enelion

User manual

ENELION LUMINA

Premium charger for electric vehicles

Dear user

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

Up-to-date manuals for users
and installers always available at:
https://enelion.com/en/support-ENELION LUMINA/

Please read this manual before installation
or prior to the station being commisioned.

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Safety instructions

Please read this manual before attempting to install or commission the charger.

Safety instructions for installation:
- Do not carry out outdoor installation during precipitation or strong winds if there is a risk that water or debris may enter the device.
- Carry out all operations described in this manual after ensuring that there is no voltage in the power cord.
- This product may only be installed, repaired or serviced by an authorised electrician.
- All local, regional and national electrical installation regulations must be observed.
- Installation must not be carried out near explosive atmospheres or in areas where there is a risk of running water.
- Risk to life from high electrical voltages.
- The product must be permanently installed in its final location.
- The product must be installed on a wall or structure with sufficient load bearing capacity.
- The clamps on the rear panel are live when the power circuit is closed and must never come into direct contact with anything other than the Enelion LUMINA plug-in electronics.
- Enelion LUMINA's network SSID and password are required for installation and configuration; they can be found on the back of the charging head.

Safety instructions for use:
- Never use or touch the device if it is damaged or not functioning properly.
- Always perform the recommended maintenance, installation and any repair work by an authorised service centre and in accordance with local requirements.
- Do not use water to extinguish a fire.
- Never clean the station with high pressure or running water.
- Do not immerse the station in water or other liquids.
- Never touch the contacts of the Type 2 socket/plug and never insert foreign objects into it.
- Never use the charging cable if it is damaged or if the connector is wet or dirty.
- Do not use extension cables or adapters in connection with the station.
- If the light bar on the device lights up red, an error has occurred.
- The charging cable can only be disconnected from the station by pulling on the plug handle, not on the cable.
- Make sure that the charging cable does not cause a tripping or running over hazard.
- Even though the station is designed to withstand normal weather conditions, it is recommended to protect it from direct sunlight or exposure to extreme weather conditions.
- Do not use the station near strong electromagnetic fields or in the immediate vicinity of radio transmitters.

Use of the charging station

01   Preparation for use

Before the first use of the charger, make sure that the charger has been correctly installed and poses no danger to the user. More information may be found in the installation guide.

02   Charging

By default the charger is configured as Freecharge configuration, which means it starts charging as soon as a car is connected. To start charging:

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.

When RFID tag authorization is enabled, place the user tag on the RFID reader located in the top cover of the charger to perform RFID tag authorization. The use of a correct tag shall be signaled with the diodes of the light bar. After the card has been accepted perform steps described above.

After performing these steps, the charger switches to charging status, communicating the

[1]Applicable to devices with a socket.
[2]Not applicable to devices with freecharge configuration or devices with cable.

fact with the light bar and showing the status on the display. While charging, the light bar flashes from the center towards the edge. See chapter **LED interface** for more information. When configuring the station as Freecharge, 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 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.

03 Completion of charging

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 **Device configuration** for more information.

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

04 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 Freecharge mode with the lock disabled, it is possible to interrupt the charging process by removing the plug from the charging station.

05 Procedure in the event of irregularities, faults 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 1000 V a carbon dioxide (CO_2) or powder extinguisher or sand.

06

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.

> **⚠**
>
> 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.

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

> **ⓘ**
>
> The device meets the IP 54 standard.

Due to the IP 54 class of the device, it is forbidden to wash the charger with pressure washers, garden hoses, a shower or any other stream of water.

> **⚠**
>
> 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.

07

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.

08 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, it is forbidden to put waste equipment (marked with the symbol of a crossed out bin) with other waste. The user who intends 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.

Device configuration

01 Available variants

The system of configuring the settings of ENELION LUMINA charger is done in the configuration panel.

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 to 7.4 kW.
- **Three–phase power system** — three phases will be used for charging. The power range may be set between 4.1 kW to 22 kW.
-

► **The charger power** – available power capacity: 1.4 kW to 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**

- **Free 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.

▶ **Deauthorizing methods**

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

▶ **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.

02   Initiating the device

Once the charger is switched on for the first time it will use the default configuration in which it only accepts offline cards that can be added manually in the Charger -> **Authorization section** in the configuration panel.

