circontrol

# Installation Manual

Genion One

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# Genion One
# Installation Manual

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# Here is the guide to install and configure Genion One

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# 1

This manual provides information about how to install, configure and use the **Genion One**.

It contains all the necessary information for safe usage and help to get the best performance from the product with step-by-step setup instructions.

**THE FOLLOWING SYMBOLS ARE USED IN THIS DOCUMENT TO INDICATE IMPORTANT SAFETY INFORMATION**

**DANGER!**
Indicates that property damage may occur if appropriate measures are not taken.

**ATTENTION**
Indicates that special attention should be paid to the point indicated.

**INFORMATION**
Useful information to take into account.

## IMPORTANT SAFETY INSTRUCTIONS

- Read all instructions before using and setting up the equipment.
- Do not modify the equipment. If you make changes, **CIRCONTROL** will reject any liability and the warranty will be void.
- You must fully comply with the electrical safety regulations applicable in your country.
- Do not repair or tamper with the equipment while it is connected to a power supply

# Introduction

Genion One is a product that allows you to manage the energy of an electrical system with a photovoltaic self-consumption system and an electric vehicle charging point. It was created with the objective of optimising energy usage in a system, specifically the contracted power and the surpluses produced by the self-consumption system, regulating the electric vehicle charging.

This manual explains the use of the web application that controls the operation of this equipment, as well as the previous steps to establish the connection.

Information is also included on the contents of the manual and how to use it effectively to ensure correct installation and proper operation of the device.

It is important to read the instructions carefully before starting the installation and ensure that all system requirements and applicable legal and safety requirements are met.

## A Checks upon delivery

Upon delivery of the equipment, check the following points:

- The equipment corresponds to the specifications of your order.
- The equipment has not been damaged during transport.
- Perform an external visual inspection of the equipment before connecting it.
- Check that it is equipped with a quick installation guide.

If you notice any delivery issues, immediately contact the carrier and/or CIRCONTROL's after-sales service.

# 2

# Before installation

## A Previous recommendations

The Genion One must be installed by authorised and qualified professional.

Before handling, modifying the wiring or replacing the equipment, the power supply must be disconnected. Handling it while it is connected is hazardous.

It is essential to keep the cables in perfect condition to avoid accidents or damage to people and/or property.

The equipment manufacturer shall not be liable for any damages whatsoever in the event that the user or installer does not heed the warnings and/or recommendations indicated in this manual, nor for damages resulting from the use of non-original products or accessories.

If an anomaly or malfunction is detected in the equipment, do not perform any operation on it.

Check the environment you are in before initiating connection: Do not make connections in hazardous or explosive environments.

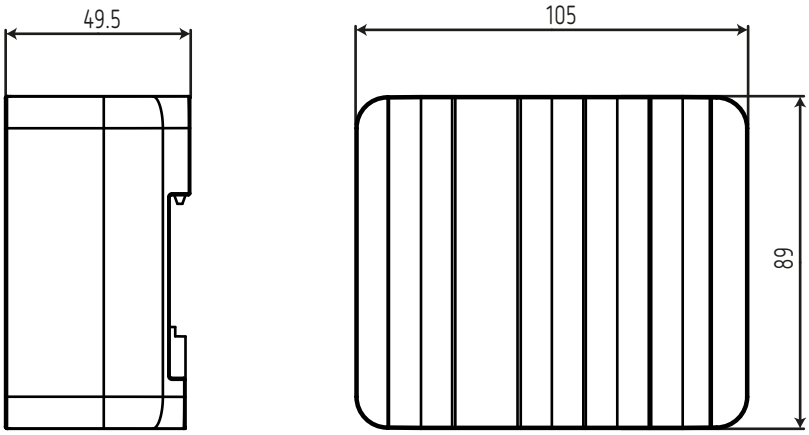
For the equipment to be used safely, it is essential that the people who handle it follow the safety measures stipulated in the regulations of the country where it is being used, wearing the necessary personal protective equipment and heeding the various warnings indicated in this instruction manual.

# 3

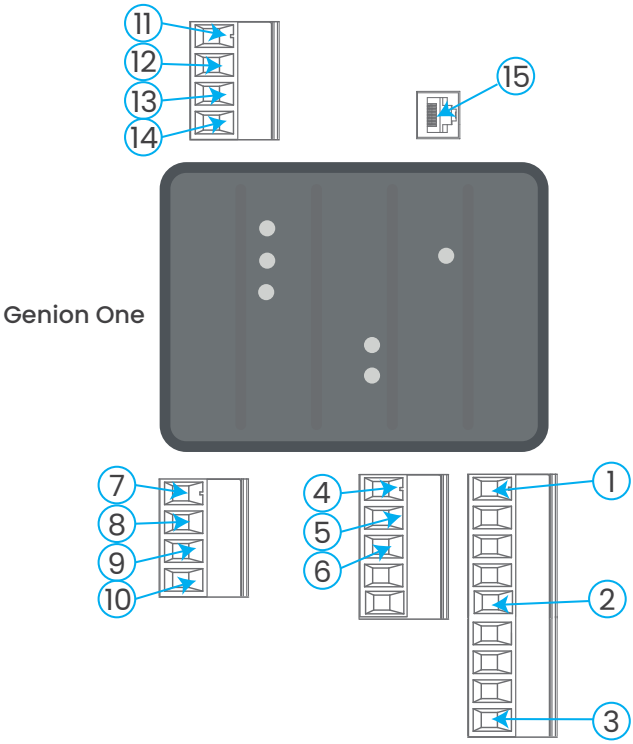
Device characteristics:

- **RS-485**, **Ethernet** and **WiFi** connections.
- **6 LED** indicators.
- A Web application that allows you to configure and visualise all the parameters of the home system in real time via **WiFi** or **Ethernet**.

