Power Sharing Smart

Installation Guide.

Index

Power Sharing Smart

1 Introduction

1 Introduction

What is the biggest problem when installing many chargers?

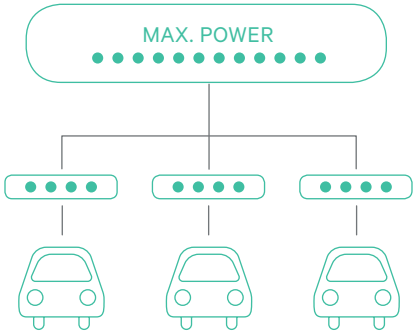
- Available power is limited (upgrade of installation is very expensive).

How do we solve the problem?

- Most efficient distribution of the available power – without extra cost / additional device.

Which factors did we take into account?

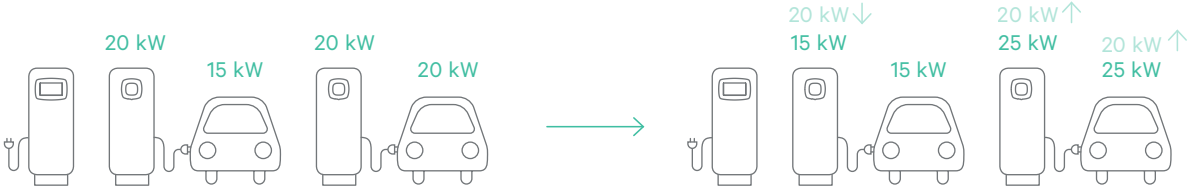
- A car stays longer than it charges.
  Wallbox will use that available power.
- Each installation has their own characteristics.
  Wallbox allows a most flexible installation.
- The installation is often not connected to the Internet.
  Wallbox does not require Internet-connection.
- When connecting many devices, easy troubleshooting is key.
  Wallbox gives full visibility over the status.



EFFICIENCY

Re-assignation of unused power:

- A car uses actually less than it has assigned from power sharing (see example below).
- A car is full and will not charge anymore.



ROBUSTNESS

- In case of communication lost with the Master, the slave will act as a stand-alone charger of 6 A.
- In case of communication lost with some slaves, the Master will adjust the maximum current available.
- A newly powered on charger will be added to the system within 1 minute.

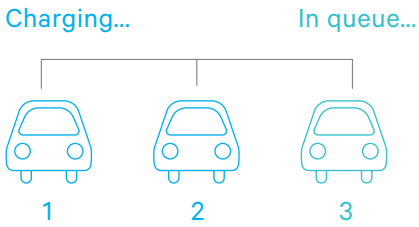
FLEXIBILITY

- Connect between 1 and 24 chargers with the Master.
- Any kind of installation.
- Configuration of the system (power/chargers) can be easily changed.
- Up to 250 m distance of communication.

Possibility to install more chargers than can charge at the same time with the “first-come-first-serve” principle.

Example:

No. Chargers _____ 3
Max. Current _____ 12 A
Min. Current _____ 6 A



Power Sharing Smart

2 Installation

2 Installation

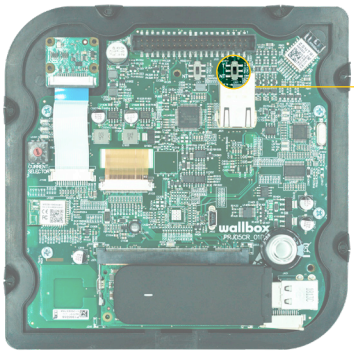
2.1 Positioning in the system (T/NT-Chargers)

When installing the Wallbox in a Power Sharing Smart network, the location is important to be taken into account.

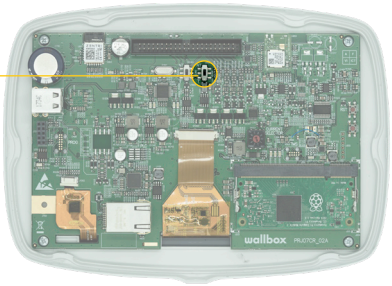
The Power Sharing system includes two Terminating (T) chargers and the rest of Non-Terminating (NT) chargers as shown in the image.

