User Manual

Complete charger
operation manual
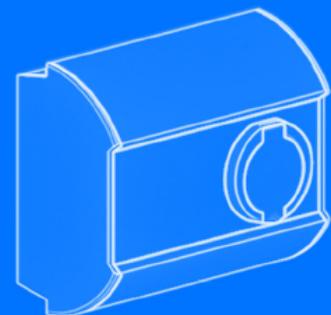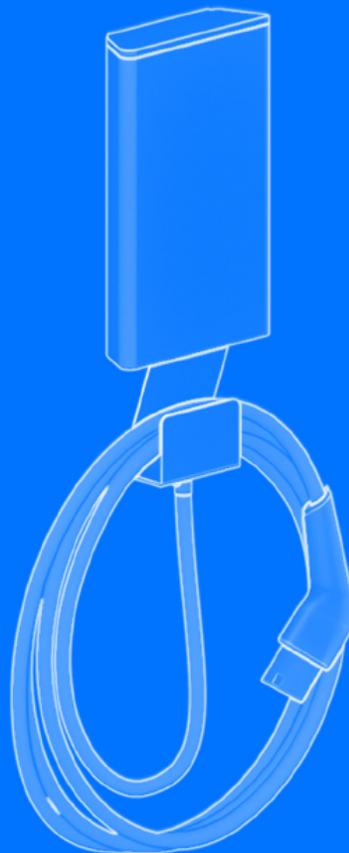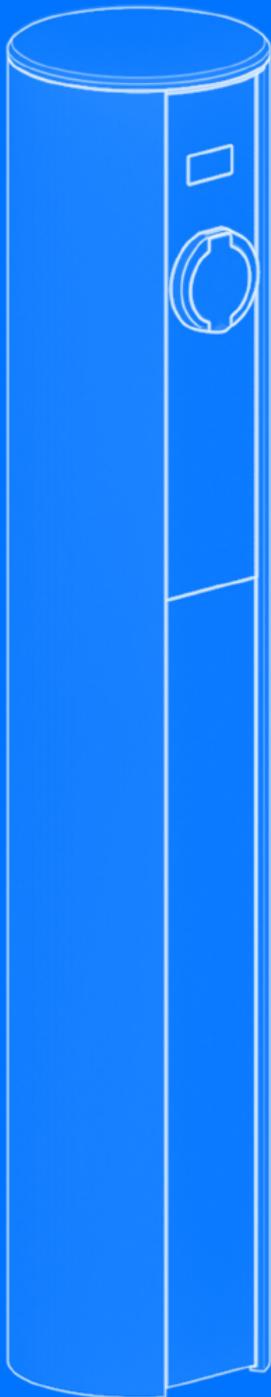
enelion

Congratulations on the purchase of the **Enelion** product and thank you for your trust.

Before installation, please make sure that the module packages contain all the elements. Up to date version of the operation manual can be accessed at **https://enelion.com/support/**

Please note the contents of the manual before initiating any activities related to the installation, or activation.

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1. Important information

1.1. General Provisions

Installation and servicing of the device must be performed by qualified and authorized persons, and re-pairs may only be carried out by the manufacturer or entities authorized by the manufacturer.

Tampering with the mechanical, electrical and electronic components and the device software is forbidden and shall result in the nullification of the warranty. The exceptions include operations described herein and those agreed in writing with the manufacturer.

The manufacturer is not responsible for damage to property resulting from the forbidden interference in the product.

The electrical installation to be used by the device during its operation must meet the conditions described in the installation manual. The manufacturer is not responsible for incorrect assembly and/or protection of the electrical installation to which the device is connected.

The manufacturer is not responsible for the malfunction of the electrical installation to which the device is connected.

The electrical installation to be used by the device during its operation must comply with the legal standards in force in the place of assembly and the operation of the device. The manufacturer is not liable for any dam-age caused by an electrical installation that does not meet legal standards.

The device does not have a built-in switch. The device activates when the supply voltage is applied. The power supply cut off function must be provided by the appropriate electrical installation devices described in the assembly manual. Except in emergencies, the device must not be turned off during the charging process.

It is forbidden to supply the power to the device when the device casing remains open.

The use of a mechanically damaged charger or a charger that indicates a critical error is forbidden.

It is forbidden to place in the charger socket any objects not intended for this purpose. A working power cable with across section appropriate for the power supplied to the device and appropriate for the type of electric vehicle, terminated with a functional plug type2 in accordance with EC 62196-2 is the only object that may be plugged in the charger socket.

It is forbidden to use any extensions of the charging cable.

The manufacturer is not responsible for loss of health or life by any persons resulting from failure to comply with the above-mentioned recommendations.

The data plate on the device is an integral part of the device and its removal or damage shall result in the nullification of the warranty.

1.2. Safety instructions

Outdoor installation should not be carried out during precipitation or strong wind, if there is a risk that water or dirt may get into the device.

All operations described in this manual should be per-formed only having made sure that there is no voltage in the power cable.

2. Use the charging station

2.1. Preparation for use

Before the first use of the charger, make sure that:

1. The charger has been correctly installed and poses no danger to the user. More information may be found in the assembly manual available at **http://enelion.com/en/help/.**

2. The charger has been initialized with the configuration card. See chapter 3 Device configuration for more information.

3. The charger has been activated correctly and is ready for use. See chapter 4 User interface for more information.

2.2. Charging

To start charging the car, place the user card on the RFID reader located behind the display, or and in the top cover – in case of the Stilo charger. The use of a correct card shall be signaled with the diodes of the light bar lighting green one after another in one direction (see chapter 4.3 LED bar). After the card has been accepted:

1. Connect the cable to the charger[1],

2. Connect the cable to the car

3. Make sure the lock is closed properly[2] and charging process has started.

After performing these steps, the charger switches to charging status, communicating the fact with a green light on the light bar and showing the status on the dis-play. While charging, the light bar flashes from the center towards the edge, and there is a charging icon in the status bar of the graphic interface. If there is no charging icon and/or there is an unchanging green color on the light bar, the charger is ready to charge and waiting for the car to respond. See chapter 4 User interface. For more information. When configuring the station as Plug&Charge, at the operator's request, it is possible to disable the locking of the plug in the station before charging. This solution is used at times in public chargers and it allows one to stop charging without the need to use an RFID card

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[1]Applicable to devices with a socket.

[2]Not applicable to devices with Plug&Charge configuration or devices with cable.

or to unplug the vehicle. The plug design ensures that the communication contacts are disconnected first, interrupting the charging process. Next, the power contacts are disconnected, with the voltage already disconnected, and finally the protective conductor contact is disconnected. With such configuration of the station, checking the correct operation of the mechanical interlock should be skipped.

2.3. Completion of charge

To complete the charging process, disconnect the charging cable from the car. This unlocks the cable lock on the charger and brings the charger to standby. In the case of RFID configuration, placing the appropriate card on the reader again also terminates charging and unlocks the lock. See chapter 3 Device configuration for more information.

> **ⓘ INFO**
>
> For Online chargers, you may need to use the appropriate card to unlock the cable lock on the charger.

2.4. Emergency stop

The charging process can be interrupted by using the RFID card again or removing the plug from the vehicle. While charging, when the lock in the station is closed, it is not possible to pull out the plug from the socket. When configuring the station in Plug&Charge mode with the lock disabled, it is possible to interrupt the charging process by removing the plug from the charging station.

2.5. Procedure in the event of irregularities, fault and fire

When a defect, damage or irregularity occurs, the use of the station should be stopped immediately and the situation should be reported to the station operator. In the event of a fire on the charging station, disconnect the charging station's power supply as soon as possible, then disconnect and if possible

move the vehicle to a safe distance.

Call the relevant services. Fire extinguishing should be carried out with tools intended for electrical devices up to 1000V–a carbon dioxide (CO2) or powder extinguisher or sand.

2.6. General rules for safe operation

The device should be used in accordance with the recommendations included in the manufacturer's documentation and the principles of common sense. Electric vehicles may be charged only with the use of properly operating stations, charging cables and the vehicle.

> **⊘ WARNING**
>
> It is forbidden to use extension cords, adapters or branch-joints.

After charging is complete, the charging cables must be put back to its designated storage location. Avoid driving over any cables or plugs while maneuvering the vehicle at all cost.

Do not use plugs that are clearly dirty or wet.

The vehicle must be parked so that the charging cable is not stretched excessively, since this may cause the user or a bystander to trip over and fall.

> **❗ WARNING**
>
> It is forbidden to open the station (especially when live), to place any objects in plugs and sockets.

> **ℹ INFO**
>
> The device meets the IP54 standard.

Due to the IP54 class of the device, it is forbidden to wash the charger with pressure washers, garden hoses, a shower or any other stream of water.

> **❗ WARNING**
>
> Incorrect use may result in damage to property, fire, and in extreme cases, loss of health or life as a result of an electric shock.

2.7. Health and Safety

The device must be used in accordance with the health and safety requirements related to electrical devices.

The device installation manual requires the installation of a residual current device (RCD) in the switchgear. The device is a form of anti-shock and fire protection.

Servicing may be performed only by authorized persons and in accordance with the Service Manual. See chapter 8 Operation for details.

2.8. Disposal and environmental protection

Electrical and electronic waste must not be disposed of together with normal household waste. According to the WEEE directive in force in the EU, separate methods of disposal must be used for electrical and electronic waste.

In accordance with the provisions on waste electrical and electronic equipment, in Poland it is forbidden to put waste equipment (marked with the symbol of a crossed out bin) with other waste. The user who in-tends to get rid of such product is obliged to return the above-mentioned waste to the equipment waste collection point.

The collection points are run by wholesalers and retailers of such equipment and by communal organizational units operating in the field of waste collection, to name a few.

3. Device configuration

3.1. Available variants

The system of configuring the settings of Enelion chargers consists in reading the settings from the configuration card attached to the device. This allows for personalizing particular settings depending on what the client requires. The settings are read into the card by the Dealer after receiving a request from the client, who must give some basic information.

Available variants resulting from the configuration of the device are presented below:

* **Type of power system**

    – One–phase power system — only the first phase connected to the device will be used for charging. The power range may be set between 1,4 kW – 7,4 kW.

    – Three–phase power system — three phases will be used for charging. The power range may be set between 4,1 kW – 22 kW.

* **The charger powe**r — Available power capacity: 1,4 kW – 22 kW

    This is set depending on the type of power system of the user. Allows the power used for charging the car to be limited in order to protect the mains against overload.

* **Authorizing methods**

    – Plug and Charge — User authorization is not required: connecting the car will initiate the charging process

    – RFID — The charging process will initiate only after applying the correct RFID card. In case of offline chargers only the card dedicated to a specific charger will be accepted. Authorization in online chargers requires the user to be accepted by the administrating system.

* **De-authorizing methods**

    The above options are applicable only with offline chargers. De-authorizing the user in an online charger must be processed by the administrating system.

    – Only with an initiating card — Ending the charging process is possible only after applying the same card which was used to initiate the charging

    – With each card issued for the charger — This configuration is used in offline chargers. It allows to finish the charging process with the use of any card which was issued for a specific charger.

* **The charger number in a network** All chargers in a network need an individual identification number. This parameter is important when creating a network of online chargers or chargers supporting DLB.

Additional parameters related to the operation of Dynamic Load Balancing:

* **Current limits**
    Given in amps. Limits current available for a single phase in the power connection. It is the border value of power which will not be exceeded by the total power of all chargers operating at the same time.

* **Phase interlacing**
    The sequence of connecting phases to the charger. There are three possible connection sequences: L1 L2 L3, L2 L3 L1 and L3 L1 L2. It allows for the power of the connection in a network of chargers to be used more effectively.

3.2. Initiating the device

> **ⓘ INFO**
>
> Before the configuration is read into the device, the charger is locked and unable to initiate the charging process.

Once the charger is switched on for the first time it will wait for user configuration to be read into it. This will be signaled with a pulsing white light on the light bar and when the charger is equipped with a OLED display, a proper message will be displayed (the Unconfigured status):


```
Charger is not configured
Use the configuration card
to unlock
```

To configure the charger you need to:

1. Install the charger according to the fitting instruction available on **https://enelion.com/support/**

2. Turn power supply on.

3. Apply the RFID card attached to the charger to the reader.

4. Wait a few seconds for the charger to respond. A properly read configuration will cause the light bar to flash four times in white light.

