Operation and Installation Manual

Energy Management System Solution

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IMPORTANT

Before establishing Energy Management System, please read this manual carefully, paying extra attention to the important notes.

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CONTENTS

1 Using This Manual

The document describes how to realize Energy Management System Solution and is intended for these groups:

- Owner of the MaxiCharger AC Wallbox (EU)
- Installation engineer

1.1 Conventions

1.1.1 Bold Text

Bold text is used to highlight selectable items such as buttons and menu options. Example:

- Tap **OK**.

1.1.2 Notes

- **NOTE**: provides helpful information such as additional explanations, tips, and comments.
- **IMPORTANT**: reminds you that you must follow the instructions to prepare, set up, and operate.

1.1.3 Hyperlinks

Hyperlinks are available in electronic documents. Blue italic text indicates a selectable hyperlink, and blue underlined text indicates a website link or an email address link.

1.1.4 Illustrations

Illustrations, especially the screenshots of the app interface, used in this document are for reference only. The actual screens shall prevail.

1.1.5 Procedures

An arrow icon indicates a procedure. For example:

➢ **To wire an RS485 cable between the primary charger and the meter**

1. Keep the power turned off during wiring.
2. Install the meter following the instructions in the Meter Wiring Guide included in the package.

3. Connect the RS485 cable to the primary charger and the meter as instructed, respectively.

2 Energy Management System

2.1 Important Notes

Before getting started, PLEASE NOTE:

1. This manual is intended to outline the instructions for the installation and the app settings of the Autel Energy Management System.
2. The Energy Management System Solution described in this manual is only applicable for MaxiCharger AC Wallbox (EU).
3. Installation must be performed by qualified personnel in accordance with local regulations.
4. To comply with relevant electric leakage protection standards, please use at least Type A RCD(s) or use other electrical leakage protector by referring to local standards.
5. Update your MaxiCharger AC Wallbox to the latest software version before installing the chargers and meters.
6. Ensure that the MaxiCharger AC Wallbox is powered off before connecting the meter and wiring the Ethernet cable.

2.2 Working Modes

Autel Energy Management System supports the following four working modes:

A. DLB Mode

B. ALM Mode

C. Boost Mode

D. Solar Mode (forthcoming)

2.2.1 General Features

Table 2-1 ***General Features of the Working Modes***

Item	Boost Mode	ALM Mode	DLB Mode	Solar Mode
Primary Charger	1	1	1	1
Secondary Chargers	N/A	1–24	1–24	N/A
Communication Protocol Between Chargers	N/A	Wi-Fi / Ethernet Cable	Wi-Fi / Ethernet Cable	N/A
Communication Protocol Between the Primary Charger and the Meter	Modbus	Modbus	N/A	Modbus
Maximum Length of Wiring Ethernet Cable	N/A	100m	100m	N/A
Maximum Length Between the Wiring of the Primary Charger and the Meter	500m	500m	N/A	500m

Item	Boost Mode	ALM Mode	DLB Mode	Solar Mode
Maximum Configurable Phase Current	Minimum between RCD Rated Current and Contract Tariff Current.			
Maximum Configurable Installation Current	Rated Current of the RCD			
Available Apps	Autel Charge / Autel Config			

2.2.2 DLB Mode

DLB mode can be used when there are several chargers. The purpose of the DLB mode is to achieve the fastest charging by maximizing power efficiency for the power allocated to the chargers and keep the system power in range.

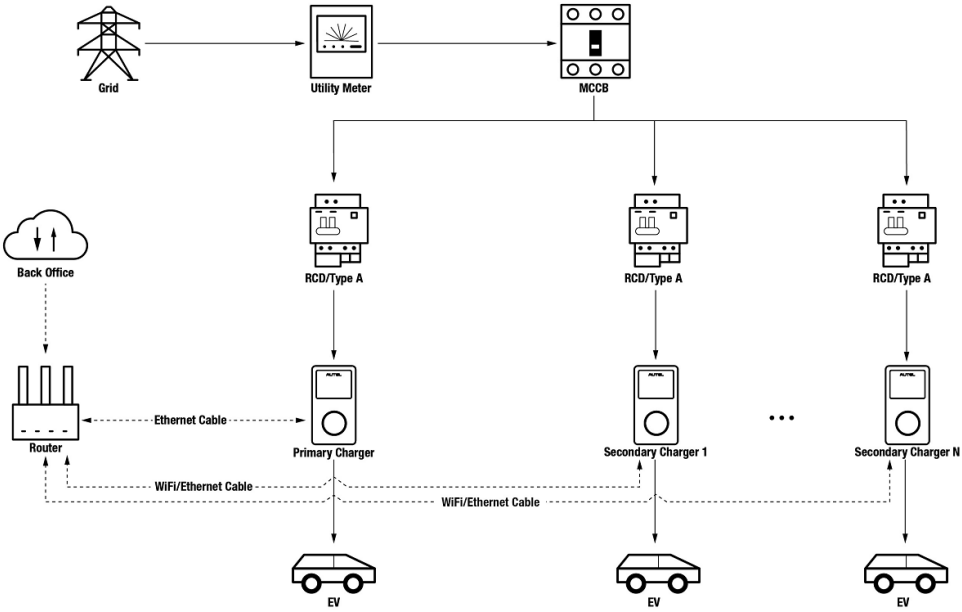


Figure 2-1 ***System Diagram (DLB Mode)***

2.2.3 ALM Mode

ALM mode is suitable for the scenarios where there are multiple chargers sharing power with other loads. ALM mode could provide consistent charging of chargers and other loads. The difference between the DLB mode and the ALM mode is that ALM mode could manage load power and chargers' power at the same time by using an external energy meter.