Device dimensions:



# Overview




| Genion One terminals | |
|---|---|
| 1. **A1(+)**, Auxiliary power supply | 9. **V3**, Voltage input |
| 2. **A2(-)**, Auxiliary power supply | 10. **N**, Neutral voltage input |
| 3. ⏚ , Earth | 11. **N1**, Neutral current input |
| 4. **B-**, RS-485 connection | 12. **I3**, EV recharging point current input |
| 5. **A+**, RS-485 connection | 13. **I2**, Photovoltaic generation current input |
| 6. **GND**, RS-485 connection | 14. **I1**, Mains current input |
| 7. **V1**, Voltage input | 15. **Ethernet**, Ethernet connection |
| 8. **V2**, Voltage input | |

# 4

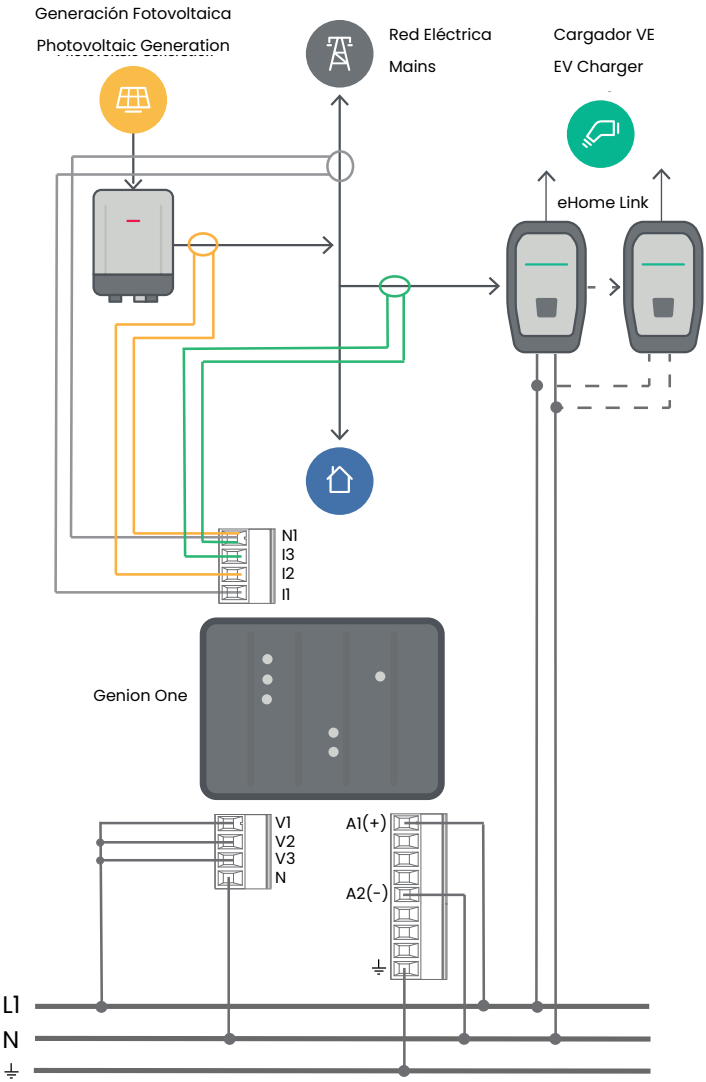
The equipment is installed on DIN rail.

> ⚠ With the equipment connected, you may have access to parts that are dangerous to the touch via the terminals or by opening of covers or removing certain elements. The equipment should not be used until it has been completely installed.

The equipment must be connected to a power supply circuit protected with gL (IEC 60269) or class M fuses, between 0.5 and 2 A. A circuit breaker or equivalent device must be provided to disconnect the equipment from the power supply.

# Equipment installation

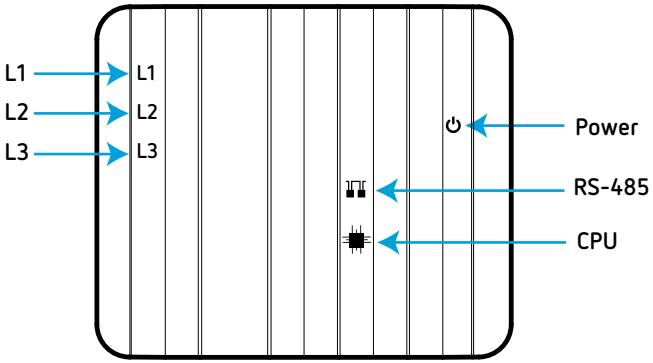
## A Wiring diagram



# 5

## A LED indicators

Genion One has 6 LED indicators that allow you to monitor the status of the equipment at all times.




- **Power**. Equipment status:

| LED | Description |
|---|---|
| **Power** | On (green) |
| | Powered equipment |

- **RS-485**. RS-485 communication status:

| LED | Description |
|---|---|
| **RS-485** | Power on (blue) |
| | Data transmission |
| | On (green) |
| | Data being received |

# Operation

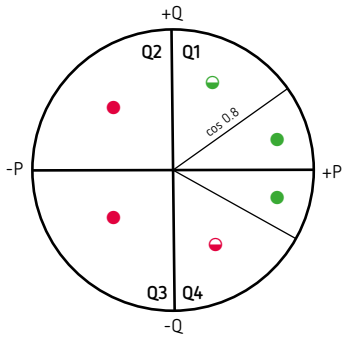
- **CPU**. CPU status:

| LED | Description |
|---|---|
| CPU | Power on (blue) |
| | CPU activated |

- **L1, L2, L3**. Line status: cos φ: 1 ... 0.8
  - » **L1.** Status of the Mains Power line.
  - » **L2**. Status of the Photovoltaic Generation line.
  - » **L3**. Electric Vehicle (EV) charging point line status.

| Standard | Q1 | | Q2 | Q3 | Q4 | |
|---|---|---|---|---|---|---|
| CIRCONTROL | ● cos φ: 1 ... 0.8 | ◒ cos φ: 0.8 ... 0 | ● cos φ: 0 ... -1 | ● cos φ: 1 ... 0 | ● cos φ: -1 ... -0.8 | ◒ cos φ: -0.8 ... 0 |
| IEC 62053-23 | ● cos φ: 1 ... 0.8 | ◒ cos φ: 0.8 ... 0 | ● cos φ: 0 ... -1 | ● cos φ: 0 ... -1 | ● cos φ: 1 ... 0.8 | ◒ cos φ: 0.8 ... 0 |
| IEEE | ● cos φ: -1 ... -0.8 | ◒ cos φ: -0.8 ... 0 | ● cos φ: 1 ... 0 | ● cos φ: 0 ... -1 | ● cos φ: 1 ... 0.8 | ◒ cos φ: 0.8 ... 0 |