Each charger includes an electric element that defines wether it is T or NT:

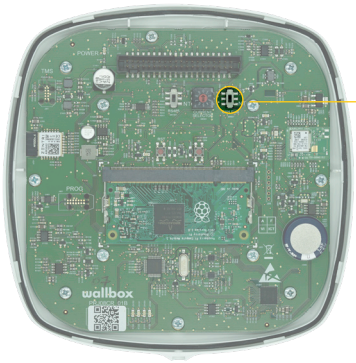
- **Commander 2, Pulsar Plus and Copper*:** The way to turn it from NT to T is to change the switch position it has inside.
- **Commander or Pulsar:** There is an specific Part Number with a -P- like in WBXX-X-X-X-P-XXX-X.



Copper T/NT Switch



Commander 2 T/NT Switch



Pulsar Plus T/NT Switch

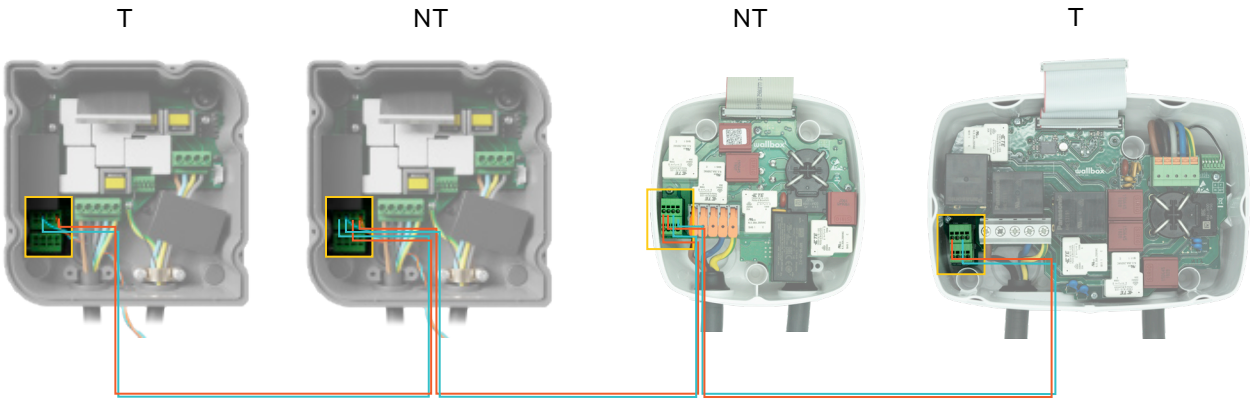
Once the location is clear, the charging station can be installed according to its delivered Installation Guide.

*In this document, Copper C, Copper S and Copper SB are referred as Copper

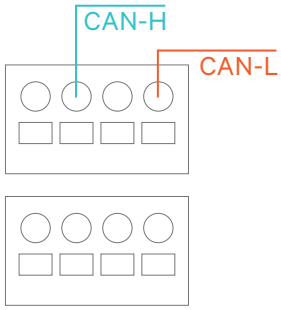
2.2 Cabling installation

- The chargers communicate through a cabling system that connects the chargers to the ones next to it.
- The cabling consists of a CAN-low (CAN-L) and a CAN-high (CAN-H) line.
- We recommend to use the following cable-type: Ethernet Class 5E no shield, 1 pair.
- A total maximum length of 250 m can be installed.

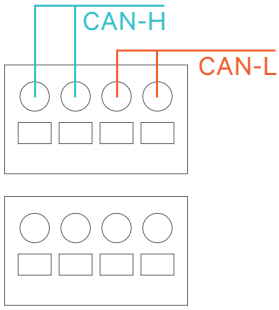
CABLING COPPER, COMMANDER 2 AND PULSAR PLUS



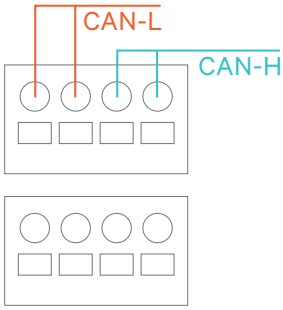
Copper, Commander 2 and Pulsar Plus have two slots for input and output cabling so the conjunction is done inside the charger.



