ZHEJIANG BENYI NEW ENERGY CO.,LTD.

SHUANGHUANGLOU INDUSTRIAL ZONE , BEIBAIXIANG TOWN, YUEQING CITY, WENZHOU CITY, ZHEJIANG PROVINCE, CHINA.
TEL: +86-577-5717 7008 FAX: +86-577-5717 7007

info@evb.com

www.evb.com

VERSION: 20250521-01

evb.com

User and Installation Manual

WWW.EVB.COM

ZBENY

G R E E N S M A R T

BENY User and Installation Manual

CONTENTS

1.Product Introduction P-01

2. Technical Parameters P-01

3. Accessories List P-02

4. Pre-installation Instructions P-03

- 4.1. Select an appropriate power supply phase sequence for the AC EV charger and record it P-03
- 4.2. Make full use of communication efficiency of monitoring host P-04

5. Installation Instructions for Monitoring Host P-06

6. Wiring Instructions and Implementation Methods P-08

- Step 1. Choose the appropriate CT specification P-08
- Step 2. Choose the appropriate CT installation method P-08
- Step 3. Install the RS485 bus P-16
- Step 4. Enable the DLB function of the charger P-19
- Step 5. Power on and log in to the device P-21
- Step 6. Link the electric vehicle charger to the monitoring device P-22
- Step 7. Set the charger phase (Only for AC EV charger) P-23
- Step 8. Set whether to use BCP-DLB-23M P-25
- Step 9. Set the specifications of CT clamps P-25
- Step 10. Mode selection and current limitation P-26
- Step 11. Set the time P-29
- Step 12. Change the password P-30
- Step 13. Check after installation (also suitable for troubleshooting) P-30

7. Common Functions P-33

- 7.1. How to remotely control the charging (Only for AC EV charger) P-33
- 7.2. How to check the status of a charger P-34
- 7.3. How to perform firmware upgrade P-36
- 7.4. How to view history P-37
- 7.5. How to unlink a charger P-39
- 7.6. How to reset the login password P-40

8. LED Lights Introduction P-41

1.Product Introduction

BCP-MH-01 is an electric vehicle charger monitoring device independently developed by BENY. This product has a built-in intelligent balancing algorithm and charging configuration strategies, and can automatically manage multiple EV chargers through RS485 communication, thus providing users with dynamic load balancing solutions for parking lots.

2.Technical Parameters

Parameter of BCP-MH-01

Model	BCP-MH-01
	
Rated operating voltage	AC230V±15%
Communication mode	RS485 bus
Number of RS485 loops	3
Quantity of EV chargers that can be bound	DC EV charger: ≤50 charging connector, AC EV charger: ≤50 charging connector
Maximum communication distance	300m
Operating temperature	-25℃ ~55℃
Storage temperature	-30℃ ~55℃
Protection Degree	IP65
HMI	LCD touch screen and LED indicator
CT specification options	100A / 300A / 600A
Maximum Altitude	<2000m
Dimensions	219.8mm*183mm*83mm
Weight	2.60kg

Parameter of Intelligent metering device BCP-DLB-23M (optional)

Model	BCP-DLB-23M
	
Rated input voltage	12V
Standby/working power consumption	<1W
Working temperature	-30°C~55°C
Storage temperature	-40°C~80°C
Working humidity	5%-95%
CT specification options	100A /300A /600A
Maximum detection voltage	230±10%
Display	OLED
Distance between BCP-DLB-23M and monitoring device	300m
Installation	Rail installation/Screw fixing
Communication	RS485 (Via RJ45 connector)
Dimensions	54.8mm*99.6mm*66mm
Weight	0.163kg

3.Accessories List

monitoring device

X1

Mounting plate

X1

Mounting plate fastening screws(M4)

X1

100A or 300A or 600A Current Transformer(1m)

X3

M25×1.5Water-proof cover(with nut)

X2

key

X2

8x40 flat head screws and anchorings

X4

M25×1.5 cable gland (For 8mm~16mm casing)

X2

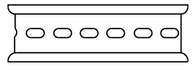
Optional accessories

Intelligent metering device

X1

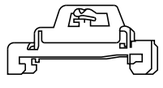
Network cable - 5m
(RJ45 TIA/EIA-568B
8-core cat5 twisted pair cables)

X1



Din rail 105mm

X1



Din rail fixing parts

X2

M4*30 expansion screw kit

X2

voltage acquisition cable-1m

X1

4.Pre-installation Instructions

In order to better use the monitoring device, users are advised to install the chargers according to the following methods.

4.1.Select an appropriate power supply phase sequence for the AC EV charger and record it

For a three-phase electric vehicle charger, there are six feasible power line installation sequences, and it is recommended to select different installation line sequences reasonably to maximize the use of power distribution.

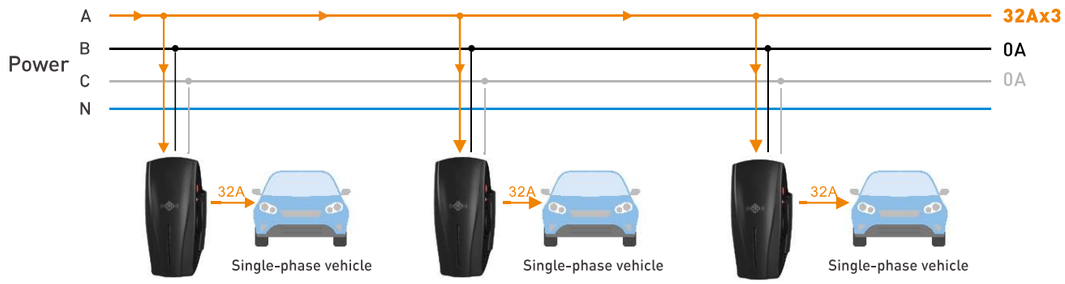
Note: Once the installation of the power cord of a charger is completed, you should record the serial number of the installed charger (the number is recorded on the nameplate of the electric vehicle charger) and the corresponding charger installation sequence in time, since such information will be used when linking a monitoring device to the charger.

BENY User and Installation Manual

Example: Suppose three chargers are to be installed.

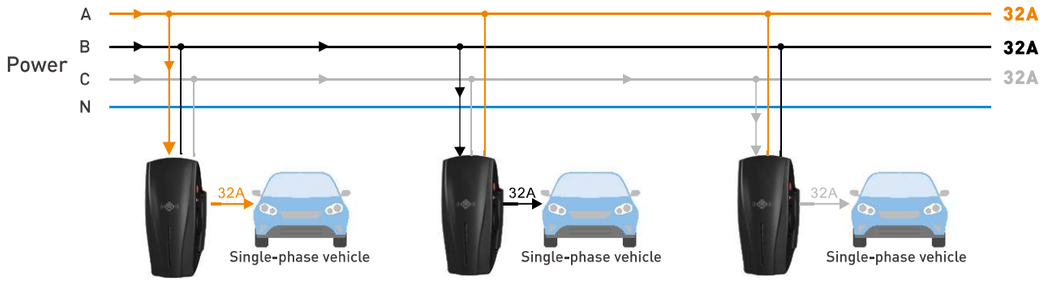
The following line installation sequence is not recommended:

The chargers are all installed in the same phase sequence, resulting in excessive load on Phase A when multiple single-phase vehicles are being charged at the same time.



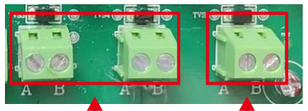
The following line installation sequence is recommended:

The chargers are all installed in the different phase sequences, allowing the load to be evenly distributed to the three phases when multiple single-phase vehicles are being charging at the same time.



4.2.Make full use of communication efficiency of monitoring host

BCP-MH-01 communicates with EV chargers through three RS485 communication buses of which from left to right, the first two are dedicated to AC EV charger while the third one is reserved for DC EV charger. The operation of monitoring device will enable all three circuits for simultaneous communication.



Only AC EV charger is supported

Only DC EV charger is supported

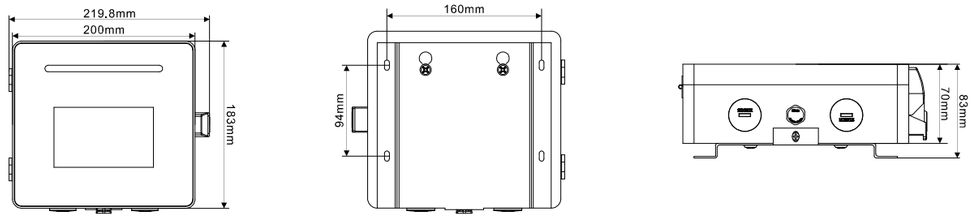
It is recommended to divide the AC EV chargers into two RS485 loops equally, so as to ensure the highest communication efficiency.

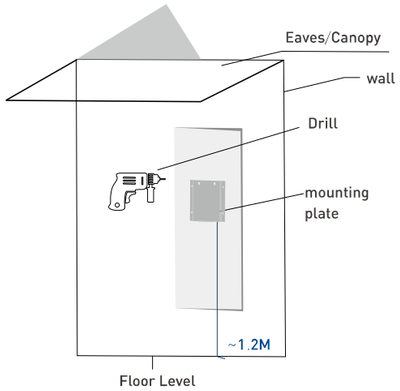
The following communication wiring method is not recommended (take the installation of 6 AC EV chargers and 3 DC EV chargers as an example):

The following communication wiring method is recommended (taking the installation of 6 AC EV chargers and 3 DC EV chargers as an example):

5.Installation Instructions for Monitoring Host

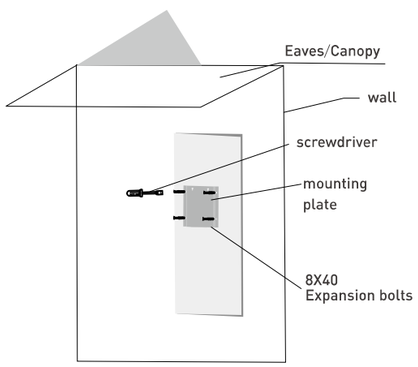
Dimensions of BCP-MH-01





Step 1

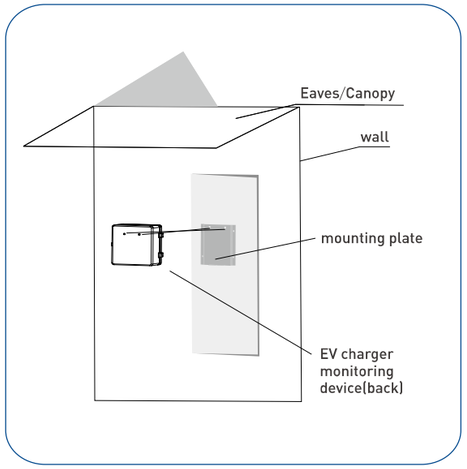
The holes of the mounting plate are drilled, and the drill size is 8mm.



Step 2

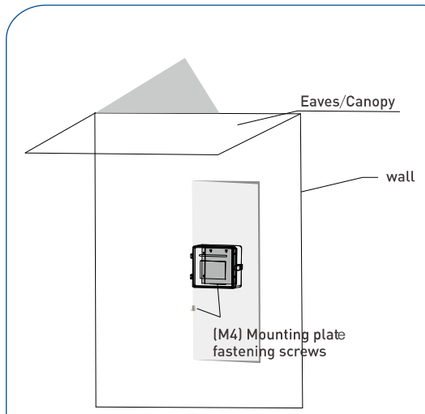
Install the Mounting bracket

Putthe 8*40 Socket head screws' anchoring into the holes, and use the screw driver make the 4pcs 8*40 Socket head screws to fix the Mounting bracket on the wall .