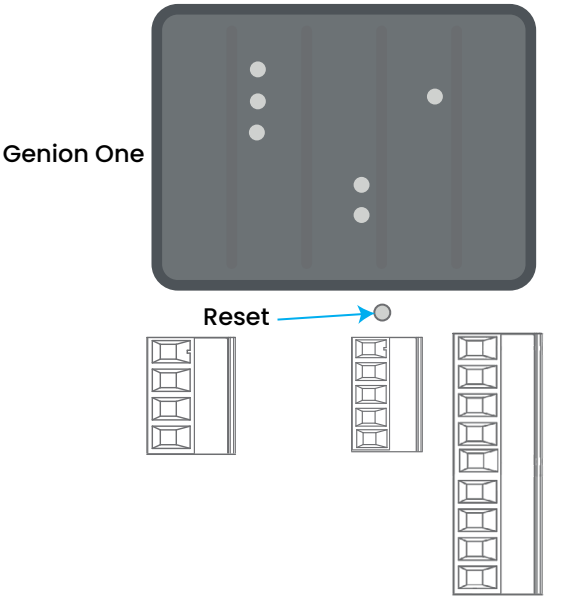
○ LED off, ● LED on, ◒ LED blinking.



# B Reset

The unit has a Reset button to restore the factory settings. There are two modes available:

- Soft Reset: If the button is pressed for 3 seconds, the unit will restore the factory settings for the communication parameters.
- Hard Reset: If the button is pressed for 10 seconds, the unit will restore the factory settings for all configuration parameters.



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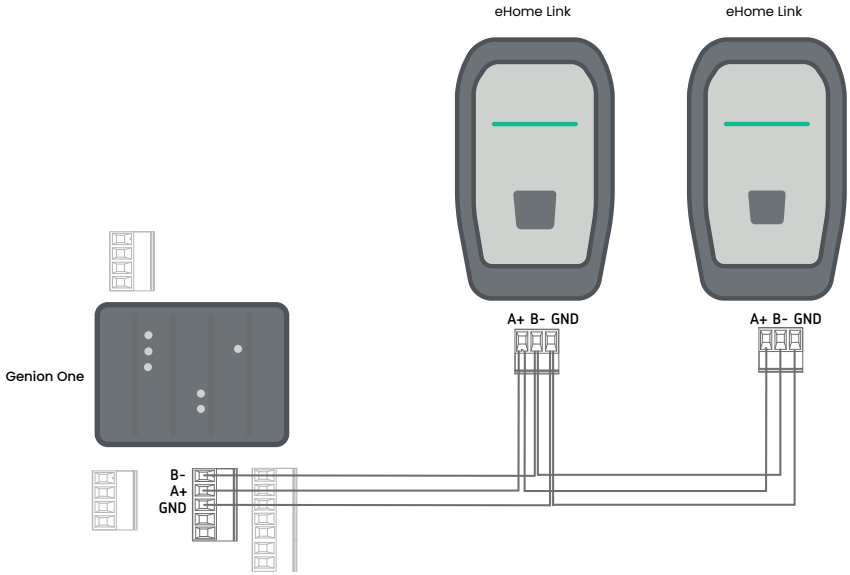
# 6

## A RS-485 communications

Genion One has an RS-485 communications port for communicating with EV charging points.

The RS-485 cable should be composed of a twisted pair cable with a shielding sheath (minimum 3 wires), with a maximum distance between the **Genion One** and the satellite equipment of **1200 metres**.



# Communications

## USAGE ENVIRONMENT AND HEALTH

Wireless communications emit radio frequency electromagnetic energy, just like other radio devices.

Because they operate within the guidelines found in radio frequency safety standards and recommendations, they are safe for users to operate.

In certain environments or situations, the use of wireless communications may be restricted by the building owner or organisation representatives. These situations can include the following:

- Use of wireless connections on board airplanes, in hospitals or near gas stations, explosive areas, medical implants or electronic medical devices implanted in the body (pacemakers, etc.).

- In any other environment where the risk of interference with other devices or services is identified as hazardous.

If you are unsure about the policy that applies to the use of wireless devices in a specific organisation (airport, hospital, etc.), it is advisable to request authorisation for the use of wireless communications.

## B Wi-Fi communications

The Genion One operates with WiFi communications in the 2.4 GHz band, according to IEEE 802.11 b / g / n standards.

## C Ethernet communications

The Genion One operates with 10/100 Mbps Ethernet communications from an RJ45 connector.

# 7

## A Connection

The configuration website can be accessed in 2 ways:

***Procedure 1***

1. Power the equipment through terminals 1, 2 and 3.

2. The equipment will create its own WiFi connection with the name **Genion-xxxxxx**, where "**xxxxxx**" is the last 6 digits of the MAC.

3. The WiFi access password will be **12345678**.

**NOTE:** *The equipment does not have an Internet connection, since the WiFi network is only for communicating with the equipment. The Internet connection must be made via the Ethernet port.*

4. Once connected, open **Google Chrome** and enter

**http://genion-xxxxxx.local/**

***Procedure 2***

1. Power the equipment through terminals 1, 2 and 3.

2. The equipment will create its own WiFi connection with the name **Genion-xxxxxx**, where "**xxxxxx**" is the last 6 digits of the MAC.

3. The WiFi access password will be **12345678**.

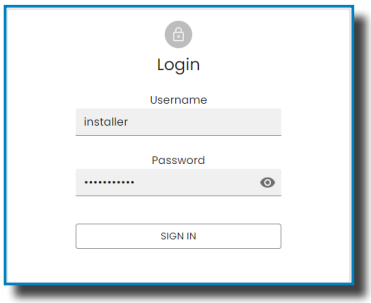
**NOTE:** The equipment does not have an Internet connection, since the WiFi network is only for communicating with the equipment. The Internet connection must be made via the Ethernet port.