5. In case of chargers with displays you can check if the read configuration is the same as the one provided when you were buying the device. The charger configuration should be displayed on the screen **(Configuration).**

> **❶ INFO**
>
> After the device has been configured, the configuration card may be used as the user card.

3.3. Changing the configuration

The process of initializing the device is carried only once at first initiation. Upon each next start the charger will read the configuration which was initialized. When needed it is possible to change the configuration of the charge which was already initialized. This requires a new configuration card to be read into a given charger. It may be connected with requesting the new card to be issued by the Dealer who sold the charger.

In order to change the configuration using a new configuration card issued for a specific device, you must follow the steps below:

1. Disconnect the car from the charger,

2. Make sure the charger is ready for use,

3. Apply the new configuration card to the RFID reader,

4. Wait a few seconds for the charger to respond,

> **❶ INFO**
>
> A correctly read configuration card will cause the light bar to flash four times with white light.

5. In case of a charger with a display you may check if the read configuration is the same with the configuration which was requested to be issued on the configuration card order.

After changing the configuration the charger will restart and after a restart it will be ready for use.

4. User interface

4.1. Display

The user display includes three elements:

1. **Status bar** — includes general information about the charger status,

2. **Display area** — includes messages depending on the charger status,

3. **Banner** — includes additional information useful for the operation of the charger.

> **ⓘ INFO**
>
> Some elements of the interface may differ depending on the model or the charger configuration.

4.1.1. Status bar

The status bar is located in the top part of the display. It is shown in each state the charger is in, except for the sleep mode, when the charger is blocked, reserved and when information about the status of reading the card is displayed.

The left side of the bar shows the maximum available power with which the charger is able to charge. The value will change dynamically according to the below charging power limits:

- Charging power limit set in the configuration,

- Charging power limit set remotely,

- Charging current limit related to the charging cable plugged into the socket[3],

- Charging current limit related to the dynamic load balancing (DLB)[4].

> **ⓘ INFO**
>
> The currently used charging power limit is the lowest value of all the limits mentioned above. The value serves for information purposes and is not the guaranteed power with which the connected car will be charged. In case of three-phase chargers the available power will always be given for charging a car which has a three-phase on-board charger.

On the right side of the bar there are icons designating the status of particular elements of the charger:

Icon	Meaning
🔒	The plug is locked
🔓	The plug is unlocked
⚡	Charging in progress **Warning:** line voltage on the socket pins. Be careful when disconnecting the plug.

In the Wallbox DUO charger there is an additional icon which shows the socket currently selected for charging. When the left socket (A) is selected, the icon showing an arrow and the correct letter is shown on the left, and when the right socket (B) is chosen, the icon appear on the right.

Icon	Selected socket
◀A	Left Socket (A)
B▶	Right Socket (B)

4.1.2. The display area

The display area includes messages informing about which actions should be taken by the user in order to start the charging process or informing about the cur-rent status of the charger.

[3]In case of chargers with a socket.

[4]In case of chargers with the additional DLB function enabled.

Unconfigured charger

The Unconfigured state means waiting for the configuration card. In this state the charging function is locked. The only option to unlock the charger is to apply the RFID card supplied with the charger. Upon applying the card the charger will display the configuration read out from it and will restart. More information in Chapter 3 Device configuration.

```
Charger is not configured
Use the configuration card
         to unlock
```
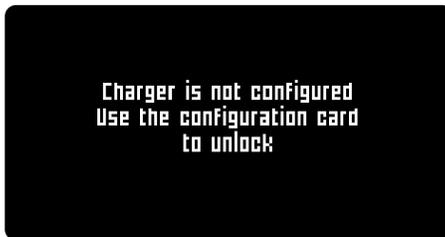
Configuration

Information about the charger configuration is displayed. It is shown for the first 6 seconds after the configured charger is initialized or after a configuration card is applied.

```
Wallbox 22.0kW 32A socket
   Addressing: 01 / 01
Authorization: dedicated cards
        RCD type A
DLB limit: 32A config: L123
      Version: 2.8.1
```
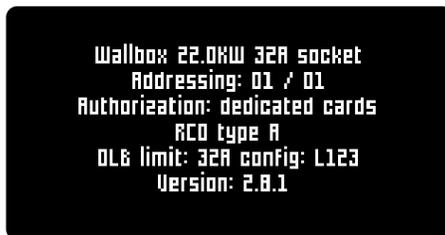
It includes the following information:

- **Device model:** Wallbox, Wallbox DUO, Vertica, Adspace,
- **Maximum charging power:** from 1,4 kW to 22 kW,
- **Current limit per phase:** from 6 A to 32 A,
- **The type of connection with the car:** cable or socket,
- **Network addressing:** address/number of connectors in a network of chargers,
- **The means of unlocking the charging process:** any card, a dedicated card or Plug And Charge,
- **Type of inbuilt RCD:** type A or type B,
- **Optional DLB configuration:** the connection current limit per phase and the phase (one-phase charger) or rotation of phases connected to the charger (three-phase charger),
- **Software version.**

Starting the charging process

The instructions displayed before the charging process is initiated will differ depending on the charger configuration.

In case of chargers unlocked with a card the following message will appear:

```
22.0 kW                     🔓
     PRZYŁÓŻ KARTĘ
    DO WYŚWIETLACZA
_____
        www.enelion.com
```

Once the card is verified correctly the charger will wait for the car to be connected. The timer located under the message shows time within which the user should connect the car in order to start the charging process. When the time elapses, you should place the card on the display again. When the car is correctly connected and the lock in the chargers equipped with sockets are locked, the charging process will begin.

```
22.0 kW                     🔓
    PODŁĄCZ SAMOCHÓD
          37 s
_____
        www.enelion.com
```

Chargers with Plug And Charge configuration only wait for the car to be connected. Once the cable is properly connected the charging process will start.

```
22.0 kW
_____
    PODŁĄCZ SAMOCHÓD

_____
        www.enelion.com
```

Charging

The charging status includes the following information:

- Total charging energy,
- Current charging power,
- The total time of the charging process.

INFO

In case of chargers configured in Plug And Charge the charging may be stopped by unplugging the charging cable from the car or the charger.

INFO

In case of chargers configured to be unlocked with the use of cards, the charging may be stopped by placing the card to the display or by unplugging the charging cable from the car.

INFO

In this state the charger allows for charging, but it is the car that decides it will be charged or not. The actual charging state is displayed as an icon on the status bar.

Summary

Once the charging process is finished the summary in-formation will appear. The display will go back to the charging initialization status after 5 minutes of being idle, after the plug is connected to the charger once more or the card is placed on the display.

The summary includes the following information:

- **Charging time** — the time during which there was transfer of energy to the care,
- **Total charging time** — the time elapsed from the beginning to the end of the charging process,
- **Energy** — total energy supplied to the car,
- **Average power** — average car charging power.
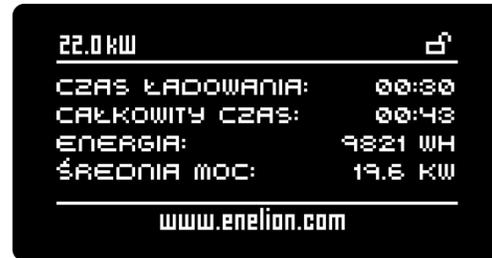
Error detection

In case of an error a message with the error code and source will be displayed. In some cases a timer counting down to error reset will appear below.
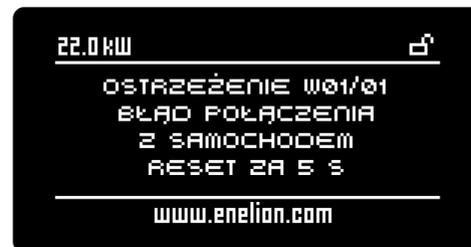
INFO

You will find more information about the errors in the section 10.1 Error codes.

Card reading status

The card reading area in Enelion chargers is located in the display area in case of chargers with a display or on the cover in case of the Stilo charger. The message in-forming about the RFID card reading status is displayed when the card is placed in the card reading area. The message is shown for 5 seconds from the moment the card was last placed on the display. When the card is placed while a current card reading status is showing the message content will be updated.

The following messages may be displayed:

- **Card accepted —** the card placed on the display was accepted by the charger. The charging will start or end depending on the previous status.
- **Card reading error Try again —** there was an error while reading the card. The card must be placed on the display once again. It may mean that the applied card is wrong or damaged.

- **Wrong card Use different card —** the card placed on the reader was denied locally by the charger in the offline mode. You must use a different card.
- **The time for connecting is over Try again —**the time for connecting the car elapsed. To start the charging process use the same card again.
- **Connecting to the server... —** The charger is waiting for the card to be accepted by the server.
- **Card denied Use different card —** the card was denied by the administrating system. You must use a different card.
- **Connection error Try again —** an error in
- connecting to the administrating system occurred. You must wait for the connection to be re-established and try to use the card again.
- **Connection terminated Try again —** the time for the administrating system to respond elapsed. You must wait for the connection to be re-established and try to use the card again.
- **Car disconnected —** the car has been disconnected during the charging process. The plug in the charger has been unlocked.

In case of chargers with the Plug And Charge mode the following message may appear:

- **Initializing the charging —** shown when the car has been connected to an online charger. The charger is being accepted by the administrating system and the charging process will soon begin.
- **Charging forbidden —** the charger has been blocked in the administrating system and it cannot initialize the charging process.

Sleep mode

The sleep mode activates after 5 minutes of the charger being idle. By showing scrolling messages the charger informs about the available power and the means of deactivating the sleep mode.

Any of the following actions taken by the user will deactivate the sleep mode:
- Connecting or disconnecting the charging cable plug,
- Connecting the car,
- Placing the card on the display.

> **ⓘ INFO**
>
> A charger to which a car is connected will not activate the sleep mode.

Reservation

The reservation of a charger may only be done remotely from the administrating system. The reserved charger will display its number in order to facilitate identification of the reserved device.

Deactivating the reservation status takes place after the reserved time has elapsed or when the correct card is placed.

Charger unavailable

The situation when the charger is blocked by the operator in the administrating system. This state may be connected with a software update or maintenance works. The charger is blocked until the administrating system operator makes it available.

4.1.3. Banner

The banner is placed in the bottom part of the display and includes additional scrolling information.

- **Website / text —** one of the banners is a personalized text which is entered by the dealer. It may be a web page address or a phone number. When the dealer does not enter any text the banner will not show.
- **Total energy: 000000.0 kWh —** the total energy consumption counter reader in the charger. The counter shows the total energy which was measured by the charger. In the Wallbox DUO charger it is the total energy of the currently active charging socket.
- **The car is overheating! Ventilation required! —**The battery inside the car is overheating. The battery needs to be ventilated.

- **Connector #01** — number of a charger in the net-work. Displayed when the charger is in the online mode.
- **Use card to unlock** — use the card to finish the charging process and release the socket lock.
- **Disconnect the car to unlock** — disconnect the car to finish the charging process and release the socket lock.
- **To change the connector press A** — displayed in DUO chargers. Informs about the possibility to change the displayed socket by pressing A button.

4.2. Wallbox DUO Charger

In the Wallbox DUO charger the display and the card reader serve to operate both charging connectors. The display shows information only about an active connector and the current selection is signaled by a proper icon on the status bar.

Icon	Selected socket
◀A	Left Socket (A)
B▶	Right Socket (B)

The active connector will switch over upon pressing the button located on the left under the display or automatically upon connecting or disconnecting the cable to the charger. During the switch the display will show a letter informing which connector the user interface has been switched to.

The charging and authorization processes in the charger are supported independently and have no influence on one another. This allows for the Wallbox DUO charger to be used by two separate users.

> **ⓘ INFO**
>
> The card reader is active only for the currently selected connector. To initialize or finish charging with the use of a card first make sure that a proper connector is active.

> **ⓘ INFO**
>
> In an online charger both connectors have their own unique addresses and are visible in the administrating system as two separate charging point.

4.3. LED bar

All Enelion chargers are equipped with a line of LED diodes called the light bar, which informs about the cur-rent state of the device with the use of light signals.

Light signals may be distinguished into **Continues charger states** or **Signaling actions.**

4.3.1. Continuous charger states

1. **Uninitialized charger.** In the event when the charger has not been initialized yet, after five seconds the light bar will remain white. The charger will wait for applying the configuration card. More information in Chapter 3 Device configuration.
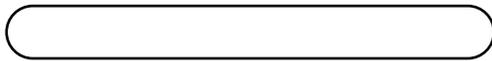
2. **Availability.** In the Available state the light bar will light in a uniform green color. The charger is ready to begin the charging process and, depending on the configuration, will wait for applying the adequate RFID card or connecting the car.