To configure the charger you need to:

1. install the charger according to the fitting instruction available on **https://enelion.com/en/support-ENELION LUMINA/,**
2. turn power supply on,
3. connect with secured AP of the station,
4. log in to the configuration panel on the Admin account,
5. set required parameters.

Above should be performed only by authorized personnel.

03   Changing the configuration

When needed it is possible to change the configuration of the charge which was already initialized.

In order to change the configuration just perform the same procedure as the first configuration using configuration panel.

This should be done only by authorised personnel on the Admin account.

04   LED bar

The ENELION LUMINA charging station has an LED interface that provides the user with basic information:
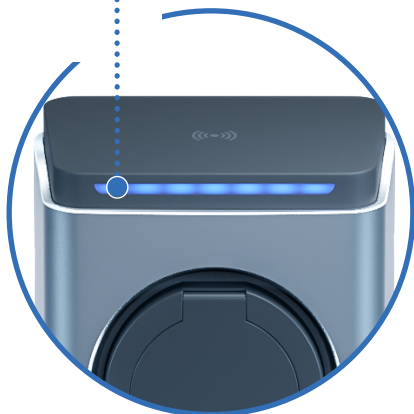
Status	Light Type
Availability	Green flashing
Charging (energy transfer in progress)	Blue flashing from inside towards the edge
Charging (no energy transfer)	Blue flashing
Warning/minor error (the charger will attempt to return to its previous state)	Yellow flashing
Error	Red flashing
Fatal error	Steady red
Authorisation	Light Type
User acceptance	Running from left to right in green
User rejection	Running from left to right in red
Authorisation pending	White dot moving from left to right

The interface provides only basic operational information, detailed information can be read from the configuration panel.

Configuration panel

01   Features

ENELION LUMINA charger is equipped with connectivity features that enable:

Preview and basic management of charging point:
- Reading the status of the charging point, including its meter, charging power, available power.
- Socket lock management.
- Starting, stopping and scheduling charging.

Internet connectivity:
- Wi-Fi.
- GSM LTE.

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.

02   Communication

ENELION LUMINA charger allows you to connect to the configuration panel using its Wi-Fi Hotspot. In order to connect to the Wi-Fi Hotspot, use a computer or your smartphone to scan the

ENELION app available on:

Download on the **App Store**

GET IT ON **Google Play**

EXPLORE IT ON **AppGallery**

available Wi-Fi networks. The broadcast network is named **Enelion-XXXX-XXXX** where X signs stand for the charger's serial number. Password for this network can be found on the identification sticker placed on the charger's head, cardboard and configuration panel

02.1   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.
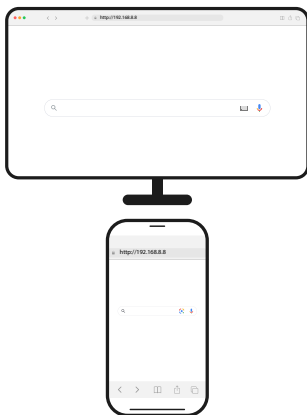
There are accounts for the **User** (User) and **Administrator** (Admin) in the configuration panel. The default password for each of these users is the same as the username and can be changed in the settings.

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.

Log in page of the configuration panel.

03

Navigation in the configuration panel

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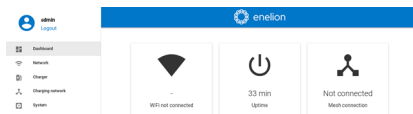
Dashboard site of the configuration panel.

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.

Mobile version of the Dashboard site.

04

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:

- Wi-Fi connection status,
- GSM connection status,
- Mesh communication status,
- device operation time from startup (uptime),
- active alerts.

05

Network

05.1

Overview

View the status of all available network interfaces. Clicking on any of them will take you to the corresponding subpage.
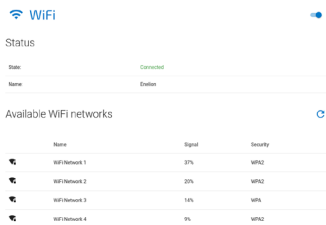


Overview section of the Network tab.

05.2   Wi-Fi

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

Wi-Fi section of the Network tab.

The **Available Wi-Fi networks section** presents a list of Wi-Fi 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 refresh icon on the right side of the section header will rescan the surroundings for Wi-Fi 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.
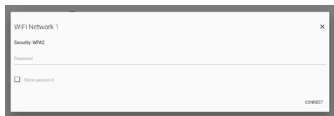
View of connecting to the Wi-Fi network.

