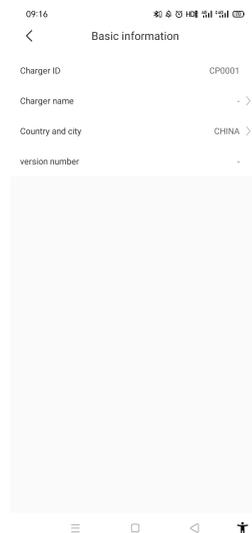
(e)

9. Other Settings

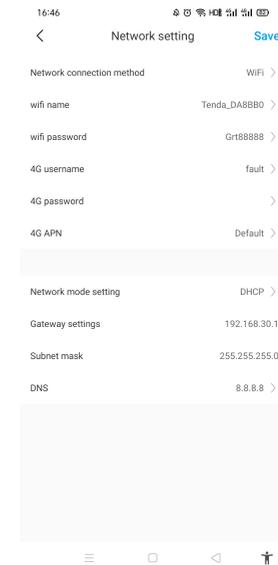
The setting page includes basic information, network setting, pile setting, load balancing and authorization management.



●Basic information: EV charger ID, EV charger name, country and city, version number.

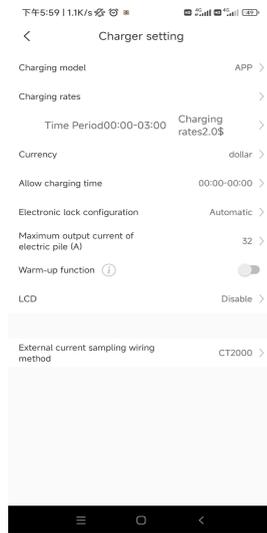


Network setting: network connection method, network mode setting, gateway settings, subnet mask, DNS address



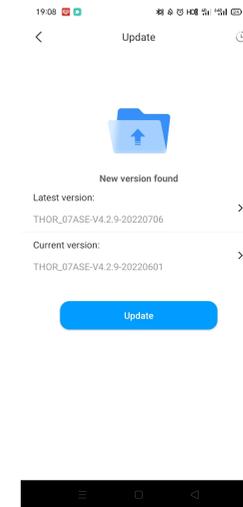
●Charger setting:

- 1) Charging activation: users can set the charging activation way like APP, RFID, plug and charge
- 2) Charging rates: users can set their charging fees, which could be used for the calculation of electricity cost and off-peak mode.
- 3) Currency:Users can set the currency to calculate the budget etc.
- 4) Allow charging time: user can use it to limit the time to use the EV charger.
- 5) Maximum output current of the EV charger: users can use it to limit the max. power output from the EV charger.
- 6) Warm up function:In the case of extremely cold weather,the EV mostly needs to preheat and defrost after starting.Once the warm-up function is enabled,when the EV is fully charged,the EV charger will preheat the EV,which can reduce battery consumption.
- 7) LCD:users can disable or enable the LCD.
- 8) External current sampling wiring method:When CT meter is used,the external current sampling wiring method should be CT2000 or CT3000.When direct connection meter is used,the external current sampling wiring method is METER.



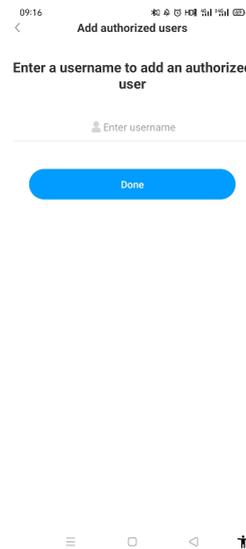
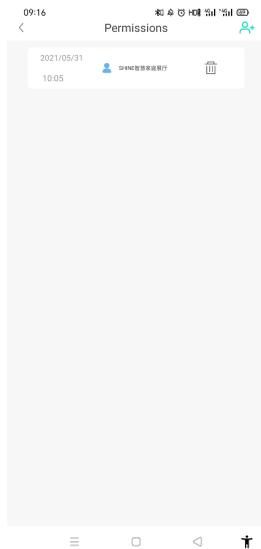
●Version upgrade

Users can check the latest version of the charger's firmware and the current version they are used now. If there is new version, users can upgrade by clicking the 'Upgrade'.



●Authorization management:

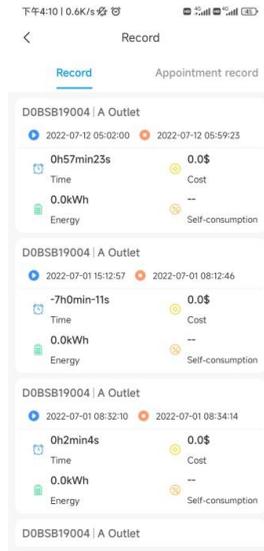
Permissions: it's useful for authorization management, add and authorize the other account which can use the EV Charger directly



10. Record

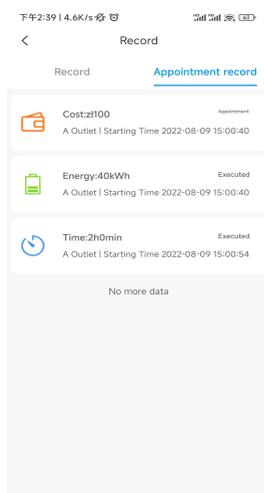
a)Charging record:

Display the serial number of the EV charger, number of the charging gun, start time, end time,charging time, charging cost, charging capacity, and self-consumption rate



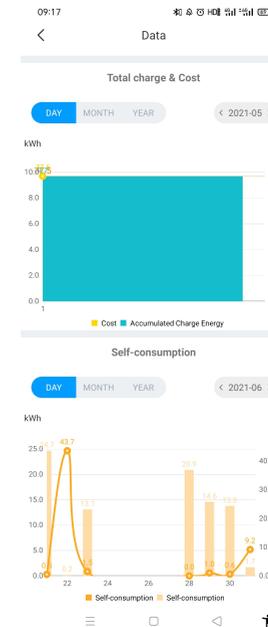
b)Appointment record:

Display the list of charging schedules that have been set before.