3. **Charging in progress** The light bar will light in blue, pulsating in a radiant manner from the center toward the edges. The pulsation rate depends on the charging power. When the power is smaller than 0,5 kW , the pulsation rate is 6 seconds, and for the maximum charging power (22 kW) the pulsation rate is 1 second. In a situation when the charger allows for charging, but the car does not draw power, the light bar will light in a uniform blue light.
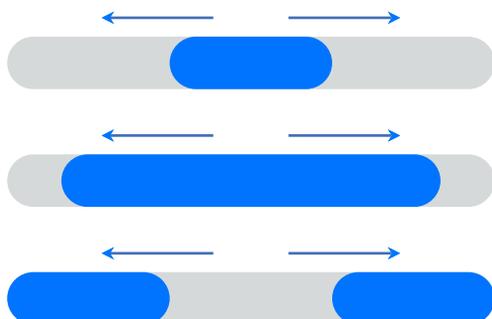
4. **Reservation:** When in the reservation state, the charger shows a dimmed light bar which flashes with green light every three seconds. The charger is waiting for the adequate card of the user who made the reservation to be applied.

5. **Charger locked**. A charger which has been locked by the administrating system has a fully dimmed light bar. The charger remains locked until it is unlocked by the operator.
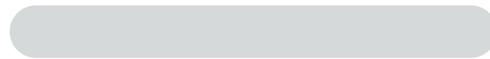
4.3.2. Signaling actions

Some user actions are signaled by light effects on the light bar. Colors of some light signals depend on the continuous state the chargers is in.

- **Connecting or disconnecting the charging cable:** Results in one flash of a light bar in the current color of the charger's continuous state.

- **Connecting or disconnecting the cable to the car** Results in two flashes of the light bar in the current color of the charger's continuous state, the same as in "Connecting or disconnecting the charging cable".

- **Accepting the applied RFID card.** The diodes on the light bar light up subsequently in green in one direction. After this the charger will wait for the car to be connected.
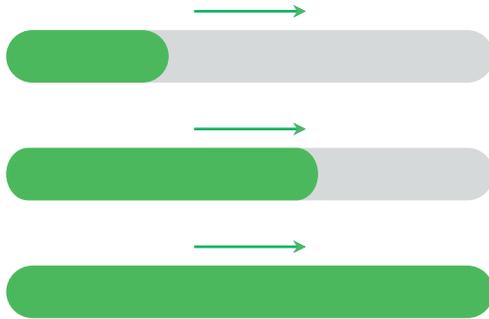
- **Reading the configuration card correctly.** After the configuration card has been correctly read the light bar will turn white. The time for restart is signaled with four flashes at one second intervals.

> **ⓘ INFO**
>
> It is possible to change configuration so that the color blue and green are swapped. In this case the charging point will show its availability with a green color and it will flash in blue when charging.

- **Rejecting the applied RFID card:** The diodes on the light bar light up subsequently in one direction in **red.** The reason for rejecting the card may result from an error in reading the card, applying the wrong card or exceeding the time limit for connecting after a correct authorization.

- **Waiting for the card to be accepted by the Administrating System.** Waiting for response from the administrating system is signaled with a moving animated light dot. The color of the dot depends on the current state the charger is in. Waiting for response from the administrating system is signaled with a moving animated light dot. The color of the dot depends on the current state the charger is in.

5. Enelion Bridge LTE

5.1. Features

Enelion Bridge module installed in the Enelion charger enables:

- **Preview and basic management of charging points:**

    – Reading the status of the charging point, including its meter, charging power, available power

    – Socket lock management

    – Charging point restart

- **Internet connectivity:**

    – WiFi

    – GSM

- **Connectivity with Management Systems compliant with OCPP 1.6 (JSON)**

    – User authorization and billing

    – Monitoring the status of chargers and charging power

    – Reservations

    – Charging power profiles

    – Management of access to the charging point

    – Remote diagnostics and software update

5.2. Structure

fig. 1: Enelion Bridge (obverse)

1 USB socket

2 Main antenna SMA socket

3 Main antenna UFL socket

4 Diversity antenna SMA socket

5 Diversity antenna UFL socket

6 WiFi antenna socket
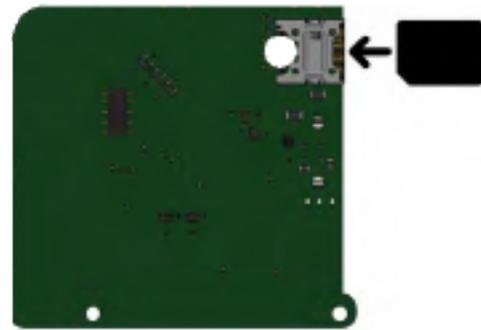
**fig. 2:** Enelion Bridge (reverse) and sim installation direction

> ⓘ **INFO**
>
> For information on installing Enelion Bridge in the devices, see the installation instructions.

5.3. Connection

Enelion Bridge allows you to connect to the configuration panel in three ways:

1 Broadcasted WiFi network

2 USB Cable

5.3.1. WiFi hotspot

In order to connect to the WiFi hotspot, use a computer or telephone to scan the available WiFi networks. The broadcast network is named "EnelionChargerXXX" where XXX stands for the last three characters of the serial number of the communication module. By default, the broadcast network is not password protected. Selecting this network will connect to the device.

5.3.2. USB cable

After connecting USB type B cable to a Bridge module and a computer the module will be recognized as a network card.

5.3.3. Access to the configuration panel

After connecting to the device's network, it is possible to access the configuration panel via a web browser. Enter the address **http://192.168.8.8** in the address bar ad log in. There are accounts for the **user** (user) and administrator (admin) in the configuration panel. The default password for each of these users is the same as the username and can be changed in the settings.

In case a password to the configuration panel is lost it is possible to reset the device to factory settings. To do so please choose Forgot password? link and confirm the choice.
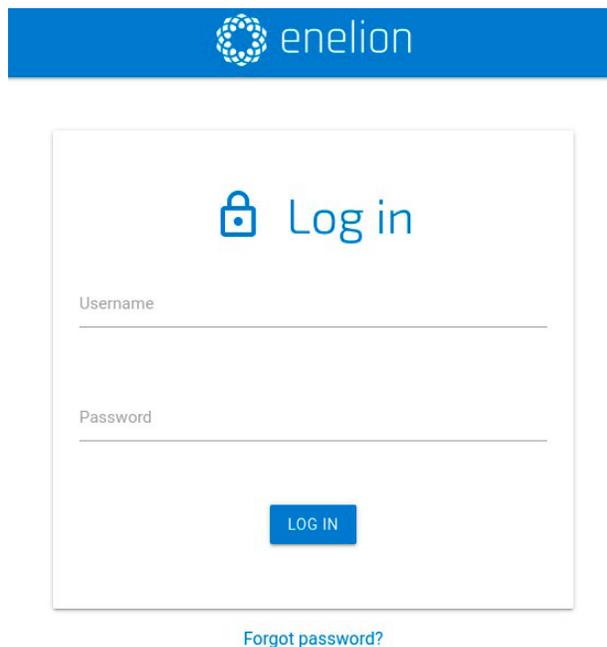

fig. 3: Log in page of the configuration panel

5.4. Navigation in the configuration panel

The interface of the configuration panel consists of an upper bar with the Enelion logo, common to all sub-pages, a side menu with the name of the logged in user and access to individual subpages, and the proper content of a given subpage.


fig. 4: Dashboard site of the configuration panel.

The interface is responsive, which means it adapts to the different screen sizes of the devices on which it is used. On small screens, the side menu is hidden, and to eject it, touch the dedicated button.
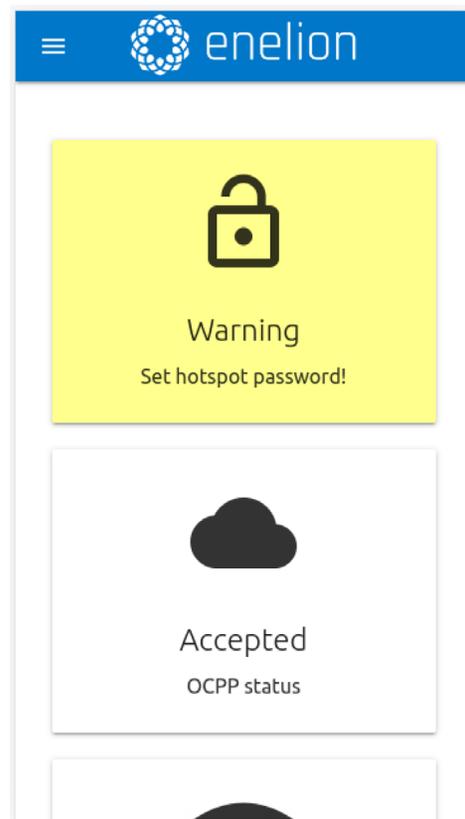

fig. 5: Mobile version of the Dashboard site

5.6. Dashboard

The Dashboard tab contains basic information about the overall status of the Bridge and the charging net-work and presents them in the form of tiles. Depending on the situation, not all tiles will be visible. The available tiles are:

- Warning of an unsecured WiFi hotspot

- OCPP status

- Ethernet connection status

- WiFi connection status

- WiFi hotspot status

- Device operation time from startup (uptime)

- Number of charging points on the network

- EnergyGuard's presence in the network

5.5. Network

5.5.1. Overview

View the status of all available network interfaces. Clicking on any of them will take you to the corresponding subpage.
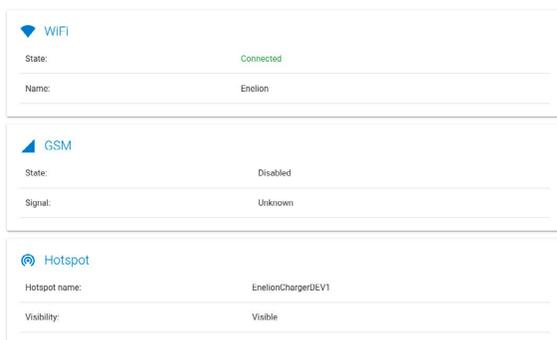
fig. 6: Overview section of the Network tab.

5.5.2. WiFi

Enelion Bridge enables WiFi connectivity in the 802.11 b/ g / n, 2.4 GHz standard. The WiFi subpage allows you to manage the Bridge's connection to the WiFi network. The switch on the right side of the subpage header can disable the WiFi interface, and the Status section shows detailed information about the WiFi connection.

fig. 7: WiFi section of the Network tab.

The Available WiFi networks section presents a list of WiFi networks detected by the Bridge module in its vicinity, along with information about the signal level and type of security. Clicking the button with the re-fresh icon on the right side of the section header will rescan the surroundings for WiFi networks. Clicking on any of them will open a window that allows you to enter the password (in the case of secured networks) and save the settings in order to connect to the network.
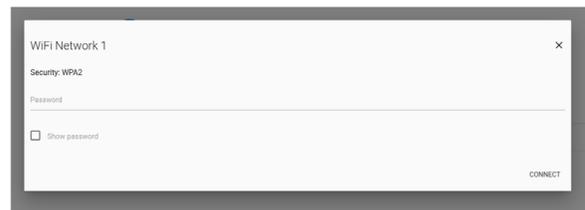
fig. 8: View of connecting to the WiFi network

5.6.1. GSM

Enelion Bridge is equipped with LTE cat4 module. To connect the module with GSM internet please, before powering the charging station on, make sure that the SIM card is properly inserted in the SIM slot.

After powering the station on please go to the GSM sec-ion in the configuration and turn the GSM module on with the switch found in top-right corner. After a short moment you will see the SIM card state. If the PIN code is not necessary and the SIM card is activated and in GSM network coverage, then the GSM section will be filled with SIM card and network details, and State field will show the Ready text.