4. Scan the QR code on the label on the side of the equipment. This code will take you to the website:

**http://genion-xxxxxx.local/**

# Configuration website

Once the connection to Genion One has been established, the login page will be displayed, where the Username and Password must be entered.




The Web application has 3 access profiles:

- **Installer**. Allows you to manage and configure all installation parameters from the installation wizard.

| Access via Installer profile | |
|---|---|
| **Username** | installer |
| **Password** | ins+password *(Located on label on the side of the equipment)* |

For more information on installation, please refer to the section "***7G - Installation***".

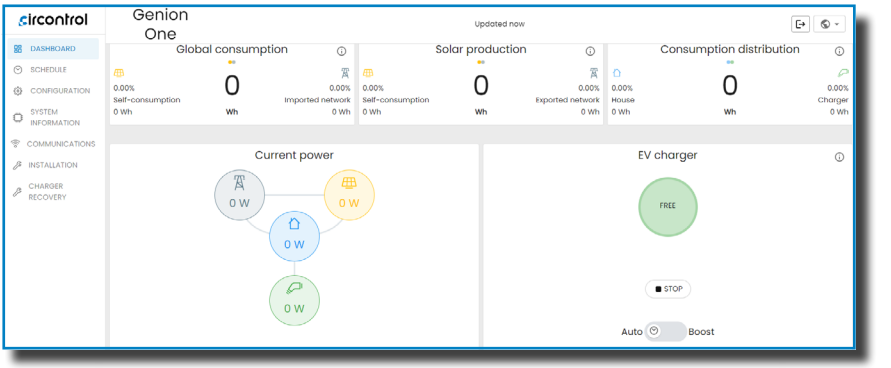
- **Administrator**. Allows access to all the options on the website, except for the installation wizard.

| Access through the Administrator profile | |
|---|---|
| **Username** | admin |
| **Password** | *(Located on the label on the side of the equipment)* |

- **Guest**. Allows access only to the main screen (Dashboard) of the Web application.

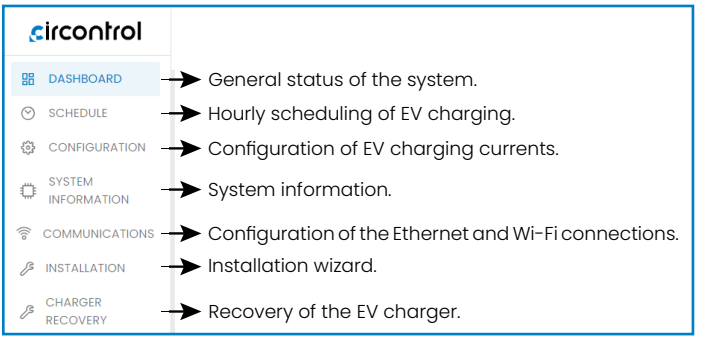
| Access through the Guest profile | |
|---|---|
| **Username** | guest |
| **Password** | guest |

Once validated, you can access the main screen.




Use the log out button to log in with a different profile.

From this screen you can access the configuration website menu.

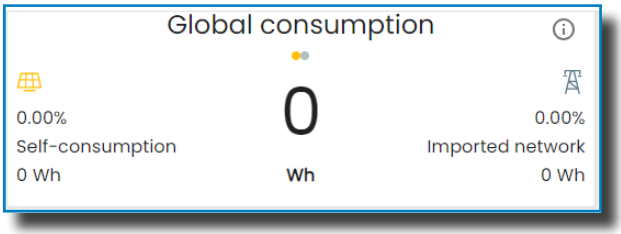



# B Dashboard

The Dashboard section displays the graphical interface that shows the general status of the system.

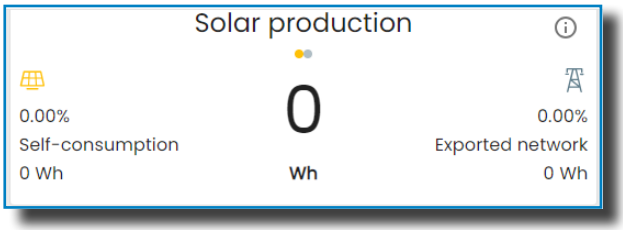
## GLOBAL CONSUMPTION

The **Global Consumption** interface displays the global energy consumption data, as well as the distribution of energy according to its origin, in relative and absolute terms.



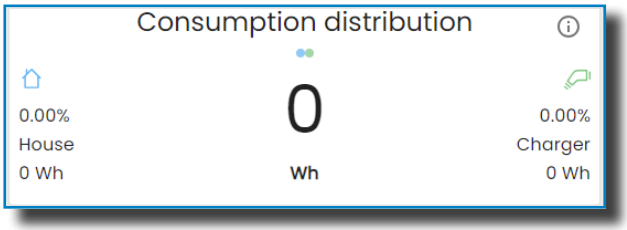

## SOLAR PRODUCTION

The **Solar Production** interface displays the photovoltaic production data. Specifically, the total production and the relative and absolute data on the distribution of this production, self-consumed energy and energy exported to the grid.



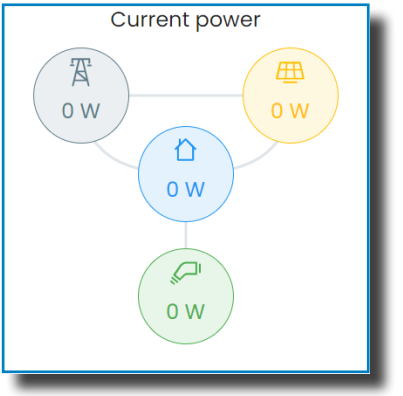

## CONSUMPTION DISTRIBUTION

The **Consumption Distribution** interface shows the total energy consumed and divides it between the total for the house and that of the electric vehicle charging point. It also shows relative and absolute data.