05.3   GSM

Enelion Bridge is equipped with LTE cat 4 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 section** 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.
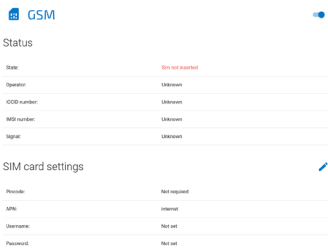
GSM section of the Network tab

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

GSM configuration window.

05.4 Hotspot

The **Hotspot section** shows the status of the emitted Wi-Fi network and its settings.

Hotspot section of the Network tab.

Since Hotspot is the only method to access the charger's configuration, its settings only include the possibility to hide the network, not to disable it.
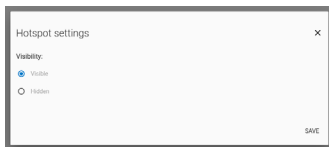
Hotspot settings.

The **Charger section** allows for configuring charging related settings.

06 OCPP

06.1 Connection

ENELION LUMINA supports OCPP 1.6 over JSON. To connect to OCPP backend please use the toggle on the right of **OCPP Connection** header. The **Status** and **Connection settings** fields will become active and you will be able to see current connection status along with registration state.

To set OCPP URL and Station ID click the pencil icon on the right of **Connection settings**. You will see a modal window with OCPP settings. In charging networks consisting of multiple chargers one of them needs to me a Master device and the rest of them must be set as Slaves. The Master device will connect all the chargers with the OCPP backend. There can only

be one Master device in the network.
If the device you are configuring is a Master Type, choose Master as device Type and fill other data, including OCPP URL, Station ID and the number of connectors in the network.
When configuring multiple chargers in single charging network you need to assign different Connector IDs to each of them. Freecharge ID Tag ist the tag used to OCPP authorization when Freecharge mode is enabled and RFID tag is not used.

After Connection settings form is filled, press **Save** button. The charger should connect to the OCPP backend.

06.2   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 their value.

> ⚠️
>
> 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.

☰ Configuration keys

This list contains all configuration keys and their values set in the charger. If the key is changeable you can change it here with a pencil button or using ChangeConfiguration request from your OCPP server.

Key	Value	Edit
AllowOfflineTxForUnknownId	false	✏️
AuthorizationCacheEnabled	false	✏️
AuthorizeRemoteTxRequests	true	✏️
ClockAlignedDataInterval	1800	✏️
ConnectionTimeOut	30	✏️
ConnectorPhaseRotation	[1.RST]	✏️
ConnectorPhaseRotationMaxLength	50	
GetConfigurationMaxKeys	50	
HeartbeatInterval	200	✏️

07   Charger

The **Charger section** allows for configuring charging related settings.

07.1   Overview

In the **Overview section,** we can check information about the connector status, schedule, start or stop charging.

🔋 Charger

Connector   🕐 ◼ ▶

Cable status:	Connected (20 A)
Charging status:	EV connected, not charging
User ID that started charging:	No active transaction
Authorization method:	No active transaction
Transferred energy:	0 Wh
Transaction duration:	0 hours and 0 minutes
Available power:	11 kW
Total transferred energy:	0 Wh
Charging point temperature:	23.7 °C
Charging point humidity:	26%

Overview section of the Charger tab.

To Schedule charging click **Schedule** icon on the right of **Connector** header. A modal will be opened in which we can set the time after which charging should start. After clicking **Set start time** next modal will allow to set stop time or choose **Don't stop** option.
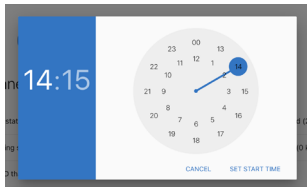
07.2   Mains

In the **Mains section**, we can check Mains status and settings like power limit or phase sequence.

🔌 Mains

Status

Power limit:	11 kW (3 phases, 16 A)
L1 voltage:	229.7 V
L2 voltage:	195 V
L3 voltage:	196.2 V
Phase sequence:	L1, -, -

Settings ✏️

Number of phases:	3
Current limit:	16 A
Phase connected to first terminal block:	1

Mains section of the Charger tab.