Step 3

Install the hook of the EV charger monitoring device (back) corresponding to the hanging hole of the mounting plate.



Step 4

Use (M4)mounting plate fastening screws Fix the EV charger monitoring device on the mounting

(Tightening torque:0.8N·m~1.5N·m)

6.Wiring Instructions and Implementation Methods

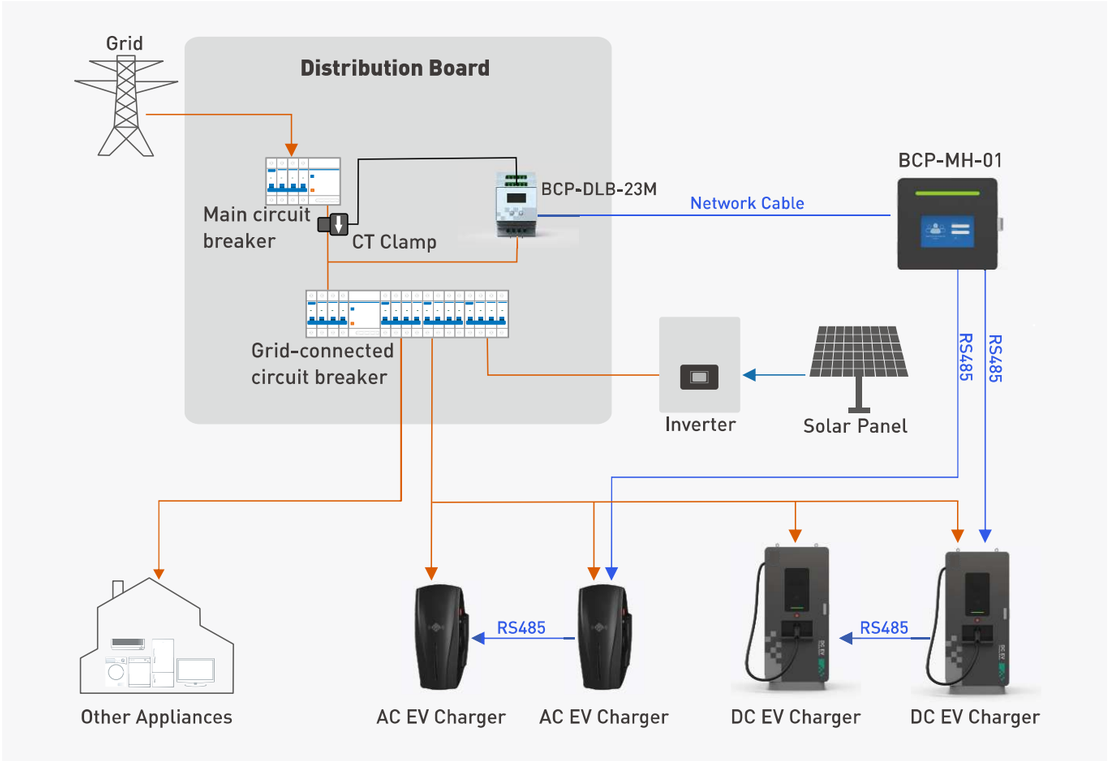
Step 1. Choose the appropriate CT specification

CT clamps have three specifications, 100A, 300A and 600A. Please choose the appropriate specification according to your needs.

Step 2. Choose the appropriate CT installation method

6.2.1.The distance between BCP-MH-01 and the distribution box is greater than 1.5m (additional intelligent metering device is required)

The length of a CT clamp is only 1.5m. In case the BCP-MH-01 cannot be installed near the distribution box due to the length limitation of the CT clamp, an BCP-DLB-23M should be installed, The BCP-DLB-23M collects current data, and it is connected to the monitoring device through the network port at the upper right of the monitoring device motherboard, and the current data is then transmitted to the BCP-MH-01.

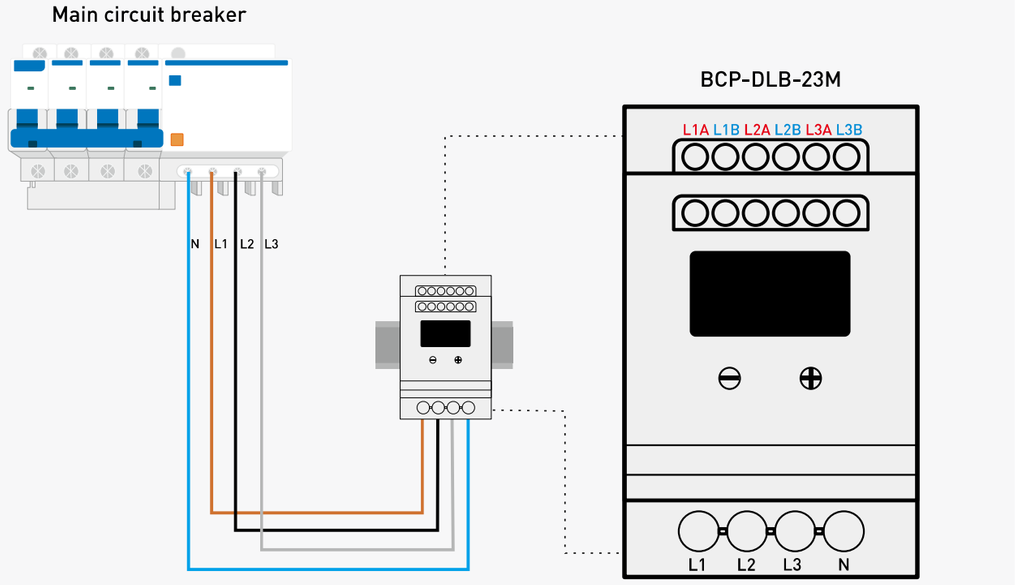


6.2.1.The distance between BCP-MH-01 and the distribution box is greater than 1.5m (additional intelligent metering device is required)

① Install the voltage acquisition line.

Connect the BCP-DLB-23M to L1, L2, L3 and N. In order to ensure the accuracy of measurement data, the voltage acquisition line should be connected to the outlet end of the main circuit breaker.

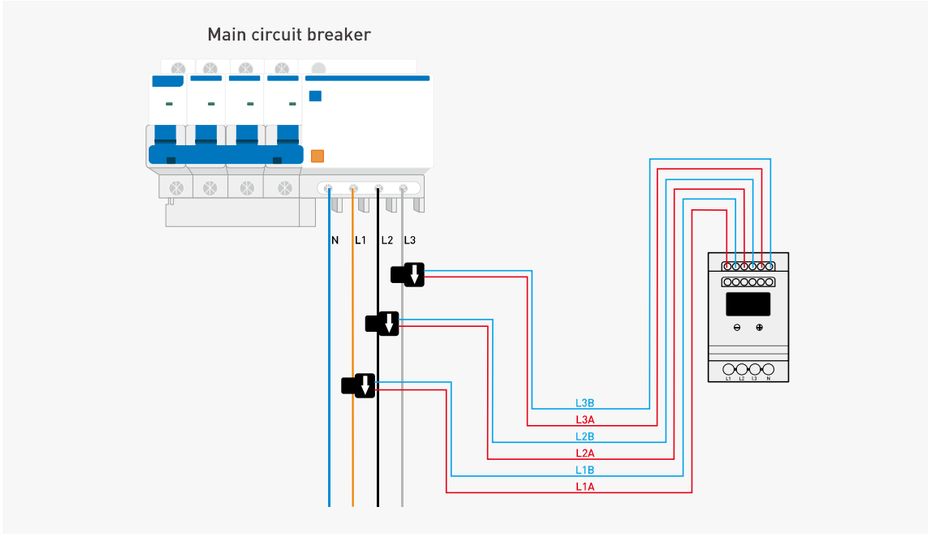
Note: The voltage acquisition line is not a power cord, it is only used for power acquisition.



② Install the CT.

CT clamps are respectively installed on the power lines L3, L2, and L1 at the outlet end of the main circuit breaker. The The S1 lines of CT are respectively connected to the L3A, L2A and L1A ports of the BCP-DLB-23M , and the S2 lines of CT are respectively connected to the L3B, L2B and L1B ports of the BCP-DLB-23M.

Note: The arrow on the CT indicates the current direction of the cable being measured. Please make sure that all CTs are installed in the correct direction so as to ensure the normal work of the system.



The system diagram is not a physical diagram and is only for wiring reference. The color of the cables may vary due to different batches or specifications of the physical items. Please refer to the style of the CT clamp physical object to determine the wiring.

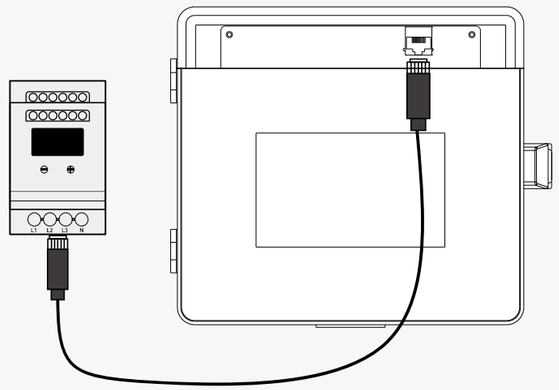
With the silk - screened surface as the front side and the arrow pointing to the front, the S1 of this CT clamp is blue.

With the silk-screened surface as the front side and the arrow pointing to the back, the S1 of this CT clamp is red.

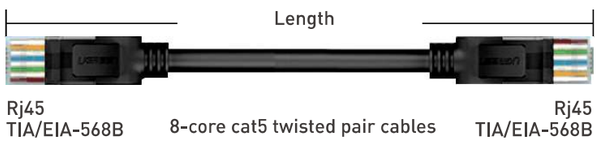
S1 is the positive pole, corresponding to the red wire in the system diagram.

③ Connect the BCP-MH-01 to the BCP-DLB-23M with a network cable.

Both the BCP-DLB-23M and the BCP-MH-01 are equipped with RJ45 interfaces, therefore they should be connected with a network cable. Through this network cable, the BCP-MH-01 can supply power to the BCP-DLB-23M, thus the data communication is established.