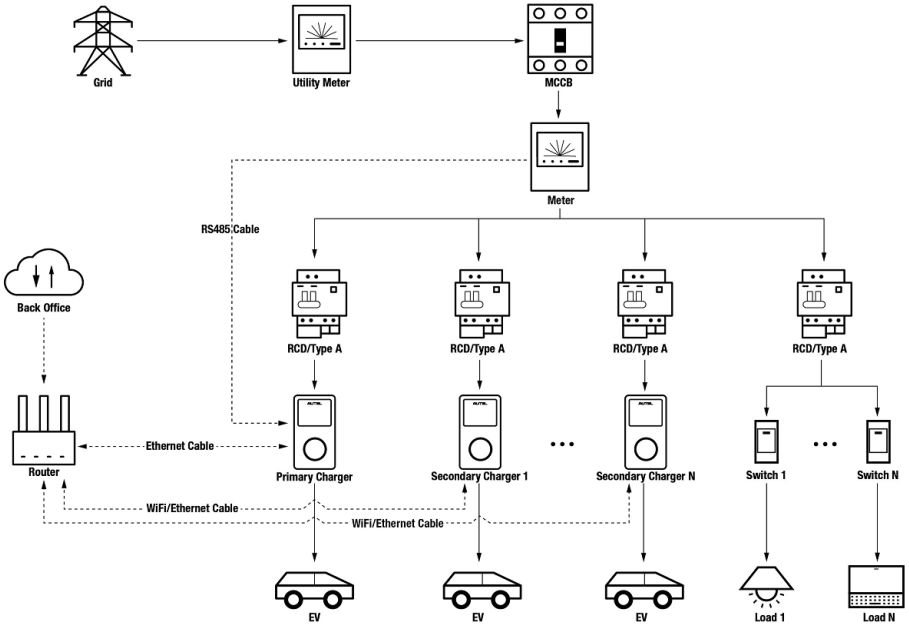


Figure 2-2 ***System Diagram (ALM Mode)***

2.2.4 Boost Mode

Boost mode is a simplified version of ALM mode, suitable for the scenario where there is only single charger. It is an intelligent adaptive load management method that provides consistent charging of the charger and the other loads.

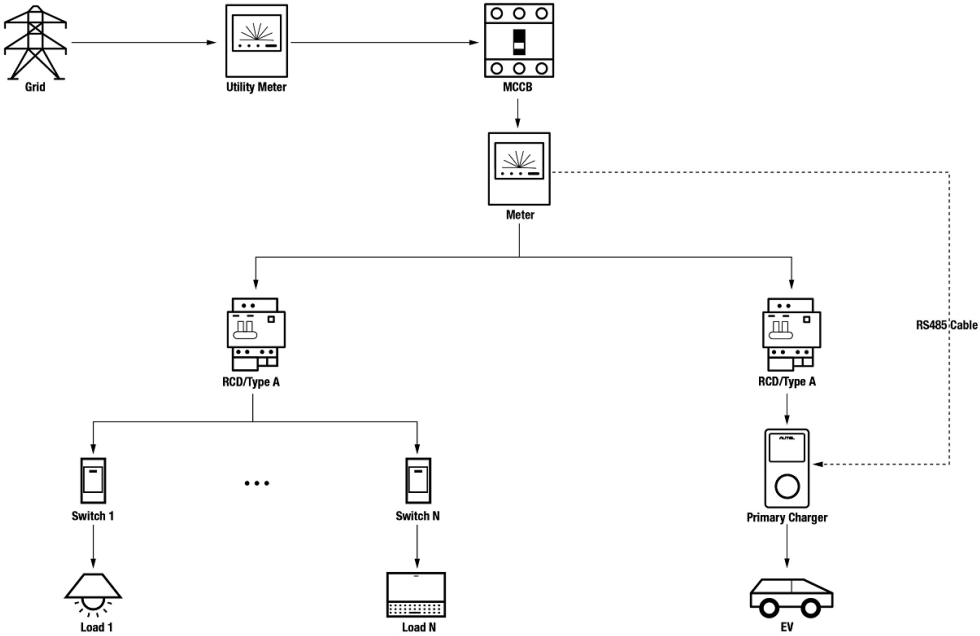


Figure 2-3 ***System Diagram (Boost Mode)***

2.3 Install MaxiCharger AC Wallbox

Before setting up the Energy Management System, please install MaxiCharger AC Wallbox (EU). For information on how to install the MaxiCharger AC Wallbox (EU), please consult your dealer. No details on that will be provided here.

2.4 System Internet Connection

2.4.1 Chargers Grouping

In Boost mode, the charger is not compulsory to connect to Internet. If needed, the Internet communication can be established via Ethernet cable or Wi-Fi.

In ALM mode and DLB mode, both the primary charger and the secondary charger(s) need to be connected to Internet:

1. The primary charger must establish Internet communication via Ethernet cable.
2. The secondary chargers can connect to Internet either via Ethernet cable or Wi-Fi.

2.4.1.1 Via Ethernet Cable

To establish a stable Internet connection, whether as a primary charger or secondary charger, we recommend you use an Ethernet cable to connect the charger to the router.

- **To connect the Ethernet cable between the charger(s) and the router**

  1. Keep the power turned off during wiring.
  2. Insert the RJ45 plug of the Ethernet cable into the RJ45 port (A) at the bottom of the charger.

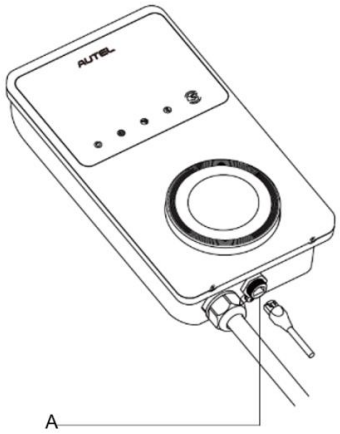


Figure 2-4 *Plugging the RJ45 Cable*

Before connecting the Ethernet cable, we recommend you install the waterproof Ethernet cable gland on the Ethernet cable first.

- **To connect the waterproof Ethernet cable gland**

  1) Put the Ethernet cable with RJ45 plug (E) through the nut (D) and the waterproof cap (B), leaving some space between them.

  2) Connect the sealing ring (C) via its opening to the Ethernet cable and insert it into the waterproof cap.

  3) Screw the nut into the waterproof cap and make sure they are securely fastened.

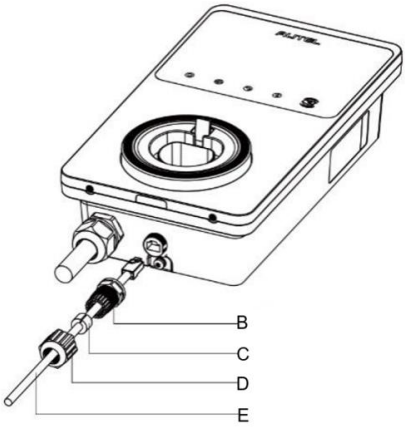


Figure 2-5 ***Installing the Waterproof Ethernet Cable Gland***

3. Insert the other end (RJ45 plug) of the Ethernet cable into the RJ45 port of the router.

IMPORTANT

1. The length of each Ethernet cable should be less than 100m (328 ft), and the distance from the router to all chargers should be less than 50m (164 ft).
2. When the length of Ethernet cables exceeds 100m (328 ft), or when the Wi-Fi connection distance is more than 50m, the Internet connection may become unstable. In this case, an external signal amplifier can be used to boost the signal.