To change power limit click an **Edit** icon. A settings modal will show up in which we can choose predefined power limit options or choose our own depending on number of phases and chosen maximum current limit.
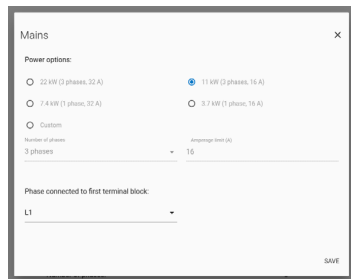
Mains settings.

07.3   Dynamic Load Balancing

Enelion charging stations are featured with a dynamic load balancing (DLB) function. It allows all the charging stations in the network to share information about the use of power connection and to control charging power so it is not exceeded at this connection.
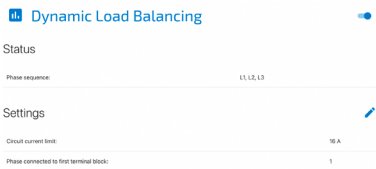
In the **Status** section, we can check the sequence of phases connected to the device. If the sequence of connected phases is incorrect, a relevant warning message will be displayed.

> ⚠️
>
> For the DLB function to work correctly, the sequence of phases connected to the device must be correct and the corresponding phase number must be selected in the **Phase connected to first terminal block** field. Possible phase connection sequence: 1, 2, 3 or 2, 3, 1 or 3, 1, 2.

In the **Settings** section, we can set the total connection current limit (Circuit current limit) for all stations in the charging network and the number of phase connected to the first terminal block (Phase connected to first terminal block).

> ⚠️
>
> For the DLB function to work correctly, the **Circuit current limit** value must be the same at all charging network stations.

> ℹ️
>
> In order to utilise the connection more efficiently when charging single-phase cars, it is advisable to use phase rotation, i.e. to connect other phases at different stations to the first-phase terminal of the charger. For example, phases can be connected to the first station in the following sequence: 1, 2, 3 to the second one: 2, 3, 1 and to the third one: 3, 1, 2. This will ensure that when charging three single-phase cars, each will be charged from a different phase.

07.4   DLB Overview

In the **DLB Overview** section, we can see information on the performance of the entire charging network in terms of the use of connection by each station in the network.

> ⚠️
>
> When a particular charger loses communication with the rest of the network, making the DLB non-functional, it will switch to low-power mode and charge the car with 6 A current.

If an **Energy Guard** is available in the network, information about it and the current it has measured will be displayed at the top of the page. Otherwise, this section will be inactive.

Energy Guard

Serial number:	ABCD-1234
Network limit:	40 A
Measured current on L1:	12.8 A
Measured current on L2:	16.5 A
Measured current on L3:	22.3 A
Metering point:	All powered equipment

In the **Charging network** section we can see the following information, divided by phase:

- total current available for charging,
- total current used by chargers
- current available per charger.

Charging network

	L1	L2	L3
Total current available for charging:	10 A	20 A	30 A
Total current used by chargers:	11 A	21 A	31 A
Current available per charger:	10.1 A	20.2 A	30.3 A

The **Active chargers** section contains a list of currently active stations supplying energy to a car. It shows the serial number of each charging station, the current consumption value on each phase, and the energy supplied to the car from the moment the charger has left the charging queue.

The **Charging queue** section.

When the current available for a single charger is less than 6 A, the charging stations that are short of current will be moved to the charging queue.

The queue is rotated every 5 minutes as follows: the charger that has transferred the highest amount of energy to the car from the moment it has left the charging queue ('Recent energy transferred' field) is moved into the queue, and the charging is started by the station that has waited in the queue for the longest time.

The serial number of the waiting charger and its waiting time are shown in the queue.

07.5   Authorization

Authorization section allows us to configure charger's lock, enable Freecharge feature and set tags that should be accepted offline.

🔒 Authorization

Lock		✏ 🔓
Mode:	Automatic	
Status:	🔓 Opened	

Freecharge		✏ ●
OCPP idTag:	Not set	

Offline accepted tags

#	idTag	Delete

Recently used tags

idTag	Last used	Add

Authorization section of the Charger tab.

To open or close the lock simply click the **Lock** icon. To set specific lock mode click the **Edit** icon and choose preferred lock mode.

Possible lock modes are explained in the table below:

Lock state	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

Possible lock status.