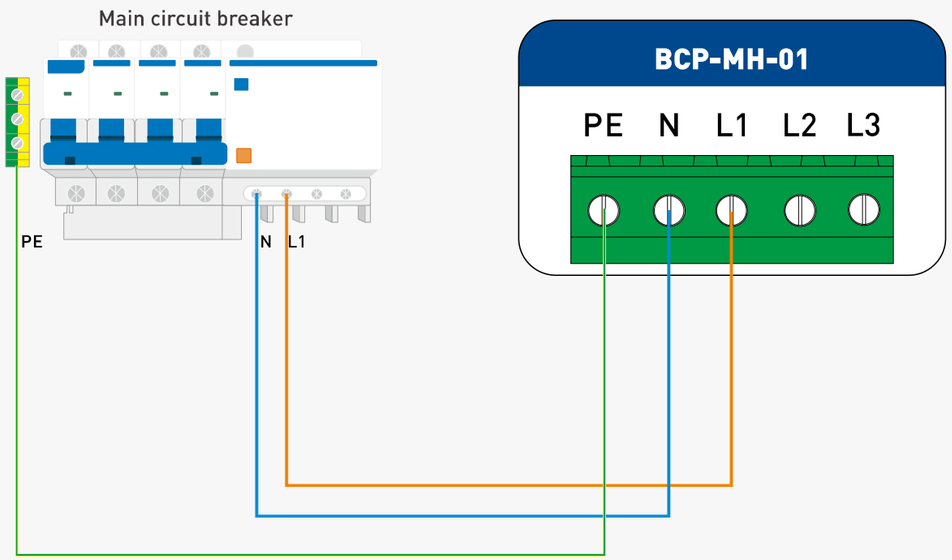
Network Cable Recommended



BENY User and Installation Manual

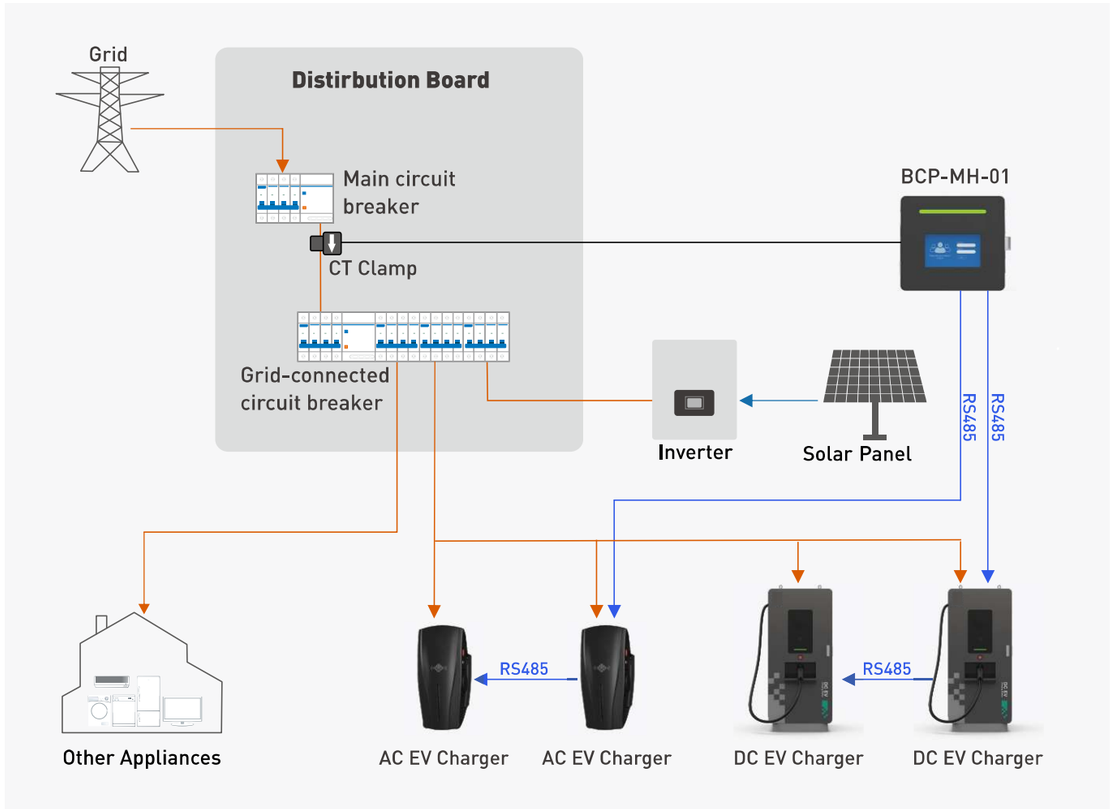
④ Install the power cord of the monitoring device.

Connect L1, N and PE for the monitoring device. Since an external intelligent metering device(BCP-DLB-23M) is used, it is no longer necessary to connect L2 and L3, but only need to connect L1 to supply power for the device.



6.2.2.CT wiring mode of BCP-MH-01 within 1.5m from the distribution box

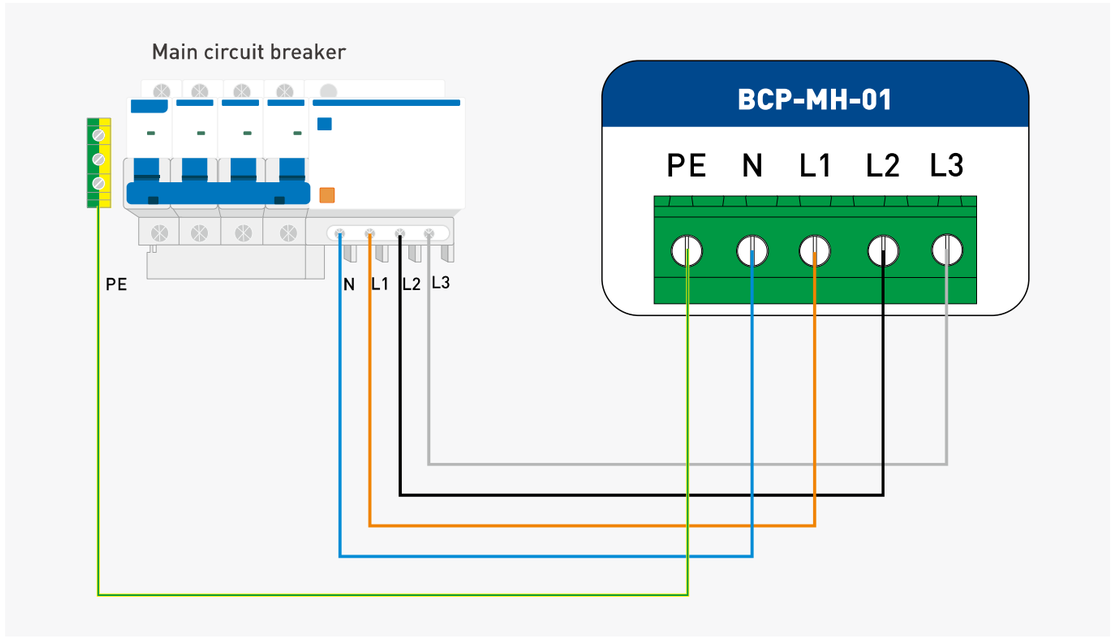
When the distance between BCP-MH-01 and the distribution box is less than 1.5 m, the CT can be directly connected to the corresponding port of the monitoring device, and the monitoring device collects current data through the CT.



BENY User and Installation Manual

① Connect the voltage acquisition line and ground it

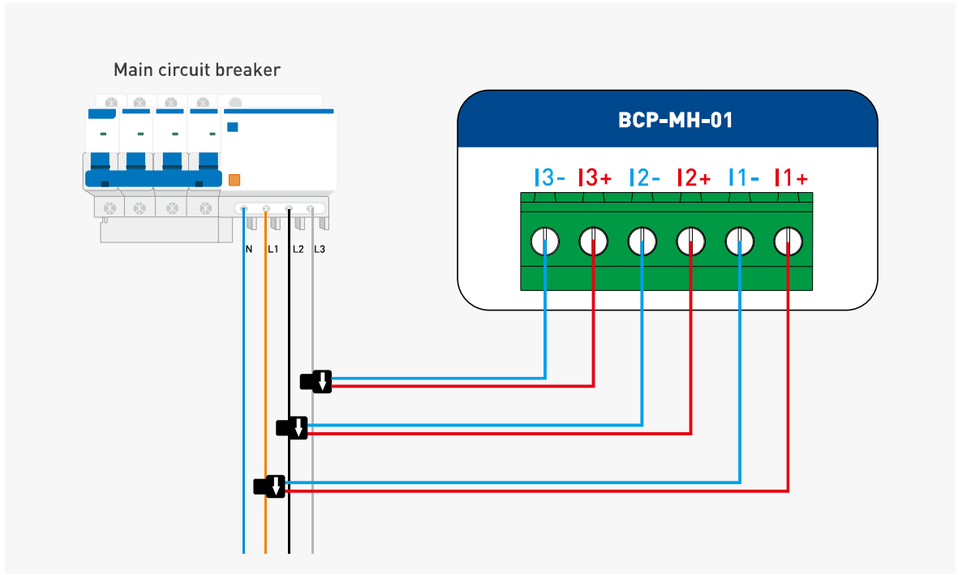
Connect L1, L2, L3, N and PE for the monitoring device. In order to ensure the accuracy of the measurement data, the voltage acquisition line should be connected to the outlet end of the main circuit breaker.



② Install CT clamps

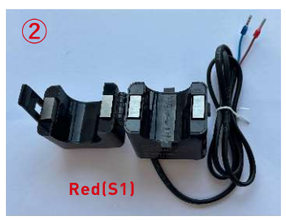
The CT clamps are respectively installed on the lines L3, L2, and L1 at the outlet end of the main circuit breaker. The S1 lines of CT are respectively connected to the I3+, I2+ and I1+ ports of the BCP-MH-01, and the S2 lines of CT are respectively connected to the I3-, I2- and I1- ports of the BCP-MH-01.

Note: The arrows on the CT indicate the current direction of the cable being measured. Please make sure that all CTs are installed in the correct direction so as to ensure the normal work of the system.



The system diagram is not a physical diagram and is only for wiring reference. The color of the cables may vary due to different batches or specifications of the physical items. Please refer to the style of the CT clamp physical object to determine the wiring.

With the silk - screened surface as the front side and the arrow pointing to the front, the S1 of this CT clamp is blue.



With the silk-screened surface as the front side and the arrow pointing to the back, the S1 of this CT clamp is red.

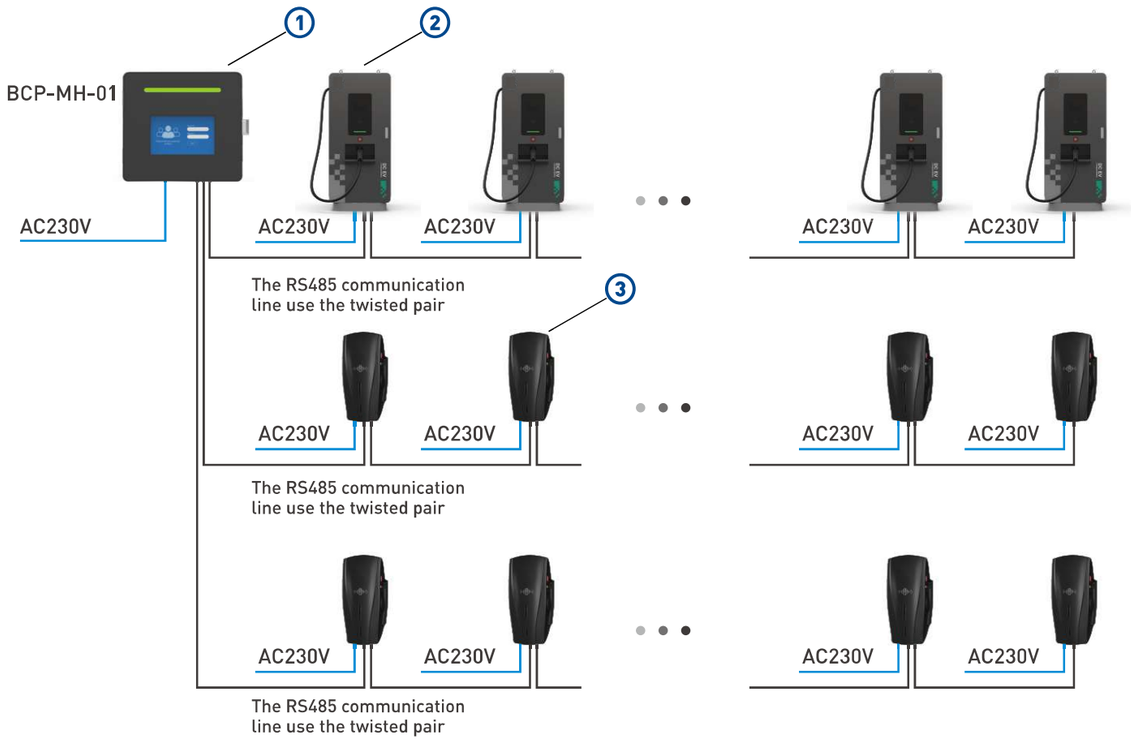
S1 is the positive pole, corresponding to the red wire in the system diagram.