2.4.1.2 Via Wi-Fi Connection

To establish an Internet connection between the charger(s) and router via Wi-Fi, download Autel Charge app and log in first. Then refer to *Bluetooth and Wi-Fi Connection* on page 18 of this document for details.

- **Internet Connection Indicator**

When the charger is connected to network, the Internet connection indicator on the charger will be on. Please check if the charger is connected to network for smart charging by observing the status of the Internet connection indicator.

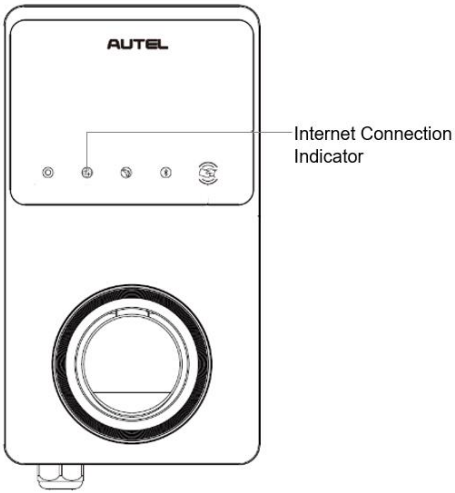


Figure 2-6 *Internet Connection Indicator*

The table below describes the status of the Internet connection indicator:

Table 2-2 *Internet Connection Indicator*

Indicator	Status	Description
Internet Connection Indicator	Steady On	Network is connected, but not for smart charging.
	Steady Off	Network is not connected.
	Blink Fast	Smart charging connection NORMAL.
	Blink Slow	Smart charging connection ABNORMAL.

2.4.2 Meter Connection

In ALM and Boost mode, an RS485 cable is required for establishing a communication between the primary charger and the meter. It is recommended to select the charger nearest to the meter as a primary charger.

To save your time for purchasing an appropriate energy meter to set up the Autel Energy Management System, the recommended AC energy meters are listed below, which can be bought from local distributors or Autel webshop.

- Single phase ≤ 100 A for EU market: SDM230-Modbus V1
- Single phase ≤ 100 A for UK market: SDM230-Modbus V2
- Three phase ≤ 100 A: SDM630-Modbus V2
- Three phase > 100 A, ≤ 250 A: SDM630MCT-Modbus V2

➢ **To wire an RS485 cable between the primary charger and the meter**

1. Keep the power turned off during wiring.
2. Install the meter following the instructions in the Meter Wiring Guide included in the package.
3. Connect the RS485 cable to the primary charger and the meter as instructed, respectively.

