Technical Primer

Aurora 22kW

Star Charge

Aurora

Technical Primer

Congratulations with your new Aurora charging station for electric vehicles, and thank you for your purchase.

To ensure a safe installation process and to fully utilize all advanced features of your new system, we advise you to read this manual carefully.
Properly store this manual for future usage.

We have invested a great amount of care to provide you with a complete and comprehensible manual. As we continue to modify and further improve its contents, please refer to the following link to download the most recent version: http://www.starcharge.com

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1 Copyright and Disclaimer

1.1 Disclaimer

- This document has been subject to rigorous technical review before being published. It will subsequently be revised at regular intervals. Any modifications or amendments will be included in the future. Content of this document is compiled for information purposes only.
- Although StarCharge has put its best efforts to keep the document as precise and up-to-date, StarCharge shall not assume any liability for defects and damage which may result from the use of information contained herein.
- In no event will StarCharge be liable for direct, indirect, special, or consequential damages (incl. loss of profits) resulting from any errors or omissions in this manual. All obligations of StarCharge are stated in the relevant contractual agreements. StarCharge reserves the right to revise this document from time to time.
- Any deviation to the products including, but not limited to, customer-specific modifications (like placing stickers, SIM cards or the usage of different colours), hereafter referred to as *'Customization'*, can alter the final product's user experience, appearance, quality and/or lifespan.
- StarCharge is not liable for any damage to or caused by the product Customization is the main cause.
- Contact your dealer for more information on Customization versus the default product.

1.2 Copyright

All rights reserved. The disclosure, duplication, distribution and editing of this document, or utilization and communication of the content are not permitted, unless authorized in writing. All rights, including rights created by patent grant or registration of a utility model or a design, are reserved.

1.3 Warranty

StarCharge shall not be liable in any way for damage. All warranties on both the product and accessories shall become void under the following circumstances:

- The ambient temperatures during are below -30°C or above 50°C.
- The products have been installed wrong, subject to misuse or badly maintained.
- The instructions in manuals associated with operation and maintenance for the products(or parts provided at the time of purchase) of the device have not complied.
- The products are used in the vicinity of explosive, highly flammable substances or in or near water.
- There is a failure of the distribution network.

Attention

Extensive safety information is available in the relevant sections of this document. The safety instructions are intended to ensure proper practical usage. If the user does not comply with these safety regulations and instructions, the user may expose herself/himself to the risk of electric shock, fire and/or severe injuries.

2 Safety and Usage instructions

2.1 General safety

StarCharge equipment is intended exclusively for charging Electric Vehicles (EV). To ensure proper usage of the charging station, the instructions in this manual must always be complied with. Installing, Commissioning, and Maintaining this equipment may only be performed by a qualified electrician (*StarCharge certified partner*). Using this product is prohibited in the following situations

- Near explosive or Highly flammable substances.
- If the product is in or close to water sources.
- If the product as a whole or individual components of the product are visibly damaged.
- Usage by children or individuals not properly able to assess the risks associated with using this product.

2.2 Summary of safety symbols on the equipment

Symbols	Meaning
	“Warning”, which indicates a hazard. Pay attention to personal injuries or death caused by operation steps, practice or incorrect implementation. The operation after the "warning" sign can only be performed when the conditions are fully understood and satisfied.
	“Caution”, which indicates a hazard. Pay attention to the damaged or destroyed product caused by the operation steps, experiments or incorrect execution. Only after fully understanding and satisfying the indicated conditions, the operation after the “caution” mark can be performed
	"Hint", which indicates skill or useful information. Skills and useful information are marked as “Hint”. It does not contain information that warns of dangerous or harmful features.
	"Garbage disposal”, which indicates electrical and electronic waste. This symbol is located on the product, in the instruction manual or on the packaging, indicating that the electrical and electronic equipment and its Materials can be reused based on their markings. By reusing old equipment materials and other forms of reuse, you can make a significant contribution to the environment

3 Technical Data about the Product

- Suitable for all vehicles complying with IEC 62196-2.
- Configurable Output power setting possibility
- MID certified meter for verifiable output power measurements
- Charge via scanning QR Code and RFID swiping card.
- The charger supports the OCPP 1.6J communication protocol i.e., the charger can communicate to the data service platform and management platform (Cloud platform) of OCPP 1.6J.
- The charger can work normally when used in an outdoor environment IP55, IK10.
- The device has the following protection feature
  - Lightning protection
  - Overload protection
  - Short circuit protection
  - Leakage protection
  - Over-voltage protection
  - Under-voltage protection
- It has the same configuration functions as WebConfig, such as OCPP, which can control the start, stop and restart of charging station, set the maximum output power of charging station, and modify the PIN code.

3.1 Technical Specifications

3.1.1 Mains Supply Parameters

Recommended cable diameters at the input (Minimum)	UL-AWM1015 9AWG (outside diameter 13 mm-15 mm)
Nominal input voltage	400V AC (+/- 10%)
Limits of input power	Single Output, 3-phase: 32 A max per phase
Nominal frequency	50/60 Hz
Connection terminals	Pin terminal:E6012-BLACK,KST*3 Round terminal:RVL5-4,KST*3 Ground terminal:AVK16RD*1
Grounding	TN system (PE wire) TT system (independently installed ground electrode)
Main MCB	400 V AC, 40A, 50/60 Hz, Tripping characteristics C
Stand-by consumption	Less than 7W

3.1.2 Output of the Charger / Connecting to the EV

Vehicle connection	1 x type 2 socket, compliant with IEC62196-2 1 x type 2 socket with shutter compliant with IEC62196-2 1 x type 2 plug, compliant with IEC62196-2
Output voltage	400V AC
Maximum Charging Current	32A per phase
Maximum Output Power	22kW per socket

3.1.3 Protection features and integrated components for Safety

Residual current protection	Type A 30mA, per socket DC current detection 6mA, per socket
Energy meter	MID certified
Power switching relay	Integrated, Simultaneous activation
Overcurrent protection	Integrated in firmware; shutdown at: 110% after 5 seconds. 125% immediately

Attention
Your installation must comply with the standards and regulations of the region where it is located. The tables are advisory and based on proper practical functioning of the charging stations, provided that all prerequisites are satisfied.

3.1.4 Charging and access

Controllers	Central unit for sockets and communication
Communication with vehicle	LED light
Card reader	RFID (NFC) ISO/IEC 14443A/B, MIFARE 13,56 MHz, DESFire, MIFARE Class 1K, MIFARE Class 4K, MIFARE Ultralight, MIFARE Ultralight C, MIFARE PLUS ISO/IEC 15693, EPC UID ISO/IEC 18000-3 mode 3/ EPC Class-1HF ISO/IEC 18092 P2P passive initiator mod corresponding,
Internet / Networking capabilities	4G/ Ethernet/ Wi-Fi/Bluetooth
Communication protocol	OCPP 1.6 (JSON)

3.1.5 Operating conditions and Physical aspects

Operating temperature	-30℃ to +50℃ (Naturally Cooled)
Relative humidity	5%-95% (No condensation)
Electrical safety class	I
Protection rating	IP55
Mechanical Impact	IK10

3.1.6 Accesories

Mounting post	AJGSMP1970
Dimensions (H x W x D)	1650 x 320 x 120 mm
Material	SUS304 stainless steel Electrostatic powder spraying Outdoor polyester powder coating High weather resistance PC material
Color	Silver and Black
Packaging (H x W x D)	409 x 282 x 148 mm
Weight	Approx. 5.6 k.g.
Additional RFID card	StarCharge card

Notice

- If temperatures exceed the minimum/maximum values, the charging station will automatically decrease the charging current to stabilize the internal temperature. This prevents unexpected interruptions during transactions.
- If the product is directly exposed to sunlight, the automated temperature management may automatically start below the rated maximum ambient temperature.

3.2 Appearance Overview - Case B type

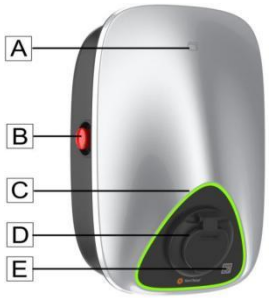


Figure 1: Aurora - Case B type

A. Swiping card area to Start/Stop charging

B. Emergency stop button (Optional)- To stop ongoingsession immediately

C. LED status indicator

D. Charging connector socket

E. QR code location for authentication

3.3 Appearance Overview - Case C type

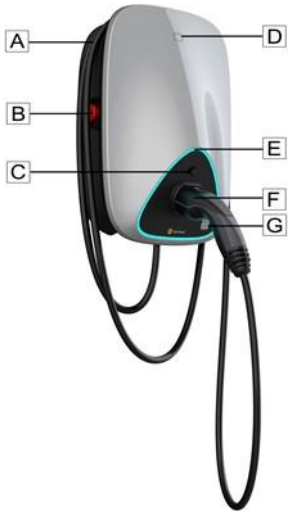


Figure 2: Aurora Case C type

A. Cable winding trough

B. Emergency stop button (Optional)- To stop ongoingsession immediately

C. Charge connector unlock button

D. Swiping card area to Start/Stop charging

E. LED Status Indicator

F. Position of the charging connector

G. QR code location for authentication

3.4 LED status Indications

The Aurora is equipped with a color LEDs to visualize the status of the charging station.

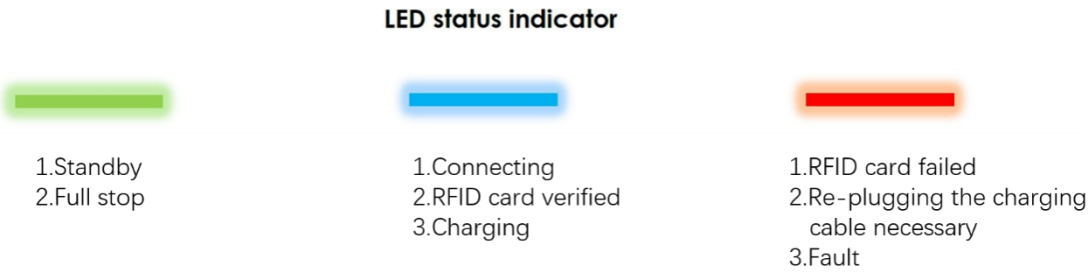


Figure 3: LED status indicator

4 Installing and Connecting the Charger

4.1 Package content

Content of the package of the charging station consists of

- Aurora Charger
- Installation manual
- Wall mounting block and assembly accessories
- 2 RFID charge cards (depending on the selected options)

4.2 Installations site requirements

While selecting a location to install the Aurora, the following criteria must be taken into account:

- The charger should not be installed close to dangerous and explosive locations. E.g Water Sources, Gas and Steam pipes.
- The installation location should be convenient for charging. While installing the charger, wiring length should be shortened as the cable resistance reduces and the power loss through the wire reduces as a consequence.
- The installation position of the charging station should not be set at a place where the terrain islow. The installation should be vertical and the center of gravity be adequate to prevent tipping
  or tilting. The charger should not be placed in an environment subject to severe vibrations or high temperature.
  N.B. - The recommended installation height is 70 to 120cm from the ground to the bottom side of the casing. The installation site must have a levelled and solid underground.
- The wall-mounted charging station must be connected to the wall at least two points. The wall should withstand the weight of the charging station and its accessories. The wall and internal lines should not be too close.
- It isrecommended that the charger be installed in an environment with a sunshade.
- The charging cable (approx. 5-meter length) must not be under tension while connected to the vehicle.
- It is recommended that customers install a circuit breaker in front of the charging station. Theminiature circuit breaker (MCB) needs to meet local regulations.
- Prevent road users from being able to drive over the cable and pedestrians from being able to trip over cables.
- Ensure that the UTP/Ethernet connection on the bottom side of the charging station is covered to prevent it from being unintentionally disconnected or used by unauthorized individuals.
- The RCBO and RCD+MCB module is necessary for the charger as the safty protection. It is recommended to use at least type A RCD+MCB or TYPE A RCBO. The following table lists the specifications.

Power	Rated voltage	Rated current	Tripping characteristics
7kW	230V	40A	C
11kW	400V	20A	C
22Kw	400V	40A	C

- Always fully comply with local technical requirements and safety regulations and the following ambient conditions needs to be maintained.

  Maximum atmospheric humidity of 95%

  Ambient temperature of -30˚C to 50˚C.

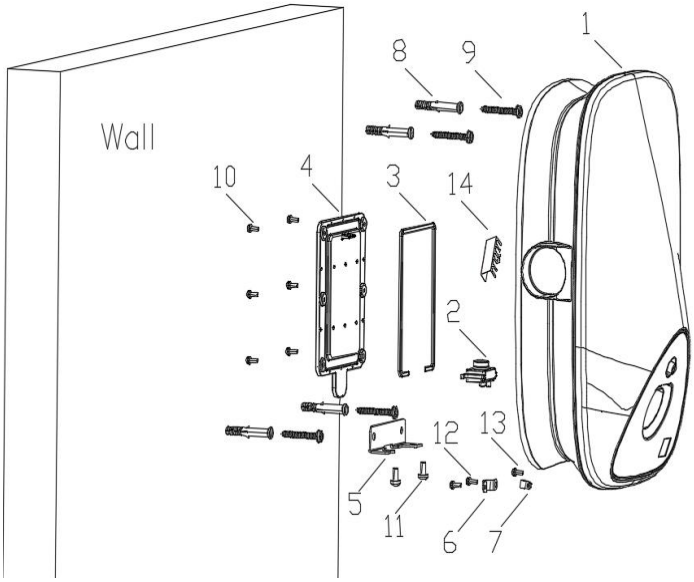
4.3 Tools and equipment required to install the Aurora

No.	Category	Name	Use	Picture
1	Cable processing	Stripping pliers	Stripping of insulating layers	
2	Cable processing	Stripping pliers	Stripping of insulating layers	
3	Cable processing	Crimping pliers	Terminal crimping	
4	Network cable processing	Network cable pliers	Pressing of network cable joints	
5	Installation tools	Percussion bit	Drilling	
6	Installation tools	Open-end wrench (full set)	Installation and removal of nuts	
7	Installation tools	Cross screwdriver (PH2，PH3)	Installation and removal of screws	
8	Installation tools	Slotted screwdriver (SL2)	Installation and removal of screws	
9	Installation tools	Inner hexagon socket screwdriver (full set)	Installation and removal of screws	
10	Installation tools	Electric torque screwdriver (with full set of cross screw bit, hexagon screw bit and slotted screw bit)	Installation and removal of screws	
11	Installation tools	Manual torque screwdriver (with full set of cross screw bit, hexagon screw bit and slotted screw bit)	Installation and removal of screws	
12	Installation tools	Torque monkey wrench	Installation and removal of nuts	
13	Installation tools	Hammer	Knock	
14	Measuring devices	Level	Levelness measurement	
15	Measuring devices	Tape measure	Distance measurement	
16	Marking tools	Pencil	Marking	

Notice: The above tools shall be selected based on the actual situations on site.

4.4 Wall Mounting

The general assembly drawing of wall mount is shown in Figure. 4.



1-Charging point;
2-Cable inlet rubber plug;
3-Sealing joint strip;
4-Rear cover;
5-Mounting bracket;
6-Metal crimping clip;
7-Plastic crimping clip;
8-Φ8*60 plastic expansion tube;
9-M6*50 self-tapping screw;
10-M4*12 cross combination screw;
11-M6*12 hexagon screw
12-M4*12 cross combination screw;
13-M4*12 cross combination screw;
14-Insulating shield

Figure. 4 General assembly drawing of wall mount

Installation steps:

(1) Wiring:

① Because the wiring position of this product is on the back, the wiring must be completed before fix the charging point on the wall. First install the sealing strip, as shown in Figure 5.

② Take out the cable inlet rubber plug from the spare parts package, The sealing points of network cable and trip signal cable shall be cut before use, as shown in Figure. 6.