11. Data

The users can read the total charge capacity(kWh) and cost, also the self-consumption energy and rate by day, month, and year.



12. Configuration through internal web (Service Tool)

After the installation and wiring is done, connect the Charger to a computer and configure parameters via the web browser of the computer, then the Charger can be ready for use.

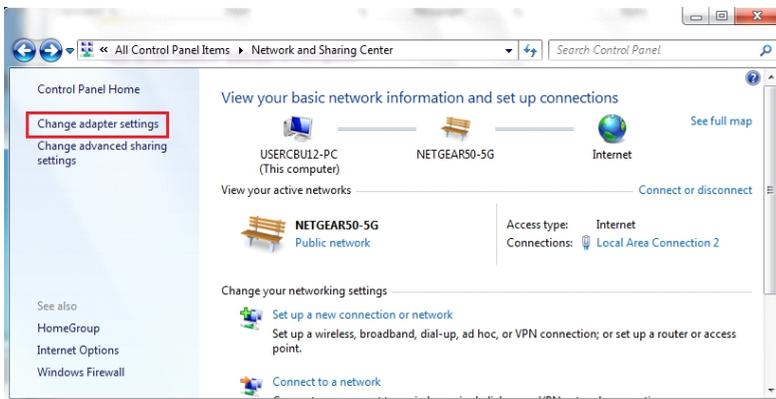
12.1 Set computer's IP

The Charger's default IP address is 192.168.1.5. To access the parameter setting interface, you'll need to first set the computer's IP to 192.168.1.x (x can be any value between 1 and 255 except for 5, e.g. 192.168.1.10).

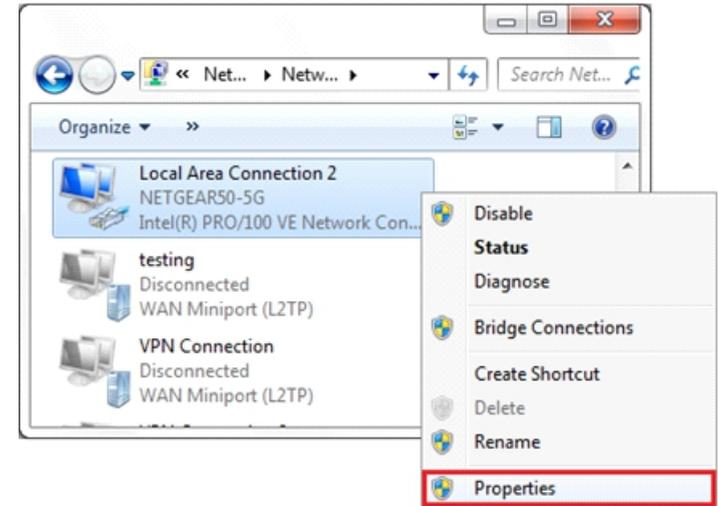
To set a static IP on your Windows computer:

1. Click Start Menu > Control Panel > Network and Sharing Center. (For Windows 8 and higher, search for and open Control Panel and select Network and Internet).

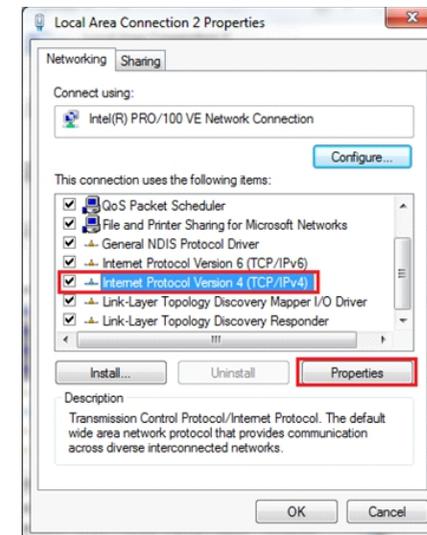
2. Click Change adapter settings.



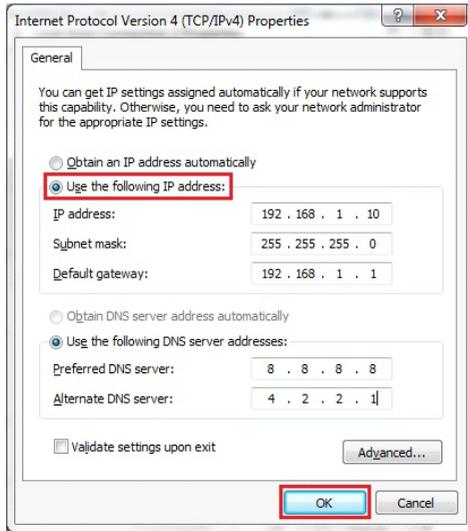
3. Right-click on Local Area Connection and click on Properties.



4. Select Internet Protocol Version 4 (TCP/IPv4) and click on Properties.

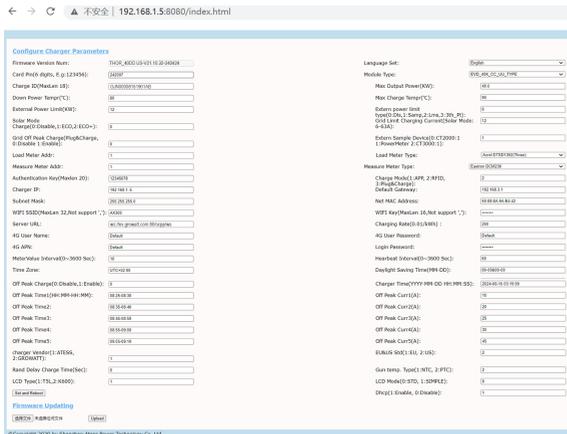


5. Select "Use the following IP address" and enter the IP address, Subnet Mask, Default Gateway. Click OK and close the Local Area Connection properties window.



12.2 Configure parameters

Connect the charger to a computer via a network cable. Open the web browser and type in <http://192.168.1.5:8080/> in the address field and click enter, then the parameter setting page of the charger will ask for a password and the password is 12345678. It is recommended that you change your password immediately after logging in for the first time. Parameter setting can only be done via web browser on a computer. It is suggested to use IE or Firefox, other browser might have compatibility problem.