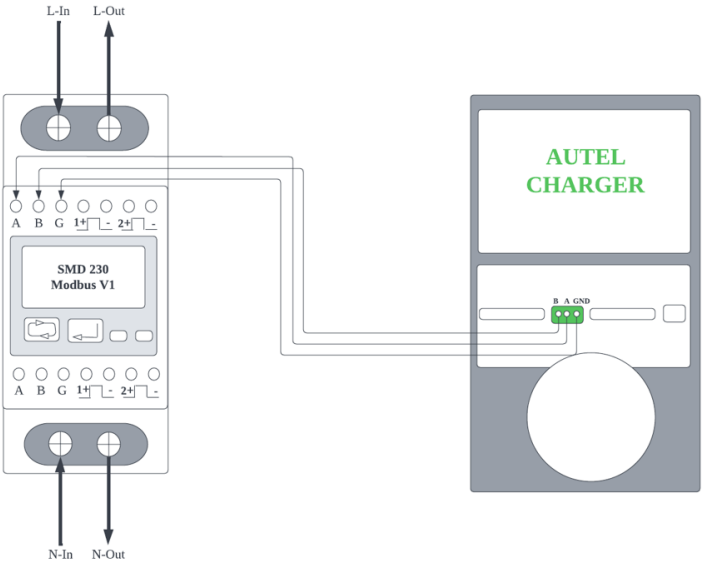


Figure 2-7 ***SDM230-Modbus V1 Energy Meter RS485 Cable Wiring***

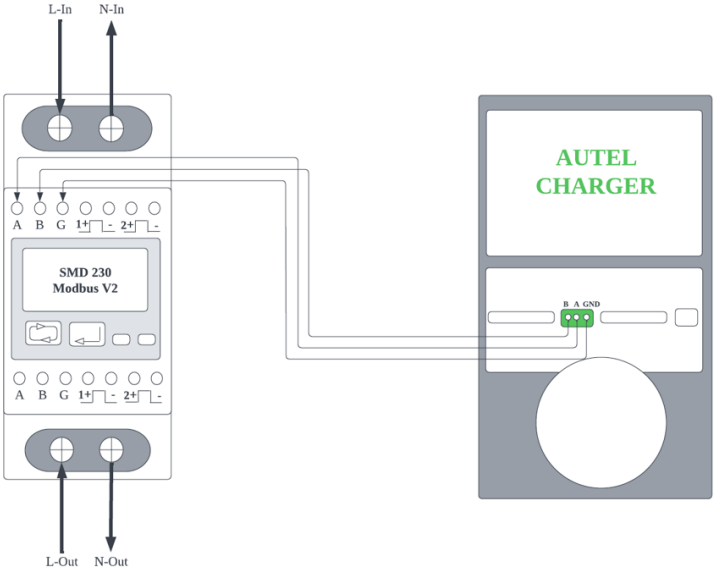


Figure 2-8 ***SDM230-Modbus V2 Energy Meter RS485 Cable Wiring***

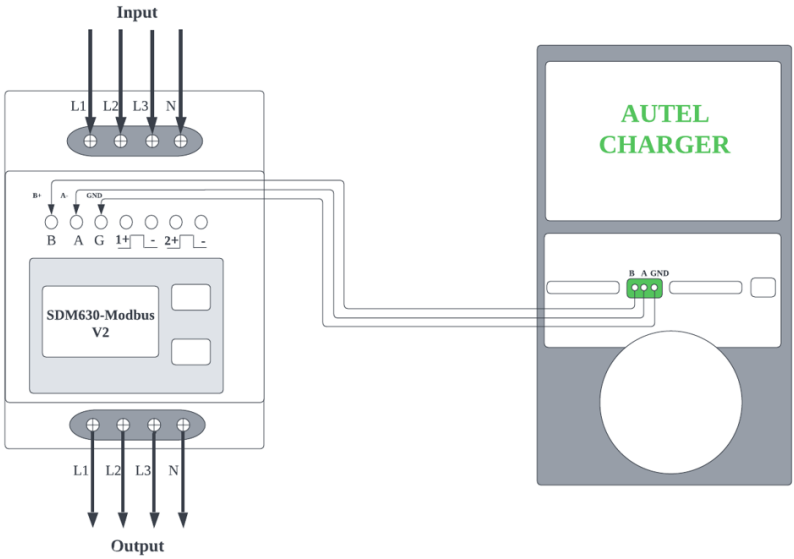
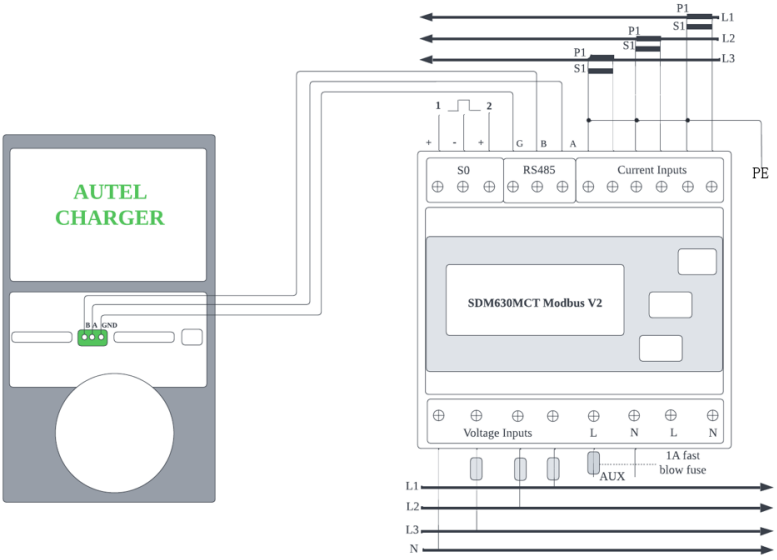


Figure 2-9 ***SDM630-Modbus V2 Energy Meter RS485 Cable Wiring***



*The CT sensors should be grounded to local PE due to the need for surge current protection.

Figure 2-10 ***SDM630MCT-Modbus V2 Energy Meter RS485 Cable Wiring***

3 App Settings

Follow the steps below to activate the relevant mode once you have installed and wired all the units according to the corresponding system diagram.

3.1 Download App

Two apps can be used to achieve Autel Energy Management System Solution: **Autel Charge** and **Autel Config**. Here we use the **Autel Charge** app as an example to illustrate the app settings.

Scan the QR code below to download the **Autel Charge** app. Or you can download the **Autel Charge** app from app store: iOS users can download the **Autel Charge** app from the Apple App Store, while Android users can download the app from the Google Play Store.

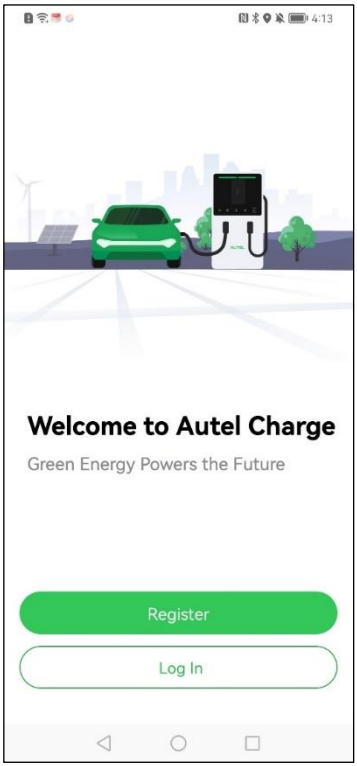
NOTE

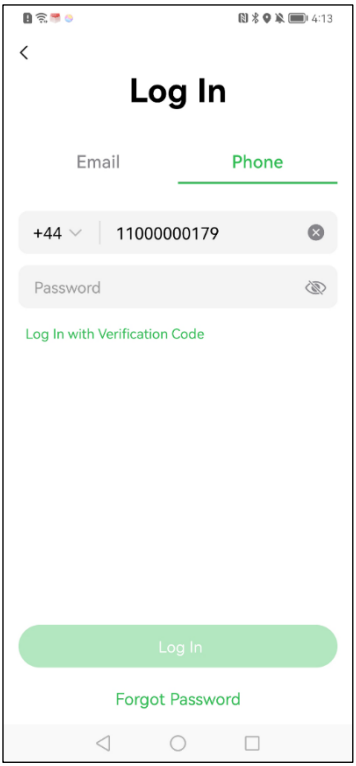
Make sure the MaxiCharger AC Wallbox and **Autel Charge** app are using the latest software versions.

3.2 Log In

a) If you don't have an Autel Charge account, tap **Register** to create an Autel Charge account.

b) If you already have an account, tap **Log In**, then log in with either your phone number and password or with your email and password.



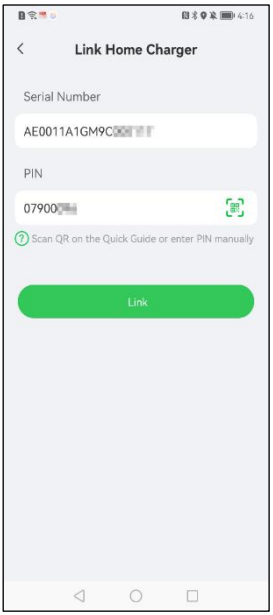


3.3 Initial Configuration

The initial configuration helps to link a charger, connect Bluetooth and Wi-Fi, and set your personal preferences and parameters.

3.3.1 Link the Charger

After successfully logging in, the screen enabling you to add chargers will appear, tap **Add** to continue. Scan the QR code on the Quick Reference Guide to acquire the serial number and PIN of the charger, or you can tap **Enter Terminal Number** to manually enter the serial number and PIN. After confirming the serial number and PIN, tap **Link**.