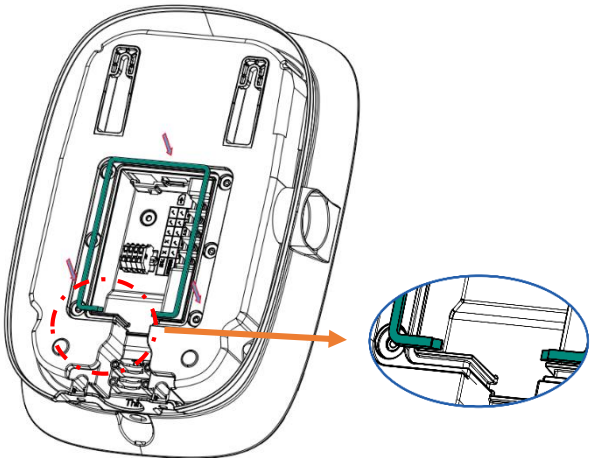


Figure. 6 Installing sealing strip

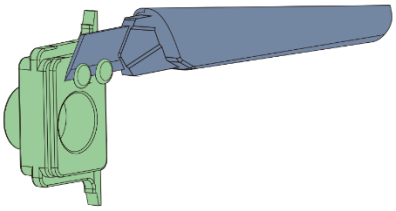


Figure. 7 Cutting cable inlet rubber plug

③ Pass the power cable and trip signal cable into the sealing rubber plug. If network cable needs to be connected, please pass the network cable into it, as shown in Figure. 8.

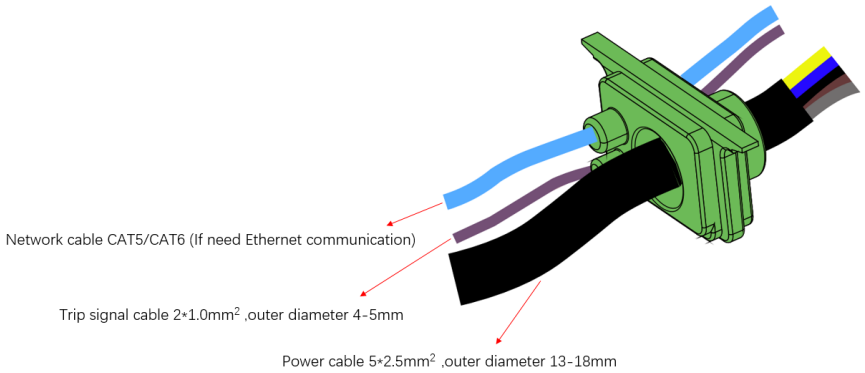


Figure 8 Passing cable into the cable inlet rubber plug

④ Control the cable inlet length and stripping length according to the requirements in Figure. 9. The power cable is a flexible cable, which needs to be crimped with a ring terminal. CAT5 or CAT6 cable can be used as network cable, and the network cable is crimped with the network cable connector.

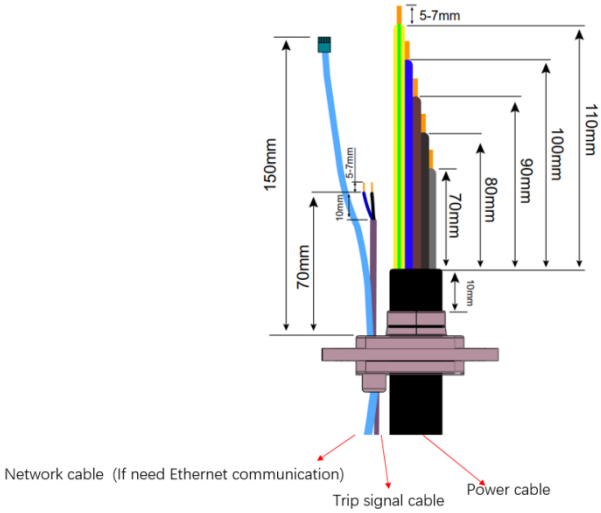


Figure. 9 Cable inlet length

⑤ The power cable needs to be crimped with the ring terminal. The crimping process is shown in Figure. 10.

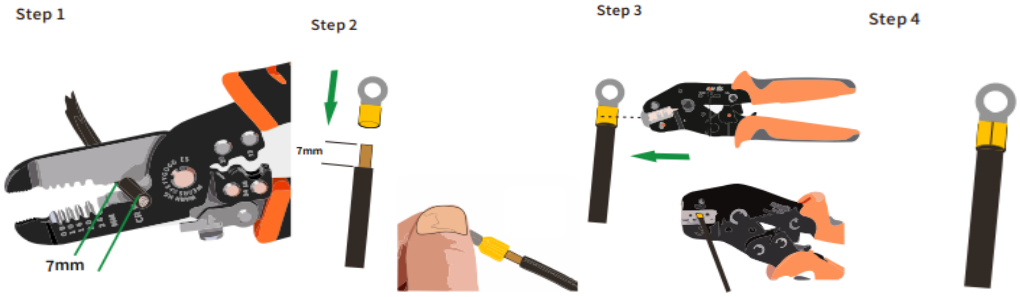


Figure. 10 Ring terminal crimping

⑥ Crimp the cable inlet rubber plug to complete wiring operation, as shown in Figure. 11. Complete power cable wiring using a PH2 screwdriver with torque of 1.4-1.6Nm; connect the trip signal cable to the terminals K-1 and K-2 with an SL2 screwdriver. Then restore the insulating shield, as shown in Figure. 12.

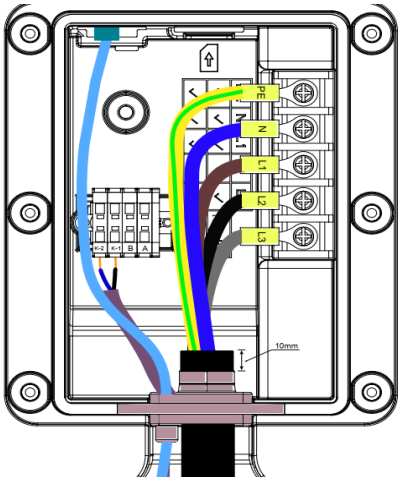


Figure. 11 Wiring diagram

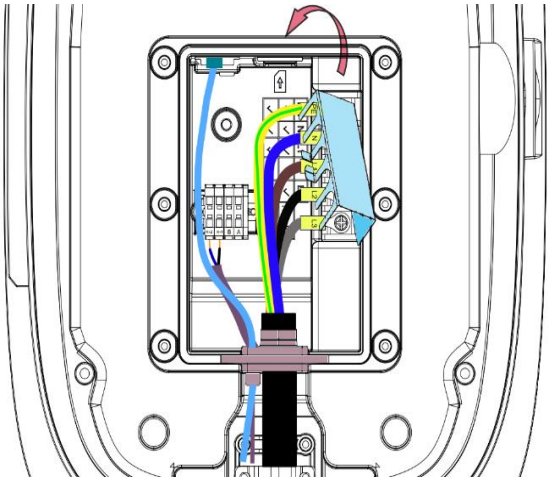


Figure. 12 Restoring insulating shield

⑦ Crimp the metal crimping clip to the power cable (PH2 screwdriver, with torque of 1.2-1.4Nm) with two M4*12 Philip's head screws, and crimp the plastic crimping clip with trip signal cable and network cable (PH2 screwdriver, with a torque 1.2-1.4Nm) using a M4*12 Philip's head screw, as shown in Figure. 13.

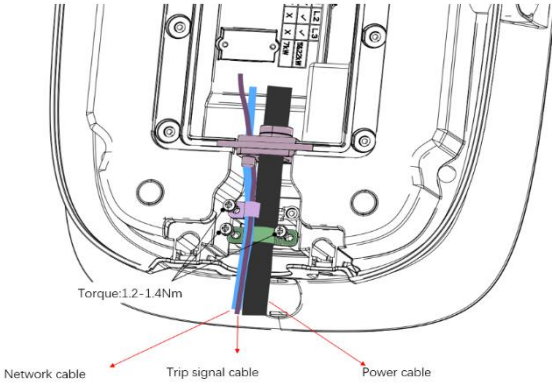


Figure. 13 Crimping cable clip

⑧ After completing the wiring, insert the SIM card, as shown in Figure. 14.

⑨ Cover the rear cover, and screw in 6 M4*12 Phillip's head screws using PH2 screwdriver with torque of 1.2-1.4Nm, as shown in Figure. 15.

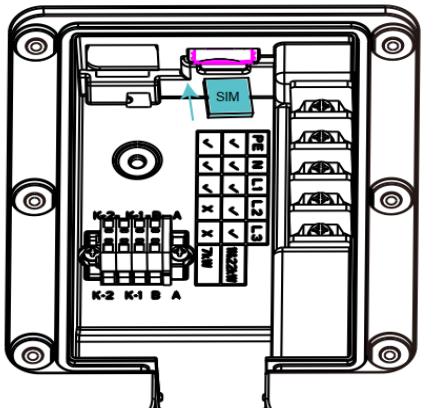


Figure. 14 Insert the SIM card

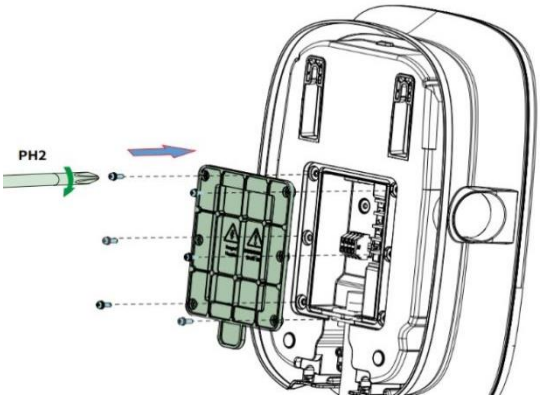


Figure. 15 Close the rear cover

Note: before installing the cable cover plate, please conduct the safety inspection before closing according to 4.1 commissioning safety instructions in the manual.

(2) Confirm the installation position. A distance of 1-1.3m between the top of charging point and the ground is recommended. Confirm the levelness of template with a level ruler. Then mark the drill holes with a pencil, as shown in Figure. 16.

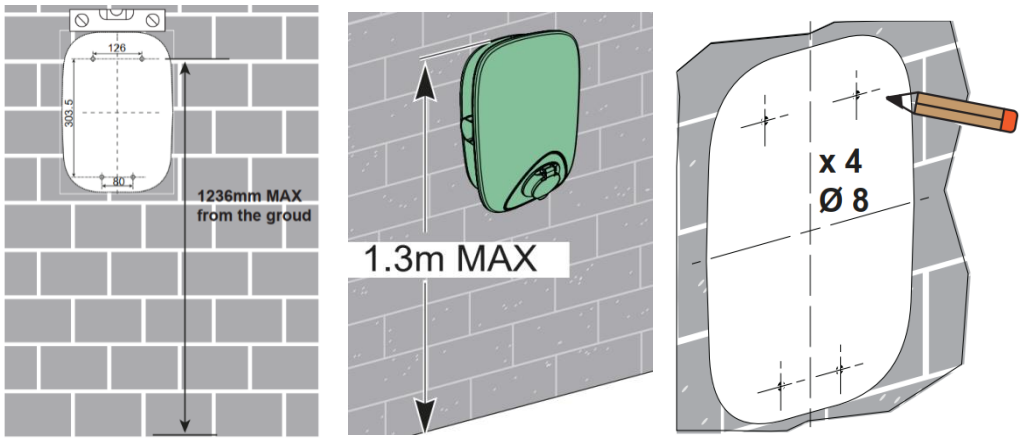


Figure. 16 Marking drill holes

(3) Drill holes at the marked position with a φ8 drill. The effective length of drill is not less than 80mm, and the drilling depth is 60mm, as shown in Figure. 17.

(4) Insert Φ8*60 plastic expansion tubes into the four mounting holes, and fix the mounting bracket to the two mounting holes below with a PH3 screwdriver and two M6*50 self-tapping screws, as shown in Figure. 18; confirm the levelness with a level ruler after fixing the mounting bracket.

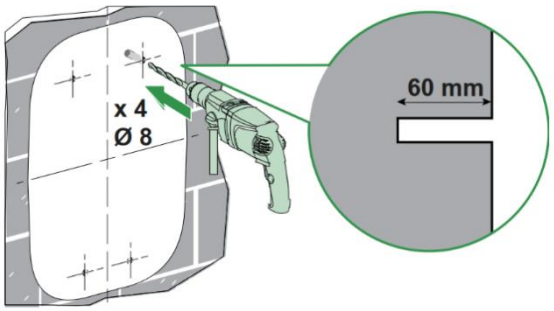


Figure. 17 Drilling holes on the wall

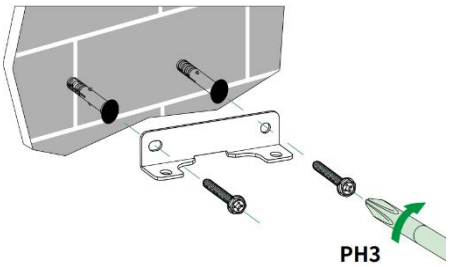


Figure. 18 Fixing mounting bracket

(5) Install M6*50 self-tapping screws in the two holes on the top. The protruding length of screw from the wall is 7mm. Then hang the charging point on the two self-tapping screws through the two concave buckles on the back, as shown in Figure. 19.

(6) Fix the bottom of charging point on the mounting bracket by using two M6*12 hexagon socket screws with a T30 hexagon socket screwdriver, with torque of 2.0-2.2Nm, as shown in Figure. 20. Then check the levelness of charging point with a level ruler.

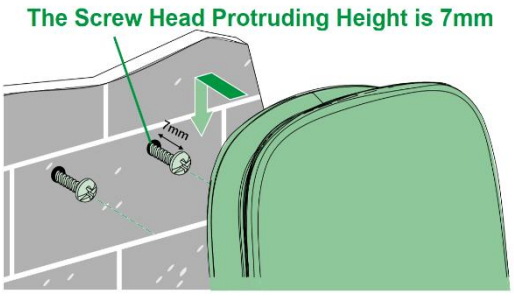


Figure. 19 Hanging charging point

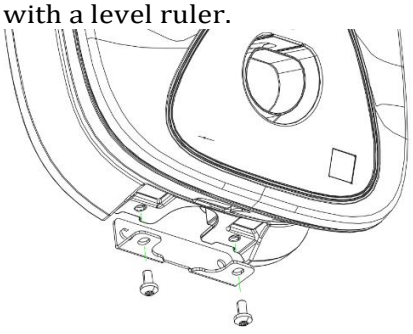


Figure. 20 Fixing bottom of charging point

4.5 Cement Foundation requirements for mounting the metal pedestal

4.5.1 Installation distance of parking space for column type single charging station or double charging stations instal-lation

When the Column-type Single charging station or Double charging stations are installed in a single parking space or back- to-back parking space, it is recommended that the linear distance between the vehicle block and the Center of the charging station is not less than 1200mm, as shown in Figure 21.

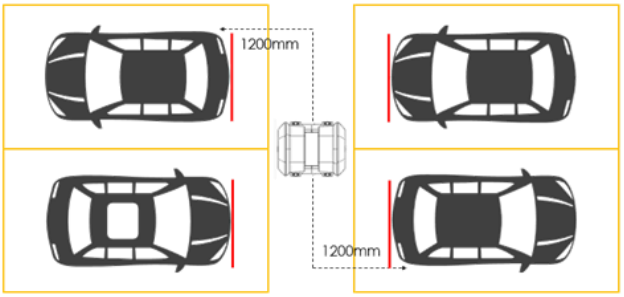


Figure 21: Installing at a parking place

4.5.2 Coulmn Installation steps

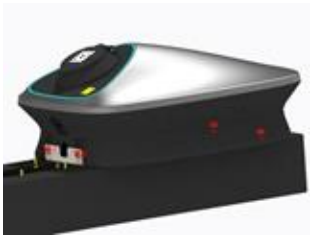
1. To start off with Column installation, use concrete base or metal base. The general assembly scheme is shown in Figure 22(a).

(a) Floor standing assembly drawing

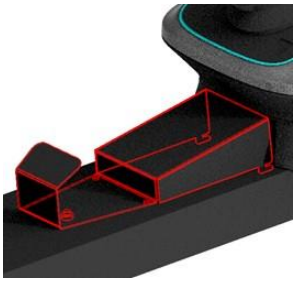
(b) Inserting the cable into the column for installation

Figure 22: Installing the pedestal for Aurora

2. Lay the column horizontally and insert the wire from the bottom hole and exit from the middle hole. (Fig 22b)
3. After connecting the inlet line with the charging station body, fix the charging station body on the vertical column. First, use two cross M6*12 (Torque: 1.8 - 2.0 N.m) combination screws to fix the wall mount on thecolumn.
4. Hang the charging station on the column, screw in two pattern M6*12 (Torque: 1.8 - 2.0 N.m) combination screws at the bottom, as shown in Figure 23.
5. Insert the hanger hook and guard cover into the mounting position and push them up, and then lock them from the front with two M4*12 pattern composite screws (Torque: 1.4 - 1.6 N.m) with column core head, as shown in Figure 23b.