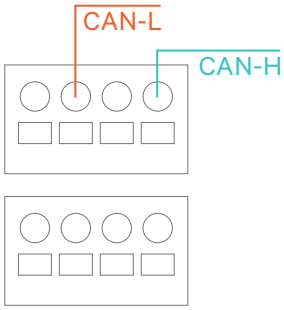
Copper
T connection



Copper
NT connection



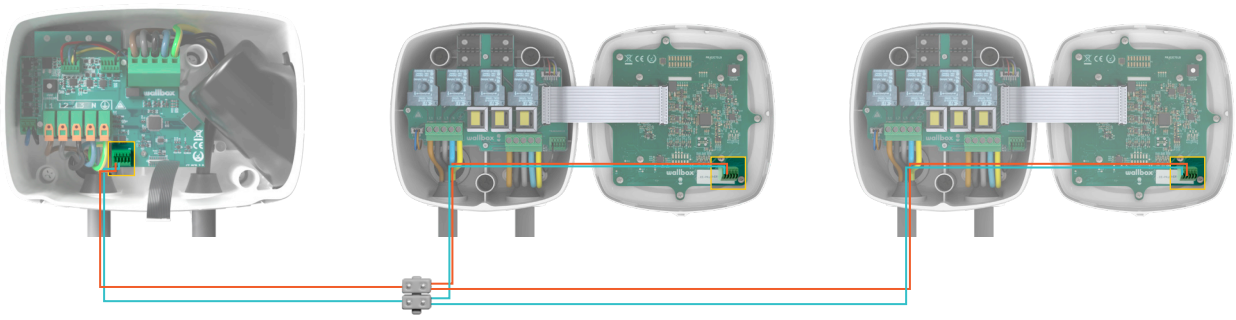
Pulsar Plus or
Commander 2
NT connection



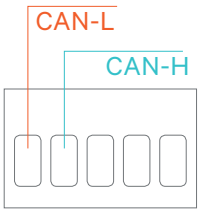
Pulsar Plus or
Commander 2
T connection

⚠ The cabling polarity must always be respected:
CAN-H must be connected to CAN-H terminal.
CAN-L must be connected to CAN-L terminal.

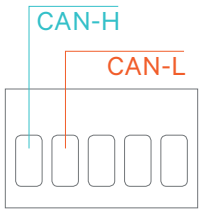
CABLING COMMANDER AND PULSAR



Commander and Pulsar only have one slot so the conjunction is done with external terminals.



Commander connection



Pulsar connection

⚠ The cabling polarity must always be respected:
CAN-H must be connected to CAN-H terminal.
CAN-L must be connected to CAN-L terminal.

Power Sharing Smart

3 Configuration

3 Configuration

3.1 Master/Slave setup and powering on

Each power sharing system consists of 1 Master charger and 1-24 Slave chargers. The chargers can be configured in the following way:

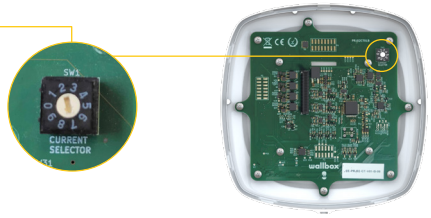
Charger	Master	Slave
Copper	✓	✓
Commander 2	✓	✓
Commander	✓	✓
Pulsar Plus	✓	✓
Pulsar		✓

Any combinations are possible.

The master can be set at any position within the group (T or NT).

Each charger has to be configured before the start-up as a Master or a Slave, using the rotary switch:

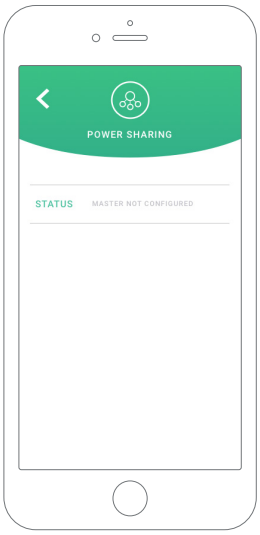
Position	Configuration
0	Slave
8 or 9	Master
Any other	Stand-alone (see Installation Guide)



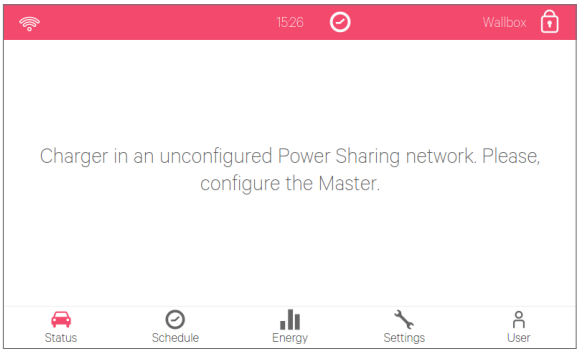
Once all chargers are configured with the rotary switch, the sytem can be powered on.