Overview of Parameter setting page

Explanation of parameters:

(1) Firmware version of the Charger. This item cannot be modified here on the setting page.



Fig.1

(2) PIN of the charger, used to verify the PIN of user card. To use a RFID card with the charger, their PIN must be consistent. If the user card has a different PIN, then it cannot be used on this charger. The default PIN setting of the charger is 242007.



Fig.2

(3) Charger ID, this is the unique identification of the Charger. If the charger is to be connected to Growatt back-office server, this ID must be set as the serial number on the nameplate of the Charger. Otherwise the Charger cannot be registered on the server.



Fig.3

(4) The temperature protection value of the charger is not allowed to be modified without authorization.



Fig.4

(5) Load balancing sets the total current input of the home grid to avoid tripping. The current is calculated single-phase.

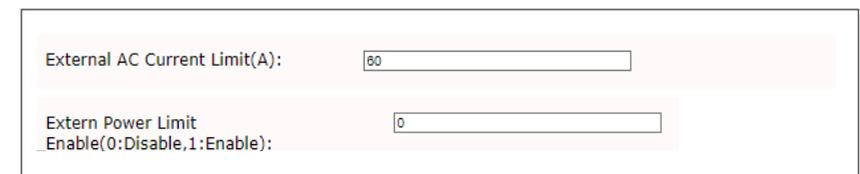


Fig.5

(6) To set the working mode of solar, the ECO mode requires setting the KWH of electricity obtained from the grid.

Grid Limit Charging Current(Solar Mode: 0-63A):

Solar Mode Charge(0:Disable,1:ECO,2:ECO+):

Fig.6

(7) Set the load balancing or Solar function, sampling instrument type and address.

Extern Sample Device(0:CT2000:1 1:PowerMeter 2:CT3000:1):

Load Meter Addr:

Load Meter Type:

Fig.7

(8) Open the function, the user's home meter provides dry contact signal, identify the off-peak period, reduce the charge of electricity.

Grid Off Peak Charge(Plug&Charge, 0:Disable 1:Enable):

Fig.8

(9) The charger built-in metering meter, keep the default value.

Measure Meter Addr:

Measure Meter Type:

Fig.9

(10) Server URL is to set the domain name or IP address of the back office server to be connected.

The domain name of Growatt server is "ws://ev.growatt.com:80/ocpp/ws";

IP address is "ws://192.168.1.5:8080/ocpp/ws".

Authentication Key and Heartbeat Interval is used for testing and no need to reset.

Authentication Key(MaxLen 20):

Server URL:

Heartbeat Interval(0~3600 Sec):

Fig.10

(11) Charger IP. The default IP is 192.168.1.5. It is not suggested to change the default IP. If you have changed the default IP and forgot the new IP, you can reset the charger to factory setting by long press the reset button(the reset button on control board, not the red emergency stop button) until the charger reboot. Then you can use the default 192.168.1.5 for access.

Please note: After restoring the charger to factory setting, you'll need to reset the charger ID(same as serial number, can be found on the nameplate sticker) and server url, otherwise the charger won't be connected to the back-office server.

Charger IP:

Fig.11

(12) Charger Subnet mask. The default value is 255.255.255.0. It is not suggested to change. If the subnet mask has been reset to other value and you have forgotten the new value, you can restore the charger to factory setting by long press the reset button.

Subnet Mask:

Fig.12

(13) WiFi SSID(wireless network name) and WiFi Key(WiFi password) is used for WiFi connection.

WiFi SSID(MaxLen 32,Not support ','):

WiFi Key(MaxLen 16,Not support ','):

Fig.13

(14) 4G connection, when the 4G network cannot be connected, login SIM card APN and other information.

4G User Name:

4G APN:

4G User Password:

Fig.14

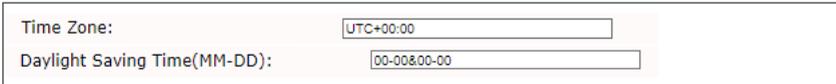
(15) Interval for uploading metering data during charging, keep the default value.



MeterValue Interval(0~3600 Sec):

Fig.15

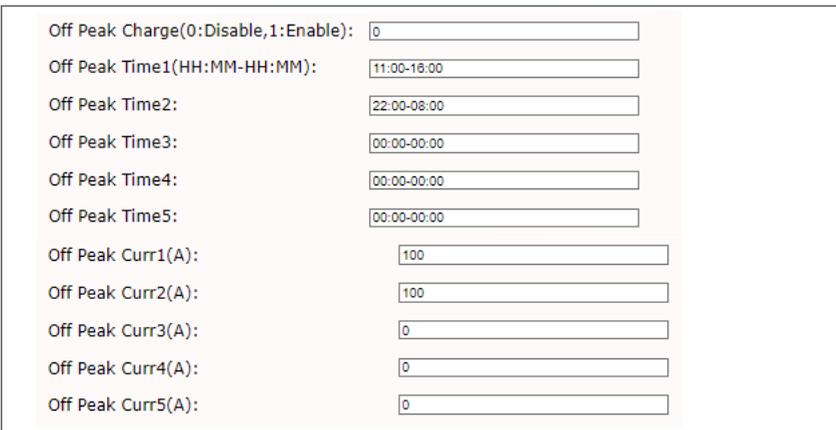
(16) Time of the charger. Set according to the local time. After the charger is connected to back-office server, the time will be synchronized with the server's time. If the charger has no server connection, then you'll have to reset the time every time you turn off and back on the charger.



Time Zone:
Daylight Saving Time(MM-DD):

Fig.16

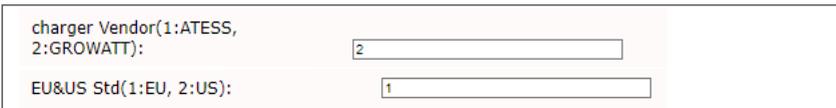
(17) Set low electricity prices for charging time to reduce costs.