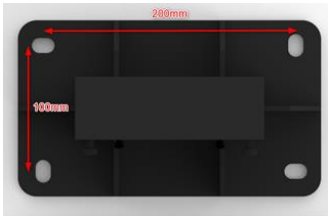
(a)Charger installation



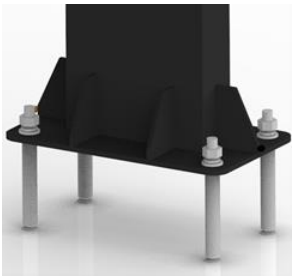
(b) Thread hook and guard installation

Figure 23: charging station settings for Aurora

6. Drill 4 holes with A diameter of 10mm and A depth of 150mm on the concrete floor, and the spacing between hole centers is 100mm x 200mm. Use four M10*120 expansion screws to install and tighten the charging station posts, as shown in Figures 24a and Figure 24b.



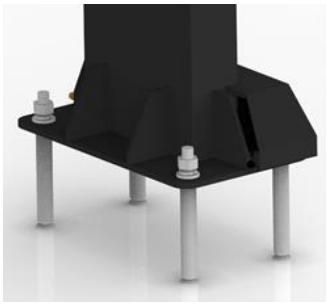
(a)Fixed base



(b)Fixed column

Figure 24: Charging station settings for Aurora

7. Place the rear decorative cover on the bottom plate of the column. (Figure 25a)
8. Insert the front decorative cover into place from top to bottom and the back decorative cover, and fix both sides of the front decorative cover with two M4*12 flower-shaped composite screws (Torque: 1.4 - 1.6 N.m) with column core in Figure 25b.



(a) Install the rear decorative cover

(b) Fixed the decorative cover

Figure 25: charging station settings for Aurora

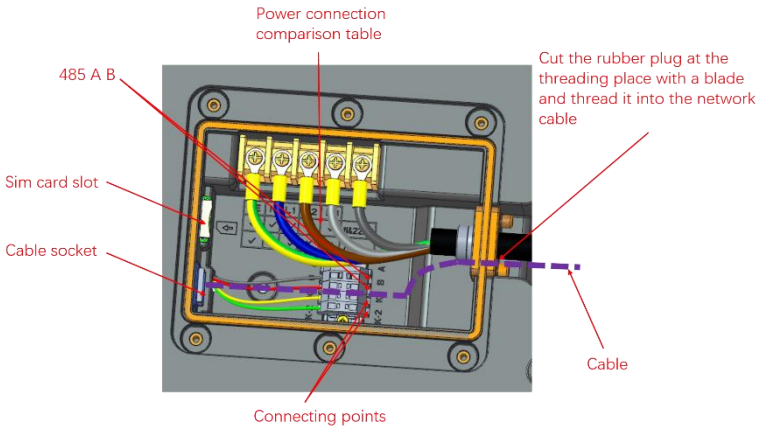
5 Commissioning the charging station

5.1 Safety instructions before commissioning

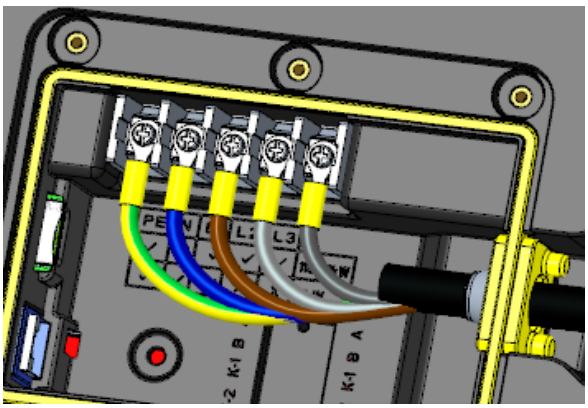
- Ensure that the charging station is correctly connected to the power source according to the re-quirements of this manual.
- Ensure that the power distribution system is individually protected by appropriate circuit breakers (Residual Current Fuses).
- Ensure that the charging station installation complies with this manual.
- Ensure that the enclosure is always closed during normal use.
- Check whether the charging cable is twisted and whether the cable, plug, and casing are intact.

5.2 Wiring steps before commissioning

- Unscrew the M4 hexagon socket countersunk head screw at the bottom. Remove the decorative cover and open the wiring window cover.
- Insert the SIM card supported by the local operator into the slot. (Figure 26a)



(a) SIM card slot



(b) Incoming wire connections

Figure 26: Making Connections

- The incoming wire passes through the metal waterproof joint at the bottom of the charging station. (Figure 26b)
- Use six M4*12 screws to tighten the wiring compartment cover, and two M4*12 screws to tighten the crimping ferrule. Note that there are two positions for the crimping ferrule, depending on the thickness of the incoming cable. (Figure 27)

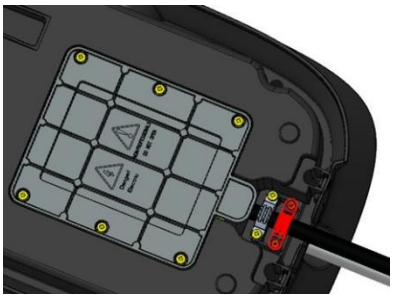


Figure 27: Install the wiring cover and the cable entry clamp

- Reinstall the wiring window cover and decorative cover to complete the installation.

Attention
If there is a gap between each part of the shell, it will affect the moisture-proof and water-proof function of the charging station, and it is highly likely to affect the service life

5.3 Debuggin

5.3.1 Establishing connection

To establish a wireless connection, the charging station must be equipped with a supported SIM card. Also, to connect to the backend, the correct settings must be configured.

5.3.2 Using third party back-end

If you use your own management system or the service is provided by a third party, please make sure that the charging station type is registered correctly. If these settings are not properly configured in this management system, the charging station will not be connected. After the correct registration of the back-end system is completed, the charging station can be easily connected.

Attention
The connection to the management system can only be established by arranging to start the service with the supplier. Services provided by third parties are not within the scope of StarCharge.

5.4 Safety instructions before commissioning

- Please make sure that the charging station is correctly connected to the power supply.
- Please make sure that the charging station is installed as required.
- Please make sure that the charging station is powered-on during the commissioning process (Note: The power supply needs to be turned off during wiring/installation).
- Check whether the charging connector is twisted and whether cables, plugs and housings are in good condition.

5.5 Network connection method

There are three network connection methods to choose from: 1.data traffic, 2. WIFI and 3. Ethernet.
Notice: If Ethernet communication is required, it is necessary to connect the network cable. If the network cable is not connected during installation, it is recommended to configure the charging station by the APP configuration method. (See below)

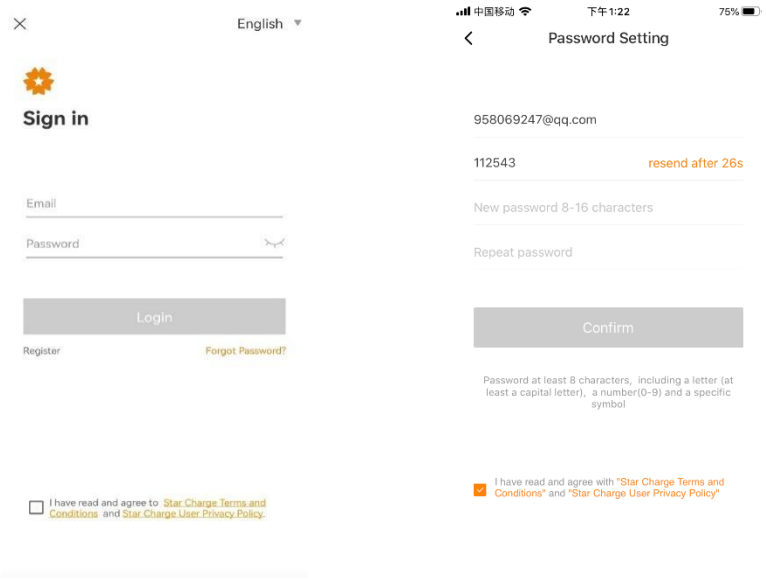
6 Configuration of charging station

6.1 APP configuration

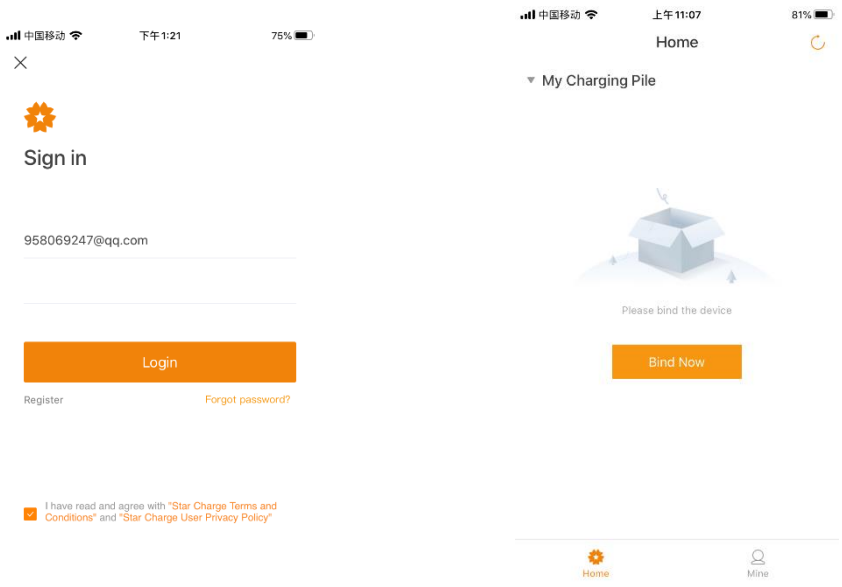
6.1.1 APP configuration

Need to download the IOS version APP in the Apple App Store, and download the Android version APP in the Google Play. The icon of the APP is shown in the figure below.

6.1.2 APP account login



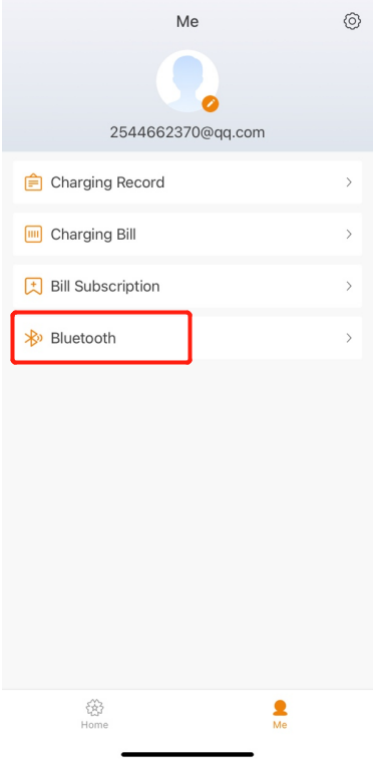
After entering the email address and password, tick to agree to the user agreement, and click [Login] to complete the login.

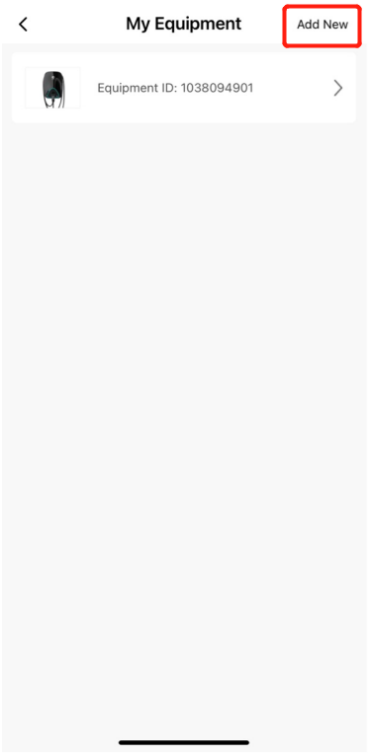


6.1.3 Adding a Bluetooth device

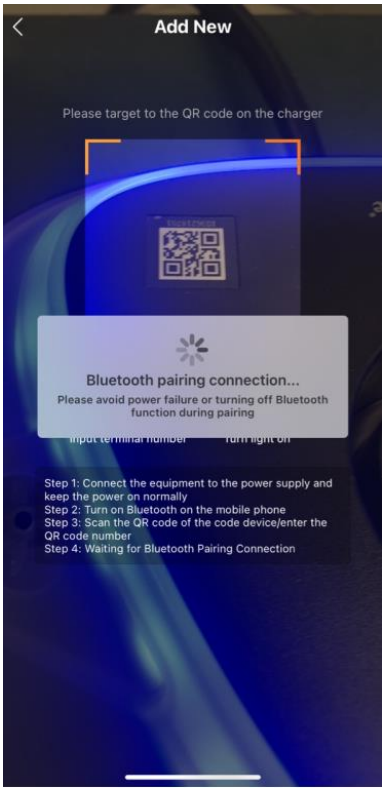
(1) Display the [Bluetooth] entry on the [Me] page

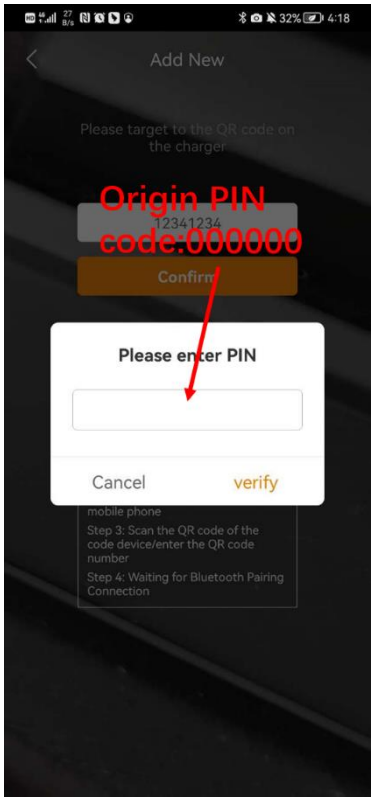
(2) Click [Bluetooth] to enter the Bluetooth device list, and click [Add New] in the upper right corner to add a Bluetooth device

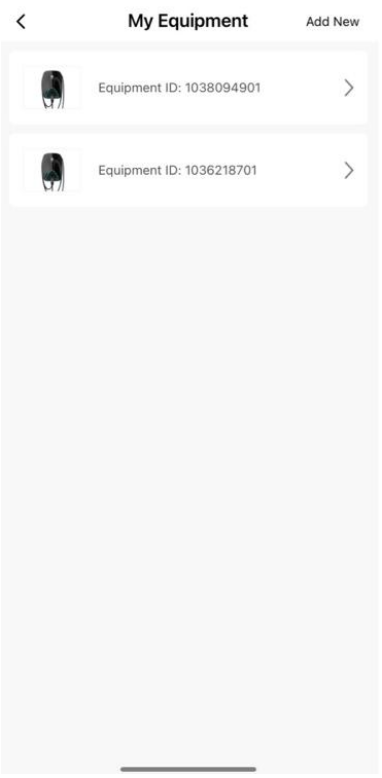




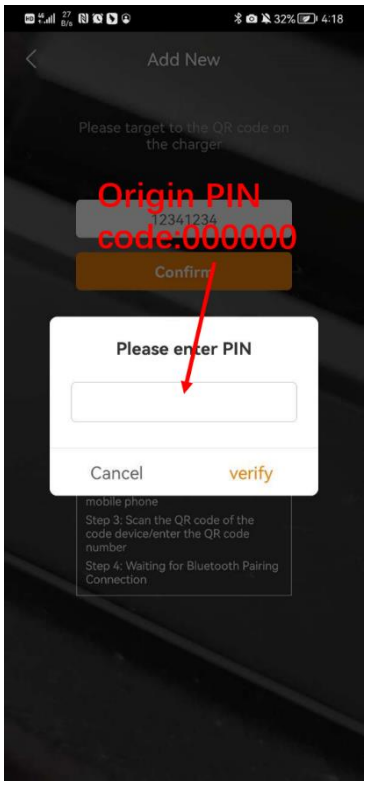
(3) The window for scanning the QR code will pop up. After scanning the QR code, the window for entering the PIN code will pop up. After entering the correct PIN code, the bound Bluetooth device will be displayed on the list page.