Step 3. Install the RS485 bus

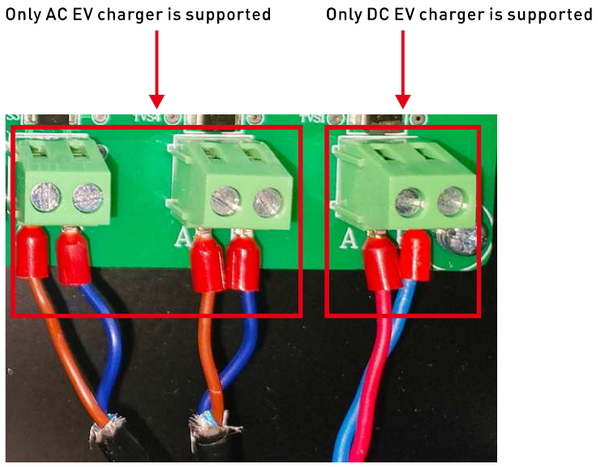
Wire Recommended: Two-core RS485 twisted pair with shield, with wire diameter above 0.5 mm.

Channel selection:BCP-MH-01 communicates with EV chargers through three RS485 communication buses of which from left to right, the first two are dedicated to AC EV charger while the third one is reserved for DC EV charger. The operation of monitoring device will enable all three circuits for simultaneous communication.It is recommended to divide the AC EV chargers into two loops equally so as to achieve maximum communication efficiency.

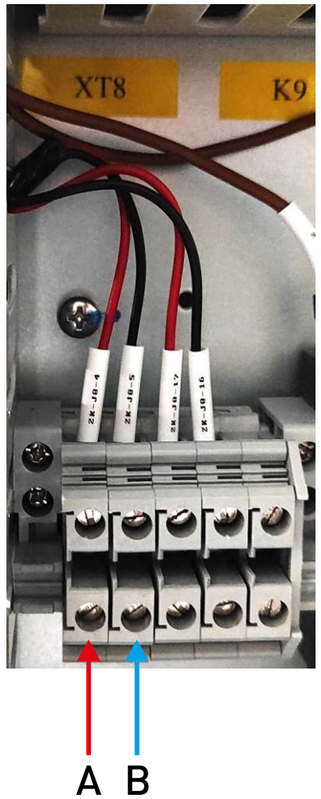
Connect the wires on the monitoring device buses A and B to the A and B ports of corresponding chargers.



① Wiring of ports A and B of the monitoring device:

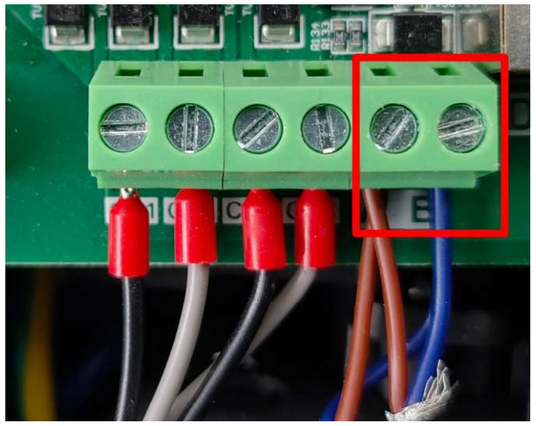


② Wiring of ports A and B of a DC EV charger:

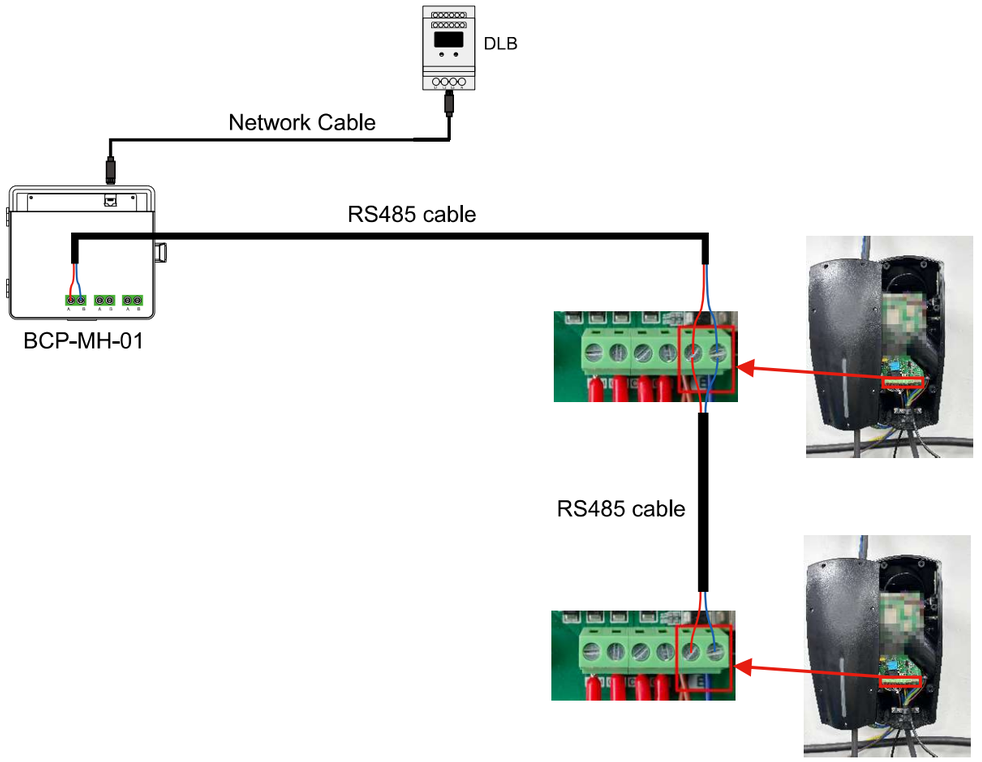


BENY User and Installation Manual

③ Wiring of ports A and B of an AC EV charger:



Multi - device Monitoring Wiring Diagram (with two AC EV chargers as an Example)



Step 4. Enable the DLB function of the charger

6.4.1. For AC EV chargers

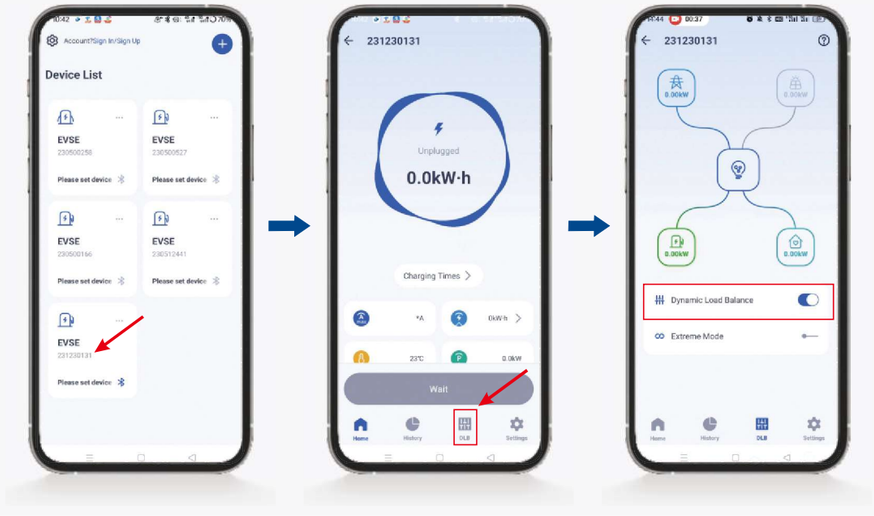
Unsmart AC EV Chargers:

First turn off the power supply of the charger, then adjust the DIP switch to enable the DLB function of the charger, and finally power up the charger.

The DIP switch at Position "4" can set the DLB function:
ON: Disable the DLB function;
OFF: Enable the DLB function.

Smart AC EV Chargers and OCPP AC EV Chargers:

Power on the charger, and enable the DLB function of the charger through the APP.



6.4.2. For DC EV chargers

To switch on the "power of DC EV charger to be limited by monitoring device" through the upper computer:

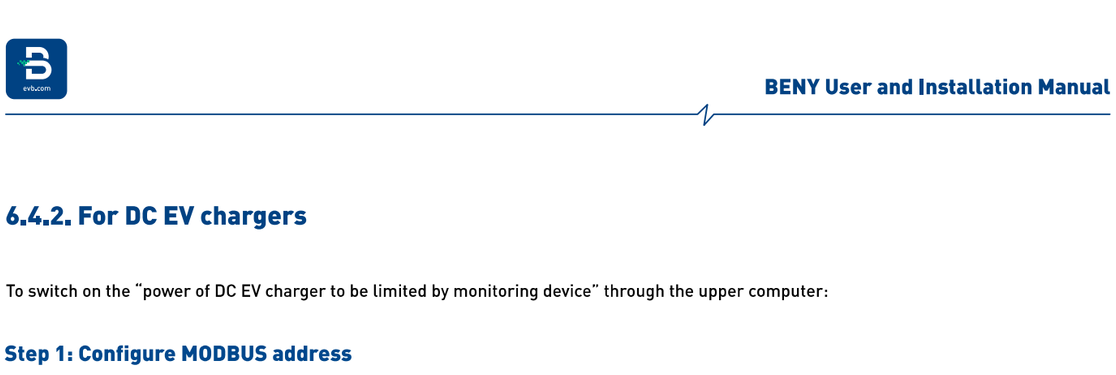
Step 1: Configure MODBUS address

In this interface, users can configure MODBUS address, which will be used to identify the DC EV charger for subsequent registration of DC EV charger on the monitoring device based on this address.

Note: MODBUS address is unique on a 485 bus (setting range: 1~247).

Step 2: Switch on the MODBUS power limit for DC EV charger

Then, DC EV charger will allow the monitoring device to limit power through MODBUS.



Description of configuration items:

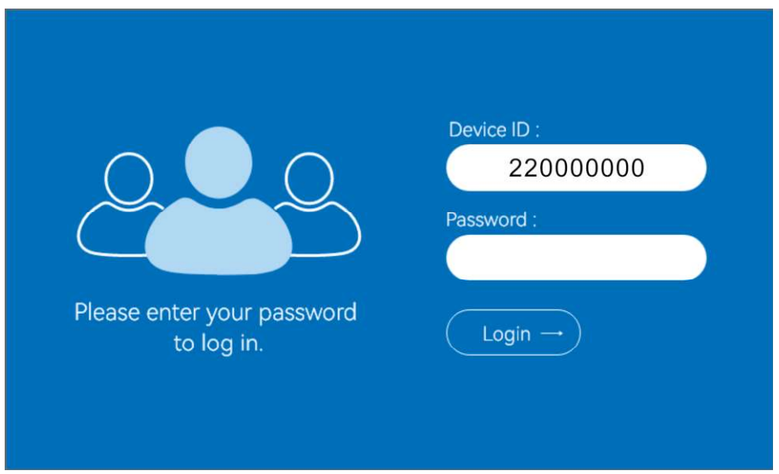
Configuration items	Description
0 Disable	Not enable
1 Enable (Safe Mode)	After "Enable (Safe Mode)" is selected, to ensure the load safety of charging station, EVSE will automatically enter a fault state and stop charging if there is no related MODBUS data received in a 5-minute period, and will automatically recover from the fault state when MODBUS data is received again (but will not resume charging).
2 Enable (Non-Safe Mode)	After "Enable (Non-Safe Mode)" is selected, EVSE will always operate under the last temporary power limit received until it is reset after a power-off restart. There is no power limit after reset.