Enabling Freecharge option results in charger not requiring any RFID tag to start charging. Just connect a car and charging will start immediately. If we want to use Freecharge mode with OCPP charging management systems, we can choose what IDTag is to be used for authorization. To change it click **Edit** icon and choose preferred IDTag.

To see a list of recently used tags scroll to the bottom of the webpage. We will see tags numbers, date of last usage and an ability to add the tag to Offline accepted tags list. If we want to use specified tags for offline authorization, we can fill in this list according to our preferences. The list is limited to 5 tags. More advanced authorization and task management is available with OCPP charger management systems.

07.6   Accessories

Accessories section allows us to manage accessories supported by the station, which include: Schuko socket relay, RCMB and External Energy Meter (MID).

We can turn Schuko socket relay on or off, as well as delay switching it off until a specific time.
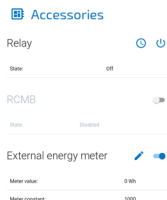
Accessories section of the Charger tab.

If RCMB module is installed in the charger, we can enable it by a switch on the right. We can also check RCMB status under it.

To use an external energy meter, we need to enable it. If we use different than default meter constant or change displayed meter value, we can set it up in settings, by clicking an **Edit** icon.
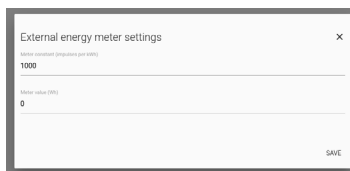
External energy meter settings.

07.7   Modbus

The Enelion ENELION LUMINA charging station features a Modbus communication protocol, configured as a slave device.

The protocol makes it possible to read and set (write) charger parameters according to the list of registers available in the Support section on the Enelion website.

The Modbus subpage allows to configure the server Type (TCP or RTU) and to change the Slave ID number.

In order to use Modbus RTU, the transmission lines A and B must be connected to the lower two pins of the connector described on the charging station's backplate as MID (in the graphic below).

To insert the cable into the station, make a hole using one of the two recesses in the lower part of the rear housing of the unit.
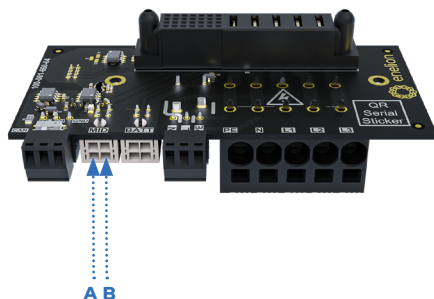
The TCP server is activated on port #502 and supports only one connection to the master device at a time.

The RTU server uses an RS485 connection for the transmission with the following parameters:

- baud rate: 9600,
- data Bits: 8,
- stop Bits: 1,
- parity: Even.

Modbus settings.

08   Charging network

The **Charging network section** allows for managing the network of Enelion devices connected locally to exchange charging, ocpp and maintenance related data.

08.1   Overview

In the **Overview section,** we can check network status and connection details, as well as the network topology.

Overview section of the Charging network tab.

08.2   Settings

In charging network settings we can set and change wireless Mesh settings. All chargers in a network must use tha same Mesh ID and Mesh password. Bear in mind that there must be one and only one root device in the network.

Mesh connection settings section

To change Wireless Mesh settings click **Edit** icon and fill in fields with preffered configuration. Finally click **Save** and wait for the devices to connect with each other. You can see the network topology in an **Overview .**

Configuration panel

Mesh connection settings section.

09   System

The **System section** allows for managing the Bridge module settings.

09.1   Overview

In the **Overview section,** we can check information about the ENELION LUMINA head and Backplate hardware details.

Overview section of the System tab.

09.2   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

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.
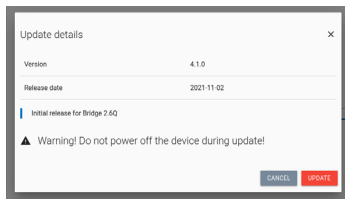
An example of update details

The Bridge module will start an update. The process should not last longer than 3 minutes. After the update the configuration panel will reload with a new firmware. In case the update is performed through the device's Wi-Fi Hotspot, you might need to connect to it again.

09.3   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.

❸ Users

User

Admin

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.**

09.4   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.

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

Reboot section of the System tab.