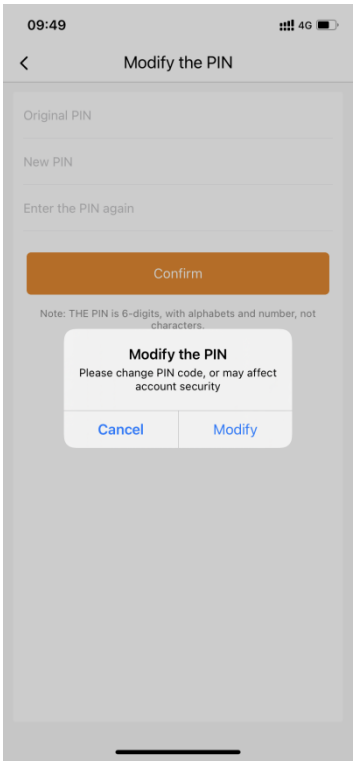




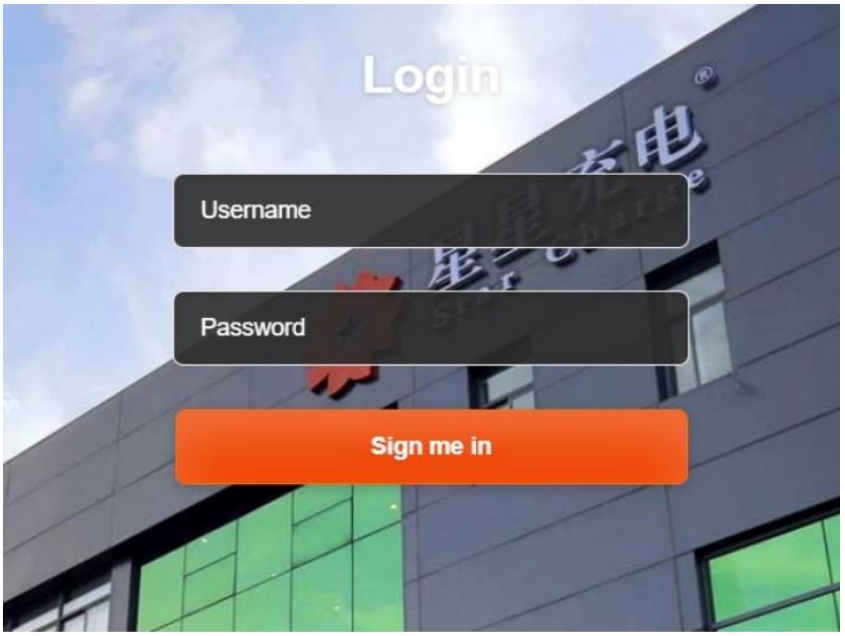


(4) When binding the bluetooth device for the first time, you will be prompted to modify the PIN code, as shown in the following figure:

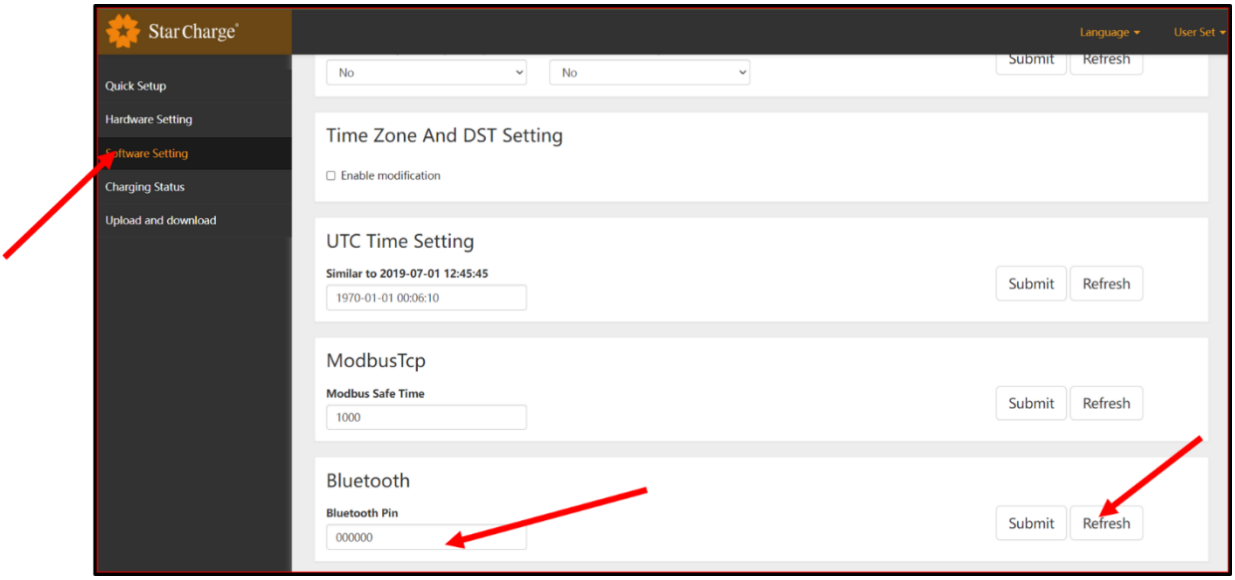




Notice: You can follow these steps to find the original PIN code or modify the new PIN code:
Using Chrome browser and put default IP address 192.168.88.206 in address bar. After launching, put in user name “xxcd” and password “28912891.

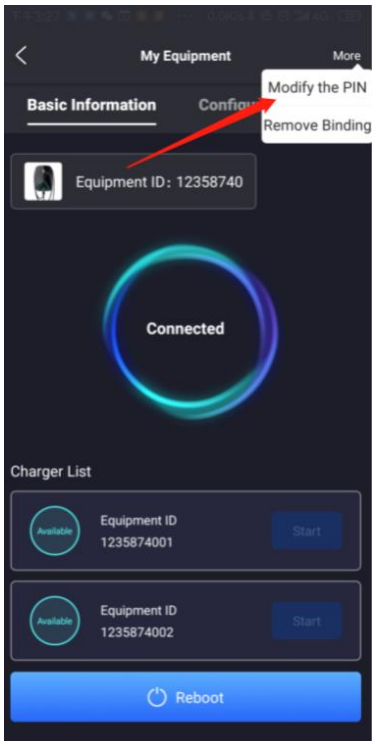


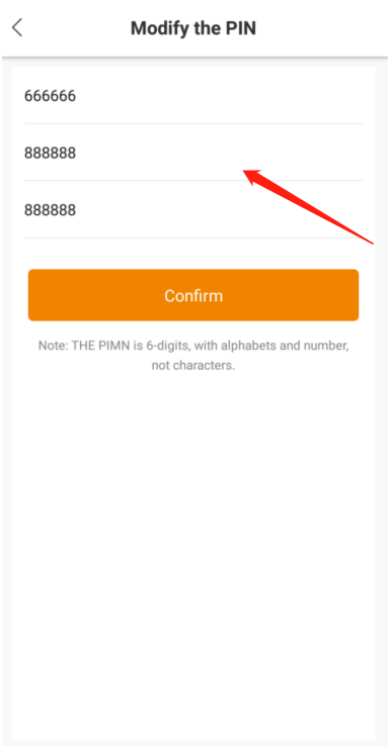
1、Click "Software Setting"
2、Locate "bluetooth"
3、Click "Refresh". At the same time, you can enter the new PIN code and click "submit" to modify the PIN code.

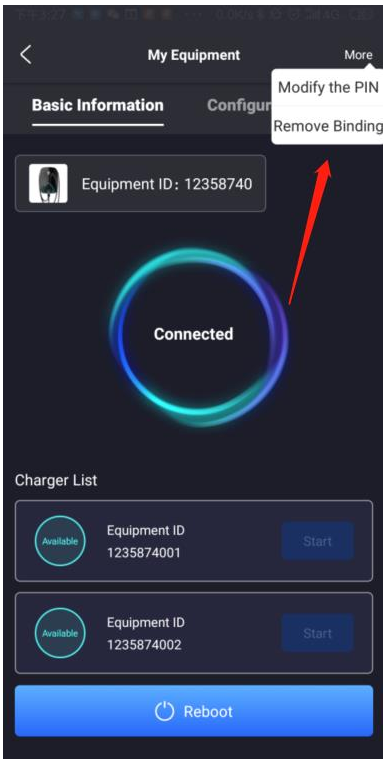


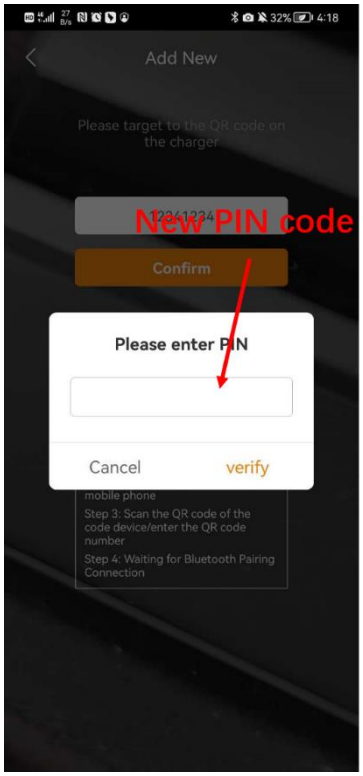
6.1.4 Modifying the PIN code

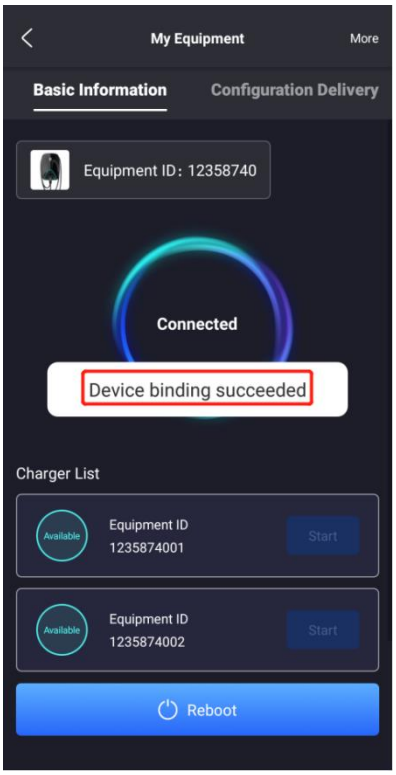
"My Equipment" page, click "More", could change the PIN code of the charger. After changing the PIN code, if you remove the Binding, re-bind the charger needs to use the new PIN code, then could connect Bluetooth successfully.

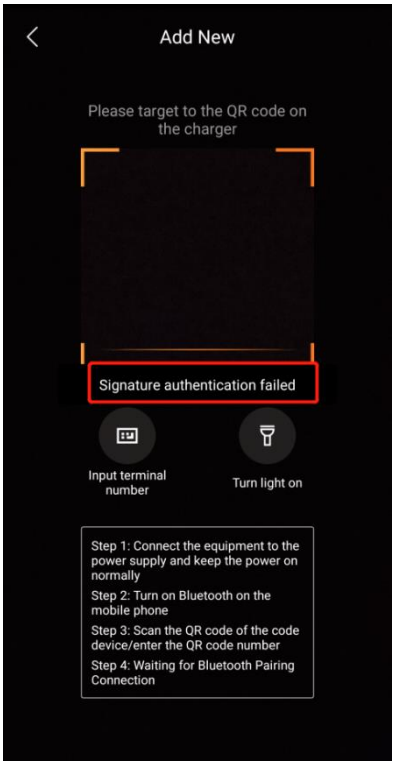








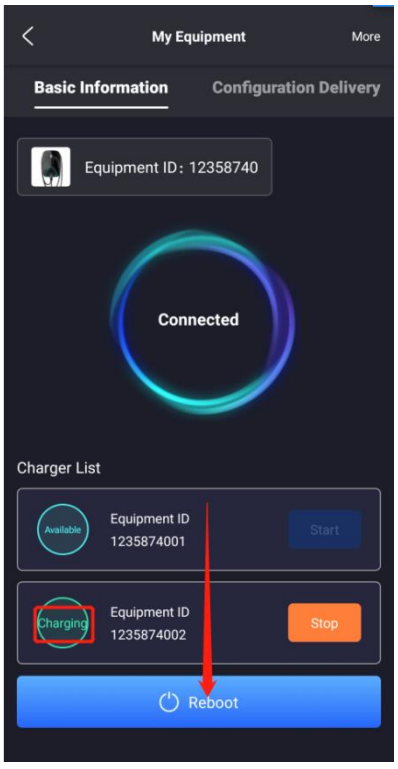


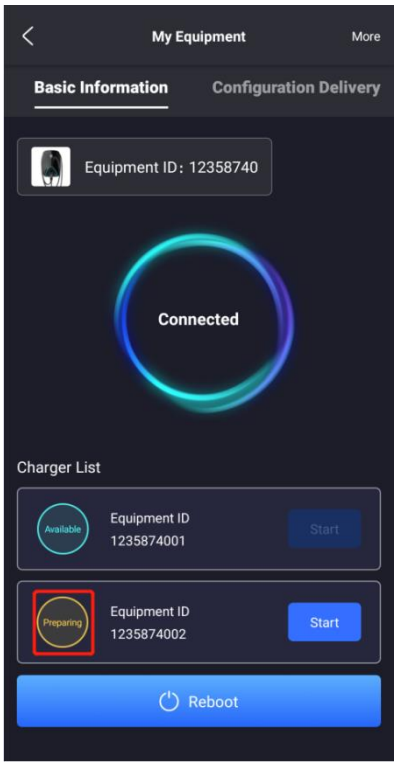


Notice : Please change the pin code after the first use, otherwise there will be a risk of user information disclosure.

6.1.5 Reboot

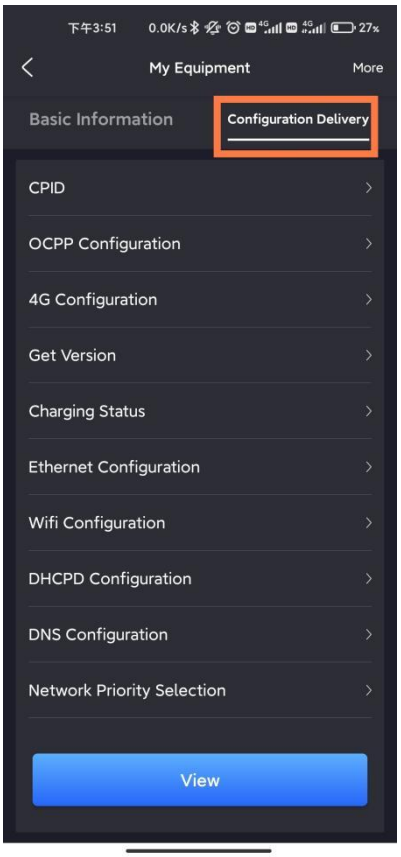
Click the "Reboot" button, could reboot the charger. If reboot during charging process, the charging order will be stopped. (After you configure and save the parameter, then reboot charger, the parameter will not return back to default.)





6.1.6 Configuration information

Click "Configuration Delivery" to configure.



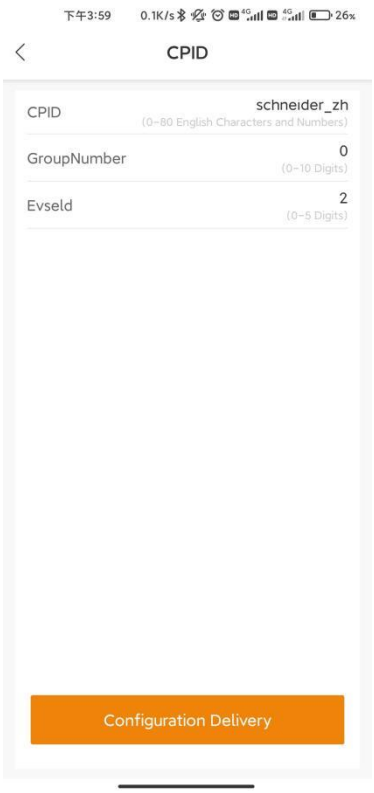
6.1.7 CPID

(1) Fill in the CPID in “CPID”

(2) Fill in the group number in "GroupNumber"

(3) Fill in the evse id in "EvseId"

(4) Click "Configuration Delivery" to confirm



6.1.8 OCPP configuration

(1) Fill in the IP address or platform domain name in “IP or Domain Name”

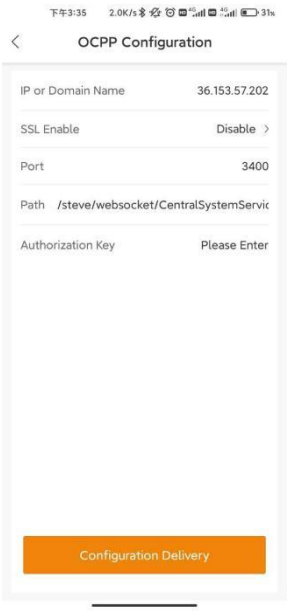
(2) “SSL Enable” is “Enable” for TLS access of platform, and it is “Disable” for non-TLS access.