To type a PIN code in and configure a GSM connection please click a pencil icon found in the right side of SIM card settings section. The configuration window will open. After typing the configuration in please save the changes using a Save button.
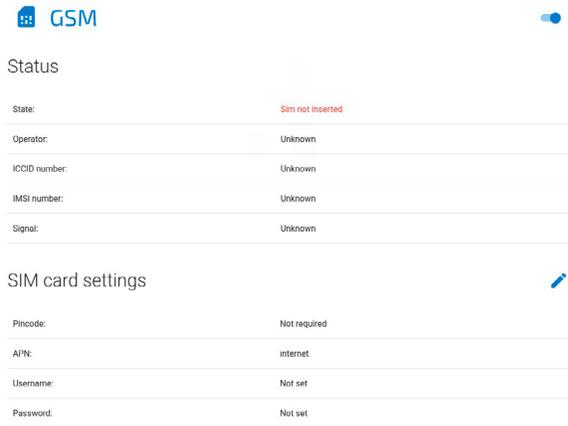
fig. 9: GSM section of the Network tab

To change configuration please chooseapencil icon. A configuration window will open. After typing in the chosen configuration please click a Save button.

fig. 10: GSM configuration window

5.6.2. Hotspot

The hotspot section shows the status of the emitted WiFi network and its settings. As with the WiFi interface, the hotspot can be turned off with the switch on the right.

fig. 11: Hotspot section of the Network tab.

Hotspot settings include name, password and the possibility to hide the network. The password must be at least eight characters long.
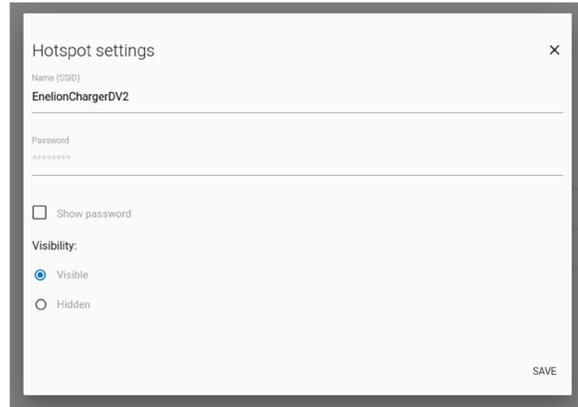
fig. 12: Hotspot settings.

5.7. OCPP

Connection to the management system is via the protocol OCPP 1.6 JSON over websocket. Activating the OCPP connection on the Bridge will change the behavior of the charging points as follows:

- Charging points configured for Plug And Charge will begin sending the serial number of the charging point to the management system for authorization purposes. To enable charging, the appropriate number must be entered in the management system. With Enelink this happens automatically.

- Charging points configured in RFID mode will be-gin to authorize user cards by the management system. Users who have been able to charge so far may lose the ability to charge. Appropriate cards must be added to the management system to enable charging at the charging points.

- Using the Emergency start charging buttons shown in the charging point settings will send the management system's serial number to that point, same as for Plug And Charge setup.

- No cards will be accepted while Bridge is not communicating with the OCPP server. However, offline authorization settings can be changed from the management system.

- The communication module will start to record the status of the applied cards. The cache can be cleared from the management system.

5.7.1. Connection

On the Connection subpage, you can choose one of the following connection options to the OCPP server:

- Don't connect to Management System - selected by default, this option disables the Bridge module from connecting to the management system. The behavior of the chargers, including card authorization, will remain unchanged.

- Connect to specified Management System connection to a third-party management system. If you choose this option, complete the "OCPP URL" item to indicate the server address and StationID as the station name.

fig. 13: Connection section of the OCPP tab.

The selected changes are saved with the Save button. The result of the saved changes (server response) can be checked on the Dashboard page on the OCPP Status tile. Possible statuses:

OCCP status	OCPP status description
Accepted	The device correctly connects to the management system.
Pending	The device is connecting to the server, but the system is not ready to accept the device.
Rejected	The device connects to the server but is not accepted by it. If this status occurs, contact the management system vendor.
Offline	OCPP communication is enabled, but not connected to the server. On the Logs page in the System section, you can check the details of the connection attempt.
inactive	OCPP communication is disabled.

Tab. 1: Status OCPP

5.7.2. Configuration keys

The Configuration keys subpage allows you to check and edit the values of configuration keys defined in the OCPP 1.6 specification. Using the pencil icon, you will open the window for editing the value of a given configuration key. For read-only keys it is not possible to change the value.

> **⚠ WARNING**
>
> Changing the value of these keys can change the behavior of the charging stations undesirably. Only use this feature if you know what you are doing.

fig. 14: Configuration keys section of the OCPP tab.

5.8. Charging points

5.7.3. Overview

The Charging Points section allows you to manage devices present in the charging network, i.e. charging points and the Energy Guard module. The Overview page presents a list of charging points on your network with details about each of them. Bridge automatically detects the number of charging points. If all devices are listed, check that the charging stations are properly connected to each other.
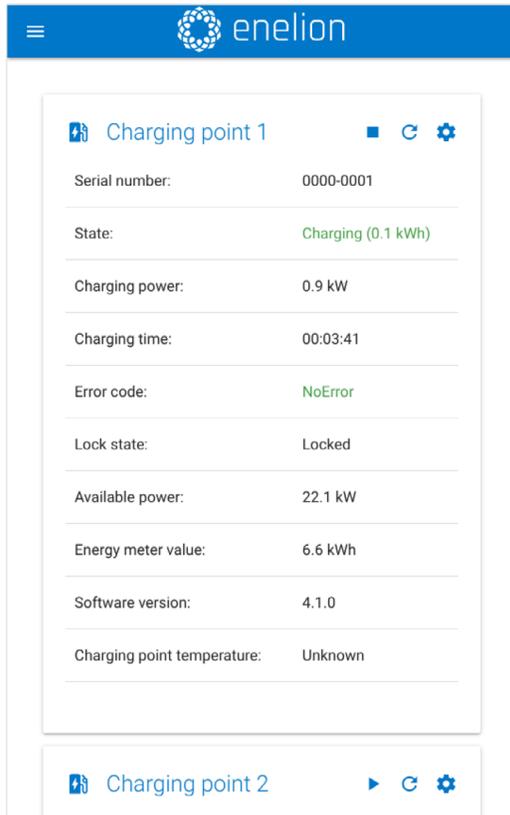
fig. 15: Charging point view in the Charging tab
Points.

The available states of each charging panel are
described in the table below:

Socket status	Description
Available	Availability status.
Preparing	Charging ready state. A car is connected to the panel or the station is waiting for it to be connected after proper authorization in order to start charging.
Charging	Charging status
SuspendedEV	Car side charging pause state. It may occur when the car is fully charged or charging is paused for other reasons.

Socket status	Description
SuspendedEVSE	Standby on charger side. It may mean a hold due to dynamic balancing of the charging power or due to the limitation of the charging profile.
Unavailable	Unavailability status. Locked charger will not start charging. State forced by the management system.
Reserved	Reservation status. Forced by the management system.
Faulted	Station error. Please check the device interface for more information.

Tab. 2: Possible connectors status

Possible lock states are explained in the table below:

Socket status	Description
Unlocked	Lock is open
Locked	Lock is closed
Unsupported	The charger does not have or does not allow the use of a socket lock

Tab. 3: Possible lock status.

The buttons to the right of the name of the loading
panel allow it to restart and change its settings. In the
set tings, you can change the lock mode and start or
stop charging in an emergency in case other methods
of starting/stopping charging fail.

fig. 16: Charger point settings

The available lock settings are described below:

Locked mode	Description
Automatic lock	The lock will be managed by the charger. Correct user verification and connecting the charging cable will close the lock. Completing charging or disconnecting the cable from the car will open the socket lock.
Always open	The lock will always be open, regardless of the connection and charging status of the car.
Always closed	The lock will always be closed, regardless of the connection and charging status of the car. Enables permanent locking of the cable on the charger side.

Tab. 4: Available lock modes.

5.9. System

The System section allows for managing the Bridge module settings.

5.9.1. Overview

In the Overview section, we can check information about the serial number of the Bridge module, its software version and the operating time since launch.

⚙ System overview

Serial Number:	BRIDGE2.6Q/DEV/DV2
Model number:	Bridge2.6Q
Production date:	2021-11-02
Software version:	4.1.0
Uptime:	49 min

fig. 17: Overview section of the System tab.

5.9.2. Update

The Update section allows you to update the charging station software using an update file. To update, after selecting the file with the gray button, click the Submit button. The Bridge module will start the update process, and the configuration panel will count down for about 3 minutes and then restart with the new software version.

⬆ Update

Update from a file

SUBMIT

fig. 19: Update section of the System tab.

After file upload and verification the Bridge module will present a window with update details to confirm the choice.

Update details ✕

Version	4.1.0
Release date	2021-11-02

Initial release for Bridge 2.6Q

⚠ Warning! Do not power off the device during update!

CANCEL UPDATE
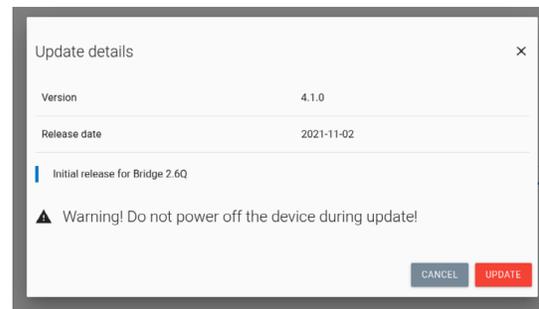
fig. 18: An example of update details

The Bridge module will start an update. The process should not last longer than 3 minutes. After the update the configuration panel will reload wit ha new firm ware. In case the update is performed through the device's WiFi hotspot, you might need to connect to it again.

5.9.3. Users

The configuration panel has two user accounts: user and admin.

The tabs that the user does not have access to are: OCPP and Update. Other functions to which the user has limited rights are: viewing logs and changing the administrator password.
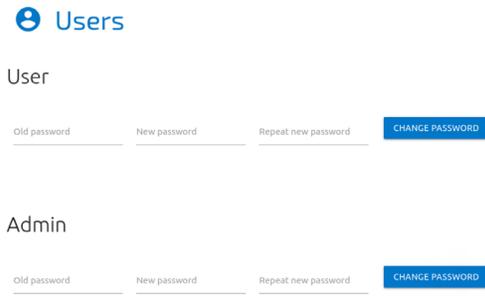
fig. 20: Users section of the System tab.

The Users subpage allows you to change the users' password. In order to change the password of a given user, enter his previous password in the corresponding fields and enter the new password twice, and then confirm the change with the Change password button.

5.9.4. Time

The Bridge module uses both the appropriate OCPP and NTP time server commands for time synchronization. The Time tab allows you to check the current time used by the Bridge module and synchronize it with the time of the device from which you access the configuration panel.
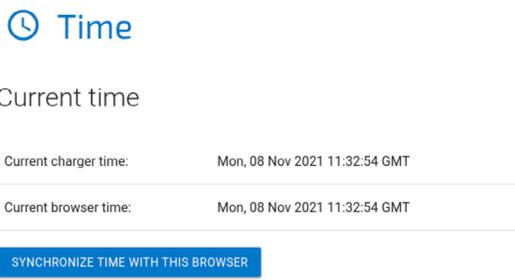
fig. 21: Time section of the System tab.

5.9.5. Logs

The list of events that occurred in the Bridge module is available on the Logs subpage. Depending on whether we are interested in logs from the system or OCPP communication and inside the charging network, we can choose the appropriate category from the list signed Displayed logs type. The event list only re-freshes when it is scrolled to the recent events view.

fig. 22: Logs section of the System tab.

The Download diagnostics button allows you to download a diagnostic file to the disk, which, in case of possible problems with the Bridge module, will help the Enelion technical support diagnose their causes. The Download diagnostics button allows you to download a diagnostic file to the disk, which, in case of possible problems with the Bridge module, will help the Enelion technical support diagnose their causes.

5.9.6. Reboot

The Reboot button allows you to restart the Bridge module. After two minutes, the configuration panel will display the Dashboard section.
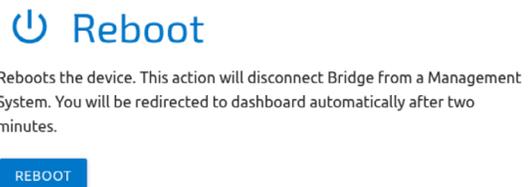
fig. 23: Reboot section of the System tab.