3.2 Network Configuration

Once the system has been powered on, the network has to be configured on the Master charger. While the network is not properly configured the charger will stay in “Unconfigured power sharing” status, signalised by the red colour.



All master chargers



Commander

Commander 2

The Power Sharing Smart system has three parameters to be set.

> If the master is a Copper or a Pulsar Plus a myWallbox account is needed in order to connect to the charger via the Wallbox APP. For more information see the corresponding User Guide.

Once connected, access the Power Sharing box in the settings menu. In case of Commander, access through Settings -> System -> Power Sharing.

The three parameters to configure in the Master are the following:

NUMBER OF CHARGERS IN THE POWER SHARING SYSTEM

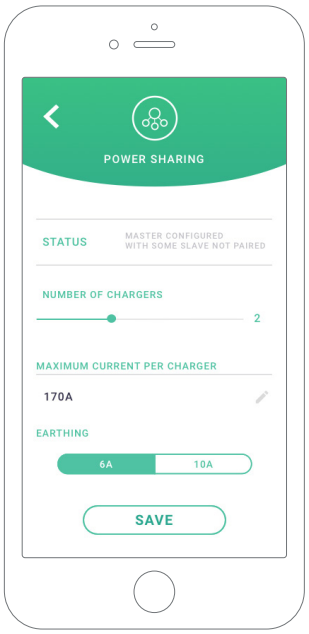
- This number must include the master charging station.

MAXIMUM CURRENT PER PHASE

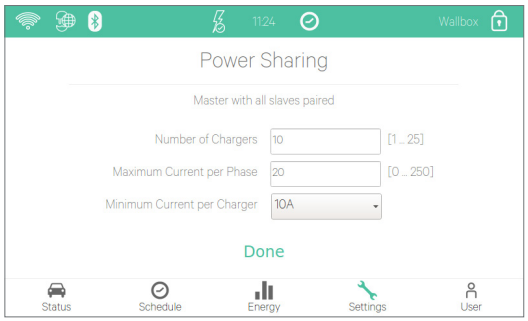
- This value determines the maximum current that your installation can carry. Typically this value can be drawn from the main MCB, that has been installed for this setup.

MINIMUM CURRENT PER CHARGER

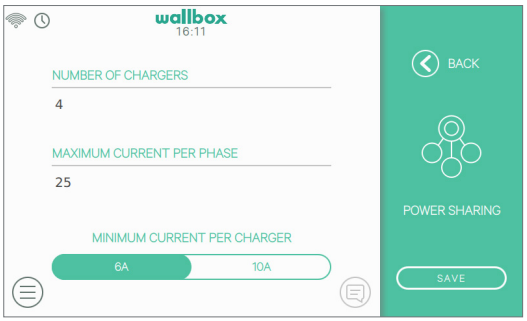
- While the standards define a minimum current of 6 A (default value), some cars need to have a minimum current of 10 A.
- Default value is 6 A.



All master chargers



Commander



Commander 2

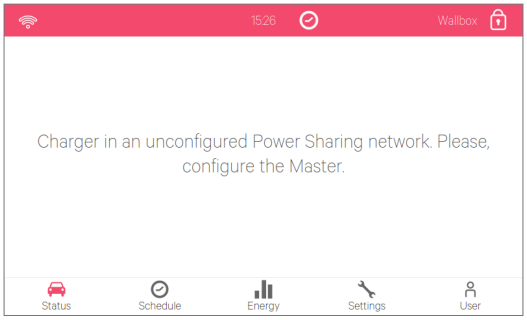
Power Sharing Smart

4 Operation status

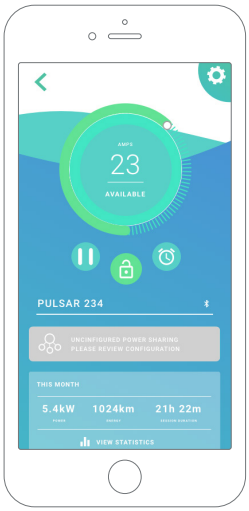
4 Operation status

4.1 Net not configured

This is the initial status after power on the setup. For more information see section 3.2.