(3) Fill in the platform port number in "Port"

(4) Fill in the path after the IP address in "Path"

(5) Only fill in "Authorization key" platform if basic authentication is being used by the platform (keep clear if not)

(6) Click "Configuration Delivery" to confirm



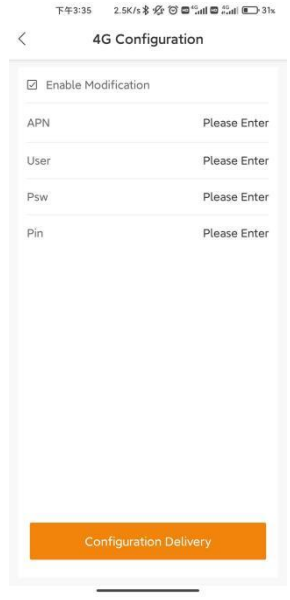
6.1.9 4G configuration

(1) Click "Enable modification"

(2) Depending on use case, set APN, User, Psw, Pin

(3) The setting of APN depends on the SIM card of the user. The user, password and pin options are usually blank

(4) Click "Configuration Delivery" to confirm

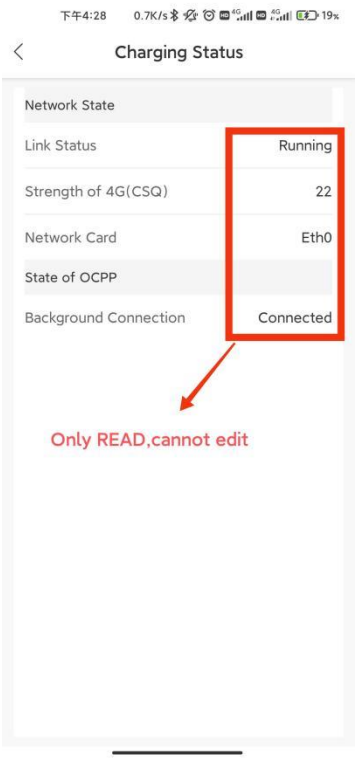


6.1.10 Get version

(1) View the version in this interface

6.1.11 Charging status

(1) View the charging status in this interface



6.1.12 Ethernet configuration

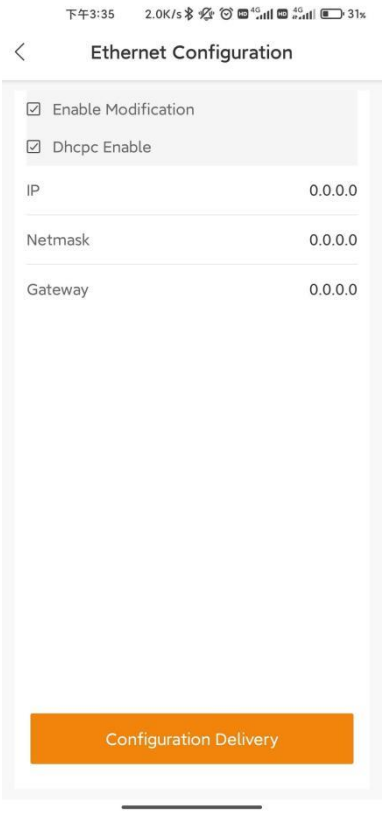
(1) Find "Ethernet configuration"

(2) Click "Enable modification"

(3) Click "Dhcpc enable" to automatically obtain the IP address; if it is necessary to fix the IP,

do not click "Dhcpc enable" to enter the IP address

(4) Click "Configuration Delivery" to confirm



6.1.13 Wifi configuration

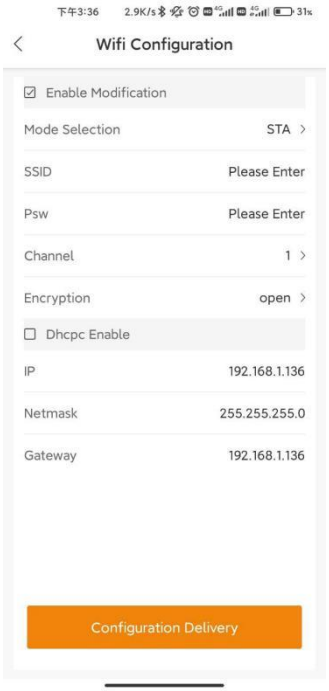
(1) Click "Enable modification"

(2) Select "STA" for "Mode selection"

(3) Fill in "SSID" (wifi account) "Psw" (wifi password) "Encryption" (generally select wpa2 for encryption method)

(4) Click "Dhcpc enable" to automatically obtain the IP adress

(5) Click "Configuration Delivery" to confirm



6.1.14 DHCPD configuration

(1) Click "Dhcpd Enable"

(2) Fill in the start address in "Start Address"

(3) Fill in the terminate address in "Terminate Address"

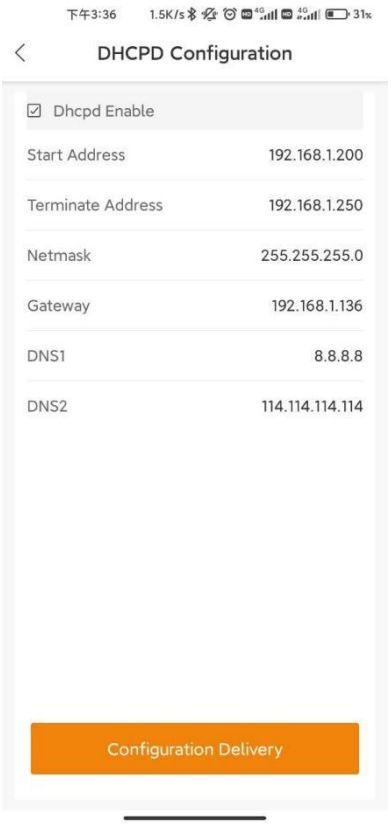
(4) Fill in the net mask in "Netmask"

(5) Fill in the gateway in "Gateway"

(6) Fill in the DNS1 in "DNS1"

(7) Fill in the DNS2 in "DNS2"

(8) Click "Configuration Delivery" to confirm



6.1.15 DNS configuration

(1) Click "Enable Modification"

(2) Fill in the DNS1 in "DNS1"

(3) Fill in the DNS2 in "DNS2"

(4) Click "Configuration Delivery" to confirm

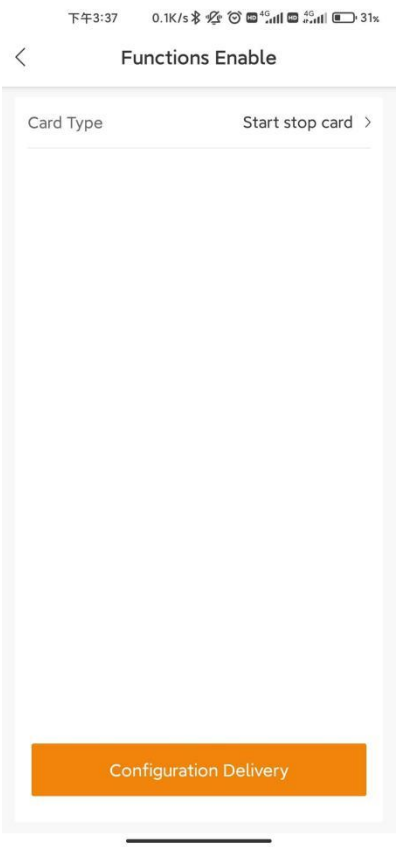
6.1.16 Function configuration

(1) "Start stop card": This is the local start and stop card that allows the charging station to be used without being connected to the platform

(2) "Billing card": This is the authentication card that the charging station needs to be connected to the platform, and the UID of RFID card needs to be entered into the platform before swiping card for use

(3) "Local pnc": Plug and Charge

(4) Click "Configuration Delivery" to confirm

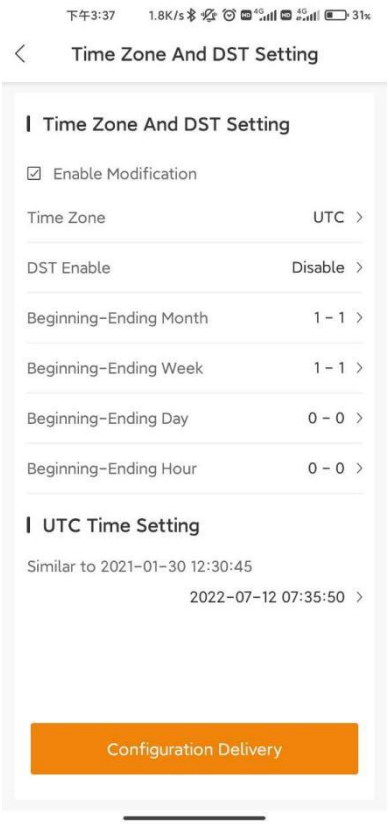


6.1.17 Time zone configuration

(1) Click "Enable modification"

(2) Select your Time Zone

(3) Click "Configuration Delivery" to confirm

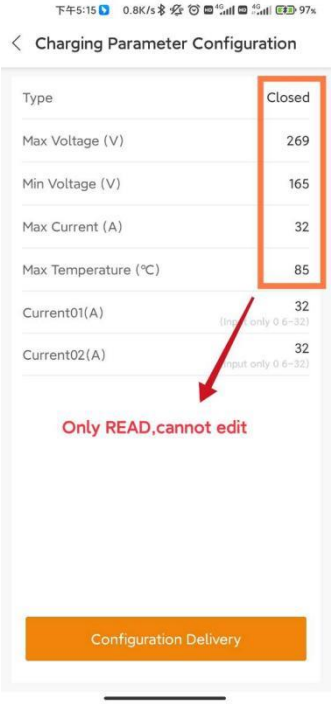


6.1.18 Charging parameter configuration

(1) Edit “Current01(A)”

(2) Edit “Current02(A)”

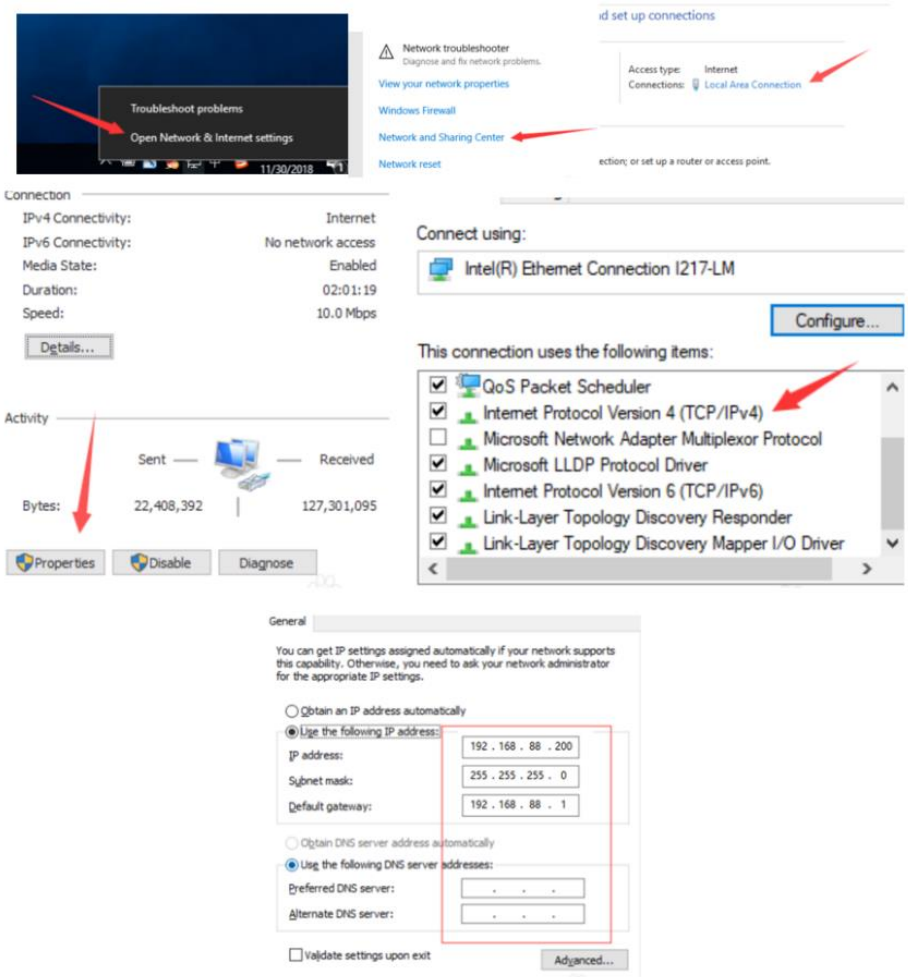
(3) Click "Configuration Delivery" to confirm



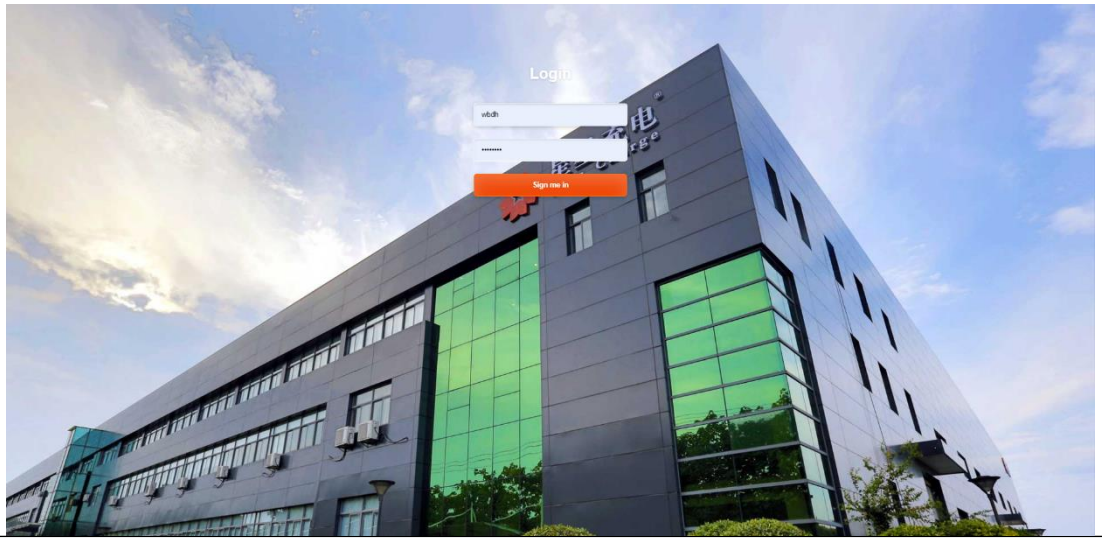
6.2 Web configuration of connecting network cable

6.2.1 Connection

After connecting the charging station to the computer, set the IP address as shown below (192.168.88.xxx, do not use 206 for xxx).