5.10. Technical data

Technical data	
WiFi	2.4 GHz, 802.11 bgn
GSM Modem	LTE Cat 4, Max. 150 Mbps (DL), Max. 50 Mbps (UL)
OCPP version	OCPP 1.6 JSON over websocket
Network ports used	TCP 20 i 21 - FTP protocol used for down-loading firmware updates and uploading diagnostics data TCP 80 i 8080 - OCPP connection TCP 443 - Secured OCPP connection TCP iUDP 53 - DNS protocol UDP 123 - NTP protocol TCP 20 i 21 - FTP protocol used for down-loading firmware updates and uploading diagnostics data TCP 80 i 8080 - OCPP connection TCP 443 - Secured OCPP connection TCPiUDP 53 - DNS protocol UDP 123 - NTP protocol
Number of charging points supported in a network	To 100

6. Enelion Bridge

6.1. Features

Enelion Bridge module installed in the Enelion charger enables:

- • Preview and basic management of charging points:
  - – Reading the status of the charging point, including its meter, charging power, available power
  - – Socket lock management
  - – Charging point restart

- • Internet connectivity:
  - – Ethernet
  - – WiFi

- • Connectivity with Management Systems compliant with OCPP 1.6 (JSON)
  - – User authorization and billing
  - – Monitoring the status of chargers and charging power
  - – Reservations
  - – Charging power profiles
  - – Management of access to the charging point
  - – Remote diagnostics and software update

6.2. Structure
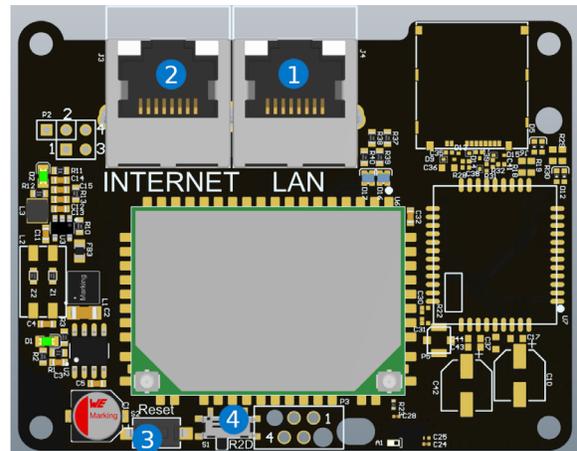
fig. 24: Enelion Bridge

1 LAN socket
2 INTERNET (WAN) socket
3 Reset button
4 Reset to factory settings switch

ⓘ INFO

For information on installing Enelion Bridge in the devices, see the installation instructions.

6.3. Communication

Enelion Bridge allows you to connect to the configuration panel in three ways:

1 Broadcasted WiFi network
2 Ethernet wired network
3 Through the network the Bridge is connected to

ⓘ INFO

The third connection option is only possible after configuring the network connection as described in the Network section.

6.3.1. WiFi hotspot

n order to connect to the WiFi hotspot, use a computer or telephone to scan the available WiFi networks. The broadcast network is named "EnelionChargerXXX" where XXX stands for the last three characters of the serial number of the communication module. By default, the broadcast network is not password protected. Selecting this network will connect to the device.

fig. 25: Dashboard site of the configuration panel.

6.3.2. LAN network

To connect to a wired network, connect the computer to the LAN port with an Ethernet cable. After a few seconds, the computer should detect a wired network without Internet access.

The interface is responsive, which means it adapts to the different screen sizes of the devices on which it is used. On small screens, the side menu is hidden, and to eject it, touch the dedicated button.

6.3.3. Access to the configuration panel

After connecting to the device's network, it is possible to access the configuration panel via a web browser. Enter the address http://192.168.8.8 in the address bar and log in. There are accounts for the user (user) and administrator (admin) in the configuration panel. The default password for each of these users is the same as the username and can be changed in the settings.

> **ⓘ INFO**
>
> After configuring the Internet connection, in the LAN network it is also possible to open the configuration panel inside the network to which the device is connected. To do this, enter the IP address of the Bridge module assigned by the router into the browser bar.

fig. 26: Mobile version of the Dashboard site.

6.4. Navigation in the configuration panel

The interface of the configuration panel consists of an upper bar with the Enelion logo, common to all sub-pages, a side menu with the name of the logged in user and access to individual subpages, and the proper con-tent ofa given subpage.

6.5. Dashboard

The Dashboard tab contains basic information about the overall status of the Bridge and the charging network and presents them in the form of tiles. Depending on the situation, not all tiles will be visible. The available tiles are:

- Warning of an unsecured WiFi hotspot

- OCPP status

- Ethernet connection status

- WiFi connection status

- WiFi hotspot status

- Device operation time from startup (uptime)

- Number of charging points on the network

- Energy Guard's presence in the network

6.6. Network

6.6.1. Overview

View the status of all available network interfaces. Clicking on any of them will take you to the corresponding subpage.
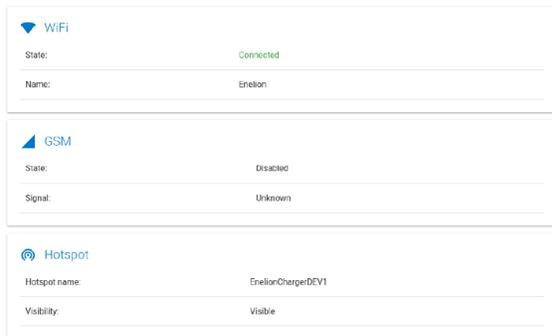
fig. 27: Overview section of the Network tab.

6.6.2. Ethernet

In order to connect the Enelion Bridge with an Ethernet cable, just connect the cable to the INTERNET (WAN) connector, and after a few seconds the device should connect to the network. Before connecting, make sure that the cable is connected to a router or switch with Internet access and that firewall blocks are not activated.

The Ethernet tab shows a detailed view of the Ethernet connection status and IP addressing configuration.

Ethernet

Status

State:	Not connected
IP address:	No IP address assigned
Data received:	2.1 kB
Data sent:	1.2 kB
MAC address:	c4:93:00:0e:fd:bb

IP settings ✏

IP assignment:	Automatic
DNS address:	8.8.8.8

fig. 28: Ethernet section of the Network tab.

Press the pencil icon to change the configuration. This will open a window for entering a new configuration. After entering it, save the changes with the Save button.
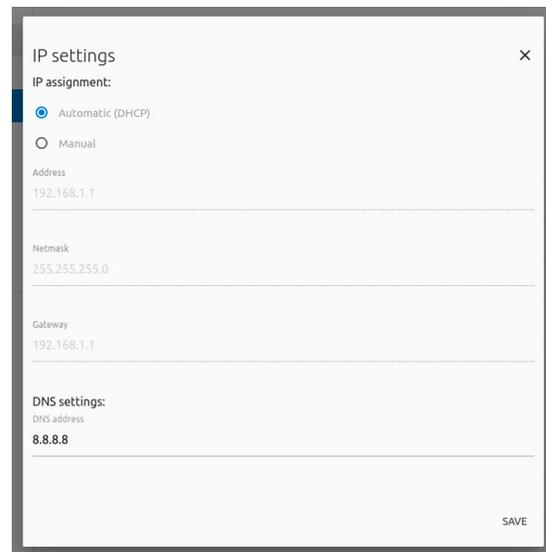
fig. 29: Ethernet interface IP addressing settings.

6.6.3. WiFi

Enelion Bridge enables WiFi connectivity in the 802.11 b/g / n, 2.4 GHz standard. The WiFi subpage al-lows you to manage the Bridge's connection to the WiFi network. The switch on the right side of the subpage header can disable the WiFi interface, and the Status section shows detailed information about the WiFi connection.
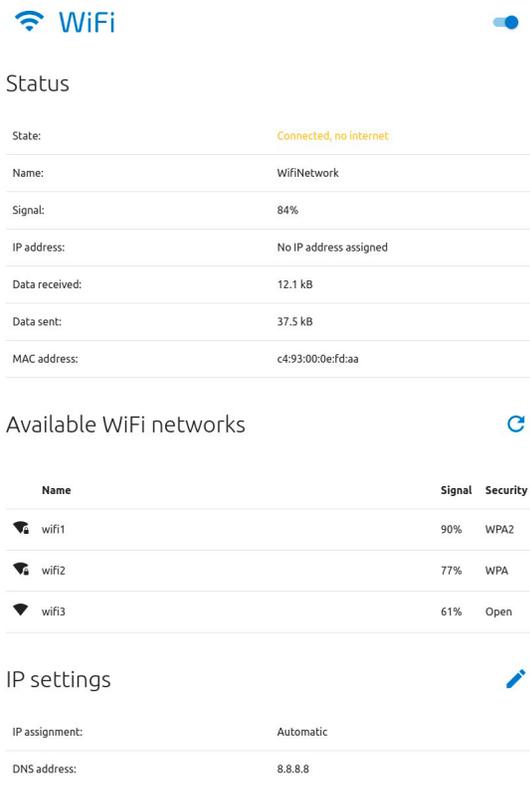
fig. 30: WiFi section of the Network tab.

The Available WiFi networks section presents a list of WiFi networks detected by the Bridge module in its vicinity, along with information about the signal level and type of security. Clicking the button with the re-fresh icon on the right side of the section header will rescan the surroundings for WiFi networks. Clicking on any of them will open a window that allows you to enter the password (in the case of secured networks) and save the settings in order to connect to the network.
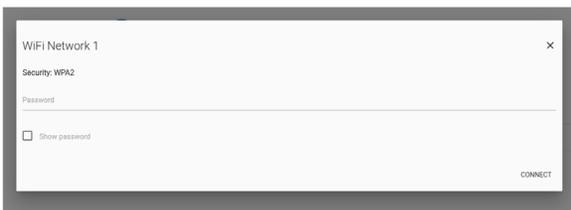
fig. 31: View of connecting to the WiFi network.

In order to change the IP addressing configuration, press the pencil icon on the right side of the IP settings section header. This will open a window for entering a new configuration. After entering it, save the changes with the Save button.

6.6.4. Hotspot

The hotspot section shows the status of the emitted WiFi network and its settings. As with the WiFi interface, the hotspot can be turned off with the switch on the right.

fig. 32: Hotspot section of the Network tab.

Hotspot settings include name and password. The password must be at least eight characters long.
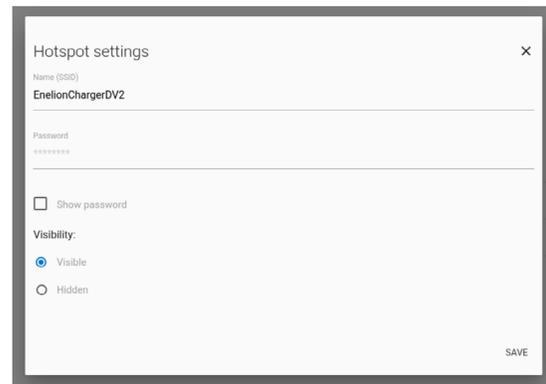
fig. 33: Hotspot settings.

6.6.5. LTE

The Bridge module does not have a built-in GSM modem, an external LTE modem can be purchased separately. To the charging stations ordered with the LTE modem, a 2.5m Ethernet cable with RJ45 connector and an additional, short RJ45 connector for installation are added during the installation.

The necessary condition for the correct operation of the LTE modem is to install the station in a localization with available cellular network coverage.

6.7. OCPP

Connection to the management system is via the protocol OCPP 1.6 JSON over websocket. Activating the OCPP connection on the Bridge will change the behavior of the charging points as follows:

- Charging points configured for Plug And Charge will begin sending the serial number of the charging point to the management system for authorization purposes. To enable charging, the appropriate number must be entered in the management system. With Enelink this happens automatically.

- Charging points configured in RFID mode will be-gin to authorize user cards by the management system. Users who have been able to charge so far may lose the ability to charge. Appropriate cards must be added to the management system to enable charging at the charging points.

- Using the Emergency start charging buttons shown in the charging point settings will send the management system's serial number to that point, same as for Plug And Charge setup.

- No cards will be accepted while Bridge is not communicating with the OCPP server. However, offline authorization settings can be changed from the management system.

- The communication module will start to record the status of the applied cards. The cache can be cleared from the management system.

6.7.1. Connection

On the Connection subpage, you can choose one of the following connection options to the OCPP server:

- Don't connect to Management System - selected by default, this option disables the Bridge module from connecting to the management system. The behavior of the chargers, including card authorization, will remain unchanged.

- Connect to Enelion Enelink Management System-The Bridge communication module will connect to the Enelink management system. Register the device network with the name specified in "Station identity: XYZ"

- Connect to specified Management System - connection to a third-party management system. If you choose this option, complete the "OCPP URL" item to indicate the server address and StationID as the station name.

🔗 Connection

⦿ Don't connect to any Management System
User authorization will be managed locally according to connector settings.