Step 5. Power on and log in to the device

Turn on the power supply of the monitoring device. If an intelligent metering device(BCP-DLB-23M) is installed, it is necessary to check whether the intelligent metering device is also powered on simultaneously.

As shown in the figure below, users can log in to the device by entering a password. Since no password is set for the monitoring device before leaving the factory, user who uses this product for the first time can directly click the "Login" button to log in to the device without entering a password.

Reset password: Find the on-board button of the monitoring device and press it 5 times continuously, with an interval of no more than 2s between two press operations.

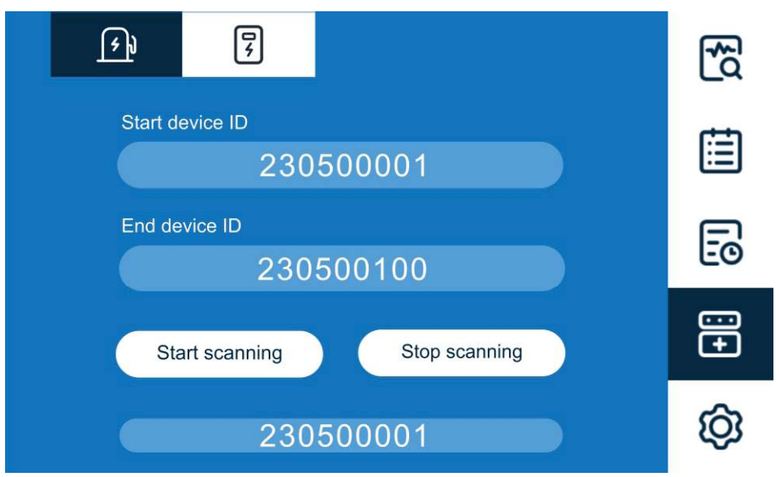


Step 6. Link the electric vehicle charger to the monitoring device

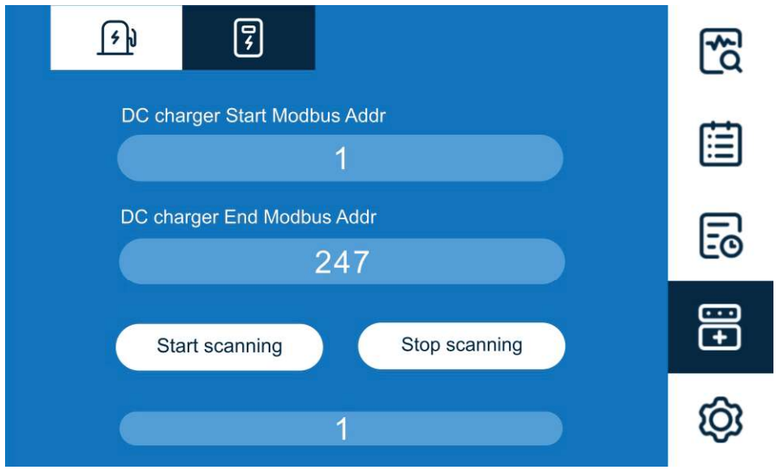
Open the registration page of the monitoring device and enter the electric vehicle charger's serial number in the code scanning interface. Click the "Start Scanning" button, and the monitoring device will automatically search and register the electric vehicle charger.

If you wish to link electric vehicle chargers in bulk, please enter the starting serial number in the "Start Device ID" box and the ending serial number in the "End Device ID" box. The monitoring device will scan and register the electric vehicle charger within this range (only the chargers that successfully communicate will be linked to the monitoring device).

For example: if the number of the AC EV charger to be linked is within the range of 230500001 to 230500100, you need to enter "230500001" in the "Start Device ID" box and "230500100" in the "End Device ID" box.



For example: if the number of the DC EV charger to be linked is within the range of 1 to 247, you need to enter "1" in the "Start Device ID" box and "247" in the "End Device ID" box.

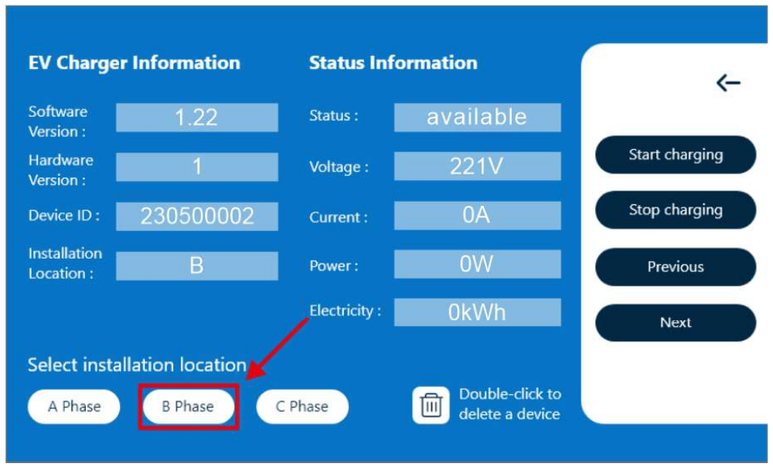


The corresponding numbers and related parameters of the linked electric vehicle chargers will be recorded in the following list, please check the information.

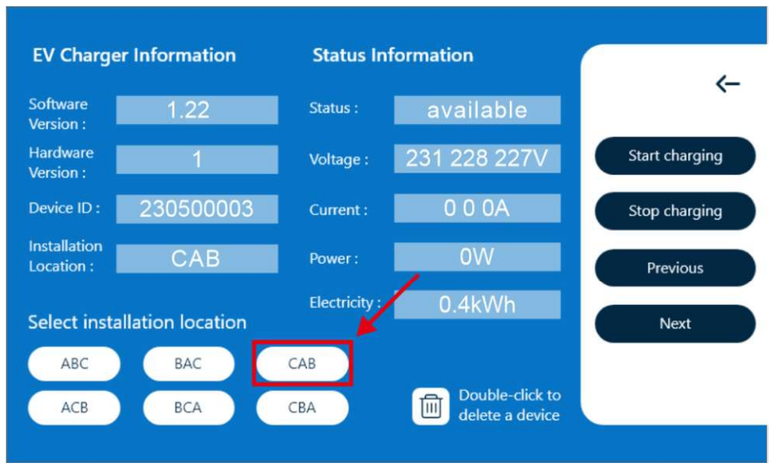
Step 7. Set the charger phase (Only for AC EV charger)

Click any data row in the charger list to enter the charger information interface. In this interface, users can fill in the connection phase of a charger according to the installation phase of the power cord of the charger.

For example: if there is a single-phase electric vehicle charger (No. 230500002) whose power supply is connected to the LB phase, the phase setting of the charger is as follows:

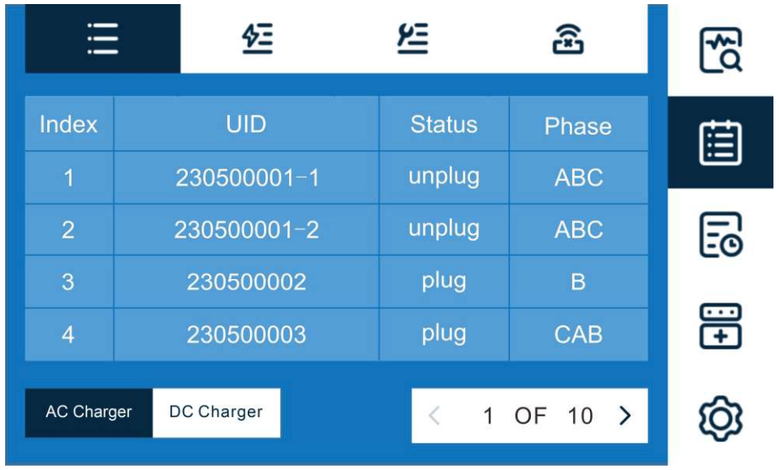


For example: if there is a three-phase electric vehicle charger (No. 230500003) whose power supply is connected to LC, LA and LB phases, the phase setting of the charger is as follows:



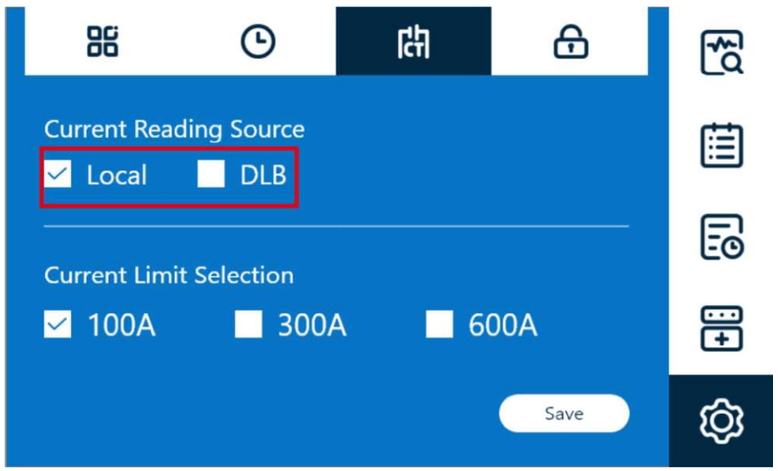
Note: The monitoring device can perform remote control of the charging only when the gun is plugged into the vehicle; for a OCPP charger, the monitoring device is allowed to remotely control the charging only when the charger is in Bluetooth mode.

The following is an example of the list of chargers for which the configuration has been completed:



Step 8. Set whether to use BCP-DLB-23M

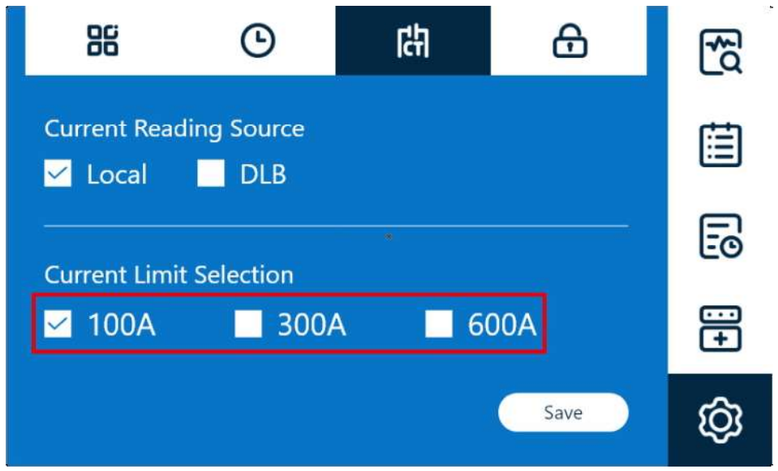
In this interface, users can select CT sources and set the upper limit of current acquisition for the selected CT. If the monitoring device directly collects the power supply data through the CT clamps, set "Local" as the CT source; if the monitoring device realizes the collection of power supply data through an external intelligent metering device(BCP-DLB-23M) , set "DLB" as the CT source.