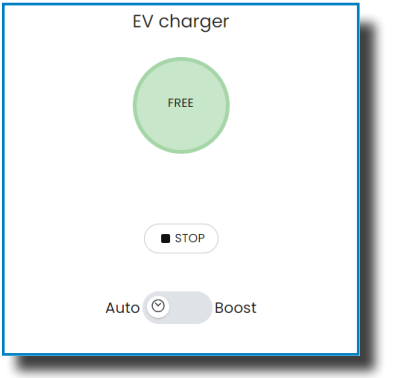
## CURRENT POWER

The **Current Power** flow diagram shows information on both the origin of the power consumed (mains or self-consumption) and the part of the energy consumed that reaches the recharge point instantaneously.




## EV CHARGER

The recharging point interface, or the **EV charger**, displays the following:



- The status of the recharging point.


Charger **Free**: you do not have any vehicle connected.


Vehicle **Charging**.


Vehicle **Connected** to the recharging point, but not charging.


**Error** at the recharging point: the recharging point and the car are not properly connected.

- The recharging point switch.


Switch in **ON** mode: when a vehicle is connected, the charging will start.


Switch in **OFF** mode: the vehicle cannot be charged.

- The charging mode.

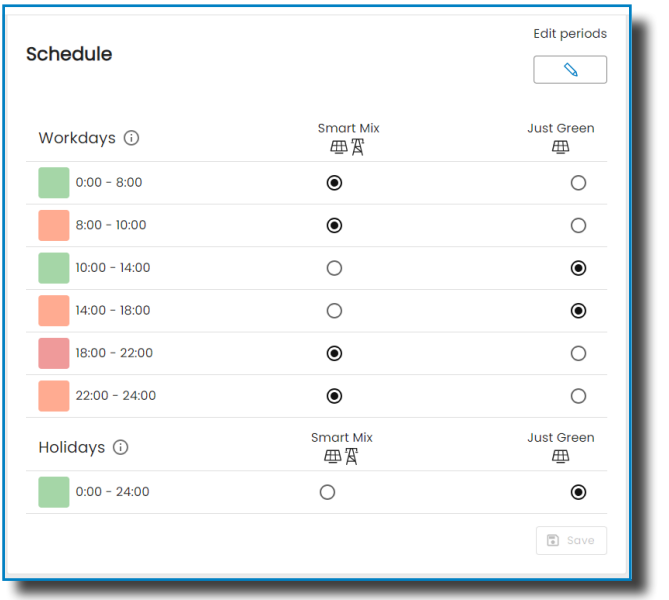

**Auto**: the vehicle will be charged as per the programmed periods.

> For more information on the periods, please refer to the section "***7C - Calendar***".

**Boost**: the vehicle will always be charged, regardless of the programmed periods.

# C Calendar

The **Calendar** section is where you can configure the hourly schedule for charging the electric vehicle.



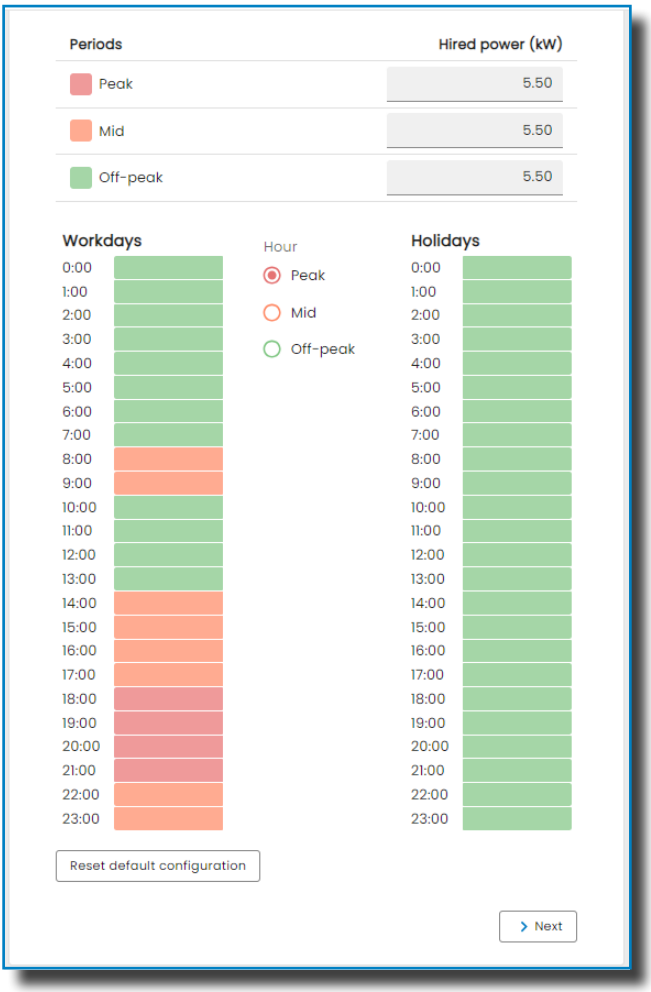

**NOTE:** *This programming will be activated when the Dashboard charging mode is set to Auto.*

For more information on the ***Auto*** mode, please refer to section "***7B - Dashboard - EV CHARGER***".

The Calendar can set different vehicle charging periods for working days and non-working days. For each period, you can select the Smart Mix Charging Mode.

- It prioritises charging with the surplus produced, but, if there is no surplus, the car will still be charged, with the power being drawn from the mains supply. This mode is usually used during Flat or Off-Peak periods.
- Just Green. Charging ONLY with the surplus from the photovoltaic system. If there is no surplus, it will not charge. This mode is normally used during Peak periods.

By clicking on the "**Edit periods**" button, you can access the configuration screen.



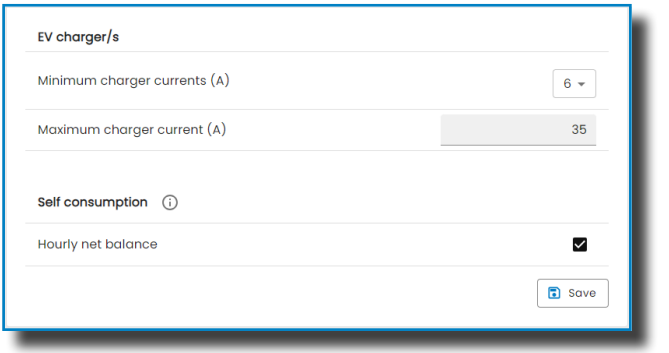

Here you will select the contracted power in Kw for each of the Periods: **Point**, **Plain** and **Valley**.