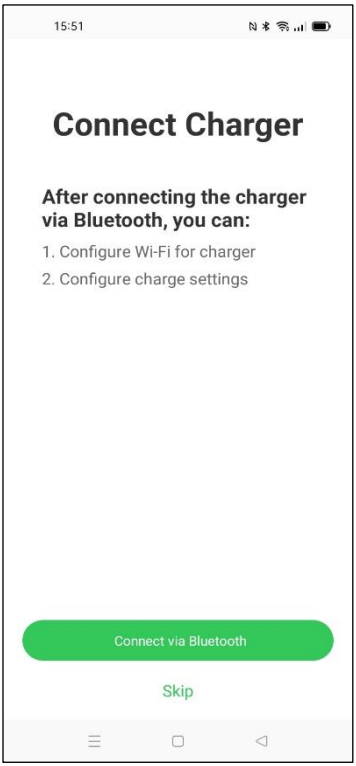


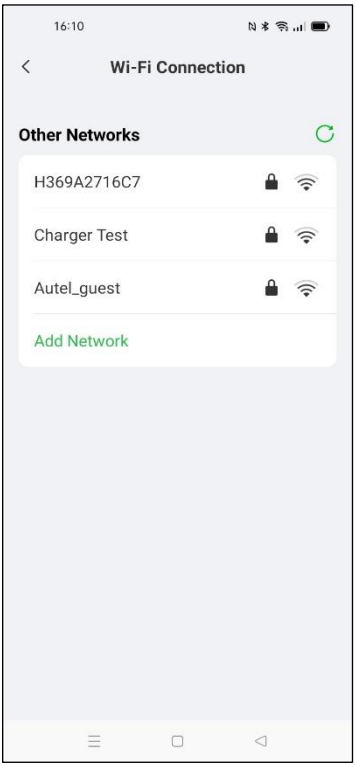
3.3.2 Bluetooth and Wi-Fi Connection

1. After the charger is linked, the following screen will appear, asking you to connect the charger via Bluetooth or configure Wi-Fi for the charger. Tap **Connect via Bluetooth** first, and then the Configure Wi-Fi screen will pop up. You can tap on the Wi-Fi network ID you need to connect.

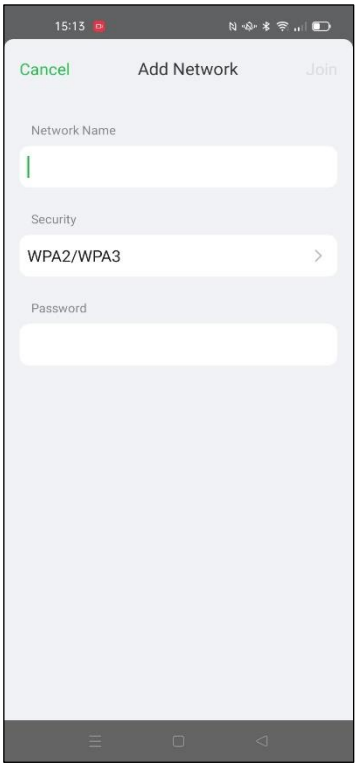
NOTE

1. A Bluetooth connection is used to enable operations on the charger, whereas a Wi-Fi connection is used to connect the chargers in the local network, such that the secondary chargers can be controlled by the primary charger. The primary charger and the secondary chargers need to be connected to the same Wi-Fi.
2. Once a charger is connected to a Wi-Fi network, it will remember the network and stay connected to it. Bluetooth can only be connected to one charger at one time. Switching the operation on another charger will disconnect the Bluetooth connection with the existing charger and connect it to a new charger. Disconnecting a Bluetooth connection will not disrupt your existing Wi-Fi connection.
3. If the charger is connected to the network via Ethernet cable, there is no need to connect the charger via Wi-Fi. If you plan to connect the charger to network via Wi-Fi, and will not use it as primary charger in later operations, we recommend you connect the charger to Wi-Fi beforehand.
4. For single charger, Ethernet cable or Wi-Fi grouping is not mandatory.



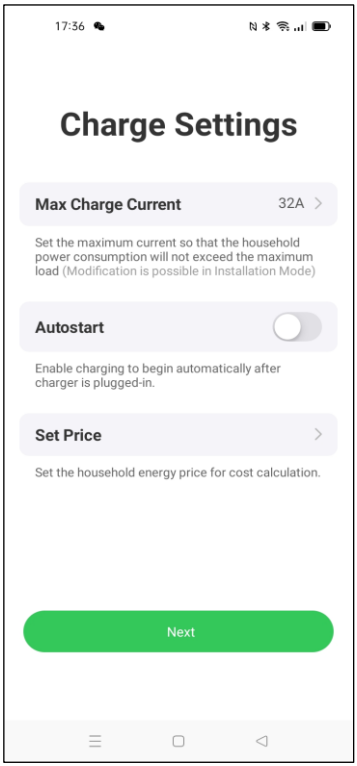


2. If the Wi-Fi for the charger is not detected by the device, tap **Add Network** on the Wi-Fi Connection screen, and enter the Wi-Fi network ID and Wi-Fi password, then tap **Join**.



3.3.3 Charge Settings

After the Wi-Fi connection screen, you will see the Charge Settings screen. On the Charge Settings screen, you can set the maximum charge current and energy price, enable/disable autostart charging when the charger is plugged-in.



➢ **To set the maximum charge current**

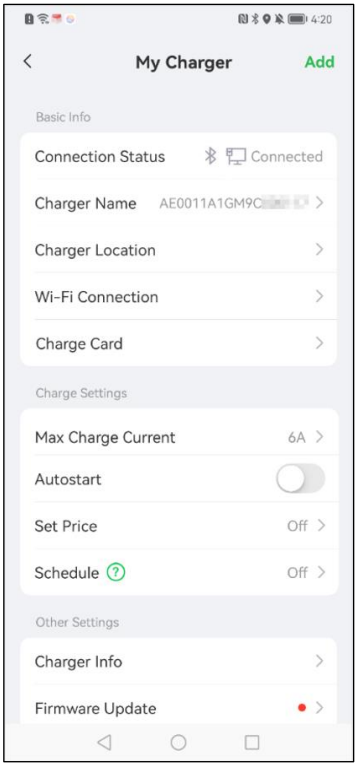
1. Tap on **Max Charge Current** from the Charge Settings screen.
2. Select the maximum charge current from the pop-up box.
3. Then select the configurable maximum charge current based on the rated power of the charger. For instance, the configurable maximum charge current of 7kW chargers is 32 A, 22kW chargers is 32 A, 11kW chargers is 16 A. Note that the configurable minimum charge current is 6 A, so the configurable charge current of the 7kW / 22kW chargers should be 6 A to 32 A, the 11kW chargers should be 6 A to 16 A.
4. Once the maximum charge current is selected, tap **OK**.