Commander

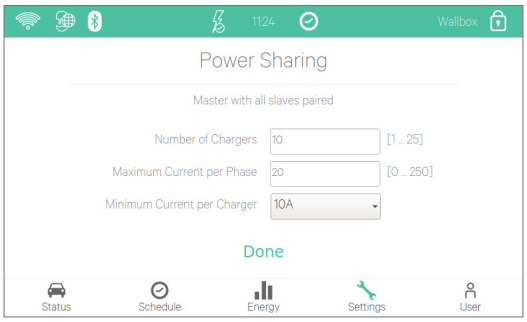


All chargers

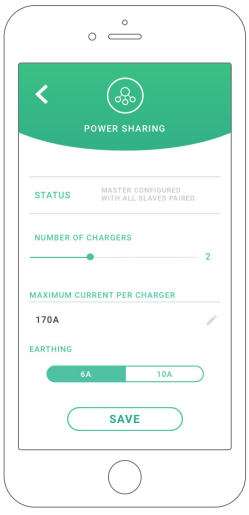
Commander 2

4.2 Master paired

The network has been successfully set. All chagers are connected with the master.



Commander

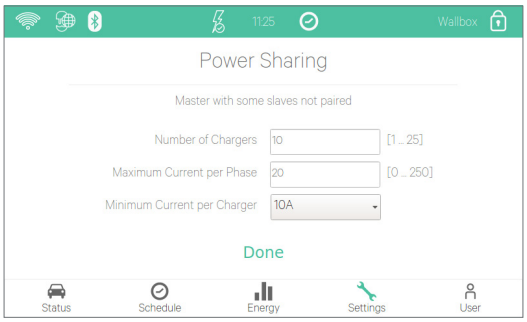


All master chargers

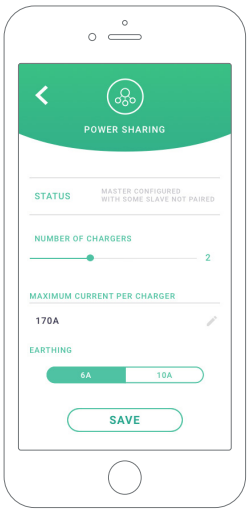
Commander 2

4.3 Master not paired

The number of chargers in the configuration are not coincident with the ones that are connected with the Master. Review sections 2 and 3 to make sure all steps are being understood.



Commander

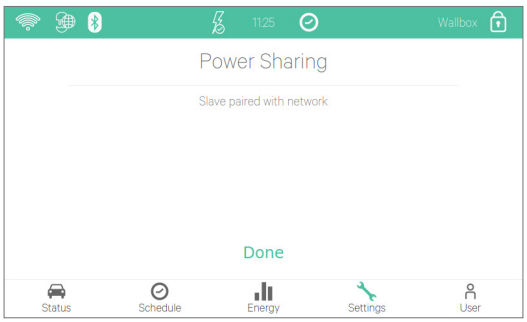


All master chargers

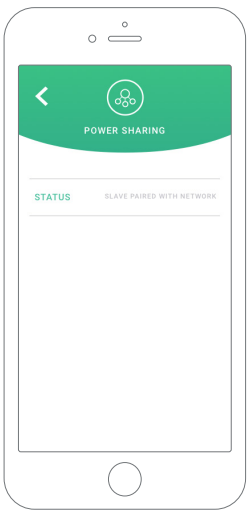
Commander 2

4.4 Slave paired

Slave connected with the master. The installation has been successful.



Commander



All chargers

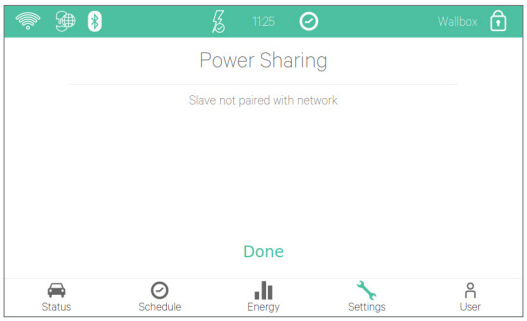
Commander 2

4.5 Slave not paired

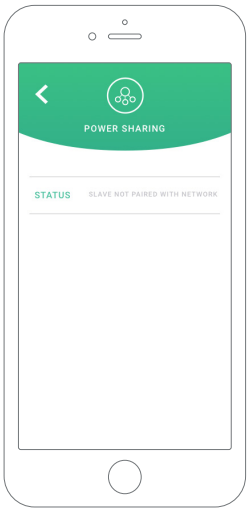
The slave is not successfully connected with the master on the Power Sharing Smart network.