Off Peak Charge(0:Disable,1:Enable):
Off Peak Time1(HH:MM-HH:MM):
Off Peak Time2:
Off Peak Time3:
Off Peak Time4:
Off Peak Time5:
Off Peak Curr1(A):
Off Peak Curr2(A):
Off Peak Curr3(A):
Off Peak Curr4(A):
Off Peak Curr5(A):

Fig.17

(18) The charger vendor and standard, can not be modified, factory default.



charger Vendor(1:ATESS, 2:GROWATT):
EU&US Std(1:EU, 2:US):

Fig.18

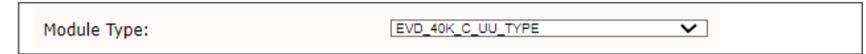
(19) Random delay charging, start charging at any time within the time period.



Rand Delay Charge Time(Sec):

Fig.19

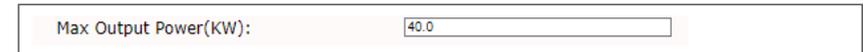
(20) The charger model, can not be modified, factory default.



Module Type:

Fig.20

(21) The maximum power of the charger. Modify the parameters to limit the output power of the charger.



Max Output Power(KW):

Fig.21

(22) Charging mode setting. 1: APP/RFID mode; 2: RFID mode; 3: Plug&Charge mode.



Charge Mode(1:APP, 2:RFID, 3:Plug&Charge):

Fig.22

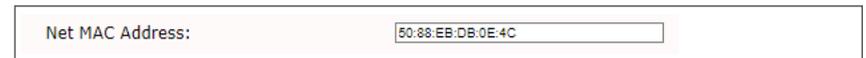
(23) Charger gateway. The default value is 192.168.1.1. It is not suggested to change. If the gateway has been reset to other value and you have forgotten the new value, you can restore the charger to factory setting by long press the reset button.



Default Gateway:

Fig.23

(24) MAC address. This is the MAC address used for LAN cable connection. If the charger is connected to Growatt back-office server via LAN cable and the router has MAC access control, then you can put this MAC in the router to allow the charger to access server



Net MAC Address:

Fig.24

(25) Charging fee per unit of electricity.

Charging Rate :

Fig.25

(26) Login password is used for web page login parameter settings,the default password is 12345678.We recommend that you change your login password in time.

Login Password:

Fig.26

(27) Set daylight saving time for the charger to switch automatically.

Daylight Saving Time(MM-DD):

Fig.27

(28) After setting the parameters, click the "button" to save the Settings and the charger will reboot.

Fig.28

(29) Choose correct firmware click "Upoad",charger upgrade automatically and reboot.

Firmware Updating

未选择任何文件

Fig.29

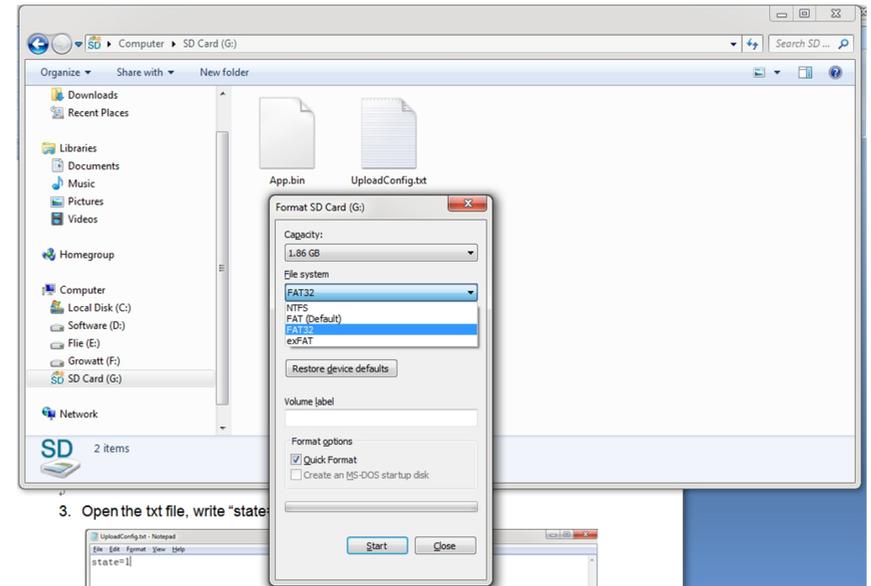
12.3 Update by SD card

There are 2 ways to update firmware for EV charger

1. Update by SD card
2. Update on parameter setting page

The firmware file must be named as "App.bin".

1. Prepare a micro SD card with capacity not greater than 4G. Format the SD card using FAT32.



3. Open the txt file, write "state"

2. In the root directory of the SD card, rename the firmware file as "App.bin". And create a txt file with name of "UploadConfig.txt".

App.bin	2018/12/5 15:58	BIN 文件	168 KB
UploadConfig.txt	2018/12/6 15:04	文本文档	0 KB

3. Open the txt file, write "state=1" in it and save the file.



4. Insert the SD card into the charger, turn off and back on the charger, the update will start automatically. The indicator will first flash red and then flash green with a long beep as the end of the update(sometimes the beep sound may not be clearly heard). After the update is done, turn off the charger and remove the SD card.