Step 9. Set the specifications of CT clamps

In this interface, users can select the corresponding options according to the actual specifications of the installed CT clamp: the CT clamp supported by the device has three specifications, namely 100A, 300A and 600A.

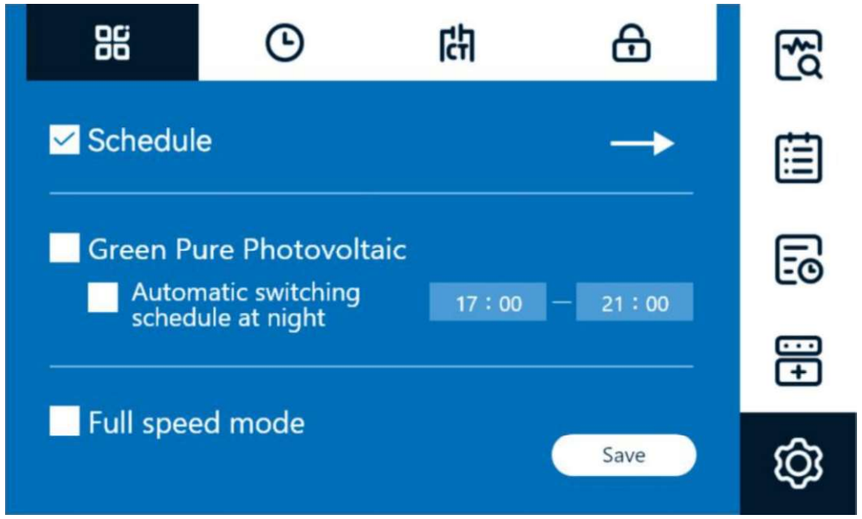
Corresponding models for CT clamps of various specifications: 100A (Model: 3000/1); 300A (Model: 4000/1); 600A (Model: 7000/1).



BENY User and Installation Manual

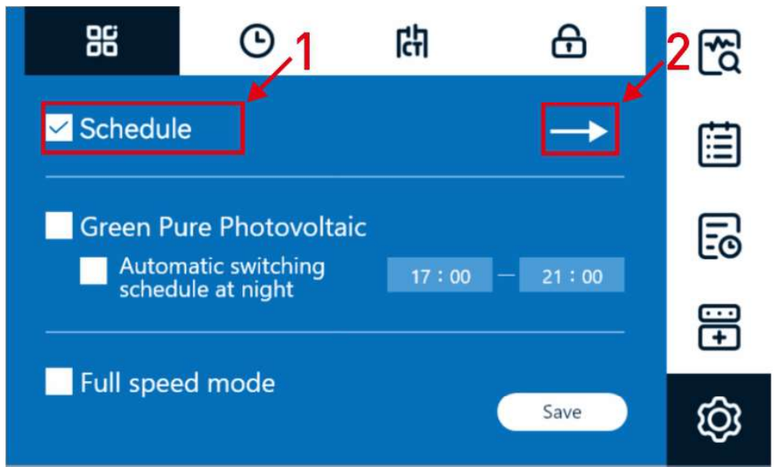
Step 10. Mode selection and current limitation

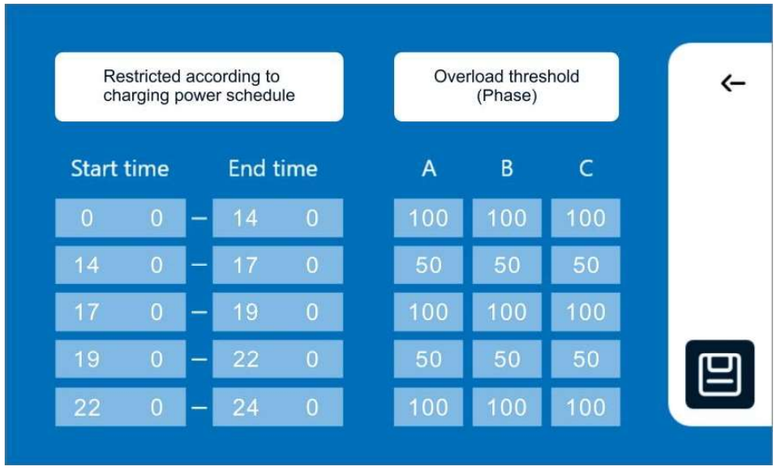
In this interface, you can set the load balancing control mode, and there are three modes optional.



Mode 1: Schedule mode

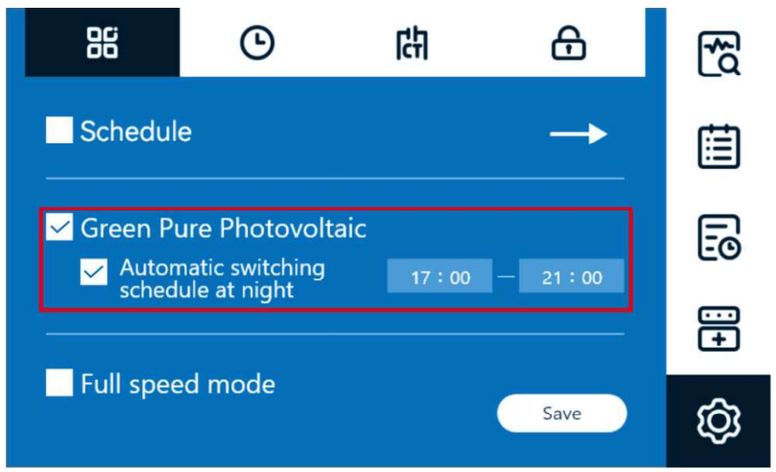
Enabling the schedule mode requires the user to fill in the time range (the time is based on the time of the time setting interface) and the upper limit of the three-phase current. During the set time period, the monitoring device will limit the total current within the preset current range by controlling the three-phase current of the charger. The pre-settable time range is 24 hours a day, and a maximum of 6 time periods can be set.





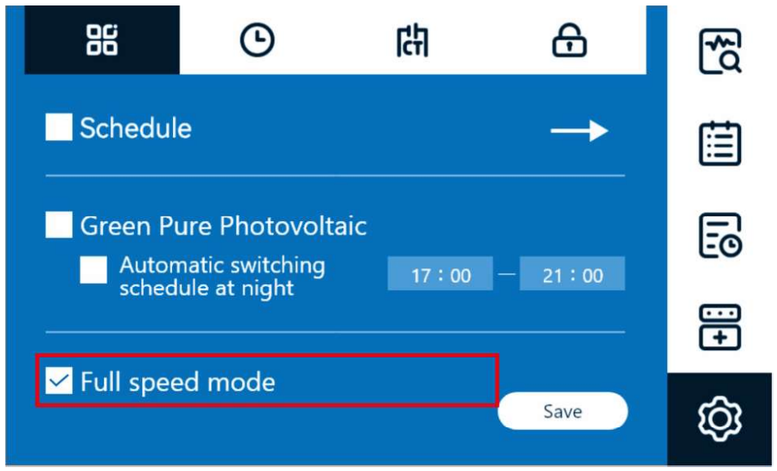
Mode 2: Green pure photovoltaic mode

When the green pure photovoltaic mode is enabled, if the current direction is grid inflow, the power consumption of the charger will be limited to keep the minimum power of the charger, and if the current direction is photovoltaic inflow, the current will be limited to the maximum photovoltaic current. While choosing the green pure photovoltaic mode, the user can also set the automatic switching time. During the automatic switching time, the monitoring device will distribute the current according to the schedule mode to prevent the charging power of the charger from being too low at night. The time set in the time setting interface should be taken as the reference time.

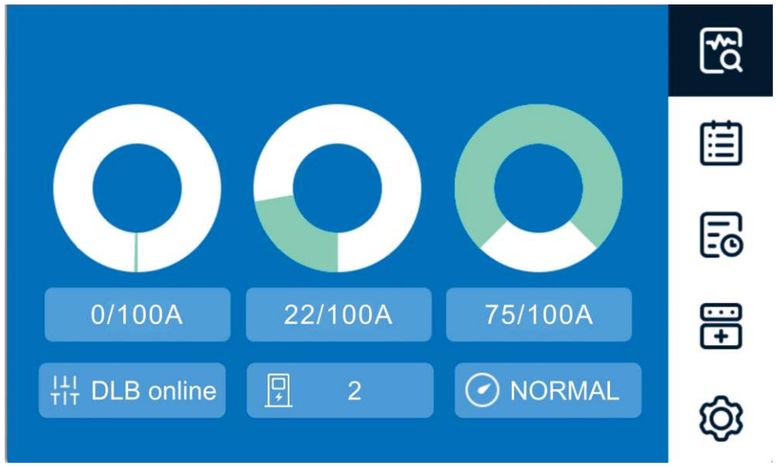


Mode 3: Full speed mode

In the full speed mode, the monitoring device does not restrict the power consumption of the charger.

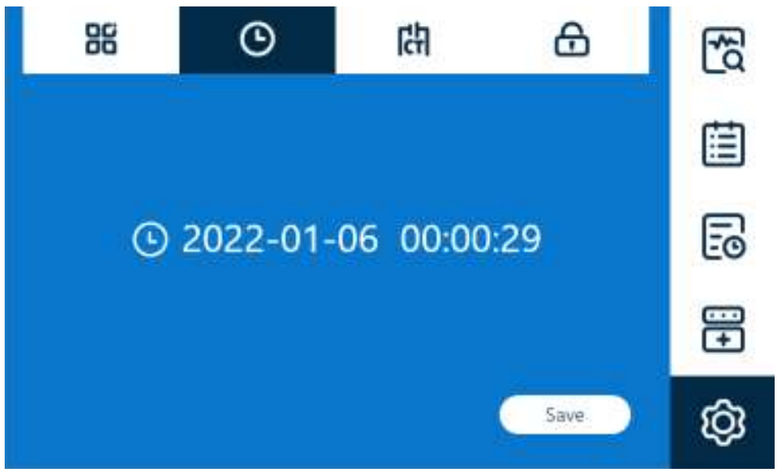


After the load balancing control mode is set, you can view the current consumption status of each phase at the parking lot, the status of the BCP-DLB-23M, the number of chargers being used and the load balancing control mode in the following interface.



Step 11. Set the time

In this interface, users can set the time, which will be used as the benchmark for the time of the schedule mode in the monitoring device, the automatic switching time of the green pure photovoltaic mode, and the time of the historical records.

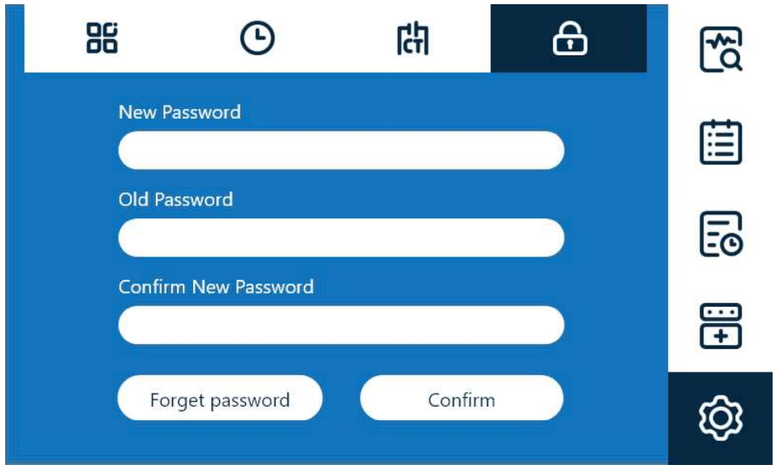


Note: Please install CR1220 battery for the motherboard, otherwise the reset of time is required after power failure of the motherboard.