This state is reached after 30 seconds without succesful communication.

In this state, the Pulsar and the Pulsar Plus will have a **fast** blinking Halo in Ready, Connected and Charging state. Remember that in this state the slave can only charge at 6 A.



Commander



All chargers

Commander 2

Pulsar / Pulsar Plus

READY
slave not paired

CONNECTED
slave not paired

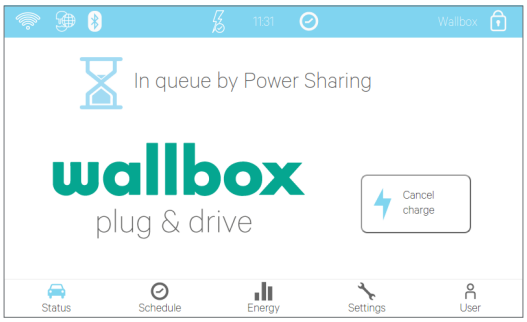
CHARGING
slave not paired

4.6 In queue

Not enough power available for this charger.

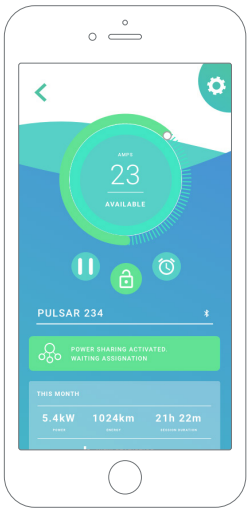
- If the power has already been reduced to the minimum, the newly plugged cars will go into this state.
- Once the system has enough power available (e.g. a car has been fully charged) it will start charging.

In this state, the Pulsar and the Pulsar Plus will have a blinking Halo.



Commander

Commander 2



All chargers

Pulsar / Pulsar Plus

Power Sharing Smart

5 Troubleshooting

5 Troubleshooting

Upgrading from older Power Sharing versions

As Power Sharing is a functionality that is working across our charging stations, and not only on a single one, all chargers must work the same.

Therefore, when upgrading from an older version of Power Sharing Smart, you need to update the Software of all of them. Our User Guides explain the update process.

Once the update of all chargers of the system has been performed, follow the chapter 3 of this manual.

Please take into account that the setup of the system (Chapter 1 and 2 of this manual) is kept identical.

Charger(s) have a red LED/HALO/top screen

- After the start up, this is the default colour on a Power Sharing Smart net. If it lasts more than around 30 seconds, then check that the net is configured properly. If not, set the net configuration and wait from 5 to 30 seconds.
- Make sure that the nº of chargers include the Master.
- Make sure that the maximum current per phase is set properly and that is higher than the minimum to be assigned.

Charger(s) have a blinking green LED/HALO or on Commander appears the message "Slave not paired with the power sharing network" on the Power Sharing menu

- Poor contact on the communication cables. Check that all the communication cables are properly connected on the chargers (see section 2).
- Wrong resistor value between communication lines. Power off all the chargers and measure the Ohm resistor between CAN-H and CAN-L, it must be around 60 Ohms. If not, please check again section 2.

Resistor's value between communication lines is different than 60 Ohms

- If it is higher is because there's only one charger with the terminal resistors. If it is lower is beacuse there are more than 2 charger with terminal resistors.
- Make sure that the two ends of the line have the "T" switch (if there's the switch) selected or that the resistors are on the correspondant chargers (see section 2).
- If the resistor value is not around 60 Ohm but the configuration is correct, a charger may be faulted. To ease the searching remove the CAN cables of the chargers and check the resistor value in each one with, if possible, the switch in T position.
- The T chargers should have a 120 Ohm resistance between lines while the NT should have an open line.

Erratic behaviour

- Poor contact on the communication cables. Check that all the communication cables are properly connected on the chargers.
- Wrong configuration on the Master.
- Wrong resistor value between communication lines. Power off all the chargers and measure the Ohm resistor between CAN-H and CAN-L, it must be around 60 Ohms. If not, please check again section 2.

Charger keeps waiting for current eventhough there's no other car

- The current assignation may last up to 30 seconds.
- Make sure that there are no schedules programmed.
- Check that the master and slaves are all paired. If not the maximum current per phase will be diminished 6 A per charger not paired.