○ Connect to Enelion Enelink Management System
You can register and manage your charging station on **admin.enelion.com** using Station Identity: **ExampleSerialNumber**. Station and user authorization will be managed by Management System.

○ Connect to specified Management System
Enter correct URL address for specified OCPP 1.6 compliant Management System. Register station according to Managment System manual. Station and user authorization will be managed by Management System.

OCPP address   StationID
wss://example.com/ocppj1_6   station_id

SAVE

fig. 34: Connection section of the OCPP tab.

The selected changes are saved with the Save button. The result of the saved changes (server response) can be checked on the Dashboard page on the OCPP Status tile. Possible statuses:

OCCP status	OCPP status description
Accepted	The device correctly connects to the management system.
Pending	The device is connecting to the server, but the system is not ready to accept the device.
Rejected	The device connects to the server but is not accepted by it. If this status occurs, contact the management system vendor.
Offline	OCPP communication is enabled, but not connected to the server. On the Logs page in the System section, you can check the details of the connection attempt.
inactive	OCPP communication is disabled.

Tab. 5: OCPP Statuses

6.7.2. Configuration keys

The Configuration keys subpage allows you to check and edit the values of configuration keys defined in the OCPP 1.6 specification. Using the pencil icon, you will open the window for editing the value of a given configuration key. For read-only keys it is not possible to change the value.

> **⊗ WARNING**
>
> Changing the value of these keys can change the behavior of the charging stations undesirably. Only use this feature if you know what you are doing.

fig. 35: Configuration keys section of the OCPP tab

fig. 36: Charging point view in the Charging tab Points.

6.8. Charging points

6.8.1. Overview

The Charging Points section allows you to manage devices present in the charging network, i.e. charging points and the EnergyGuard module. The Overview page presents a list of charging points on your network with details about each of them. Bridge automatically detects the number of charging points. If all devices are listed, check that the charging stations are properly connected to each other.

The available states of each charging panel are described in the table below:

Status	Description
Available	Availability status
Preparing	Charging ready state. A car is connected to the panel or the station is waiting for it to be connected after proper authorization in order to start charging.
Charging	Charging status
SuspendedEV	Car side charging pause state. It may occur when the car is fully charged or charging is paused for other reasons.

Status	Description
SuspendedEVSE	Standby on charger side. It may mean a hold due to dynamic balancing of the charging power-er or due to the limitation of the charging profile.
Unavailable	Unavailability status. Locked charger will not start charging. State forced by the manage-ment system.
Reserved	Reservation status. Forced by the management system.
Faulted	Station error. Please check the device interface for more infor-mation.

Tab. 6: Possible connectors status.

Possible lock states are explained in the table below:

Socket status	Description
Unlocked	Lock is opened
Locked	Lock is closed
Unsupported	The charger does not have or does not allow the use of a socket lock

Tab. 7: Possible lock status.

The buttons to the right of the name of the loading panel allow it to restart and change its settings. In the set tings, you can change the lock mode and start or stop charging in an emergency in case other methods of starting/stopping charging fail.

fig. 37: Charger point settings.

The available lock settings are described below:

Lock mode	Description
Automatic lock	The lock will be managed by the charger. Correct user ver-ification and connecting the charging cable will close the lock. Completing charging or disconnecting the cable from the car will open the socket lock.
Always open	The lock will always be open, regardless of the connection and charging status of the car.
Always closed	The lock will always be closed, regardless of the connection and charging status of the car. Enables permanent locking of the cable on the charger side.

Tab. 8: Possible connectors status.

6.9. System

The System section allows for managing the Bridge module settings.

6.9.1. Overview

In the Overview section, we can check information about the serial number of the Bridge module, its soft-ware version and the operating time since launch.

fig. 38: Overview section of the System tab.

6.9.2. Update

The Update section allows you to update the charging station software using an update file. To update, after selecting the file with the gray button, click the Sub-mit button. The Bridge module will start the update process, and the configuration panel will count down for about 3 minutes and then restart with the new software version.

⬇ Update

Update from a file

▪ _____

SUBMIT

fig. 39: Update section of the System tab.

ℹ **INFO**

A reboot is recommended before performing a firmware update of the device. In case the update operation is failing please temporarily disconnect the device from OCPP server (use "Don't connect to management system" option in OCPP section).

6.9.3. Setting Management

The Settings Management subpage allows you to ex-port and import settings and restore the Bridge module to the factory settings. The Download settings file but-ton will download the file with Bridge settings. By selecting this file in the Import settings section and clicking the Submit button, we will import the settings to the Bridge module. Using the Import StationID field, we can specify whether we want the Bridge module to import StationID in the OCPP connection settings, and using the Import hotspot settings field - whether we want to import the hotspot settings. These settings can be useful depending on whether you are importing a backup of the settings from the same device or as a settings template to a new device.

↕ Settings management

Export settings

DOWNLOAD SETTINGS FILE

Import settings

▪ _____

☐ Import StationID
☐ Import hotspot settings (name, password)

SUBMIT

Factory settings

Resets the device to factory settings and reboots the device. After two minutes since reboot you will be redirected to device's dashboard.

RESTORE TO FACTORY SETTINGS
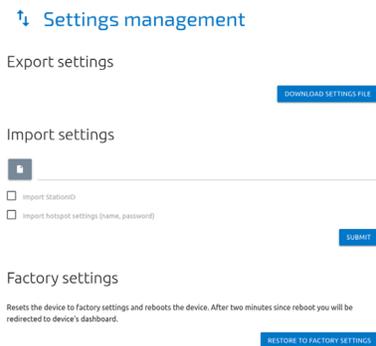
fig. 40: Settings section of the System tab.

Restore to factory settings button results in restoring the Bridge module to factory settings.

ℹ **INFO**

Bridge can also be factory reset using as witch on the device. With the charger unplugged, slide the restore switch to factory settings. When restarting, Bridge will revert to default settings.

6.9.4. Users

The configuration panel has two user accounts: user and **admin.**

The tabs that the user does not have access to are: OCPP, Update, Settings Management. Other functions to which the user has limited rights are: viewing logs, changing the NTP server address, changing the administrator password.

👤 Users

User

Old password | New password | Repeat new password | CHANGE PASSWORD

Admin

Old password | New password | Repeat new password | CHANGE PASSWORD
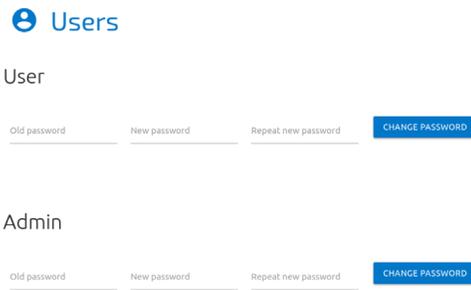
fig. 41: Settings section of the System tab.

The Users subpage allows you to change the users' password. In order to change the password of a given user, enter his previous password in the corresponding fields and enter the new password twice, and then confirm the change with the Change password button.

6.9.5. Time

The Bridge module uses both the appropriate OCPP and NTP time server commands for time synchronization. The Time tab allows you to check the current time used by the Bridge module, synchronize it with the time of the device from which you access the configuration panel, and configure automatic time synchronization with the NTP server.

Time

Current time

| Current charger time: | Mon, 08 Nov 2021 11:32:54 GMT |
| Current browser time: | Mon, 08 Nov 2021 11:32:54 GMT |

SYNCHRONIZE TIME WITH THIS BROWSER
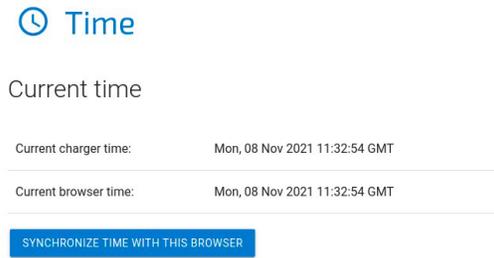
fig. 42: Time section of the System tab.

Select the pencil icon to change the NTP server. This will open a window with a text field where you can enter a new NTP server address and confirm the change with the Save button.

Time   ×

NTP server address
ntp.openwrt.org

SAVE

fig. 43: NTP time synchronization server settings.

6.10.1. Logs

The list of events that occurred in the Bridge module is available on the Logs subpage. Depending on whether we are interested in logs from the system or OCPP communication and inside the charging network, we can choose the appropriate category from the list signed Displayed logs type. The event list only re-freshes when it is scrolled to the recent events view.

fig. 44: Logs section of the System tab.

The Download diagnostics button allows you to download a diagnostic file to the disk, which, in case of possible problems with the Bridge module, will help the Enelion technical support diagnose their causes.

6.9.6. Reboot

The Reboot button allows you to restart the Bridge module. After two minutes, the configuration panel will display the Dashboard section.

Reboot

Reboots the device. This action will disconnect Bridge from a Management System. You will be redirected to dashboard automatically after two minutes.

REBOOT

fig. 45: Reboot section of the System tab.

6.10. Technical data

Technical data	
WiFi	2.4 GHz, 802.11 bgn
GSM Modem	LTE Cat 4, Max. 150 Mbps (DL), Max. 50 Mbps (UL)
OCPP version	OCPP 1.6 JSON over websocket
Network ports used	TCP 20i21 - FTP protocol used for down-loading firmware updates and uploading diagnostics data TCP 80 i 8080 - OCPP connection TCP 443 - Secured OCPP connection TCPiUDP 53 - DNS protocol UDP 123 - NTP protocol
Number of charging points supported in a network	To 100

7. Maintenance

The device is designed to operate in temperatures from -25 °C to 55 °C. The manufacturer does not guarantee the proper functioning of the charging station in temperatures outside the specified range. Chargers that are damaged because of exposure to temperatures below

-25 °C or above 55 °C are not covered under the warranty. In case it is necessary to open the device, make sure that it is disconnected from the power source. With the device installed outdoors, make sure that there is no precipitation or strong wind.

> ❗**WARNING**
>
> The device may only be opened by a qualified and authorized person.

7.1. Cleaning

The correct way to clean the charger is to wipe the housing with a microfiber cloth using a cleaning agent dedicated to anodized aluminum. Plexiglas elements (front panel) and plastic elements (socket) should be cleaned with a microfiber cloth using a cleaning agent dedicated to cleaning windowpanes. Other cleaning methods (e.g. wire brush) may lead to the damage of the device housing. Damage resulting from improper cleaning of the device does not constitute grounds for warranty claims.

> ❗**WARNING**
>
> The device meets the IP 54 standard. There-fore, it is forbidden to wash the charger with pressure washers, garden hoses, shower or any other water stream sources.

8. Operation

8.1. Operation and maintenance of charging station.

Service inspection is performed once a year.

Mechanical elements such as a socket, charging cable, plug lock, require only a superficial inspection. Solid/durable components are not expected to wear out and to require replacement during the lifetime of station. During the visual inspection, one should pay attention to potential corrosion sources, traces of water, precipitated salts or other symptoms that may indicate deterioration of the station's condition.

Service work may only be performed when the voltage is turned off. The exact procedure is described in the manuals for the given models of charging stations.

Fault diagnosis is carried out by reading the information on the screen, which displays error codes and the description of the problem. In stations without a screen, this information is transmitted by means of light pulses of the LED interface (chapter 4 User interface).

The wiring diagram and structure of the device can be found in the installation manual of the given charger model.

8.2. Technical test

The charging station should be subject to a full electrical test at least every 5 years. The proper operation of the residual current device should be tested every year. Tests checking the efficiency of the station, electric shock protection, etc. should be performed in accordance with the standards and regulations currently in force. Tests may only be performed by authorized personnel.

Below are some recommendations for the performance of the most important tests.