It also establishes the hourly limits of the billing period for the contracted electricity tariff, as well as the type of tariff. To do this, first select the time by clicking on it and then select the desired time period: ◉ **Peak**, ◉ **Flat** or ◉ **Off-Peak**.

**NOTE:** *The vehicle will be charged at the **2.0TD** tariff schedule by default.*

# D Settings

In the **Settings** section you can configure the charging currents for the EV charging points.




In the **Settings** section you can configure the charging currents for the EV charging points.

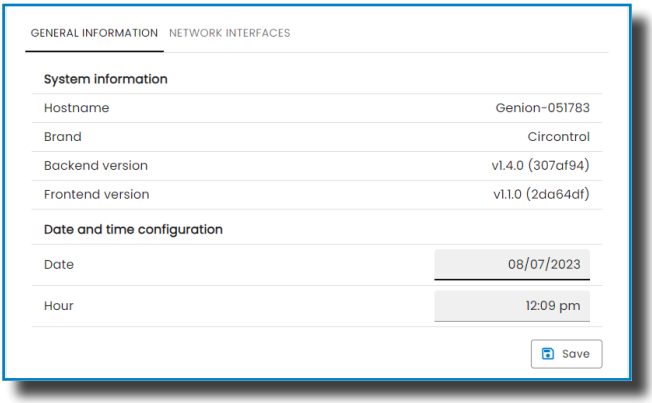
- **Minimum charging currents**: Select the minimum charging current for each of the recharging points, in order to take maximum advantage of the surplus produced by the self-consumption system. The possible values are **6 A**, **10 A** or **13 A**.

- **Maximum charging current**: Set the maximum charging current in A. This is a vehicle specification.

Press the **SAVE** button to save the changes made.

# E System information

In the **System Information** section, you can view and configure the system information in 2 tabs. Below is the **General Information** tab.

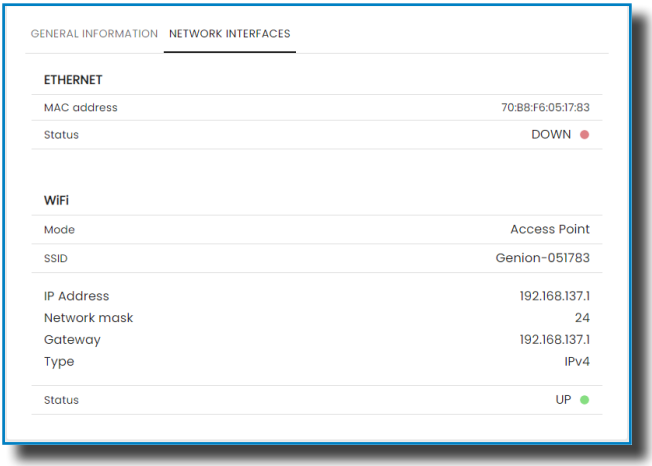



The **Server Name** shows the name of the equipment, which allows you to establish the connection and enter the Web application.

In the **Date and Time Settings**, you can change the system date and time.

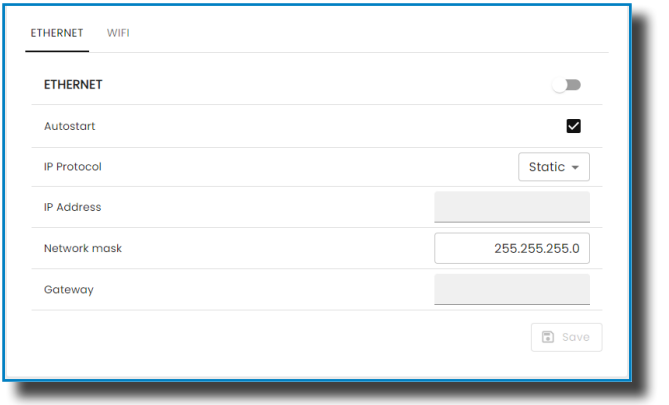
Press the **SAVE** button to save the changes made.

In the **Network Interfaces** tab, you can view all information related to Ethernet and WiFi connections. The status of each of the connections will be shown visually with a green or red indicator.



# F Communications

In the **Communications** section, you can view and configure the Ethernet and WiFi connections. The Ethernet tab is shown below:

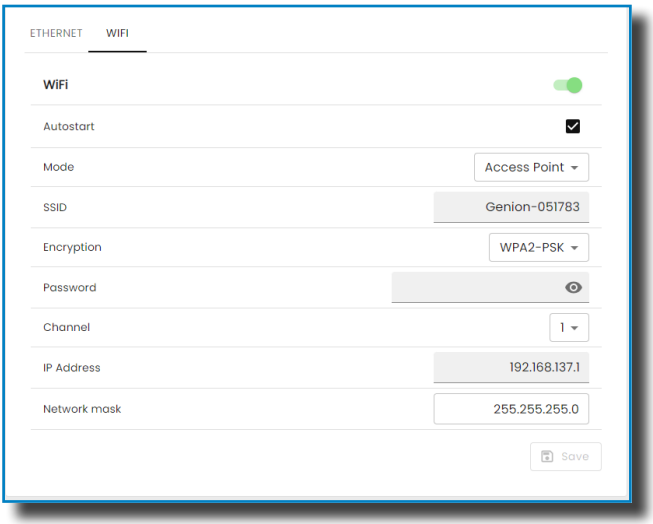



In this tab, you can enable or disable Ethernet connections. The configuration parameters are as below:

- **Autostart**: when the configuration parameters are saved, the unit will restart automatically.
- **IP Protocol**: selection of the IP protocol type, either **Static** or **DHCP**.
- **IP Address**: Ethernet IP address.
- **Netmask**: Ethernet network mask.
- **Gateway**: Ethernet gateway.

Press the **SAVE** button to save the changes made.