09.5   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 refreshes when it is scrolled to the recent events view.

📋 Logs

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.

09.6   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

Reboot section of the System tab.

10   Technical data

Technical data	
Wi-Fi	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 downloading firmware updates and uploading diagnostics data TCP 80 i 8080 – OCPP connection TCP 443 – Secured OCPP connection TCP i UDP 53 – DNS protocol UDP 123 – NTP protocol. 502 Modbus TCP
Numer of charging points supported in a network	up to 100

Maintenance

The device is designed to operate in temperatures from −30 ºC to +55 ºC. 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 −30 ºC or above 55 ºC 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.

> ⚠️
>
> It is not possible to open the head, any attempts may void the warranty. The backplate may only be opened by a qualified and authorized person.

01 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. Plastic elements 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

> ⚠️
>
> The device meets the IP 54 standard. Therefore, it is forbidden to wash the charger with pressure washers, garden hoses, shower or any other water stream sources

Operation

01   Operation and maintenance of charging stations

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.

02   Technical tests

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.

02.1 Measurement of the resistance of the Main Earthing Terminal – MET grounding

The Main Earthing Terminal in the station is the PE contact in the power connector.
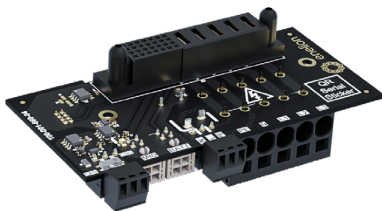
1 MET – PE contact
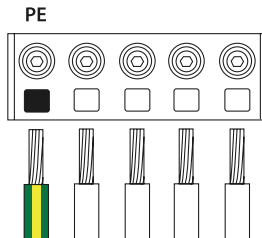
At this point, a ground resistance measurement should be made.

02.2 Continuity measurement of the protective conductors

The measurement should be made between the main potential equalization point and PE contact (wire input on the backplate) 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 1 Ω.
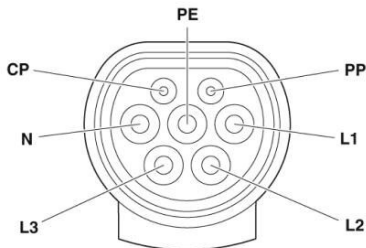
Marking of contacts of Type 2 socket/plug of the charging station.

02.3 Measurement of resistance of the working grounding

Perform the measurement if the working grounding has been made. The measurement can be made by technical, compensatory, clamp or other method allowed by the applicable regulations – PN-EN 61557-5. The maximum permissible resistance is 30 Ω.

03 Testing insulation resistance

03.1 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 head removed from the backplate. The test should be performed in a 3 or 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 overcurrent circuit breaker installed in the switchgear, to the bottom part of the post or any other convenient place.

⚠️

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

If overvoltage 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 disconnected before starting the measurements, and reconnected 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 resistance 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 voltage 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	L1-N	L2-N	L3-N	L1-PE/PEN	L2-PE/PEN	L3-PE/PEN	NPE
[MΩ]									

03.2   Testing resistance of the charging station insulation

Additionally, an insulation resistance measurement can be made in the station head. The test should be carried out in the same way as in the previous paragraph, that is, without the voltage applied, in a five-wire mode. It is recommended to use dedicated devices for performing insulation resistance measurements with a current calibration certificate. The maximum allowable test voltage is 500VDC. The minimum permissible insulation resistance value is 1 MΩ, the typical resistance value exceeds even 100 MΩ.

Minimum allowable resistance value = 1MΩ
Measurement combinations

L1-L2	L1-L3	L2-L3	N-L1	N-L2	N-L3	PE-L1	PE-L2	PE-L3	N-PE

03.3   Adapter – vehicle simulator

An additional factor is the adapter used: charging station - measuring device. In the Metrawatt device (PROTYP II Z525A), diode voltage indicators are used, which are useful during functional tests of the charger. Unfortunately, these diodes, together with current-limiting resistors (80 kΩ), significantly affect the results of insulation resistance measurements (results below 80 kΩ) depending on the polarization. For this reason, this adapter and other adapters that have voltage indicators, which may affect the measured resistance value, should not be used

for insulation measurements. It is permissible to use adapters that do not contain additional circuits, being adapters for the measurement system. Otherwise, the measurement should be carried out directly on the contacts of the socket/plug of the station, observing appropriate safety rules.
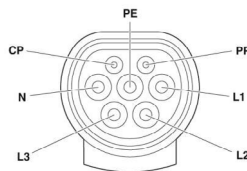
04   Measurement of the effectiveness of protection against electric shock