8.3. Measurement of housing earthing resistance

In the Vertica pole the main potential equalization point is a screw connector where the PE conductors of the charging modules and the PE conductors supplying the pole are connected. At this point, the device grounding resistance should be measured.
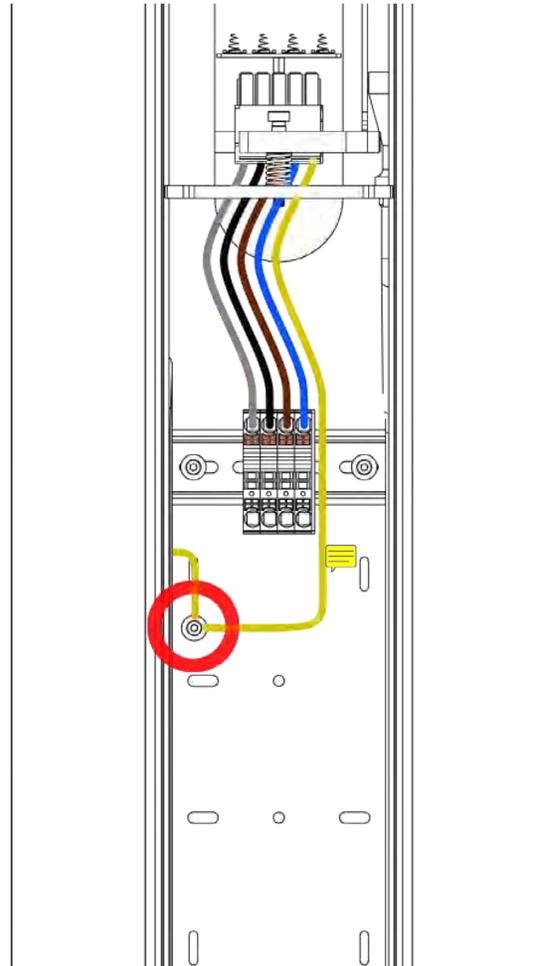
fig. 46: The main potential equalization point of the Vertica pole.
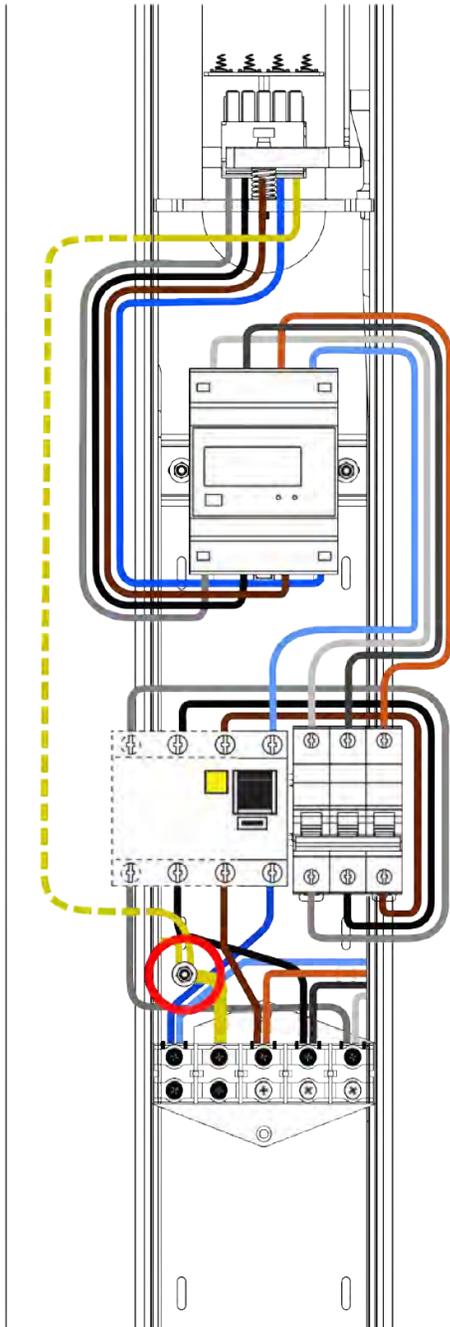
fig. 47: The main potential equalization point of the Vertica pole (obverse of the Vertica pole).
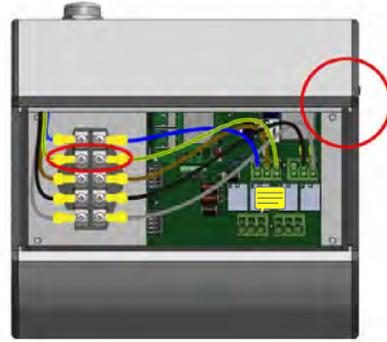
fig. 48: The main potential equalization point of the Wallbox.
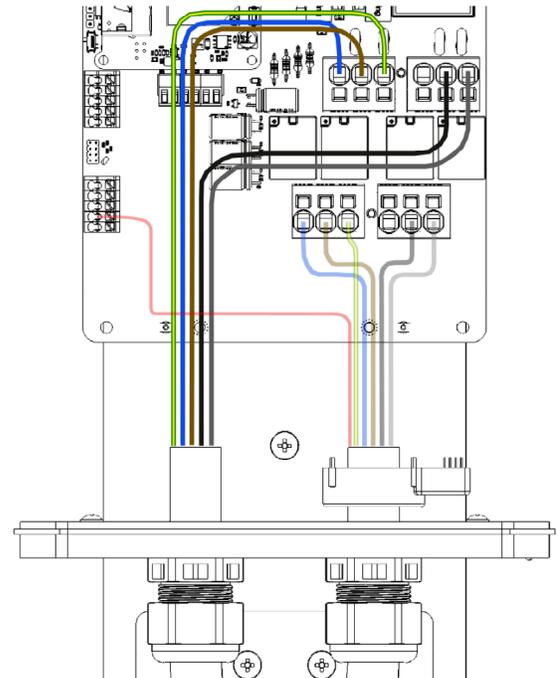
fig. 49: The main potential equalization point of the Stilo.

8.3.1. Continuity measurement of the protective conductors

The measurement should be made between the main potential equalization point and PE contact in the charging socket, or in the case of a cable station charger, in the plug.

The measurement should be made according to the PN-EN 61667-4:2007 standard.

The open circuit test voltage should be between 4 and 24 V (AC or DC). Continuity measurement should be performed with a current greater or equal to 200 mA The required accuracy of the measurement should be better than 30%. The maximum acceptable resistance is 3Ω.

8.3.2. Measurement of housing earthing resistance

The charging stations have an aluminum, grounded housing – protection class 1. For aesthetic reasons, the surface is anodized, which makes it a poor conductor. Measurements should be taken in exposed places, that is, on the cut edge of the aluminum profiles visible after removing the top cover. The probes should be pressed firmly against the metal surface to break through the oxide layer. The measurement should be performed three times.

The measurement should be made according to the PN-EN 61557-4:2007 standard.

The open circuit test voltage should be between4and 24V(AC or DC). Continuity measurement should be performed with a current greater or equal to 200 mA. The required accuracy of the measurement should be better than 30%. The maximum acceptable resistance is 3Ω.

fig. 51: The ground resistance measurement point of the Stilo housing.

fig. 50: The ground resistance measurement point of the Vertica pole.
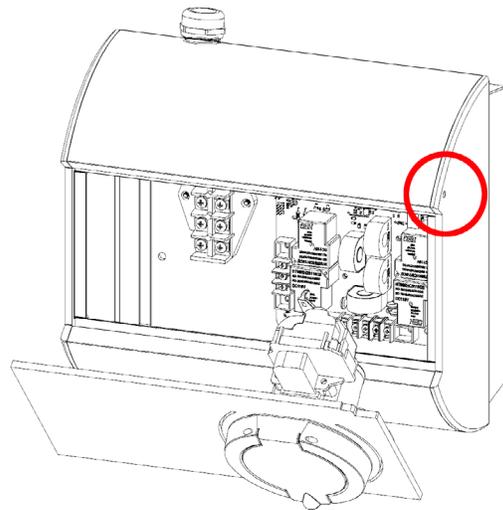
fig. 52: The ground resistance measurement point of the Wallbox housing.

8.3.3. Operational ground resistance measurement

Perform the measurement if the operational grounding has been completed. Measurements can be made using the technical, compensation, clamp or the other methods permitted by applicable regulations PN-EN 61557-5. The maximum acceptable resistance is 30Ω.

8.3.4. Effectiveness of electric shock protection measurement

The measurement should be made at the charging station's connection terminals. In the Vertica station, these terminals are in the form of a screw strip or springle connectors.

fig. 54: Vertica pole springle connectors.
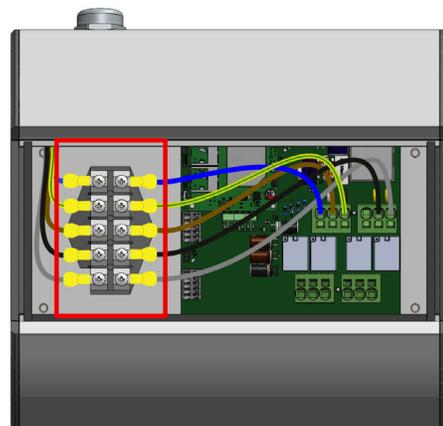
fig. 55: Wallbox connection terminals.

fig. 53: Vertica pole connecting terminals.
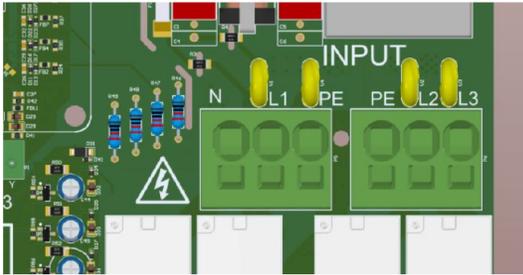
fig. 56: Stilo connection terminals.

The measurement should make according to the PN-HD 60364-6:2016-07, PN-HD 60364-4-41:2017 standards, for each powering phases of the charging point.

The test should be carried out using a meter which en-ables making an operation in the circuits with an RCD switch.

Possibly: The measuring tool can be able to make the measurement in a circuit which contains the residual current device without it's tripping.

It should be checked if the short-circuit current at the measurement site will be sufficient for the operation of the over-current protection in the required time. Use the most favorable result to access the effectiveness of protection.

The condition must be met:

$Zs \times Ia \leq U0$ for $t \leq 0, 4s$

Zs - short-circuit impedance

I a - the value of current which is able to automatic power-off in the time $t \leq 0, 4s$,

U_0 - nominal phase voltage (230V)

8.4. Testing insulation resistance

8.4.1. Testing the insulation resistance of the electrical installation supplying power to the charging station

During the test, the charger must be disconnected from the mains or the charging module removed from the Vertica pole. The test should be performed in a3or 5 wire mode, depending on the installation. It is recommended to use devices dedicated to measuring insulation resistance with a valid calibration certificate. The meter can be connected e.g. to the output terminals of the over current circuit breaker installed in the switchgear, to the bottom part of the post or any other convenient place. In Vertica stations, it is

possible to connect the measuring system directly to the socket supplying power to the charging module using the WAGO 831-3205 connector.

> **⚠ WARNING**
>
> When measuring the insulation resistance, the supply voltage absolutely must be disconnected without any possibility of it being accidentally reconnected!

If over voltage protectors have been used in the tested installation, the connection of the protector with the phases L1, L2, L3 and the N conductor should be dis-connected before starting the measurements, and re-connected after the measurement. If the station is equipped with energy meters, disconnect the wires from the input terminals of the meter and use them as a measuring point. Failure to disconnect the meter will lower the phase-to-phase resistance values to approximately 1500 kΩ and the phase-neutral resis-tance values to approximately 750 kΩ. The method of measuring and the required values of test voltages and minimum insulation resistance for the electrical installation during acceptance and periodic tests are specified in the PN-IEC 60364-6-61 standard. Typically, the test volt-age is 500 VDC and the minimum insulation resistance is 1 MΩ. Measurements should be made between the leads as specified in the attached table.

Resistance in [MΩ]									
L1-L2	L1-L3	L2-L3	N-L1	N-L2	N-L3	PE-L1	PE-L2	PE-L3	N-PE
[MΩ]	[MΩ]	[MΩ]	[MΩ]	[MΩ]	[MΩ]	[MΩ]	[MΩ]	[MΩ]	[MΩ]

8.4.2. Testing the insulation resistance of the charging station with a charging module

Additionally, the values of the insulation of the entire charging station can be checked. The test should be performed in a similar way to the test of the condition of insulation of the power supply circuits, i.e. without voltage being applied, in a 5-wire mode and with the overvoltage protection circuit disconnected. It is recommended to use tools with a valid calibration certificate dedicated to measuring insulation resistance. The maximum permissible test voltage is 500 VDC. When testing the insulation resistance of the charging station, attention should be paid to the polarization of the test voltage. It is important due to the measuring and protection systems used inside the device. The polarization of the insulation resistance meter can be easily

checked with a universal multimeter on a DC voltage measurement. If this is not possible, the measurement of the insulation between N and PE on the charging station socket will indicate the polarization of the meter. When the result is around 90 kΩ– 400 kΩ the applied voltage has N-PE+ polarization. Otherwise, the meter will show >500 MΩ, which means N+ PE- polarization. For convenience, mark the test probes appropriately and take the remaining measurements with the correct polarization from the table. When performing measurements with the Sonel MPI 520/530 Meter with an AUTO ISO-1000 adapter or similar in automatic mode, all measurements will have the correct polarization. It is sufficient to take N-PE measurement in one polarization only. When taking measurements with the Gossen Metrawatt PROFITEST MXTRA meter anda 2-pole adapter, the measurement polarization is marked in the photo below.