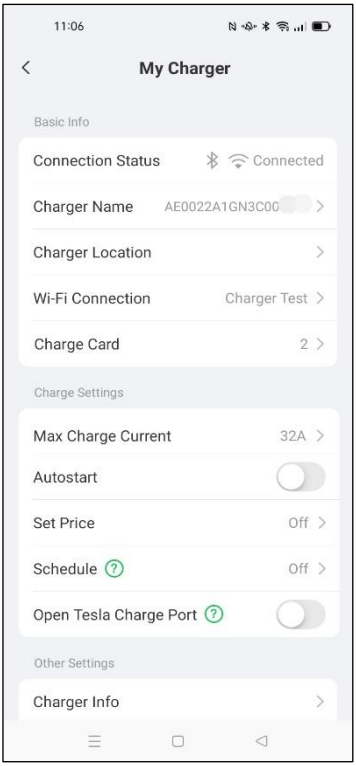
3.4 Charger Details

Finish the settings, tap **OK**. A detailed information screen for the current charger will pop up. Once the Bluetooth and Wi-Fi are well connected, the Bluetooth icon and the Wi-Fi icon (or) will be displayed on the Connection Status.

NOTE

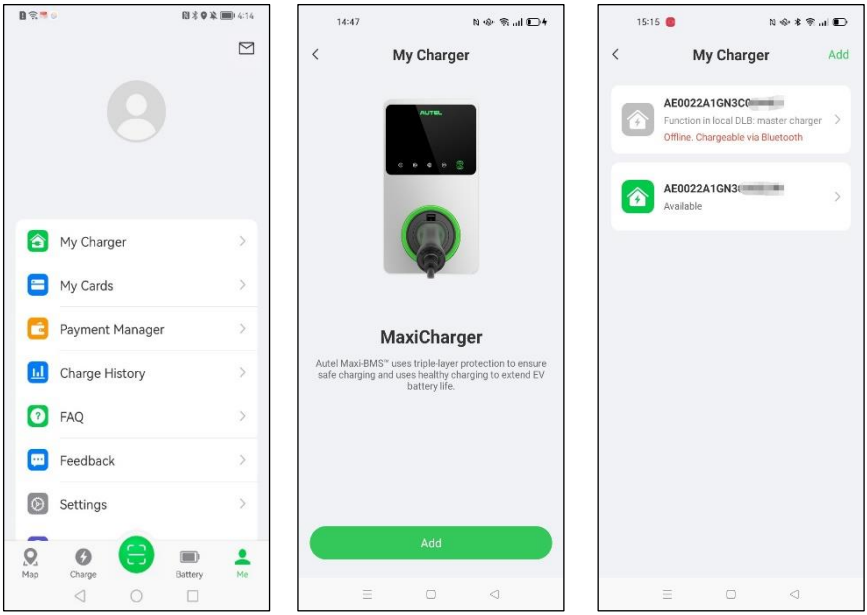
If the charger establishes a network communication via Ethernet cable, the Wi-Fi icon will display as , and will display as when established a network communication via Wi-Fi.





3.5 Link Other Chargers

1. After successfully logging in, tap **Me** → **My Charger** → **Add**.

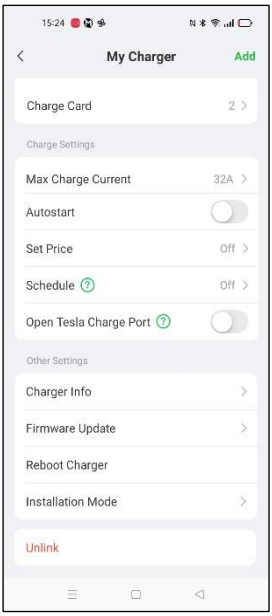


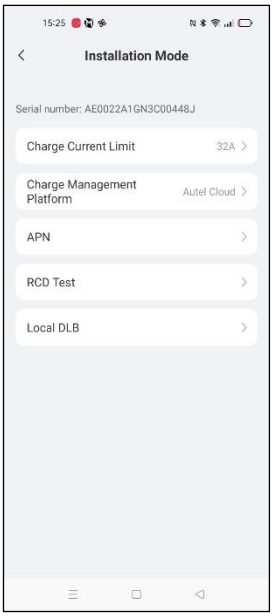
2. And then, repeat all the steps in *Initial Configuration* on page 16.

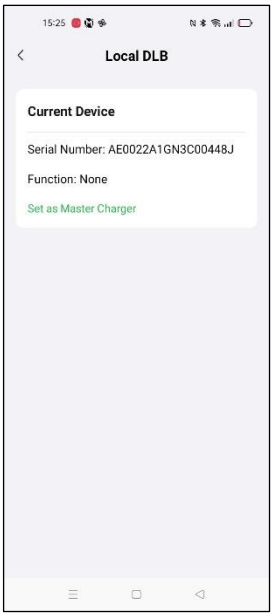
3.6 Set Primary Charger

After all the chargers are linked, you need to choose one to set as the primary charger to control all other chargers. Any charger can be set as the primary charger, however, only the primary charger with a meter connection can enable ALM / Boost mode.

Ensure the charger to be set as primary charger is connected to Bluetooth, then tap **Installation Mode → Local DLB → Set as Master Charger**.







NOTE

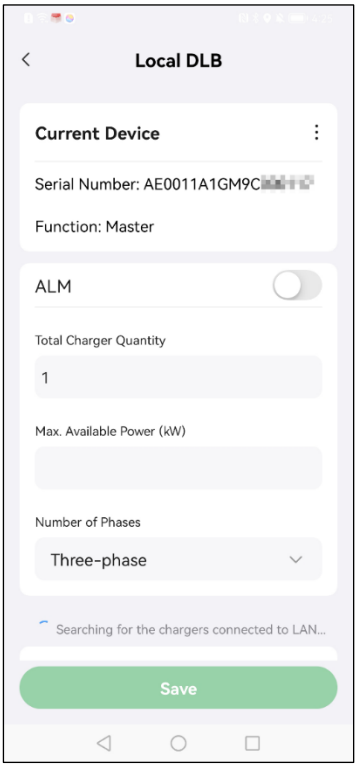
If you need to change the charge current limit, you can also tap on the **Charge Current Limit** from the Installation Mode screen to adjust it.