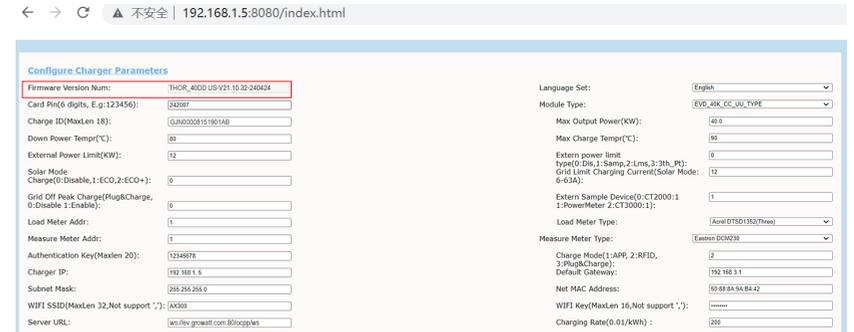


Micro SD slot of 40kW charger

5. Check the current FW version on LCD or the parameter setting page.

To check FW version on the parameter setting page

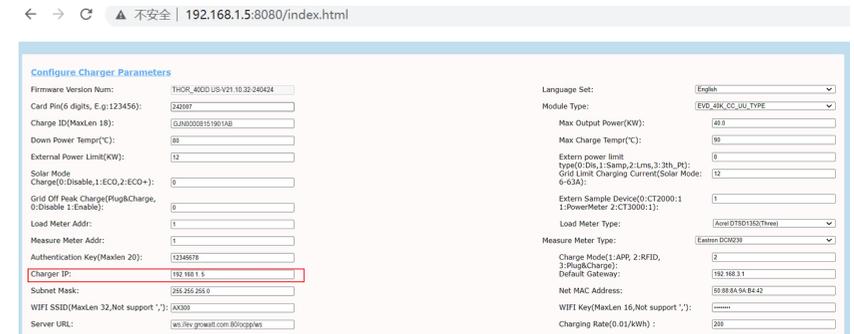
Connect the charger to computer via a network cable, the computer's IP must be within the 192.168.1.x segment(x is any value between 1 and 255 except 5).Open the web browser, type in the charger's default IP of "http://192.168.1.5:8080" and click enter, then you can check the firmware version on the appeared parameter setting page.



12.4 Update on parameter setting page

Using this method for update doesn't require any specific name for the firmware file.

1. Connect the charger to a computer with IP address set as 192.168.1.x(x can be any value between 1 and 255 except 5) via a network cable. Open web browser and type in the charger's default IP address—http://192.168.1.5:8080, click enter then you'll get into the parameter setting page.



2. Click the "Browse" button and select the firmware file. Click "Upload", then update will start automatically.

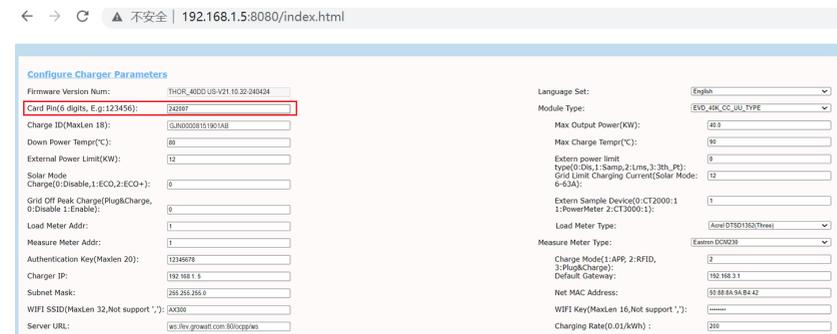
13. Troubleshooting

13.1 Fault list



During the update, the LED indicator will behave as below,
 First flash red and goes out with a short beep sound, during this period the firmware file is transmitted to the charger’s flash memory from the computer;
 Then flash red again for some seconds and quickly change to green light flashing. During this period, the charger is updating the firmware to its micro controller.
 When the greenlight goes out, there will be a long beep sound. That means the firmware is successfully updated.
 The beep sound may not be audible with the front cover fixed on the charger.
 If the update doesn’t start after click “Upload”, Turn off and back on the charge to try again.

. You might see below content. If the charger is already successfully reboot after the firmware update, close the browser and open it again to check the current firmware version.



No.	Fault description
1	Emergency stop is pressed!
2	RFID communication fault!
3	Over temperature fault!
4	Lightning protection fault!
5	Power module communication fault!
6	Power meter communication fault!
7	DC output overvoltage fault!
8	DC output overcurrent fault!
9	Waiting for BMS communication timeout!
10	Insulation detection timeout!
11	Insulation detection fault!
12	Battery voltage reverse fault!(CP fault)
13	DC+ Contactor sticking fault!
14	DC- Contactor sticking fault!
15	Plug line disconnection fault!
16	Plug head connection over temperature fault!
17	AC Contactor sticking fault!

18	AC Input Overvoltage!
19	AC Input Undervoltage!
20	BMS communication fault!
21	Door is opened
22	Fan working fault

13.2 Firmware update fails

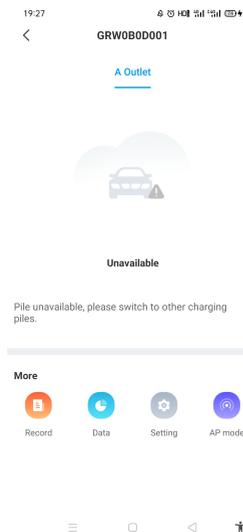
13.2.1 Firmware update failure with SD card:

- Check if the capacity is over 4G bytes, please use a SD card of less than 4G to retry;
- Check if the SD card is formatted with FAT32;
- Check if the firmware file is renamed as App.bin;
- Check if you have filled in "state=1" in the UploadConfig.txt file.

13.2.2 Firmware update failure with laptop:

Please try with IE browser. Or reboot the laptop to retry.

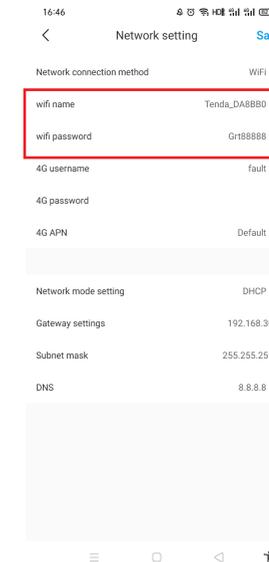
13.3 WiFi connection&APP issue



a. Please check and input the correct WiFi SSID and password to retry;