In the next tab, the WiFi connection can be enabled or disabled:




The configuration parameters are as below:

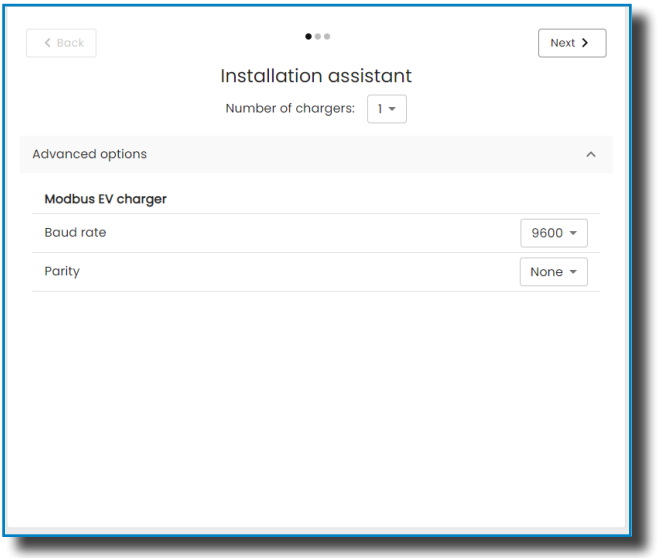
- **Autostart**: when the configuration parameters are saved, the unit will restart automatically.
- **Mode**: selection of the WiFi mode, either **Access Point** or **Station**.
- **SSID**: equipment name.
- **Encryption**: selection of the type of encryption used, which can be **OPEN, WEP, WPA1-PSK, WPA2-PSK, WPA3-PSK, WPA1-PSK + WPA2-PSK, WPA2-PSK + WPA3-PSK, WPA1-EAP, WPA2-EAP, WPA1-EAP or WPA1-EAP + WPA2-EAP**.
- **Password**: WiFi network access password.
- **Channel**: Network channel selection: 1 … 11.
- **IP Address**: IP address of the equipment.
- **Netmask**: network mask.

Press the **SAVE** button to save the changes made.

# Installation

If you access the website with the **Installer** profile, you will see the **Installation** section displayed, which allows you to configure all the installation parameters for the **Genion One** from an installation wizard.

**STEP 1** of the Installation Wizard.




The configuration parameters are as below:

- **Number of chargers**: Selection of the number of recharging points installed. In the case of 2 recharging points, the power supply for the first recharging point must be disconnected in order to carry out the configuration.

**NOTE**: *The wizard will warn you when the first recharging point is to be reconnected*.

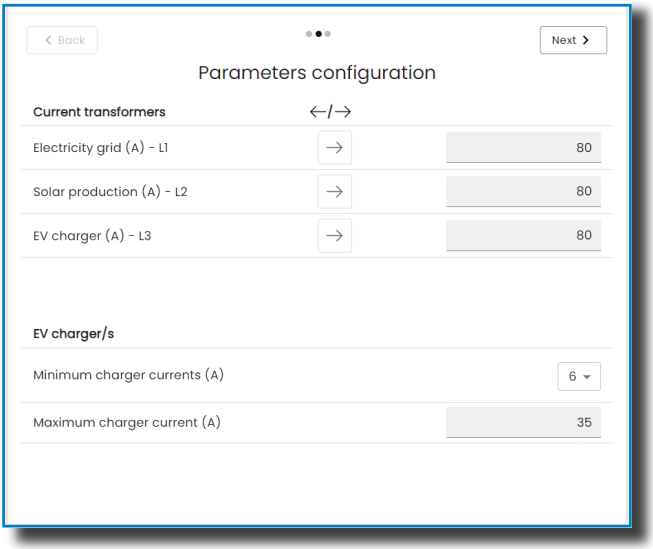
The recharging points must be configured at the factory with ID 1 by default.

In the **Advanced Options** drop-down menu, you can configure the Modbus communications for the recharging point.

- **Baud**: selection of the transmission speed: **9600, 19200, 38400, 57600** or **115200 bps**.
- **Parity**: selection of communication parity, either **None** or **Even**.

Click on the **Next >** button to proceed to the following installation step.

**STEP 2** of the Installation Wizard.




The configuration parameters are as below:

In the **Current Transformers** section:

- **Mains Power (A) - L1**: L1 current transformer primary, Mains Power line in Amps.

- **Solar Production (A) - L2**: L2 current transformer primary, Photovoltaic Generation line in Amps.

- **EV Charger (A) - L3**: L3 current transformer primary, EV Charger line in Amps.

The button → allows the polarity of the readings to be reversed so as not to obtain negative powers where they are not expected.

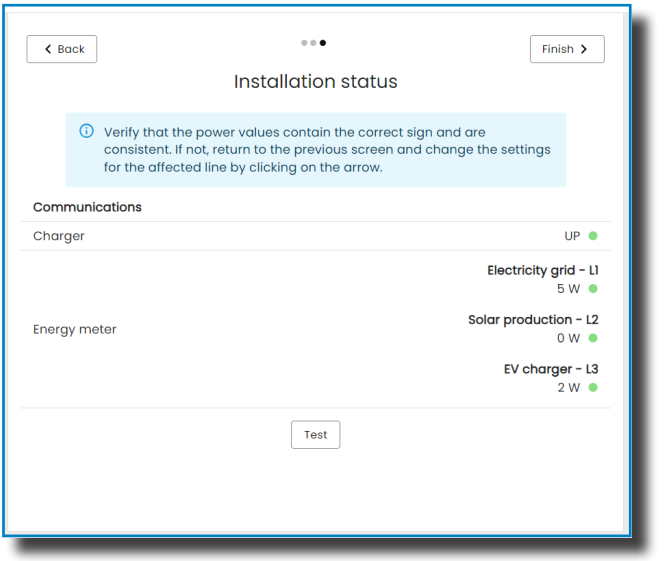
In the **EV Charger(s)** section:

- **Minimum charge currents (A)**: Select the minimum charging current for each of the chargers, in order to take maximum advantage of the surplus produced by the self-consumption system. The possible values are: **6 A, 10 A** or **13 A**.

- **Maximum charge current (A)**: Set the maximum charge current in Amps; this is a vehicle specification.

Press the **Next >** button to proceed to the next installation step.