Measurements of short-circuit loop impedance can be made at the power connector or at the energy meter contacts, if present. It is also possible to perform the test in the charging socket (cable) using an appropriate tester that allows the charging process to start.
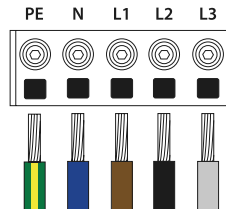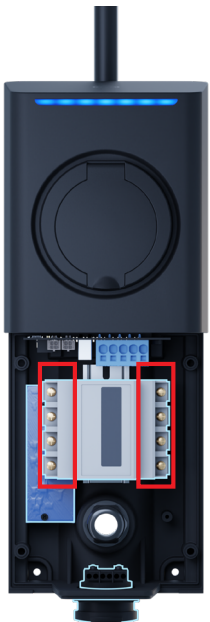
The test should be carried out using a meter that allows operation in circuits with RCD.

Alternatively: the measuring instrument must be equipped with a function that allows the measurement to be made in a circuit equipped with a residual current device without triggering the tripping of this device.

It should be checked whether the short-circuit current at the measurement site will be sufficient to trip the overcurrent protection at the required time. To assess the effectiveness of protection, take the most favorable result.

The following condition must be met:

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

Zs – short-circuit impedance

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

U0 – nominal phase voltage (230 V)

04.1 Protection against electric shock in TT systems.

In the case of a TT system, achieving a sufficiently low earth fault loop impedance can be challenging. In such situations, based on the PN-HD 60364-6:2016 standard *"Low-voltage electrical installations - Part 6: Verification,"* it is possible to consider the RCD (Residual Current Device) as a sufficient element for electric shock protection.

When protective devices are installed in the charging station, it is advisable to consider the installation of an additional RCD at the beginning of the cable line while maintaining selectivity of protections.

05

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).

Each ENELION LUMINA station includes an Enelion RCMB accessory:

- Residual Current Monitor Type B. The use of Type A RCD in the distribution board in the station's power supply circuit, together with RCMB, meets the safety requirements presented in the above standard. Special attention should be paid to the names of the devices:
- RCD disconnects the power supply to the station, the RCM interrupts charging.

The RCD protection test can be performed when the charging process has started – the voltage is applied in the charging socket = state C. For this purpose, an appropriate residual current breaker tester and a vehicle simulator – an adapter – should be used.

The RCD and RCMB are tested separately, the sensitivity of the protections and their response time are examined.

05.1

RCD Tests

Each operation of the RCD breaker will disconnect the power supply to the station, after each activation the charging process must be restarted.

Procedure:

- Ensure access to the RCD devices,
- Turn on the station voltage,
- Connect the RCD testing meter to the adapter (vehicle simulator),
- Start the charging process using the adapter – the LEDs should be blue,
- Follow the instructions on the meter while measuring the RCD breaker parameters,
- After each operation (disconnection) of the RCD, immediately turn it back on, then start the charging process. Repeat until the test is completed by the meter.

Measurement of the actual sensitivity of the RCD:

RCDA = 0, 35$I\Delta n$ ≤ $I\Delta r$ ≤ 1, 4$I\Delta n$,
RCDB = 0, 5$I\Delta n$ ≤ $I\Delta r$ ≤ 2$I\Delta n$,
where $I\Delta n$ = 30mA – nominal sensitivity of the device

Measurement of the operating time of the device:

Normalized, maximum switch-off times [s] for the RCDA differential current:

$I\Delta n$	2$I\Delta n$	5Δn	$I\Delta n$ ≥5A
0,3	0,15	0,04	0,04

Normalized, maximum switch-off times [s] for the RCDB differential current:

2IΔn	4IΔn	10Δn	IΔn ≥5A
0,3	0,15	0,04	0,04

It is also necessary to confirm the proper operation of the "TEST" button on the RCD switch when the voltage is turned on and the device is active.

Pressing the button must result in disconnecting the voltage and moving the lever to the off position - Off or O.

05.2 RCMB Tests

The built-in RCMB protection will interrupt the charging process in case of detecting Type B residual current.