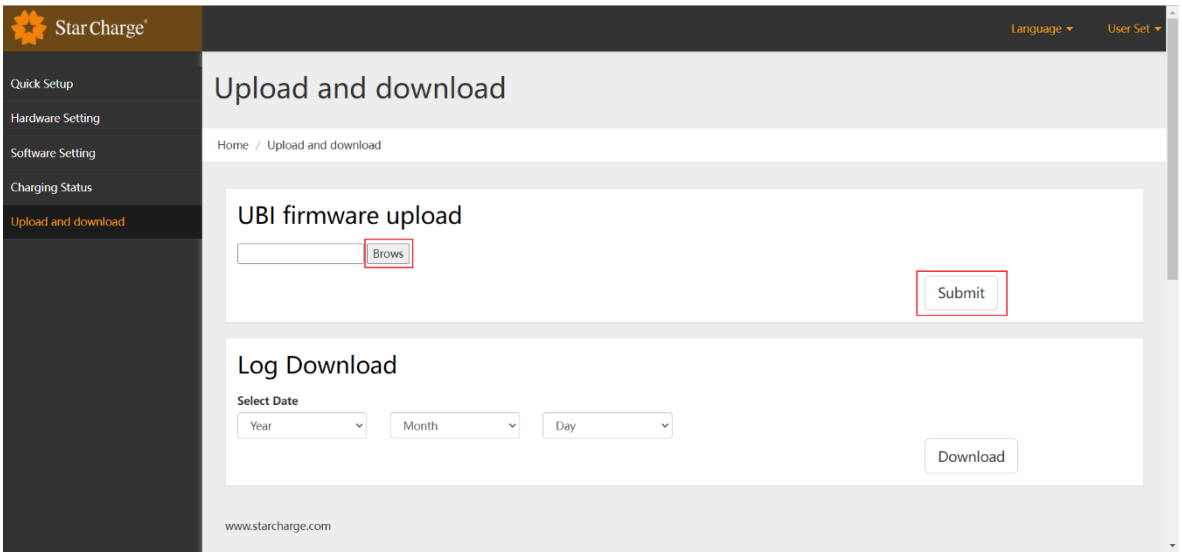
Open an incognito web browser (Chrome preferably) and enter the URL 192.168.88.206. Please contact the dealer or operation and maintenance personnel to obtain the user name and password.



6.2.2 Update

Firmware upgrade:

Click “Upload and download” – “Brows” – “firmware.zip” – “Submit”



Attention

Firmware upgrade is not a necessary step for commissioning. Please confirm whether an upgrade is required with the operation and maintenance engineer.

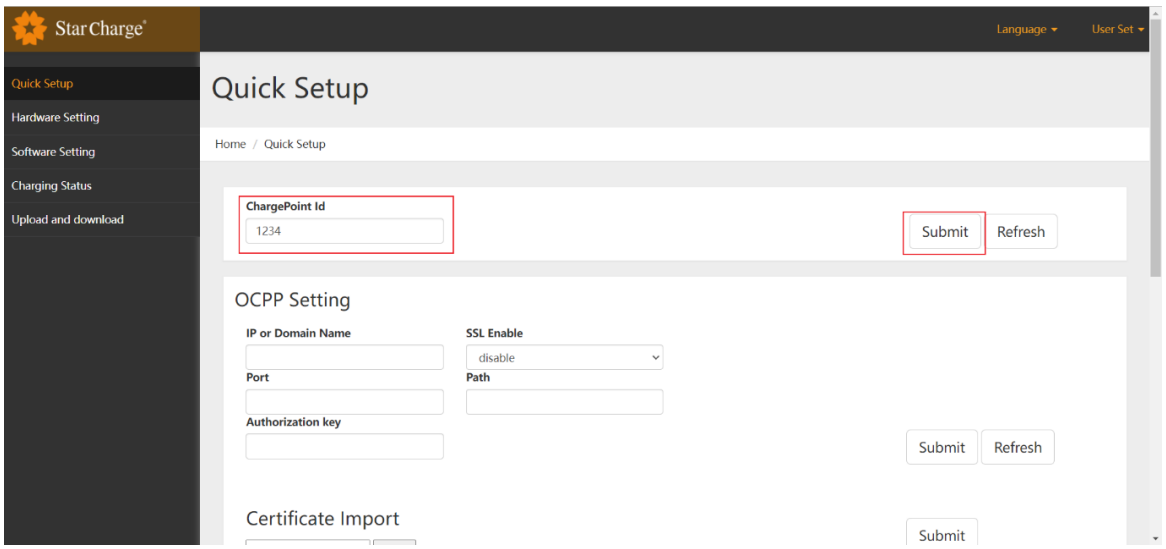
6.2.3 Web-Quick configuration

This page is used to set some common items.

ChargePoint ID:

(1) Enter "ChargePoint ID"

(2) Click "Submit"



OCPP Setting:

Taking http://36.153.57.202:3400/steve/websocket/CentralSystemService as an example, the information input is shown in the following figure:

(1) Fill in the IP address or platform domain name in “IP or Domain Name”

(2) "SSL_Enable" is "Enable" for TLS access of platform, and it is "Disable" for non-TLS access

(3) Fill in the platform port number in "Port"

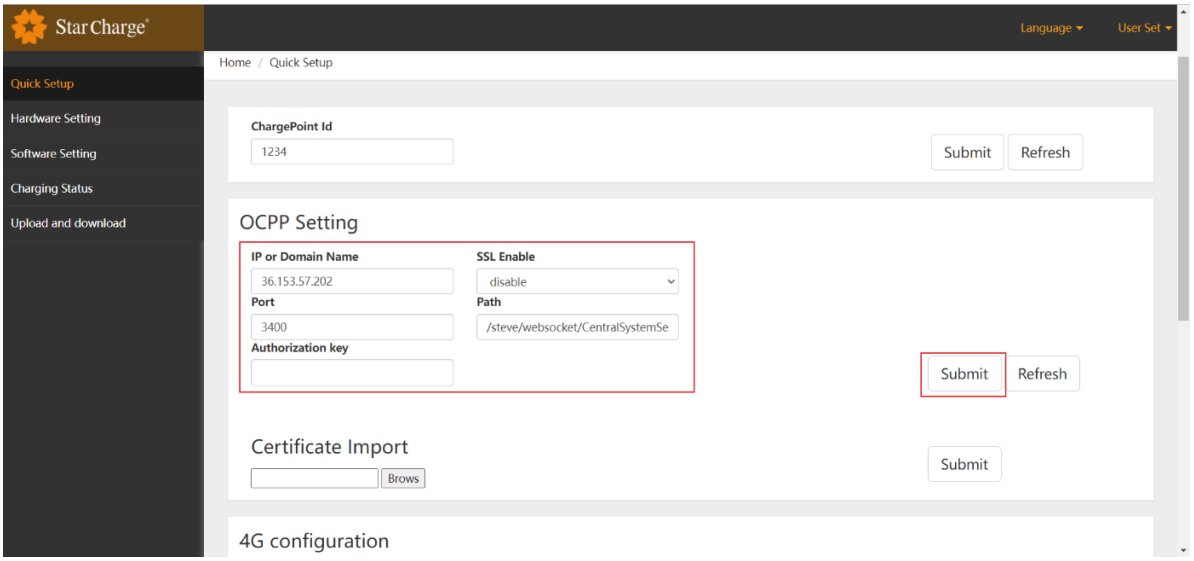
(4) Fill in the path after the IP address in "Path"

(5) Only fill in "Authorization key" platform if basic authentication is being used by the platform (keep clear if not)

(6) Click "Submit" after setting

(7) "Certificate Import": It is necessary to import the CA certificate sent by the client when using TLS, and it does not need to be filled in for non-TLS access

(8) If there is an imported certificate, click "Submit" to confirm the issuance of certificate

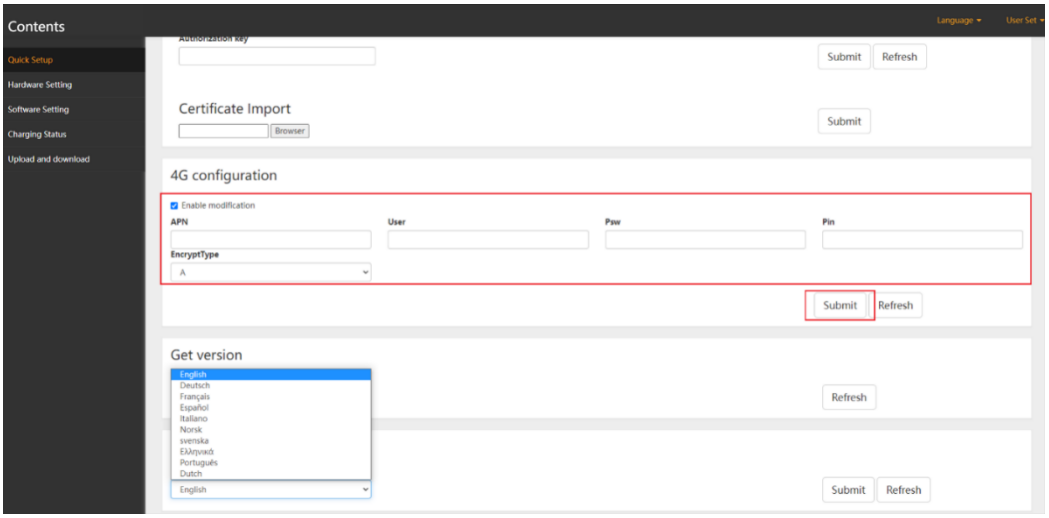


4G configuration:

(1) Click "Enable modification"

(2) Depending on use case, set APN, User, Psw, Pin

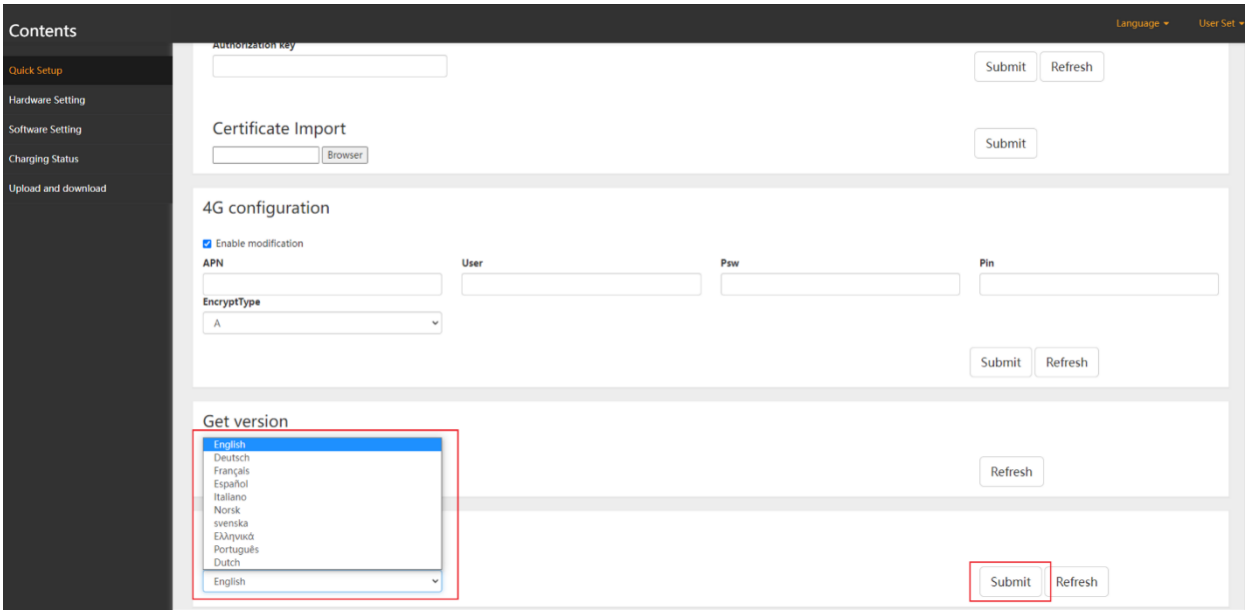
(3) Click "Submit"



Language change:

(1) Click "Language" and select

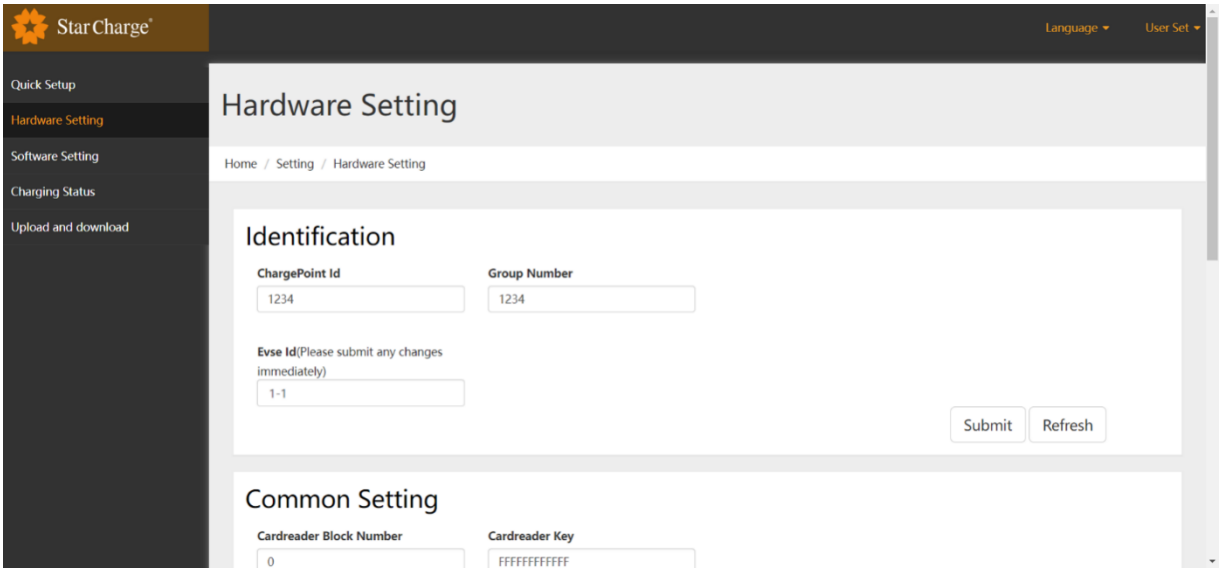
(2) Click "Submit"



6.2.4 Web-Hardware configuration

(1) Enter the charging station number (QR code of charging station), charging station group number (1234 by default), EVSE ID: 1-1

(2) Click "Submit"



6.2.5 Web-Software configuration

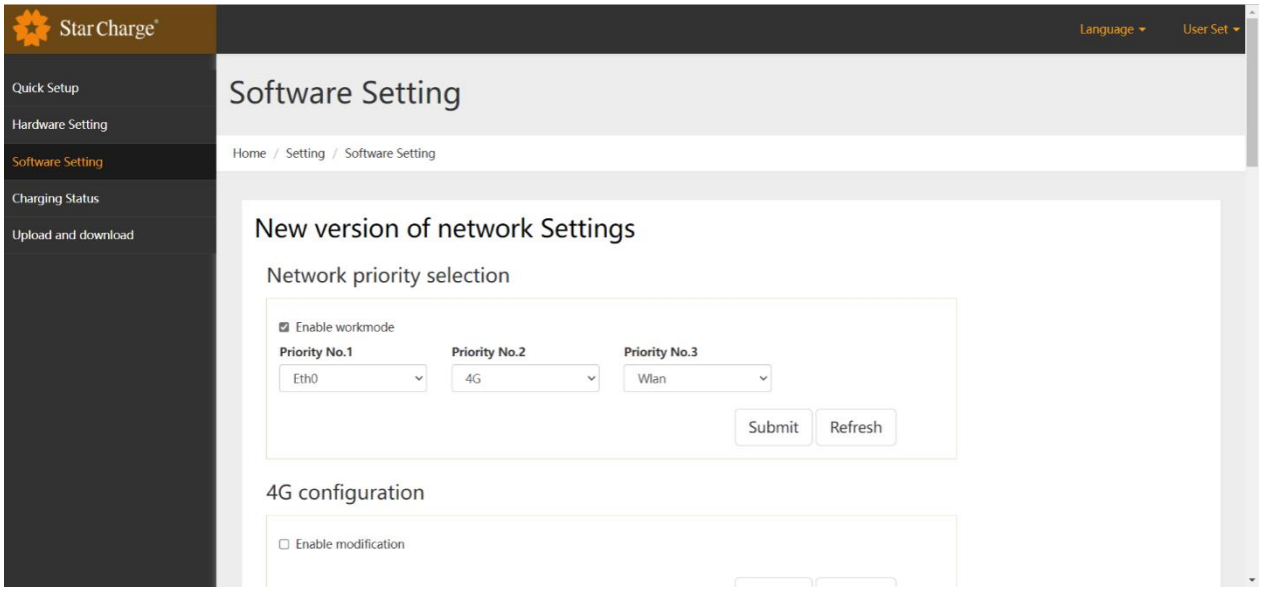
Set network connection priority:

(1) Find "Network priority selection"

(2) Click "Enable modification"

(3) Set the priority, Ethernet>4G>WIFI by default

(4) Click "Submit"



Configure 4G:

If it is consistent with the settings in "Quick Setup", there is no need to repeat the settings.