ⓘ INFO

Insulation resistance is measured with direct voltage. Various manufacturers of measuring devices adopt different polarization conventions for measurements and this is not standardized. For example, the Sonel MPI 520/530 meter gives negative voltage to phase conductors and positive voltage to N/PE. With reverse polarization (plus on L, minus on N), an internal power supply through the socket is activated in the device. This system is used to test devices. As a result, the measuring device is loaded with the starting converter and the resistance results are at the level of several kΩ, which does not correspond to the actual condition

The table with the criteria for assessing the insulation status and the measurement polarization has been presented below.

Measurement configuration and polarization	Insulation resistance rated value	Minimum acceptable value
PE+ L1-	1 MΩ	800 MΩ
PE+ L2-	1 MΩ	800 MΩ
PE+ L3	1 MΩ	800 MΩ
N+ L1-	>500 MΩ	1 MΩ
N+ L2-	>500 MΩ	1 MΩ
N+ L3-	>500 MΩ	1 MΩ
N- PE+	>500 MΩ	90 MΩ
N- PE+	400 MΩ	90 MΩ
L1-L2+	2 MΩ	900 MΩ
L1- L3+	2 MΩ	900 MΩ
L3+ L2-	2 MΩ	900 MΩ

8.4.3. Adapter

An additional factor is the adapter used: charging station– measuring device. The Metrawatt device (PRO-TYP II Z525A) uses LED voltage indicators, which are useful during functional tests of the charger. Unfortunately, these diodes together with the current limiting resistors (80 kΩ) significantly affect the results of insulation resistance measurements (results below 80 kΩ) depending on the polarization. For this reason, do not use this and other adapters with voltage indicators for insulation measurements as that may affect the value of the measured resistance. It is allowed to use adapters, which do not contain additional circuits – that are adapters for the measuring system. Otherwise, the measurement should be carried out directly on the station socket/plug contacts, observing appropriate safety rules.
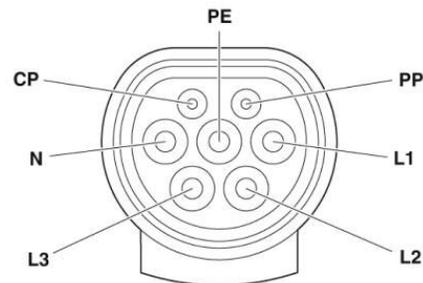

fig. 57: Pin designation of the Type 2 socket of the charging station.

8.5. Measurement of the effectiveness of protection against electric shock

The station is tested prior to the first over-current protection. Measurements are taken with the station/charging module disconnected.

In the case of Vertica or Wallbox Adspace stations, where each panel is powered by a separate cable, the fuse is located in the appropriate switchgear. The fuse must be properly selected for the location and configuration conditions of the device when preparing the electrical installation. When the Vertica Post with two modules is power supplied with one, thicker wire, the over-current protection and branching are located in the lower part of the station.

This splitter is called Vertica Splitter and is offered as an accessory in the Enelion offer. Circuit breakers with B or C characteristics and rated currents of up to 32 A are used.
The power cord must be protected in the switchgear in accordance with the guidelines included in the installation manual for a specific Enelion device model.

8.6. Testing the operation of residual current devices

Each charging point must be protected against type B residual current (devices with the EU declaration of conformity with the PN-EN IEC 61851-1: 2019-10 standard). This requirement can be met by installing a type B residual current device (RCDB30 mA/40 A) or an RCD EV (30 mA/40 A) in the switchgear. It is also possible to use the Enelion RCM B – Residual Current Monitor type B accessory. Enelion RCMBin combination with the RCD A used in the switchgear meet all safety requirements. In the case of supplying power to the Vertica Post with two charging modules by one wire (Verica Spliter accessory applied), the over-current and residual current protections are located in the lower part of the Vertica Post.
The test can be carried out when the charging process is started – voltage is on at the socket, status C. For this purpose, an appropriate RCD tester and a vehicle simulator – adapter should be used. During the tests, access to the switchgear or the lower part of the station should be ensured in order to enable lifting the protection. Any activation of the switches during the tests will turn off power to the station. After powering the station again, start the charging process anew.

The procedure looks similar for stations protected by RCD A cut-out switches and equipped with Enelion RCM B. The difference appears when testing the protections in mode B. When the built-in protection RCM B is triggered, the relays are immediately opened, interrupting the charging process, and the appropriate information is displayed on the screen. The warning contains information about the reason for the interruption of charging, the error number whose detailed description is contained in the manual, and the LED interface blinks in a specific way (see Chapter 4.3 LED bar), o draw the user's attention. The charging process is suspended until the user's action.

To reset the system and enable recharging again, pull out the plug from the station socket. For chargers with RFID identification, the identification must be used to open the plug lock. In public chargers – in Plug & Charge configuration– the vehicle must be disconnected–this also opens the lock in the station.

After the charging process has been completed, the station is ready for the next charging. In the event that the protection in the switchgear is activated ear-lier, the voltage should be reinitiated by lifting the lever and starting the next charging process. The process should be repeated until all necessary tests have been performed.

8.6.1. Functional test of the device – methods of execution

Functional tests must be carried out with a suitable tester. The charging point should be handled as in the standard charging process. The entire procedure for the initiation and termination of charging etc. is provided in Chapter 2 Use of the charging station. Attention should be paid to the different operation of the station depending on the configuration: with RFID authorization and Plug&Charge. Chapter 10 Troubleshooting describes the error codes and the situations diagnosed by the station. On their basis, it can be determined whether the station correctly diagnoses damage on the vehicle end. Examples of damage are the lack of a diode, CP short-circuit, PP short-circuit, etc. Such situations can be simulated with an appropriate test system dedicated to the AC charging station.

9. Technical description

9.1. Form with boxes to fill in

Charging Station/General Access Charging Station	
Charging point, an element of public road transport infrastructure	
Type	....
Post Model Number	....
Module Model Number	....
Post serial Number	....
Module Serial Number	....
Number of charging points	1/2
Connection power	22 kW/44 kW
Supply voltage	3 x 230 V/400 V_{AC}
Network type	TN, TT (IT per request)
Output voltage	3 x 230 V/400 V_{AC} 50 Hz/60 Hz
Charging current	Maximum 3 x 32 A
Protection class	Class I
IP class	IP54
Mechanical strength class	IK10
Dimension (diameter x height)	250 mm x 1310 mm
Post weight	22 kg ± 5%
Module weight with socket	2,7 kg/8,5 kg
Interface height	1220 mm
Charging connector	Socket/Cable
Working temperature	From -25°C to 50°C
Device location - WGS84	
Latitude	N S ....° ....´............, ...”
Longitude	EW ....° ....´............, ...”

10. Trouble shooting

10.1. Error codes

Error codes consist of three elements correspond-ing respectively to: error category, source of error and error number.
Example:

$$W01/02$$

Where :

- **W** – error category (in this case: a warning),

- **01** – source of error (communication with the car error),

- **/** – Separator,

- **02** – error number (short circuit on the CP sig-nal line).

10.2. Error categories

Error category is marked with the first letter in the error code and indicates how serious the error which occurred in the charger is. There are three error categories:

- **W** – warning,

- **E** – error

- **F** – failure

10.2.1. Warning W

Errors from the warning category are the errors which the charger will try to fix on its own or once the error is eliminated the charger will be able to return to the state before the error occurred. The display will show the time counting down to the moment the occurring error is reset. Light bars will light in a solid yellow light and will flash with impulses of green light. The number of flashes depends on the source of the error.

10.2.2. Error E

Error in this category are the errors which require user intervention in order to have the charger return to operation. To reset the error the user must disconnect the car from the charger. After the car is disconnected the charger should return to a default state. When there

is an error of this sort the light bar will be dimmed and will flash with impulses of red light. The number of flashes depends on the source of the error.

10.2.3. Failure F

Errors from the category of failure are critical errors detected by the charger which prevent any further operation of the device. After detecting an error of this category the charger should be sent to a servicing point. When there is an error of this sort the light bar will light in solid red light and will flash with impulses of red light. The number of flashes depends on the source of the error.

10.3. Source of errors

The source of error signaled as the first number in the error code should be read according to the table below:

Number	Source of errors
01	Communication with the car
02	Locking system
03	Residual current detected
04	Residual current detected
05	Device failure

> **ⓘ INFO**
>
> In case of STILO chargers it is only possible to define the error category and the source of error.

10.4. Error number

A detailed error number may be read from the charger display. Each source of error has its own set of errors which may occur when the charger is in operation. The tables below include all possible errors:

Warnings

Source	Number	Type of error	Possible solution	Light bar response
01	01	Short circuit on the PP line	Check the cable connection to the charger or replace charging cable.	
	02	Short circuit on the CP line	Wait for another attempt to communicate with the car or try to disconnect and reconnect the car	
	03	Diode failure in the car		
	04	Wrong status in the communication protocol	Wait for another attempt to communicate with the car	
	05	PP signal disappeared during the charging process	Wait for another attempt to communicate with the car or press the charging cable plug with greater force.	
	06	No PP signal detected	Disconnect and reconnect the charging cable.	
	01	Phase loss on the first phase connected to the charger	Check the circuit breakers which supply the charger and wait for the error to be reset.	
	02	Overvoltage in the power grid detected	Wait for the power grid to stabilize and the error to be reset.	
	03	Voltage dip in the power grid detected	Wait for the power grid to stabilize and the error to be reset.	
04	04	Overvoltage in the car charging process detected	The charging will be stopped and retaken after some time.	
	05	Incorrect phase connection to the charger	Turn off the charger and check the power connection. The power supply can only be connected in the order: L1, L2, L3 or in the appropriate sequence. An error in the installation can lead to improper operation of the dynamic load balancing (DLB) function.	

Errors

Source	Number	Type of error	Possible solutions	Light bar response
02	01	Socket lock error	Adjust the cable plug in the charger socket. If necessary, re–authorize	
	02	Socket unlock error	Adjust the cable plug in the charger socket and wait for another attempt to unlock the socket.	
03	03	Residual current AC 30 mA type A detected when charging	Detection of the residual current causes the charging to stop. To reset the error, disconnect the car from the charger.	
	04	Residual current DC 6mA type B detected when charging		

Failure

Source	Number	Type of error	Possible solutions	Light bar response
03	05	Residual current type A or B detected at any moment when no car is charging.	The charger may be damaged. The device should be immediately switched off and sent to the servicing point.	
04	05	Incorrect phase connection to the charger	Turn off the charger and check the power connection. The power supply can only be connected in the order: L1, L2, L3 or in the appropriate sequence.	
05	01	Communication module failure	Turn off the charger and disconnect the cables connecting the charger to the network. If the error still appears after switching on, the charger may require service. Contact the Dealer.	

10.5. Frequently Asked Questions

10.5.1. Enelion Bridge

THE COM MODULE DOESN'T CONNECT TO THE WIFI NETWORK

Make sure the WiFi password was entered correctly and that the proper security method was chosen ("Authentication type" box). Positioning the WiFi router closer to the charger may also prove helpful.

NOT ALL CHARGING PANELS WERE ACTIVATED BY THE COM MODULE

Check in the OCPP tab if the number in "Number of panels" reflects the real number of panels connected to the network. Check if the network was set properly, if there is connection between the proper cables and if all charging panels were connected to the network correctly.

I CANNOT ACCESS THE CONFIGURATION PANEL

Make sure the COM module is connected to the same network as your device. If you are connected to the WiFi network created by the charger or via Ethernet to the COM's LAN connection, try entering "192.168.1.1" into the ad-dress bar in the browser. If your device and the charger are both connected to the same different network, try entering "192.168.1.150" or the charger's local IP address obtained from the network.

In other cases contact technical support. Describe in detail the situation in which the problem occurs, which will help the technicians locate the source of the problem quicker and help you more effectively. If possible attach the file with the charger operations log (you can download it by pressing "Download logs" in the configuration panel "Logs" tab).