BENY User and Installation Manual

Step 12. Change the password

You should modify the password to prevent illegal users from accessing the device to change settings.



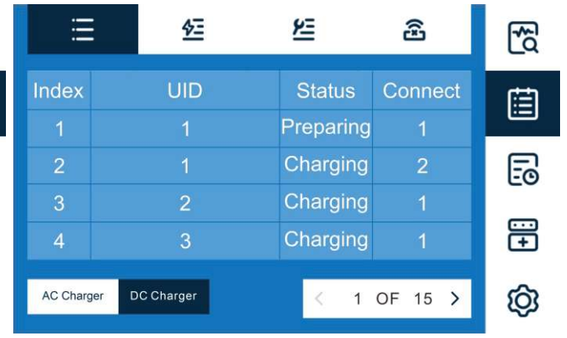
Step 13. Check after installation (also suitable for troubleshooting)

6.13.1.Registration check

View the list of chargers linked to the monitoring device to see if all the chargers have been linked to the monitoring device.

Index	UID	Status	Phase
1	230500001-1	unplug	ABC
2	230500001-2	unplug	ABC
3	230500002	plug	B
4	230500003	plug	CAB

AC Charger DC Charger 1 OF 10

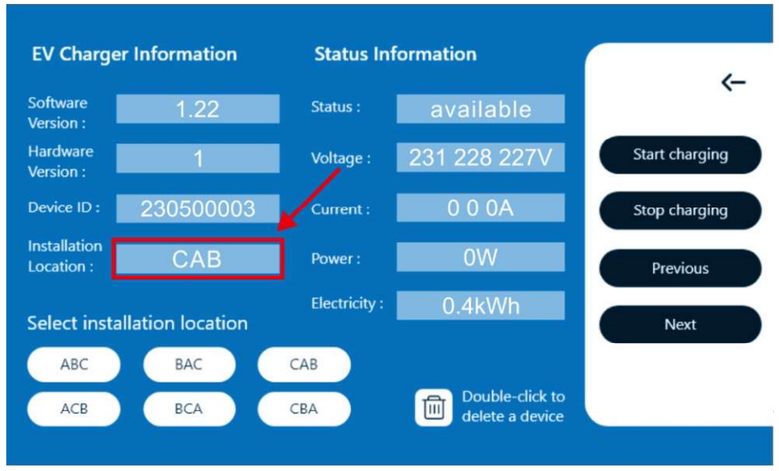


Index	UID	Status	Connect
1	1	Preparing	1
2	1	Charging	2
3	2	Charging	1
4	3	Charging	1

AC Charger DC Charger 1 OF 15

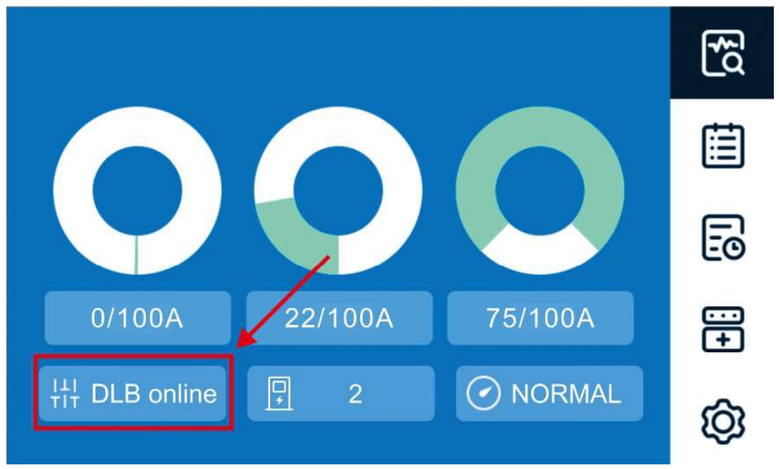
6.13.2.Phase sequence check (Only for AC EV charger)

Enter the information page of each charger to check whether its installation phase sequence settings are consistent with the current installation phase sequence.



6.13.3.Check of intelligent metering device

If an intelligent metering device(BCP-DLB-23M) is installed, check on the following interface whether the intelligent metering device has established communication with the charger. If no intelligent metering device is installed, ignore this step.

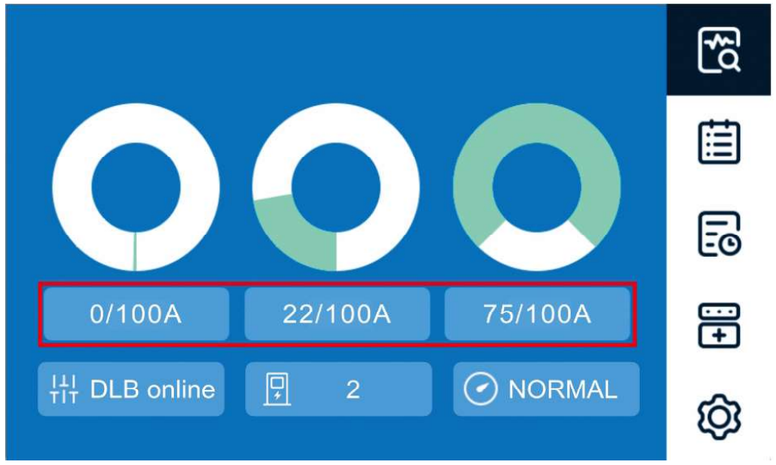


Note: If the user installs an external intelligent metering device(BCP-DLB-23M) but the device fails, the charger cannot be used for charging in such case so as to avoid the risk of overload.

6.13.4.Measurement accuracy check

Start a charger to charge, and then use a multimeter to measure the current on the cables installed on CT clamp at each phase, click on the homepage of the monitoring device and compare whether the current measured by the multimeter is consistent with the current displayed on the homepage of the monitoring device.

Note: When the current in the circuit is flowing to the grid, the current here is displayed as "0".

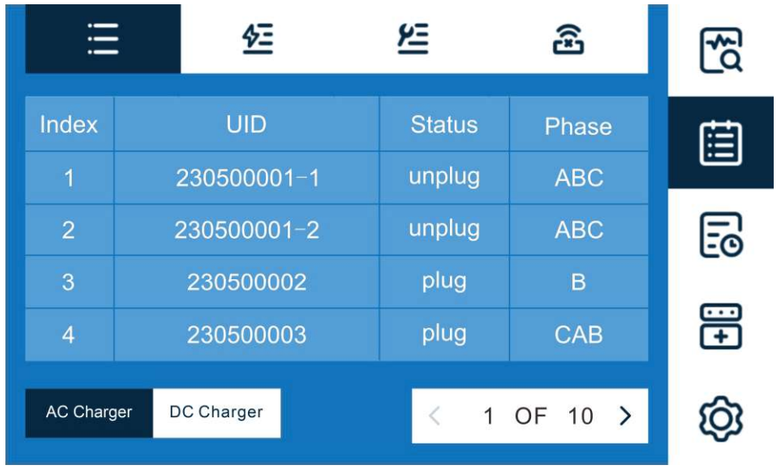


7.Common Functions

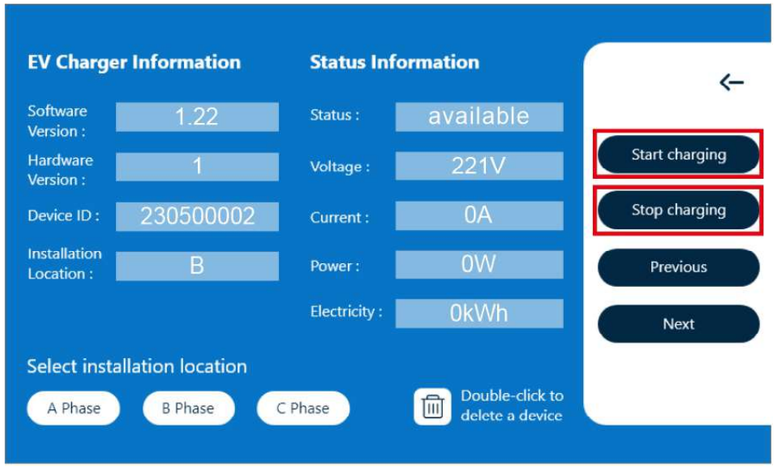
7.1.How to remotely control the charging (Only for AC EV charger)

When the gun is plugged into the vehicle, the charging can be remotely controlled by the monitoring device; for a OCPP charger, the monitoring device is allowed to remotely control the charging only when the charger is in Bluetooth mode.

Click any data row in the charger list to enter the "Details" interface of that charger.



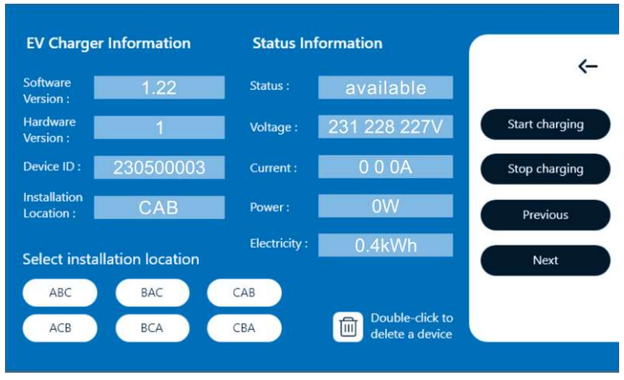
- On the details screen, click "Start Charging" or "Stop Charging".

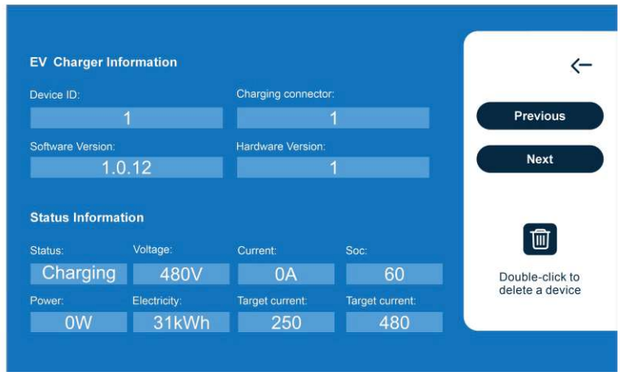


7.2.How to check the status of a charger

In the list interface, users can view the status of a charger.

Click on any data row on the list page, and the user can view the specific information of the charger in that row, including firmware version, number, and charging current.





In this interface, users can view the chargers in the charging state.

In this interface, users can view the chargers that are in a faulty state.

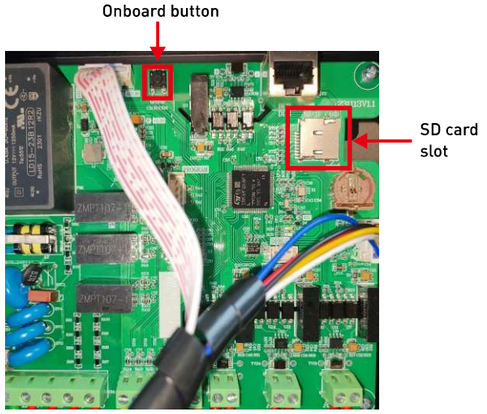
In this interface, users can view the electric vehicle chargers that are offline.