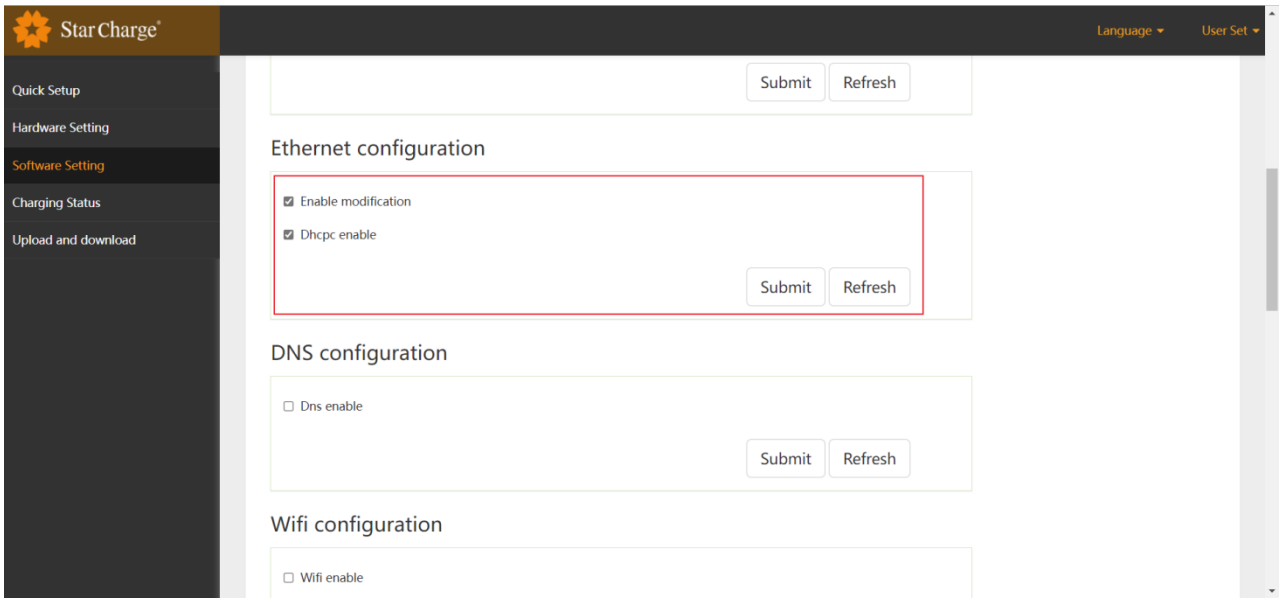
Configure Ethernet:

(1) Find "Ethernet configuration"

(2) Click "Enable modification"

(3) Click "Dhcpc enable" to automatically obtain the IP address; if it is necessary to fix the IP, do not click "Dhcpc enable" to enter the IP address

(4) Click "Submit"



Configure WIFI:

(1) Find "Wifi configuration"

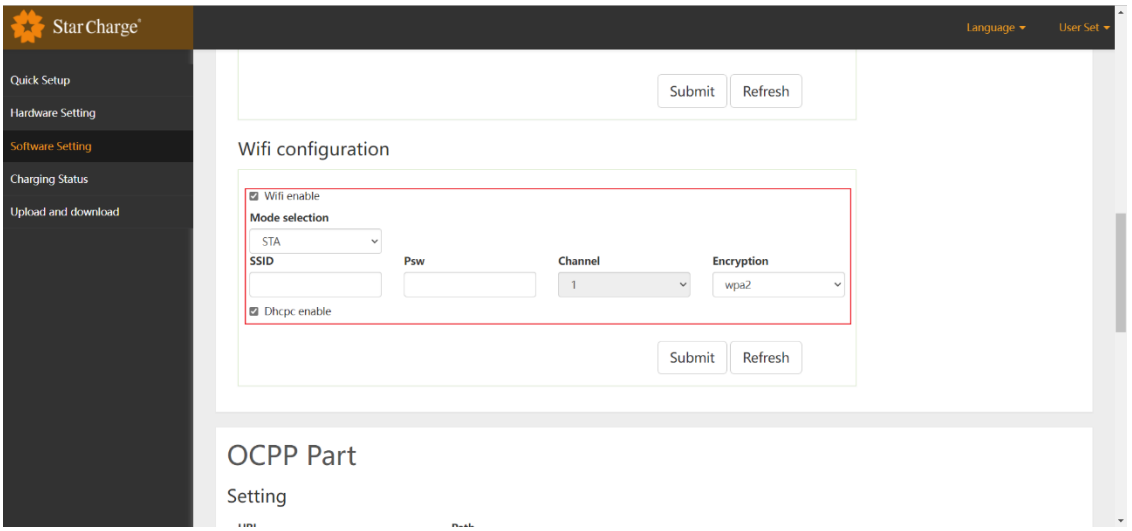
(2) Click "Enable modification"

(3) Select "STA" for "Mode selection"

(4) Fill in "SSID" (wifi account) "Psw" (wifi password) "Encryption" (generally select wpa2 for encryption method)

(5) Click "Dhcpc enable"

(6) Click "Submit"



Configure OCPP:

If it is consistent with the settings in "Quick Setup", there is no need to repeat the settings.

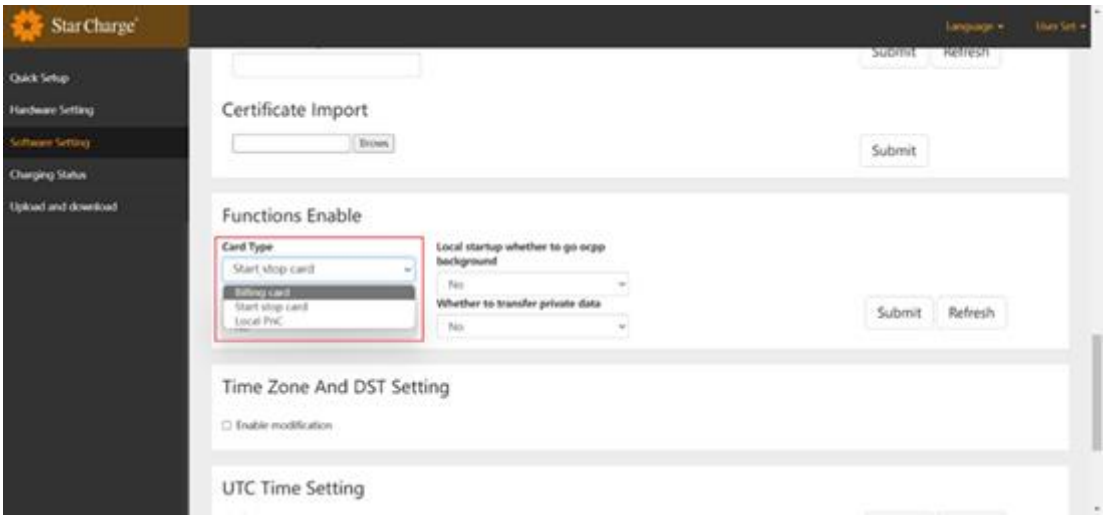
Card type:

(1) "Start stop card": It is the local start and stop card, and the charging station can be used without being connected to the platform

(2) "Billing card": It is the authentication card, the charging station needs to be connected to the platform, and the UID of RFID card needs to be entered into the platform before swiping card for use

(3) "Local PnC": Plug and Charge

Click "Submit" after setting

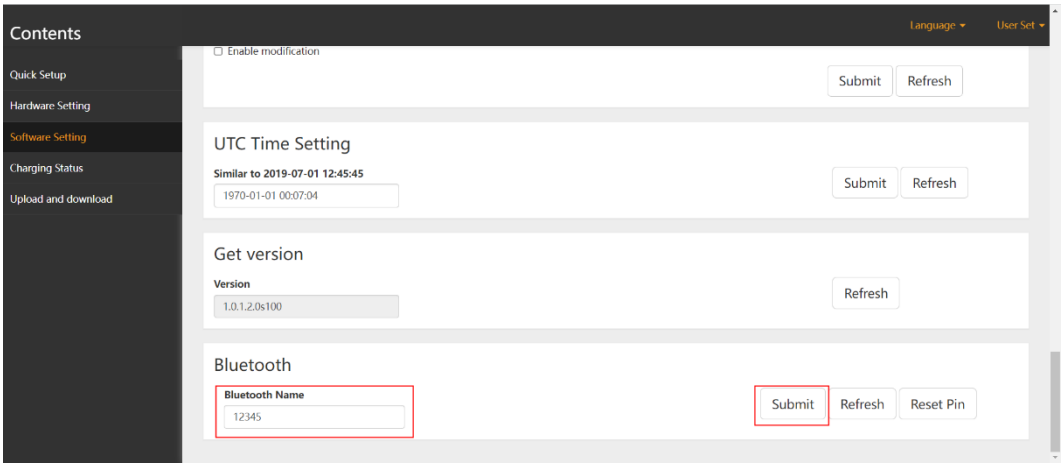


Configure Bluetooth Name:

(1) Enter "Bluetooth Name"

(2) Click "Submit"

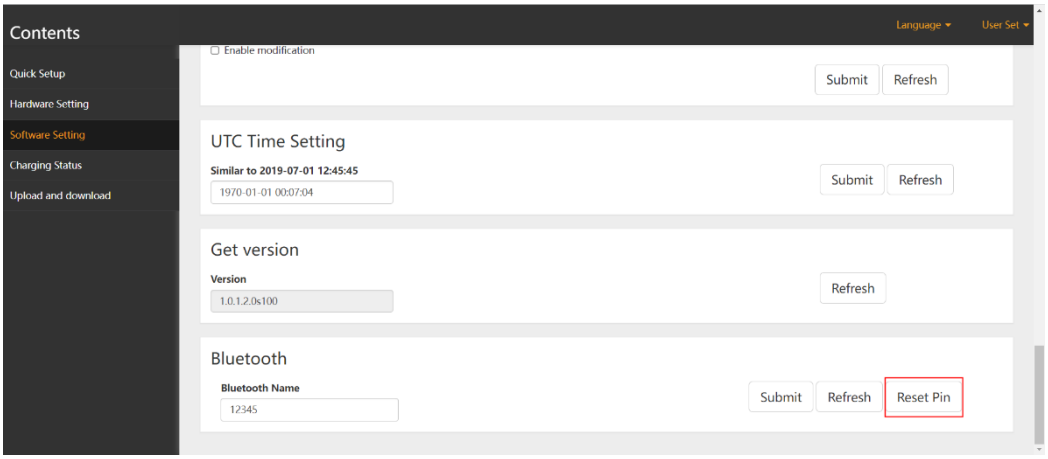
(3) The configuration takes effect after the restart



Reset Bluetooth Pin:

(1) Click "Reset Pin"

(2) The configuration takes effect after the restart



7 Instructions for Charging

The Charger's operation is divided into two parts,

- Charging connection from EVSE to EV through Type 2 cable.
- Starting and Ending the charging operation using authentication.

The user must first connect the charging device to the vehicle and then the LED light will turn from green in standby to blue after the connection is completed.

7.1 Summary of charging operation

- Insert the charging connector into the vehicle and confirm that it is connected properly (Case B), the blue LED lights up means the charger is in connection status.
- When the brightness of the blue LED changes gradually, it means that the charging process has started.

7.1.1 RFID-charging station with user authorization

Starting the session

Ending the session

7.1.2 Swiping card to start and stop charging

Starting the Charging process

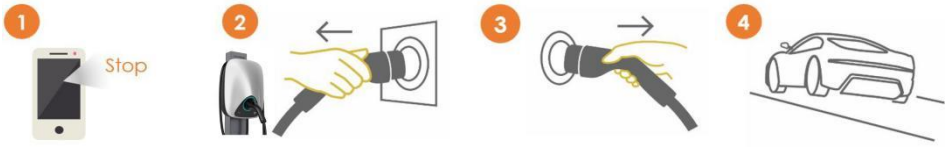
1. Placing the card above the RFID reader, the status light will flash blue if it has detected the card. Then the EVSE will do the authentication. If the authentication is successful, the status light will start pulsing blue, which means the charging process has begun.

2. Place the RFID card above the reader area; the indicator light will flash blue if the reader has detected the card. Then it will authenticate to stop. If the authentication is successful, the status light will turn green (free mode). The charging process will stop. If the startup by card swiping is not successful due to network reasons, please restart the card swiping process.
3. Pull out the connector from EV and EVSE, take out the cable, and place it connector holder. The charging session has concluded.

7.1.3 Scanning QR code for user authorization

Starting the session

Ending the session



7.1.4 Scanning QR Code to start and stop charging

Starting the Charging process

1. Open "Star Charge" or third-party app, click the QR code scan function and scan the QR code on the front of the Aurora, after successfully binded, click "Oneclick Charge" to start charging, as shown in Figure 28.

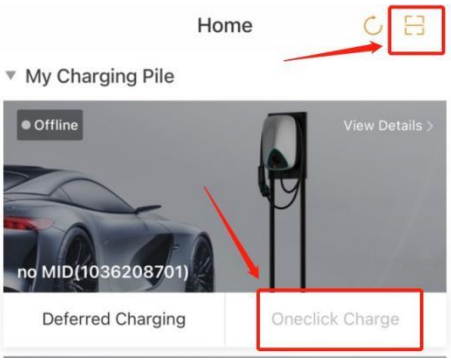


Figure 28: Mobile client interface

Stopping the Charging process

2. Open the StarCharge app or third-party app and click the "Stop" button to stop charging as shown in Figure 29. If successful, the status light will turn green to free mode and the charging process will stop.

Figure 29: Stop interface

3. Pull out the connector from EV and EVSE, take out the cable, and place it back to the lock. The charging session has concluded.

7.1.5 Start and stop charging via Bluetooth

prepartaion

1. Open ”starcharge” APP, connect the equipment to the power supply and keep the power on normally.
2. Turn on Bluetooth on the mobile phone.
3. Scan the QR CODE of the code decice/enter the QR code number.

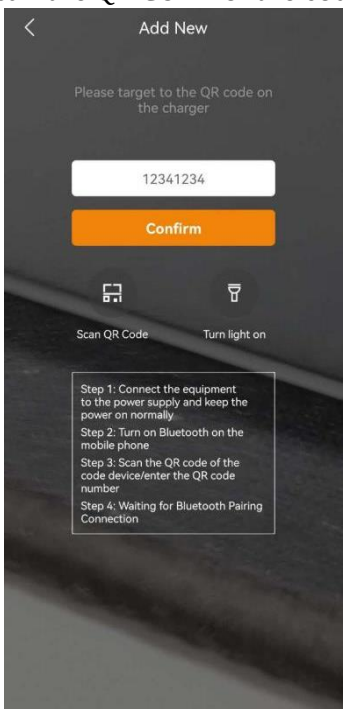


Figure 18 enter the QR code number

Figure 19 scam the QR code

4. Enter the correct PIN.

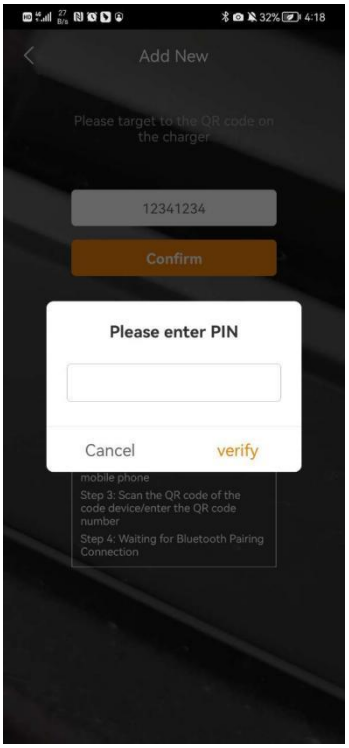


Figure 20 enter the PIN

5. Waiting for Bluetooth Pairing Connection.
6. If the following figure appears, the binding has been successful, and then click “start” to start charging.