Load Meter Addr: 1	Load Meter Type: Acrel DTSD1352(Three)
Measure Meter Addr: 1	Measure Meter Type: Eastron DCM230
Authentication Key(MaxLen 20): 12345678	Charge Mode(1:APP, 2:RFID, 3:Plug&Charge): 2
Charger IP: 192.168.1.123	Default Gateway: 192.168.1.1
Subnet Mask: 255.255.255.0	Net MAC Address: 50:88:C0:32:CE:31
WiFi SSID(MaxLen 32,Not support ','): TP-CDZ	WiFi Key(MaxLen 16,Not support ','): *****
Server URL: ws://cpouk.swarco.com:8080/CPMaster/ocpi	Charging Rate : 200
4G User Name: Default	4G User Password: Default
4G APN: Default	Login Password: *****

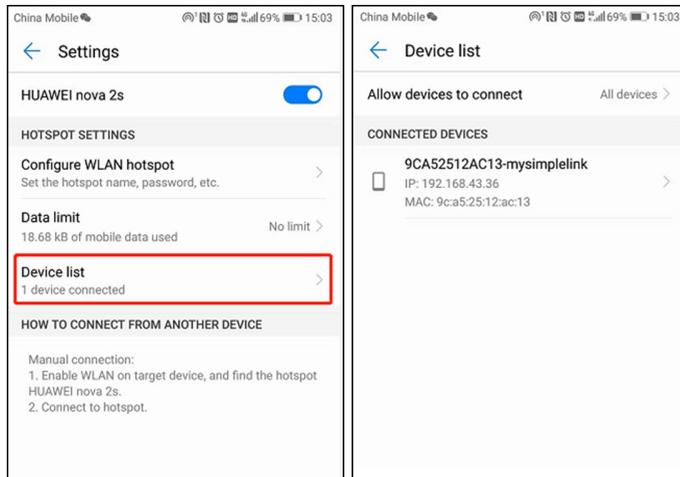
If you check the WiFi setting on the APP, please turn off and back on the charger and connect your mobile to the WiFi emitted by the charger for checking and setting.



b. Check if there is access control in the router, e.g. MAC filtering, port blocking, etc.

To verify this, you can use your mobile phone to create a hotspot and try to connect the charger to this mobile hotspot. If charger can connect to the hotspot, but cannot connect to the router, there must be access control in the router, please check with the site owner for this.

Check if charger is connected on Device list of the hotspot setting page



d. 1. Some routers have 2 WiFi, one is 2.4GHz, the other is 5GHz. Most homes just use the 5GHz WiFi as their default WiFi. But the charger can only connect to the 2.4GHz WiFi. So if the charger can connect to your mobile phone hotspot, but cannot connect to the home WiFi. Please check with the home owner or check on their router to see if you are using the 5GHz WiFi. Please do use the 2.4GHz WiFi for charger connection.

2. When the WiFi signal strength is lower than -75dbm, the charging point will not be able to connect with WiFi.

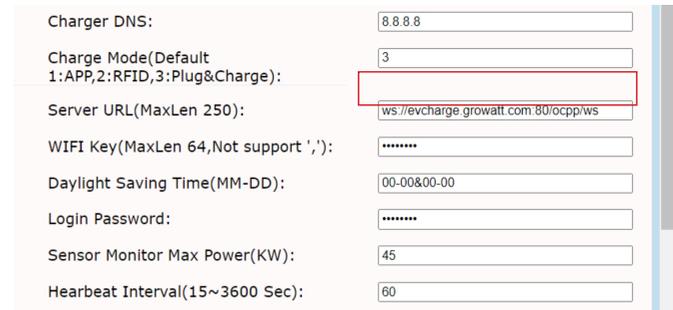
(1) Download the WiFi signal strength test tool from the app store to check whether the WiFi signal strength connected to the charging point is greater than -75dbm.

(2) If the WiFi signal strength is weak, it is recommended to use AP repeater to increase the signal strength, which can enlarge the WiFi signal range.



d. Check if the charger is still connected to the computer. Please unplug it from computer otherwise the charger won't connect to the back-office server.

e. Check if server address is correct in the "Server URL" field. The correct setting is : ws://evcharge.growatt.com:80/ocpp/ws



12.4 Cannot access parameter setting page

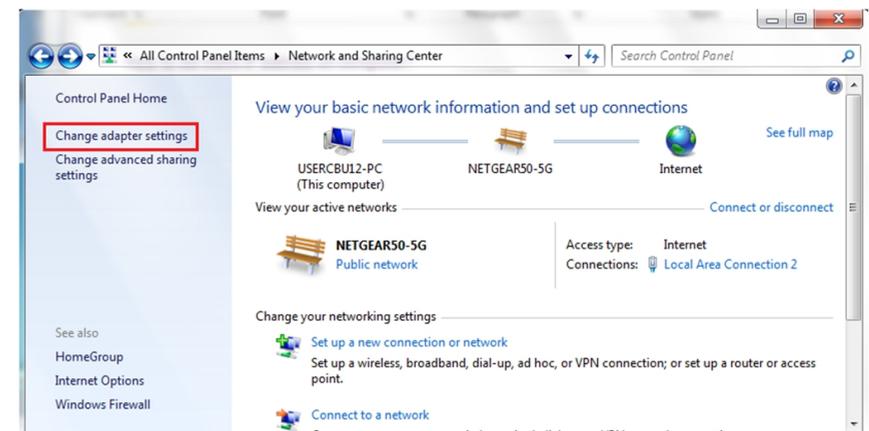
a. Check if you have connected the charger to your computer,

b. Check if you have change the computer's IP to 192.168.1.x(x can be any value between 1 and 255 except 5).