7.3.How to perform firmware upgrade

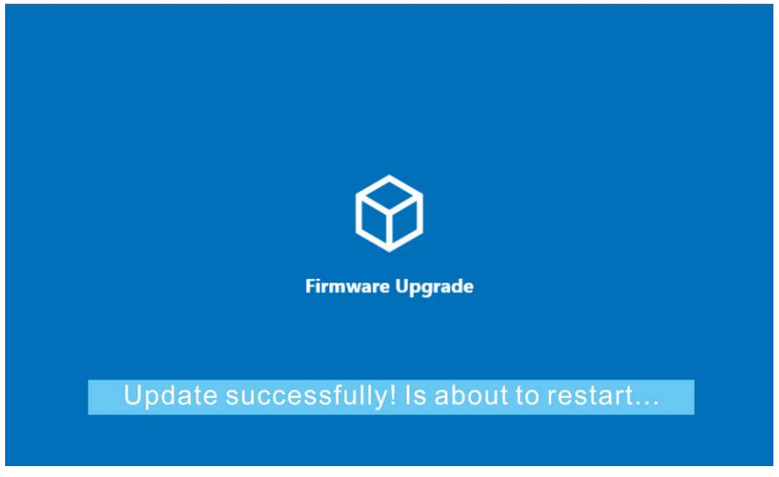
Step 1: Firmware upgrade requires the user to first download the firmware that needs to be upgraded to the motherboard, and then link the SD card to the computer through microSD to USB, create a folder MH, put the firmware into the folder, and wait for the creation to end.

Note: The capacity of microSD should be 2GB or less, otherwise the monitoring device may not recognize it.

Step 2: Insert the SD card into the card slot on the motherboard, and hold down the onboard button for 5 seconds until the LCD screen shows the firmware upgrade image.

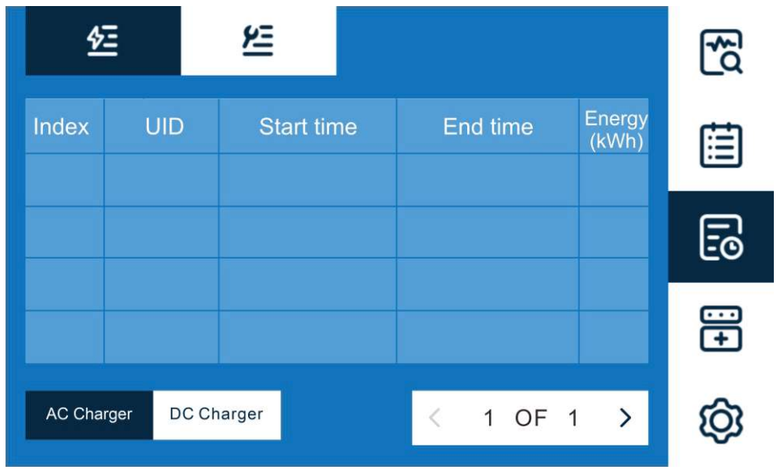


Firmware upgrade completion screen:

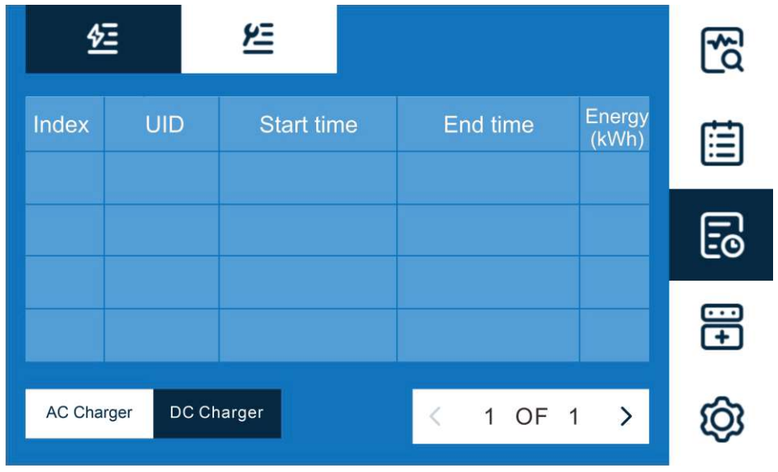


7.4.How to view history

In this interface, users can view the historical charging records of electric vehicle chargers. The monitoring device may store up to 1024 historical charging records of AC EV charger.

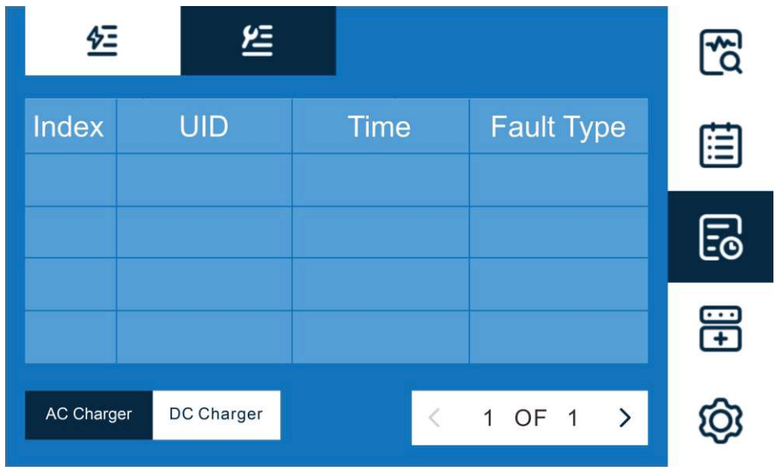


In this interface, users can view the historical charging records of electric vehicle chargers. The monitoring device may store up to 10000 historical charging records of DC EV charger.

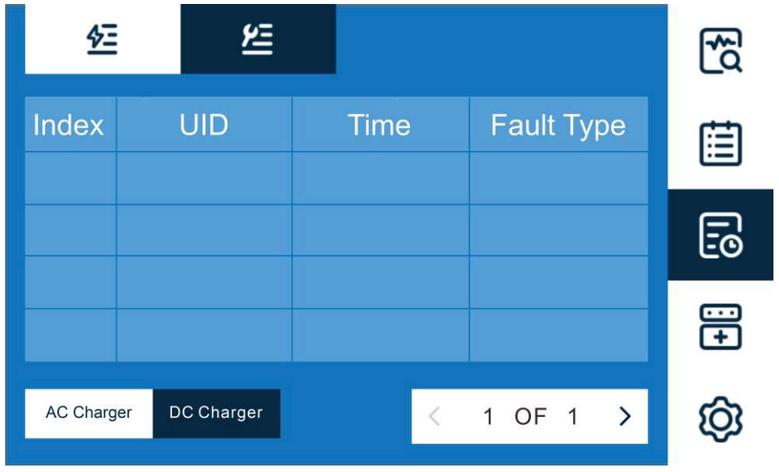


BENY User and Installation Manual

In this interface, users can view the historical fault records of electric vehicle chargers. The monitoring device may store up to 1024 historical fault records of AC EV charger.

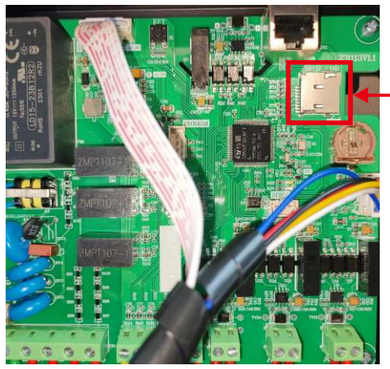


In this interface, users can view the historical fault records of electric vehicle chargers. The monitoring device may store up to 10000 historical fault records of DC EV charger.



Note: The historical records of DC EV charger are stored on SD card. Please install an SD card in the mainboard. Otherwise, the monitoring device will not be able to store the historical record data of DC EV charger.

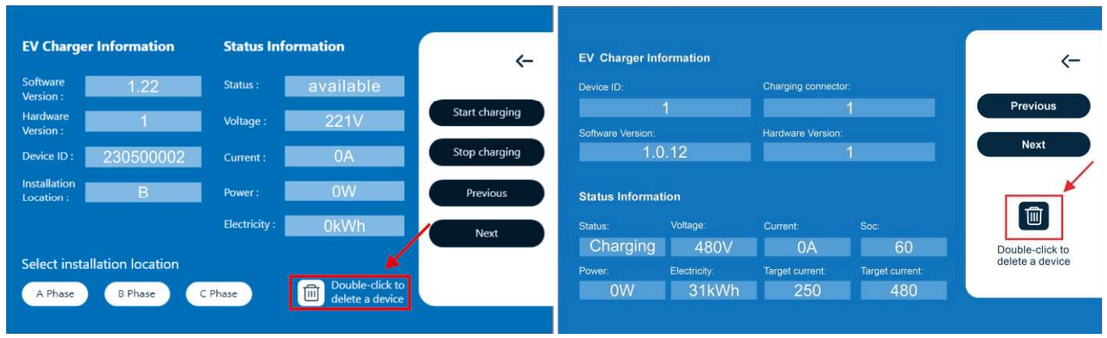
Note: The capacity of microSD should be 2GB or less, otherwise the monitoring device may not recognize it.



7.5.How to unlink a charger

Click any data row in the charger list to enter the “Details” interface of that charger.

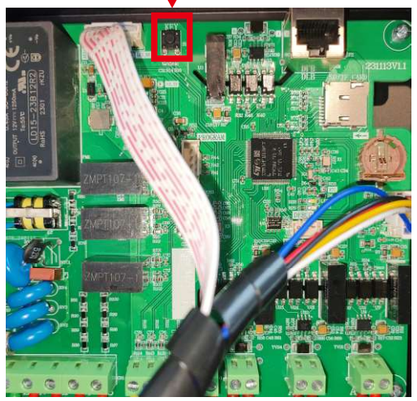
In the charger information interface, double-click the “Delete” icon in the lower right corner to unlink the charger and the monitoring device.



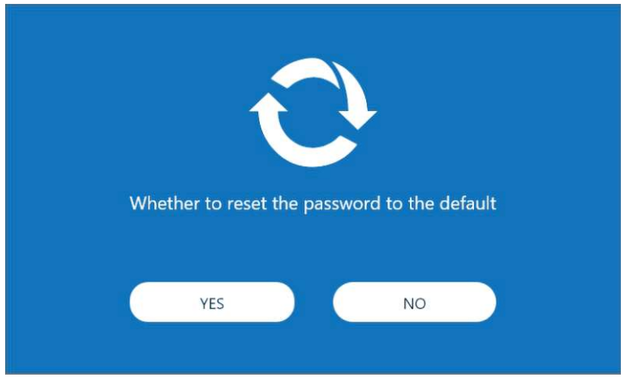
7.6.How to reset the login password

The user can reset the password to the default: press the onboard button of the monitoring device for 5 times in a row, with an interval of no more than 2s between two press operations.

Onboard button



Password reset interface:



BENY User and Installation Manual

8.LED Lights Introduction

State of monitoring device	Trigger condition	Description
Error	An error is reported by a charger in the list	Red lamp flashes
Offline	Lamp panel is offline	Yellow lamp flashes slowly once, then quickly twice
Device offline	A charger in the list is offline	Yellow lamp flashes
Connected	A charger in the list is online	Green lamp is in breathing light state
Idle	No EV charger is connected	Green lamp is at a low brightness