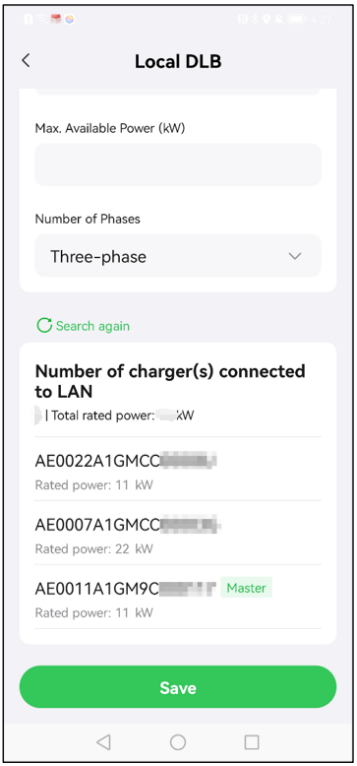
3.7 DLB Mode Setup

After designating a primary charger, you can set up DLB mode in the Local DLB screen.

For DLB mode, you need to confirm and set:

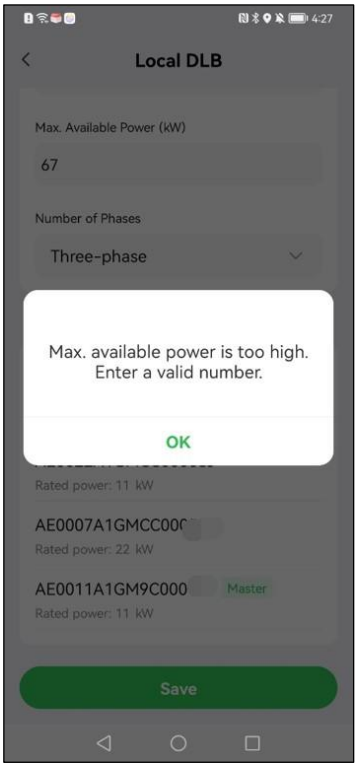
- Total Charger Quantity: displays the total number of the chargers in the DLB device group. The charger quantities will be updated based on the search.
- Max. Available Power (kW): you need to enter the maximum power the system can supply to the chargers. You must enter an integer.

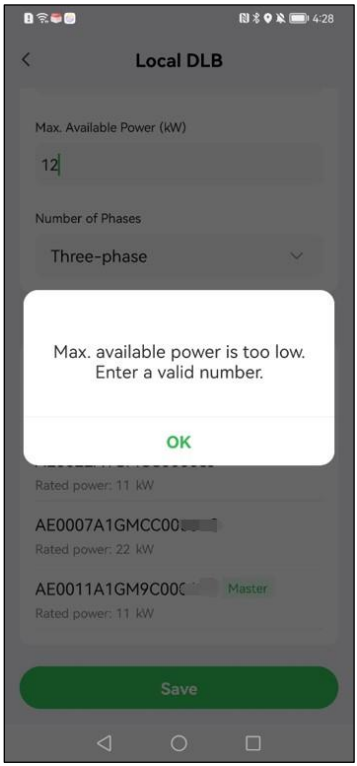




➢ **To enter the suitable maximum available power**

1. The value of the maximum available power should be within the following range:
   - Maximum Value: 1.5 times the sum of the rated power of all chargers in the DLB device group.
   - Minimum Value: when you use single-phase power supply (≤250 V), the input value should be 1.4*N (N represents the number of chargers in the DLB device group); when you use three-phase power supply (≤480 V), the input value should be 4.2*N (N represents the number of chargers in the DLB device group).
2. If the input value is too high or too low, a warning asking you to enter a valid value will appear on the screen.





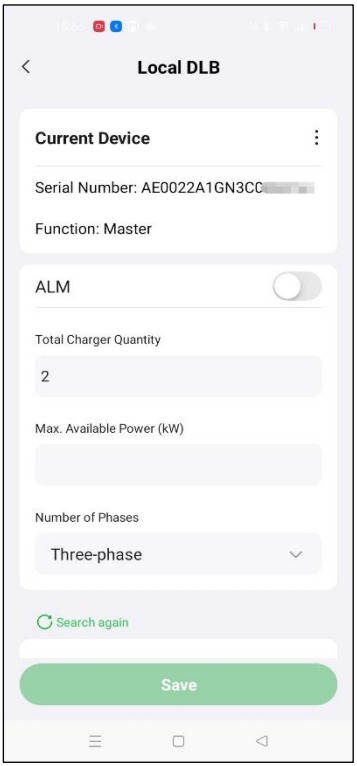
3. Once the maximum available power is set, tap **Save**. A message “Saved successfully” will appear on the screen; then tap **OK**. Now your chargers can be charged according to your new settings.

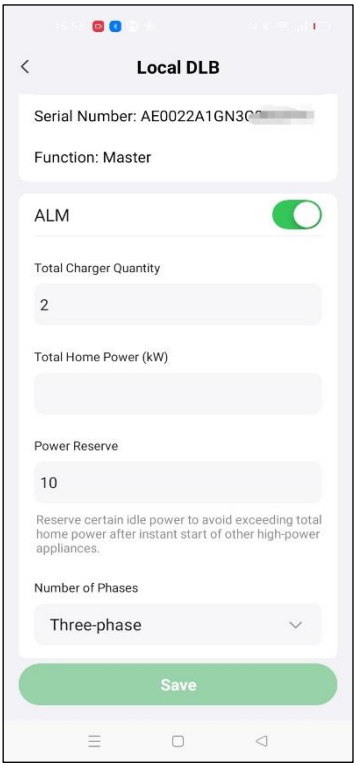
3.8 ALM / Boost Mode Setup

After designating a primary charger, you can set up ALM / Boost mode in the Local DLB screen.

For ALM / Boost mode, you need to make the following adjustments:

- ALM: Toggle the **ON/OFF** button to ON.
- Total Home Power: you must enter the maximum available household power.
- Power Reserve: you must enter the maximum power available for the chargers.