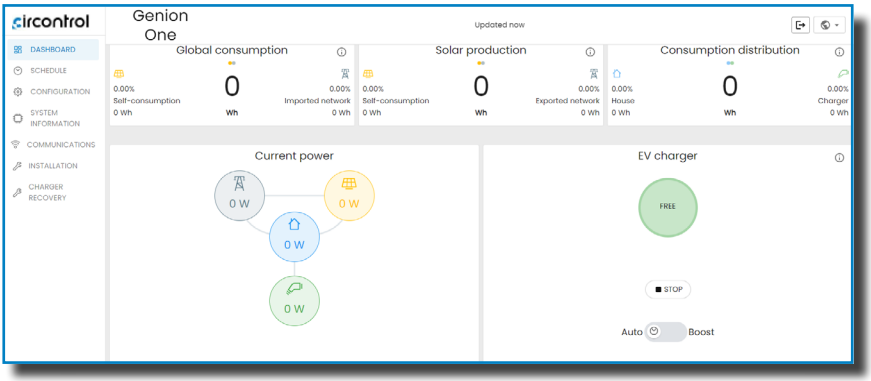
**STEP 3**. Installation status.



In the **Installation Status** screen you can view the Modbus communication values returned by the recharging points. These power parameters should be checked to verify that the values returned by the **Genion One** are correct.

If any of the 3 lines fail, you can carry out all the necessary checks again by pressing the **Test** button, until the installation is correct.

At the end of the installation, the main Dashboard screen will be displayed again:



# 8

| POWER SUPPLY IN CA | |
|---|---|
| **Rated voltage** | 90 ... 264 V ~ |
| **Frequency** | 47 ... 63 Hz |
| **Consumption** | 5.5 ... 6.5 VA |
| **Installation category** | CAT III 300 V |

| VOLTAGE MEASUREMENT CIRCUIT | |
|---|---|
| **Rated voltage (Un)** | 230 $V_{F-N}$ ~, 480 $V_{F-F}$ ~ |
| **Voltage measurement range** | 5 ... 120% Un |
| **Frequency measurement range** | 45 ... 65 Hz |
| **Input impedance** | 1 MΩ |
| **Minimum measurement voltage (Vstart)** | 10 V |
| **Installation category** | CAT III 300 V |

| CURRENT MEASUREMENT CIRCUIT | |
|---|---|
| **Rated current (Un)** | ... / 250 mA |
| **Current measurement range** | 2 ... 120% In |
| **Input impedance** | 0.5 mΩ |
| **Minimum measurement current (Istart)** | 1% In |
| **Installation category** | CAT III 300 V |

| ACCURACY | |
|---|---|
| **Measurement of active energy** | Class 1 |
| **Measurement of reactive energy** | Class 2 |

# Technical Characteristics

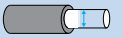
| RS-485 COMMUNICATIONS | |
|---|---|
| **Fieldbus** | RS-485 |
| **Communications protocol** | Modbus - RTU |
| **Speed** | 9600 - 19200 - 34800 - 57600 - 115200 bps |
| **Stop bits** | 1 - 2 |
| **Parity** | none - even |

| Ethernet communications | |
|---|---|
| **Type** | Ethernet 10/100 Mbps |
| **Connector** | RJ45 |
| **Protocol** | TCP/IP |
| **Secondary service IP address** | DHCP |

| WIFI COMMUNICATIONS | |
|---|---|
| **Band** | 2.4 GHz |
| **Standards** | IEEE 802.11 b / g / n |
| **Mode** | Access Point |
| **SSID** | Genion-xxxxxx |
| **IP** | 192.168.137.1 |

| USER INTERFACE | |
|---|---|
| **LED** | 6 LED |

| ENVIRONMENTAL CHARACTERISTICS | |
|---|---|
| **Working temperature** | -20°C ... +50°C |
| **Storage temperature** | -25°C ... +75°C |
| **Relative humidity (non-condensing)** | 5% ... 95% |
| **Maximum altitude** | 2000 m |
| **IP degree of protection** | IP20 |
| **IK degree of protection** | IK08 |
| **Pollution degree** | 2 |
| **Application** | Interior |

| MECHANICAL CHARACTERISTICS | | | |
|---|---|---|---|
| **Terminals** |  |  |  |
| **1 ... 13** | 1.5 mm² | 0.2 Nm | M2 |
| **Dimensions** | 105 x 89 x 49.5 mm | | |
| **Weight** | 150 g | | |
| **Envelope** | Polycarbonate UL94 V0 self-extinguishing | | |
| **Fixing** | DIN rail | | |

| ELECTRICAL SAFETY | |
|---|---|
| **Protection against electric shock** | Class II double insulation |
| **Insulation** | 3 kV~ |

| STANDARDS | |
|---|---|
| **Electromagnetic Compatibility (EMC). Part 6-4: Generic standards. Emission standard in industrial environments.** | UNE-EN 61000-6-4 |
| **Electromagnetic Compatibility (EMC). Part 6-2: Generic standards. Immunity in industrial environments.** | UNE-EN 61000-6-2 |
| **Safety requirements for electrical measuring, control and laboratory equipment. Part 1: General requirements.** | UNE-EN 61010-1 |
| **Safety requirements for electrical measuring, control and laboratory equipment. Part 2-030: Specific requirements for equipment with testing and measurement circuits.** | UNE-EN 61010-2-30 |
| **Environmental testing. Part 2-1: Tests. Test A: cold. (IEC 60068-2-1:2007).** | UNE-EN 60068-2-1 |
| **Environmental testing. Part 2-2: Tests. Test B: dry heat. (IEC 60068-2-2:2007).** | UNE-EN 60068-2-2 |
| **Environmental testing. Part 2-78: Tests. Cab test: damp heat, continuous test.** | UNE-EN 60068-2-78 |

# 9

# Need help?

If you have any queries about operating the equipment or if it develops a fault, please contact the **Post-Sales Department**.

support@circontrol.com

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(+34) 937 362 941

# CIRCONTROL
# GENION ONE
# INSTALLATION MANUAL

A comprehensive guide on how to install, configure and use Genion One.

v1.2 - 21st September 2023