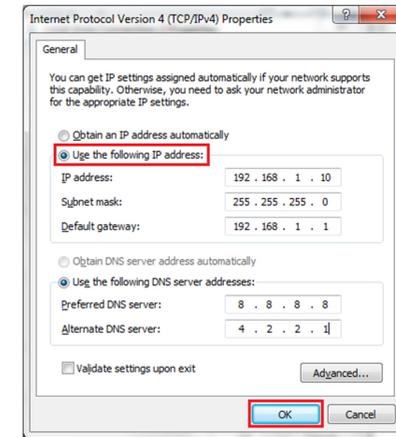
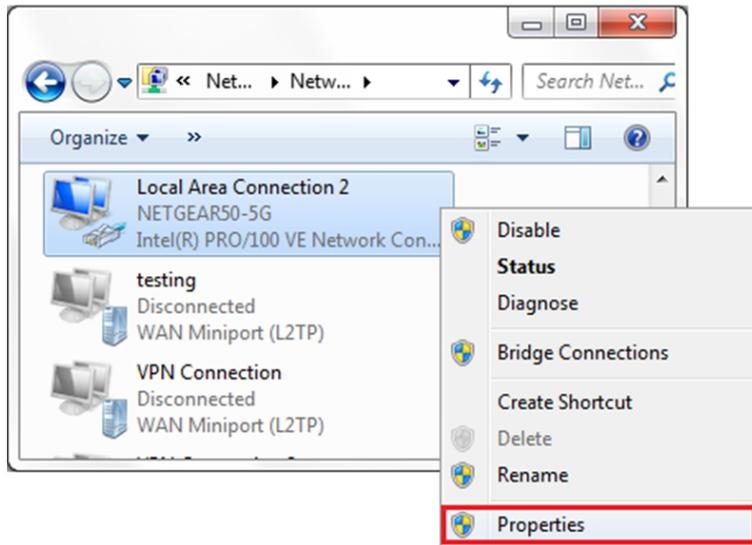
To set a static IP on your Windows computer:

(1). Click Start Menu>Control Panel>Network and Sharing Center. (For Windows 8 and higher, search for and open Control Panel and select Network and Internet).

(2). Click Change adapter settings.



(3). Right-click on Local Area Connection and click on Properties.



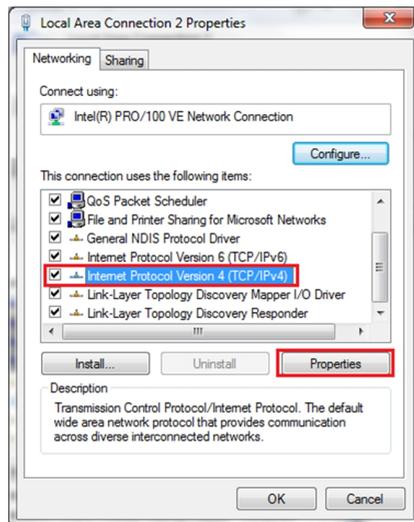
c. Check what web browser is being used, it's suggested to use Firefox or IE, Chrome cannot be used to update firmware.

d. Check if you have input the complete content, which is `http://192.168.1.5:8080`, in the address field, do not leave out the `http://` or the `:8080`.

e. Sometimes you may need to restart the charger to access its parameter setting page.

f. If you have changed the charger's IP to other value and cannot remember, you can restore the charger to factory setting by long press the reset button. Then you can access it using `http://192.168.1.5:8080`

(4). Select Internet Protocol Version 4 (TCP/IPv4) and click on Properties.



Reset button

(5). Select "Use the following IP address" and enter the IP address, Subnet Mask, Default Gateway. Click OK and close the Local Area Connection properties window.

Please note: After restoring the charger to factory setting, you'll need to reset the charger ID and server URL, otherwise the charger won't be connected to the back-office server.

14. Specification

Model	THOR 40DD-P US
Dimension(mm)	632*858*300(W*H*D)
Weight(kg)	90kg
Display	LCD
Casing material	Stainless steel&acrylic sheet
AC input	
Grid connection	208V/240V/480V (L1,L2,L3,PE)
Voltage	AC 180~528V
Current	110A/102A/51A
Frequency	60Hz
DC output	
Plug type	CCS1
Voltage	DC200~1000V
Current	0~100A
Voltage-stabilizing accuracy	<±0.5%
Current-stabilizing accuracy	<±1%
Power factor	≥0.98
Efficiency	≥95%

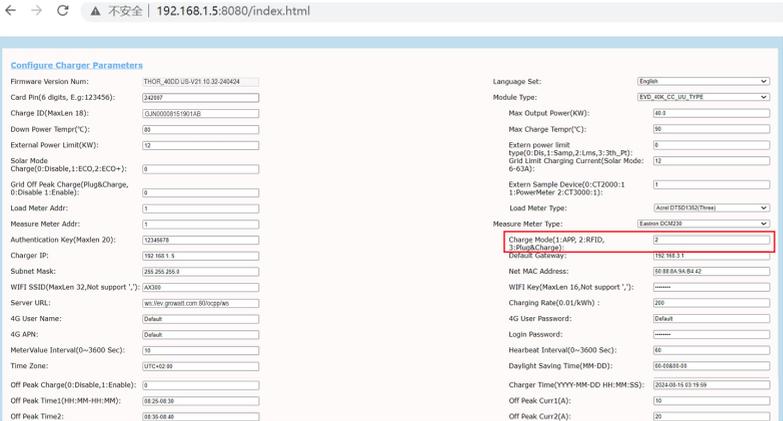
13.5 Charging issue

- If charging cannot start after the car is plugged in,
- Check if the red emergency stop button is pressed.
 - Check what charge mode is being used

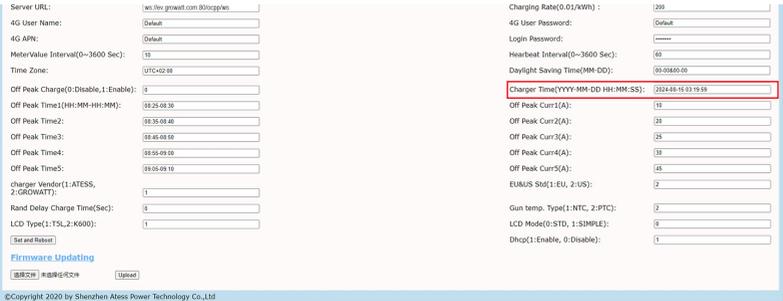
APP : Charge can only be started/stopped by APP or RFID card, and the charger must be connected to the back office server already;

RFID: Charge can only be started/stopped by RFID card;

Plug and charge: Charge will start automatically when car is plugged in.



- Check if off-peak charging is set and if charger's time is correct.
- If off-peak charging is set, charge can only start within the charging allowed time period.