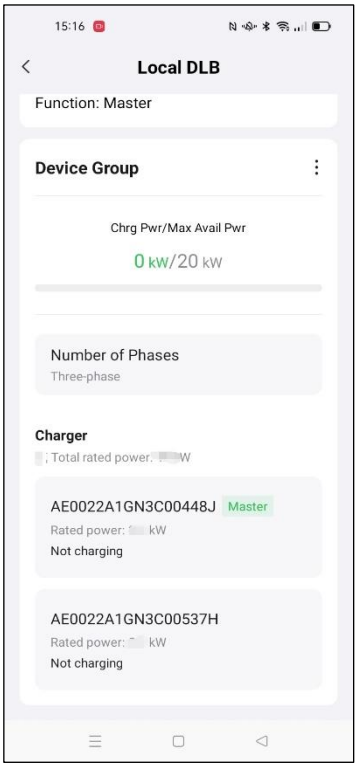




➢ **To enter the suitable power reserve**

1. Enter the total home power in the corresponding input box first.
2. Then enter the power reserve.
   - Power reserve = maximum load power (such as heaters or motor load) / local system power (total home power).
   - The range of the power reserve is from 0~50%. Namely the maximum reserved power that can be entered is 50% of the total home power.
   - The default setting of the power reserve is 10%, which is used for the dynamic power change caused by load switching in and out.
3. Once the total home power and power reserve are entered, tap **Save**. A message “Saved successfully” will appear on the screen; then tap **OK**.
4. Now your chargers and other loads can allocate the power according to your new settings. On the following screen, you can view the real-time power supply

to the charger and other loads.

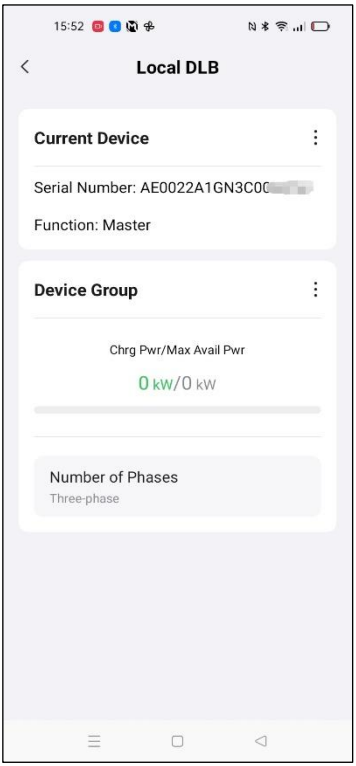


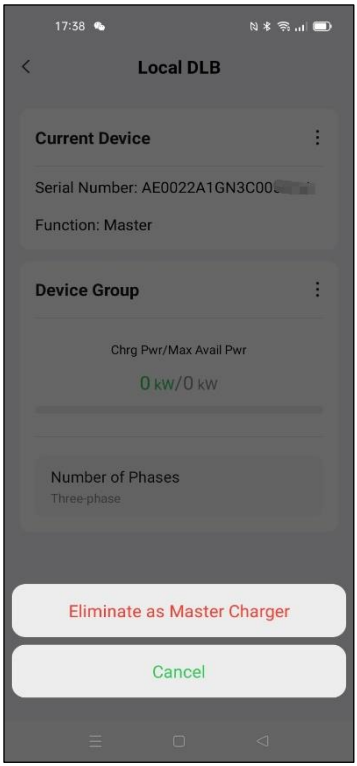
3.9 Undesignate Primary / Secondary Charger

After the DLB device group or the ALM device group is set up well, the primary charger and secondary charger(s) are designated. To undesignate the primary charger or the secondary charger of the device group, you need to make the following settings.

3.9.1 Undesignate Primary Charger

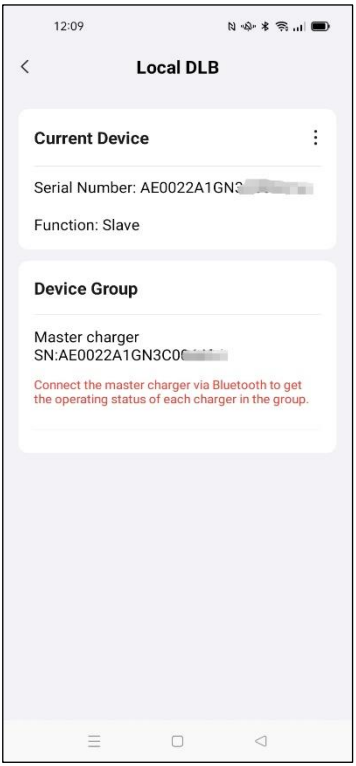
To undesignate a primary charger: On the Local DLB page of the current primary charger, tap the ⋮ icon on the right of the **Device Group**, then tap **Eliminate as Master Charger** from the pop-up box. Now the charger is undesignated as the primary charger from the device group.

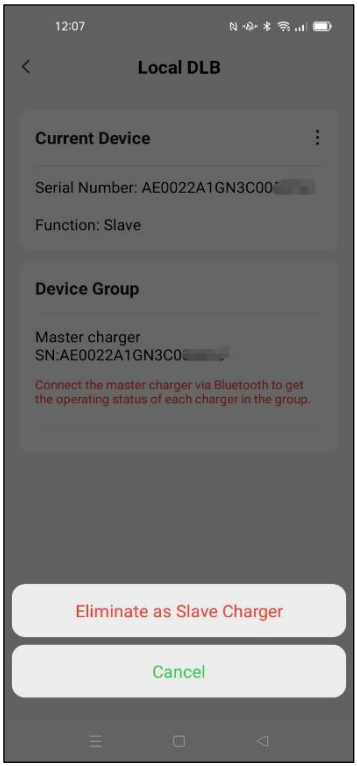




3.9.2 Undesignate Secondary Charger

To undesignate a secondary charger: On the Local DLB page of the current secondary charger, tap the ⋮ icon on the right of the **Current Device**, then tap **Eliminate as Slave Charger** from the pop-up box. Now the charger is undesignated as the secondary charger from the device group.


12:09
Local DLB
Current Device
Serial Number: AE0022A1GN3
Function: Slave
Device Group
Master charger
SN:AE0022A1GN3C0
Connect the master charger via Bluetooth to get the operating status of each charger in the group.


12:07
Local DLB
Current Device
Serial Number: AE0022A1GN3C00
Function: Slave
Device Group
Master charger
SN:AE0022A1GN3C0
Connect the master charger via Bluetooth to get the operating status of each charger in the group.
Eliminate as Slave Charger
Cancel

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