Figure 21 start charge

Starting the Charging process

1. Open "Star Charge" app, click “me”, and then click “Bluetooth”, as shown in Figure 22.

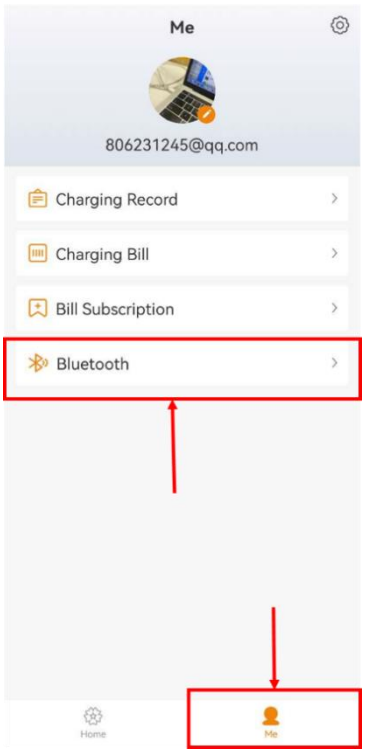


Figure 22 choose Bluetooth

2. Select the corresponding charging station, as shown in Figure 23.

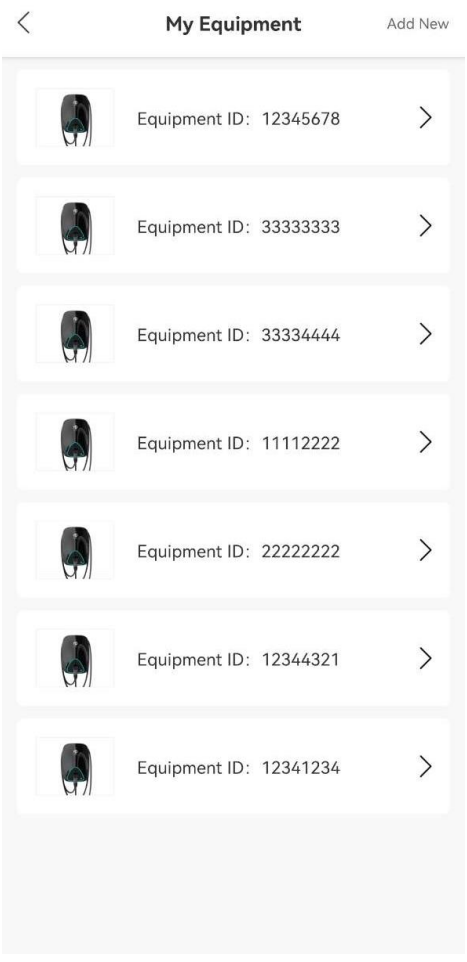


Figure 23 choose the charging station

3. Click “start” to start charging.

Figure 24 start charging

Stopping the Charging process

4. Click the "Stop" button to stop charging as shown in Figure 25. If successful, the status light will turn green to free mode and the charging process will stop.

Figure 25: Stop interface

PS: Full stop is configurable. When the full stop function is turned on, the charge will stop after 20 minutes when the current is less than 1A.

7.2 Indicator Description

LED status indicator	Meaning
Constant Green	Standby/Full stop
Constant Blue	Connecting
Pulsate Blue	RFID card verified
Breathing Blue	Charging
Pulsate Red (Fast flash)	RFID card failed
Pulsate Red (Slow flash)	Re-plugging the charging cable necessary
Constant Red	Fault

8 Maintenance

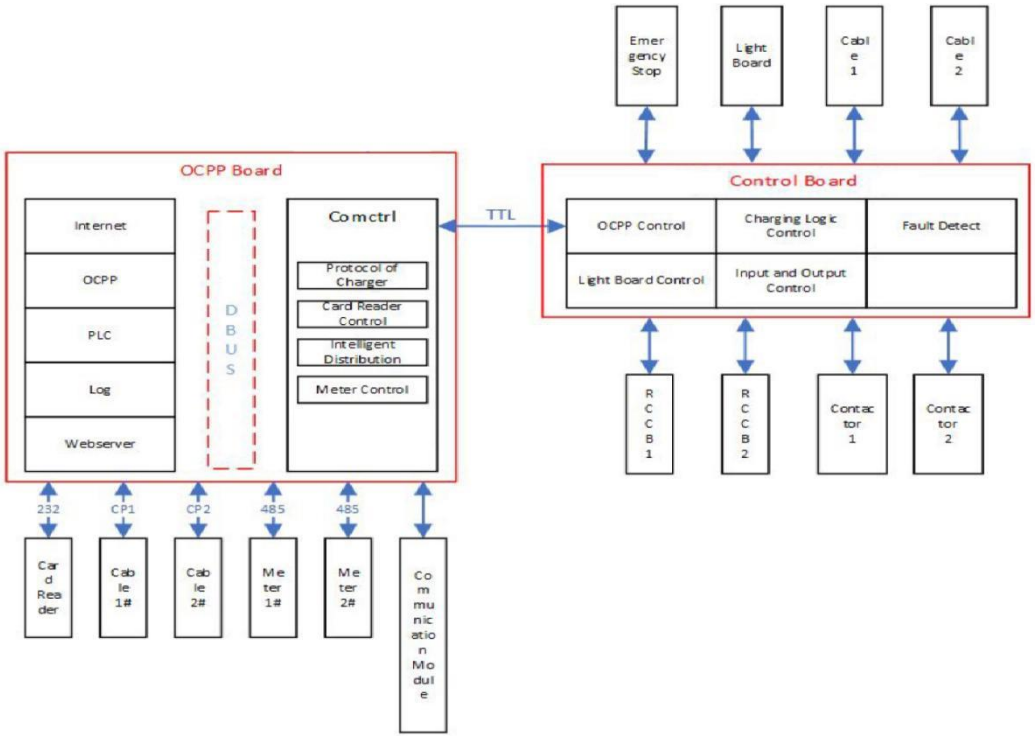
8.1 Routine Maintenance

The following table is the recommended maintenance cycle.
According to the country where the charging equipment is installed and operated, the cycle needs to be changed. Please adhere to the relevant laws and regulations at the location.

Check Item	Cycle	Handling
Charging connector	Every month	Check
Leakage switch protection	Every month	Check
Emergency stop function check	Every month	Test

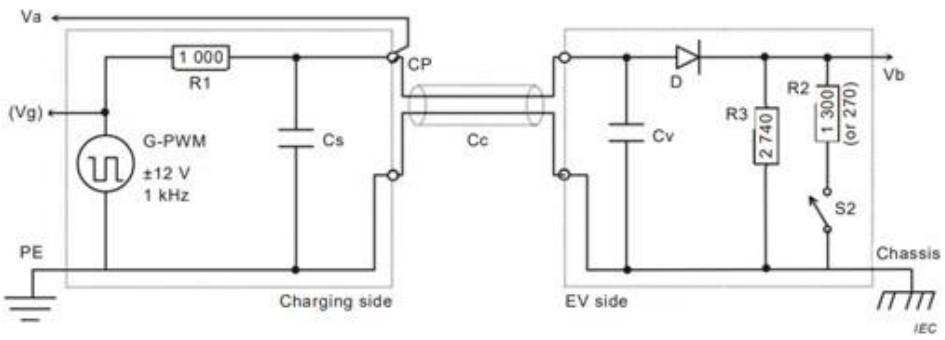
8.2 Charging control logic

8.2.1 Logic of Building-blocks



8.2.2 Typical control pilot circuit

A.2.2 Typical control pilot circuit



Key

G-PWM	PWM signal generator for pilot function	Vb	EV measurement of voltage, duty cycle and frequency
Va	Pilot wire voltage measured at EV supply equipment output	CP	control pilot contact
Vg	Internal voltage of PWM signal generator	Chassis	vehicle chassis connection
R1,Cs	as defined in Table A.2		
R2,R3,Cv,D	as defined in Table A.3		

NOTE The references of the components R2 and R3 have been interchanged with respect to IEC 61851-1:2010.

Timing	Action	Status	Explanation
1	Insert the charging connector	Va turns form 12V to 9V	EV is connected and Communication between EV and EVSE has not started
2	Send PWM wave	9V turns to 9V PWM	Communication has started between EV and EVSE
3	Vehicle response	S2 on	Relay is being closed
4	R2 equivalent resistance detected	9VPWM turns to 6VPWM	State charging is entered
5	Relay in the charger is on	Close K1, K2	Energy start to transfer
6	The battery is full and the vehicle asks to stop	S2 off	Relay is being opened, no more energy is being delivered to the EV
7	Disconnect detection R2 equivalent resistance	6VPWM turns to 9VPWM	Control Pilot (CP) voltage change to indicate charging state as been left
8	Stop sending PWM wave	9VPWM turns to 9V	Communication is stopped to the vehicle, EV is still plugged in
9	Pull out the charging connector	9V turns to 12V	This charger session ended, EVSE idle

9 Common troubleshooting examples

9.1 The Charger cannot be powered ON

Phenomenon : The Charger cannot be powered ON

General working principle - AC400V, 3-Phase power reaches the electricity meter from the distribution cabinet and enters the charger through the air switch of the meter and charger.

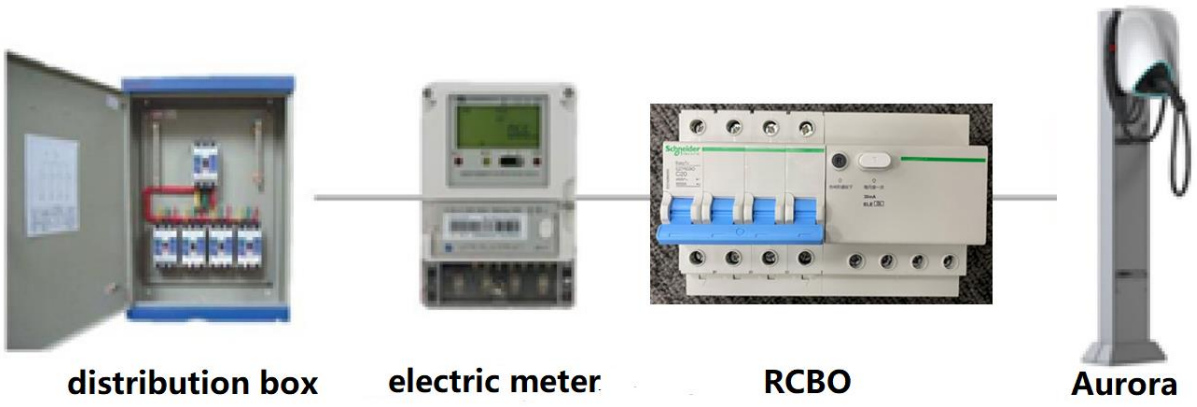


Figure 26: Power flow Scheme - Representational diagram

As shown in Figure 26, the AC power goes through the fuse, then through the varistor, and then enters the switching power supply. It is converted to DC12V to supply the mainboard.

Troubleshooting tips

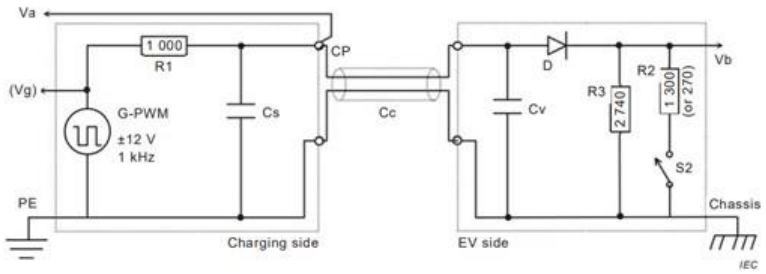
1. Check whether the input power is as per the norms. Make sure that the power supply is three-phase current for Aurora 22.
2. Check whether the air switch beside the charger trips. If it is, turn it ON. Check whether the power indicator is on. If it is ON, the fault is cleared. If it is still OFF, please check whether the air switch in the distribution box trips and use the same method to recover.
3. After eliminating the factors that would cause fault, measure the input, and output voltage of the air switch using a multimeter or a test pencil. If the input voltage is about 400V when the air switch is on, there is no output voltage or abnormal output voltage, the air switch is broken and replace it.
4. If the input and output voltages of the air switch are normal, there may be a fault in the charger. First, open the charger and measure whether the mainboard gets 400V. Observe the indicator light of the mainboard when the mainboard is on. If all of them are off, it is preliminarily determined that the mainboard does not have a 12V auxiliary power supply (abnormal switching power supply or fuse).
5. Check whether the input voltage of the mainboard is 400V. Check whether the input voltage of the switching power supply is 400V and the output voltage is 12V.
6. If the mainboard is normal, check whether the light board is faulty, replace the light board to check.

9.2 The charger is connected to the vehicle but charging doesn't get recognized by the EV

The light does not turn green after the charging connector is inserted in.

General working principle - After the charging connector is connected, the charger detects the resistance of R2 in the vehicle, so Va changes from 12V to 9V. At this time, the charger confirms the connection and the indicator light turns green.

A.2.2 Typical control pilot circuit



Key

G-PWM	PWM signal generator for pilot function	Vb	EV measurement of voltage, duty cycle and frequency
Va	Pilot wire voltage measured at EV supply equipment output	CP	control pilot contact
Vg	Internal voltage of PWM signal generator	Chassis	vehicle chassis connection
R1,Cs	as defined in Table A.2		
R2,R3,Cv,D	as defined in Table A.3		

NOTE The references of the components R2 and R3 have been interchanged with respect to IEC 61851-1:2010.

Troubleshooting tips

1. Check whether dust has accumulated in the charging connector or charging socket. If so, clean it.
2. Check whether there is an issue with the charging connector. The resistance of CP to PE is 220 Ohm when the charging connector is not inserted.

Table B.2 – Current coding resistor for EV plug and vehicle connector

Current capability of the cable assembly (A)	Nominal resistance of Rc Tolerance ± 3 %[c] (Ω)	Minimum dissipation rating of resistances [a, b] (W)	Range of resistance Rc for interpretation by the EV supply equipment [e] (Ω)
	Error condition [d] or disconnection of plug		> 4 500
13	1 500	0,5	1 100 – 2 460
20	680	0,5	400 – 936
32	220	1	164 – 308
63 (3-phase) / 70 (1-phase)	100	1	80 – 140
	Error condition [d]		< 60

[a] The power dissipation of the resistor caused by the detection circuit shall not exceed the value given above. The value of the pull-up resistor Ra shall be chosen accordingly.

[b] Resistors used should preferably fail open circuit failure mode. Metal film resistors commonly show acceptable properties for this application. Dissipation ratings are chosen to avoid destruction in the case of a fault to +12 V supply.

[c] Tolerances to be maintained over the full useful life and under environmental conditions as specified by the manufacturer.

[d] EV supply equipment shall not provide power.

[e] The minimum and maximum values of each range shall be tested. The choice of the resistance value at the transition between current levels is at the discretion of the EV supply equipment designer.

3. If the above tests are normal, try to replace the mainboard to check if the mainboard is broken.

9.3 Input Overvoltage is observed

The charger stops abnormally

General working principle

1. The allowable range of the input voltage of the charging facility is 360 to 440V.
2. If it is higher than 269V, an overvoltage fault is reported, and the charger will stop.
3. The onboard electricity meter in the charger will read the data such as the input voltage, and the mainboard will read the data of the electricity meter once every 100ms.
4. When the overvoltage conditions last 5s, the fault is established, and the charging will stop.

Troubleshooting tips

Check the input voltage of the charger. If the input voltage is too low or too high, we can advise the customer to replace the more stable line to meet the working conditions of the charger.

9.4 Not fully charged, report that the battery is full or the connection is unsuccessful

The indicator light is green but there is no current.

General working principle

When the charger is normal operation and the connection is normal, the switch S1 is switched from the +12V connection state to the PWM connection state, and the power supply control device issues a PWM signal. At this time, if the vehicle S2 is closed, the voltage of "Monitoring Point 1" changes from 9V to 6V. At this time, the power supply control device closes the contactors K1 and K2 to make the AC power supply circuit conductive.

Troubleshooting tips

1. It is recommended that the customer recharge and check whether it is an accidental fault.
2. If the fault still exists, it is recommended to drive the vehicle to an external charger or a Automobile Sales Servicshop charger for trial charging.
3. If there is another failure, the vehicle is judged to be faulty. It is recommended that the customer go to the 4S shop to check the vehicle.
4. Try to charge after replacing the mainboard.

For the newest version of the document, please feel free to check www.starcharge.com

Many thanks for your attention

Customer service

Preparation
If you have any questions or problems, please contact the company responsible for performing the electrical installation.

Before contacting Customer Service:

Check the troubleshooting measures in the Troubleshooting sectionof this manual.

Contact

Company address: No.39 Longhui Road, Wujin District, Changzhou, Jiangsu, China
Company Website: http://www.starcharge.com
Company E-mail: starcharge@wanbangauto.com

Star Charge®