15. Electric diagram

Ingress protection	NEMA 3R
Operating temperature	-13°F~122°F, derate since 122°F
Relative humidity	5%~95%
Altitude	≤2000m, derate for higher than 2000m
Cooling method	Forced air cooling
Remote monitoring	Ethernet/WIFI/4G/485/232
Payment	APP/RFID/Plug&Charge
Standby power	40W
Standards	UL2202, UL2231, ISO15118, FCC part 15B
Mounting	Wall or Pole
Certificate	CSA, UL, FCC
Metering accuracy	0.5
Protection features	
Over/Under voltage of AC output	YES
Over voltage of DC output	YES
Over temperature protection	Derate since 122°F
Emergency stop protection	YES
Lightning protection	Type II

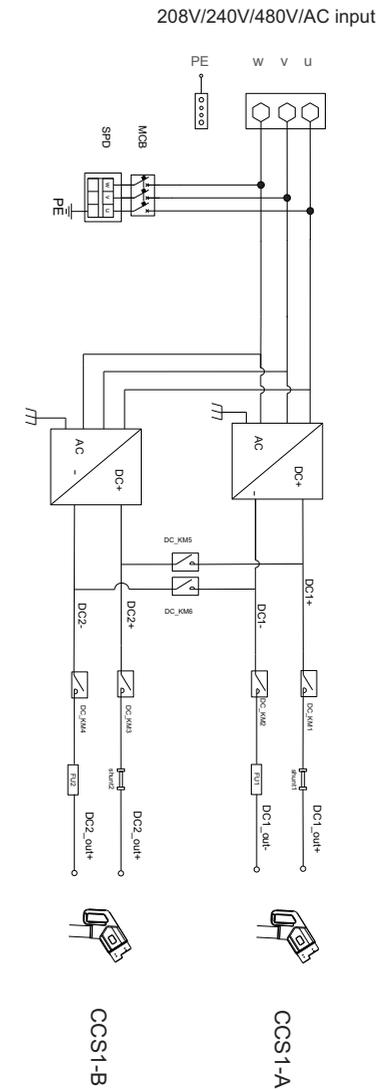


Fig7-1 Main circuit diagram

13.2 Warning and safety marks Label description

WARNING

This device is intended only for charging vehicles not requiring ventilation during charging.

THE SUITABILITY OF THE USE OF FLEXIBLE CORD IN ACCORDANCE WITH CE CODE, PART I, RULE 4-012, IS TO BE DETERMINED BY THE LOCAL INSPECTION AUTHORITY HAVING JURISDICTION.

To avoid a risk of fire or electric shock, do not use this device with an extension cord.

Risk Of Explosion. This Equipment Has Internal Arcing Or Sparking Parts Which Should Not Be Exposed To Flammable Vapors. It Should Not Be Located In A Recessed Area Or Below Floor Level.

Automatic CCID reset provided.

CAUTION

Risk of electric shock. Do not remove cover or attempt to open the enclosure. No user serviceable parts inside. Refer servicing to qualified service personnel.

AVERTISSEMENT

Ce dispositif est destiné au chargement des véhicules ne nécessitant pas de ventilation au cours du chargement C'EST À L'AUTORITÉ LOCALE COMPÉTENTE EN MATIÈRE D'INSPECTION QU'INCOMBE DE DÉTERMINER SI UN CORDON SOUPLE PEUT ÊTRE UTILISÉ CONFORMÉMENT À L'ARTICLE 4-012 DU CCÉ, PREMIÈRE PARTIE

Pour réduire le risque de choc électrique ou d'incendie, ne pas utiliser de rallonge avec cet appareil

Risque d'explosion. L'appareil comporte des pièces internes pouvant produire des arcs électriques ou des étincelles qui ne devraient pas être exposées aux vapeurs inflammables. Cet appareil ne devrait pas être encastré ni installé sous le niveau du sol

Réinitialisation CCID automatique fournie.

ATTENTION

Risque de choc électrique. Ne pas retirer le couvercle ni essayer d'ouvrir le boîtier. Aucune pièce interne réparable par l'utilisateur. Confier tout travail d'entretien ou de réparation à un technicien qualifié

Use Copper Conductors Only \geq 1AWG and Maximum Torque: 20N·m

Utiliser uniquement des conducteurs en cuivre \geq 1AWG Et couple maximum: 20N·m

16. Warranty

Warranty period

The warranty period of this product(Including hardware and software) is 3 year. If the contract stipulates otherwise, the contract shall prevail.

For warranty cases during the warranty period, the customer should present the invoice of the purchase of the product to our service team. At the same time, the nameplate on the product should be clearly visible, otherwise the warranty claim might not be accepted.

Warranty condition

We will repair or replace the product free of charge during the warranty period. The defective machine after replacement shall be owned by us, and the customer shall reserve a certain amount of time for us to repair the faulty machine.

Liability exemption

We reserves the right not to accept the warranty claim if the conditions below happen;

1. No trademark on the product;
2. Warranty period has expired;
3. Fault or damage caused by incorrect installation, by installing the device in a not allowed environment, by improper storage or usage, etc.(e.g. too high or too low temperature, moisture or too dry environment, high altitude or unstable voltage/current, etc.)
4. Failure or damage caused by the installation, repair, modification or disassembly by unauthorized service personnel;
5. Failure or damage caused by using our genuine spare parts;
6. Damage or damage caused by accident or human cause (operational error, scratching, handling, bumping, access to inappropriate voltage, etc.), or transport damage;
7. Failure or damage caused by force majeure such as natural disasters (such as earthquakes, lightning strikes, fires, etc.);
8. Other failures or damages that are not caused by quality problem of the product or its components.

Statement of liability

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17. Contact

Company Name: Shenzhen Growatt Dynocharge Energy Technology Co., Ltd.

Address: 4th Floor, No.23 Zhulongtian Road, Shuitian Community, Shiyan Street, Baoan District, Shenzhen

Website: www.ginverter.com

Service line: + 86 755 2747 1900

E-mail: info@ginverter.com