Procedure:

- Turn on the station voltage,
- connect the RCD testing meter to the adapter (vehicle simulator),
- start the charging process using the adapter - the LEDs should be blue,
- follow the instructions on the meter while measuring the RCD breaker parameters,
- after each activation of RCMB (interrupting the charging process, red LEDs indicating an error), end the charging process and then start a new one.
- Repeat until the test is completed by the meter. The built-in RCMB protection will interrupt the charging process in case of detecting Type B residual current..

Measurement of the actual sensitivity of RCMB:

RCMB = $0{,}5I\Delta n \leq I\Delta r \leq 2I\Delta n$,
where: $I\Delta n = 6mA$ – nominal sensitivity of the device

Measurement of the operating time of the device:
The built-in RCMB protection will interrupt the charging process in case of detecting Type B residual current.

Procedure:

- Turn on the station voltage,
- connect the RCD testing meter to the adapter (vehicle simulator),
- start the charging process using the adapter - the LEDs should be blue, follow the instructions on the meter.
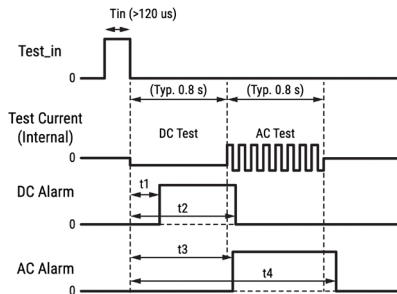
Parameter	Minimum	Typical	Maximum
t1	0.12	0.30	0.60
t2	0.80	1.05	1.30
t3	0.70	1.00	1.20
t4	1.40	1.80	2.10

06 Functional tests

Functional tests must be carried out with a suitable tester.

Functional tests should be carried out at least once every 3 years and after each installation and service.

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 **Use of the charging station**.

Attention should be paid to the different operation of the station depending on the configuration: with RFID authorization and Freecharge.

Chapter **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.

06.1 PP contact - detection of the plug and charging cable.

The charging station with the socket recognizes the rated capacity of the connected cable based on the resistor between the PP and PE contacts located in its plug.

Below is a table indicating the permissible cable capacity expressed in [A] for a given resistance Rc.

THE RESISTANCE VALUE OF RC (±3%)	THE RATED CURRENT CAPACITY OF THE CABLE
220 Ω	32 A
680 Ω	20 A
1500 Ω	13 A

The state of the PP contact is checked before starting the charging process. If there is a short circuit between PP and PE, the charging process will not start, regardless of the vehicle's state being C or D.

For a charging station with a cable, the cable's capacity on the vehicle side is checked in the same way.

06.2 CP contact - communication line between the vehicle and the charging station.

Simplified circuit diagram of the communication circuit:

The vehicle, using appropriate resistors, changes the signal voltage to communicate its state to the charging station. Additionally, several abnormal situations can also be detected.

Table of States Detected by the Charging Station

VEHICLE STATUS	CONNECTION WITH THE VEHICLE	CHARGING CAPABILITY	VOLTAGE (VA)	DESCRIPTION
A	NO	NO	12 V DC	Charging station in standby mode - Status LED: Green, pulsating
B	YES	NO	9 V PWM	Detection of vehicle presence - Status LED: Blue, pulsating
C	YES	YES	6 V PWM	Charging in progress - Status LED: Blue, pulsating from the center towards the edges
D	YES	YES	3 V PWM	Charging in progress - Status LED: Blue, pulsating from the center towards the edges
E	YES	NO	0 V	Warning – the charger interrupts the charging process but automatically attempts to restore the charging state. Status LED: Yellow, pulsating. Example: CP to PE short circuit.
F	YES	NO	- 12 V DC	Error – the indicator will pulsate with red light, indicating a problem that requires human intervention. The error can be reset by reconnecting the vehicle to the charger. Example: RCMB tripping.

It is necessary to check the station's response to:
- States A, B, C, E
- Short circuit error between PP and PE before charging starts
- Short circuit error of the internal diode in the vehicle
- Warning, status LED – yellow, pulsating

Detailed information regarding errors can be found in the **Alerts** section in the configuration panel.

07 Servicing the charging station

The main component of the ENELION LUMINA charging station, which is the charging head, is not subject to servicing repairs. If a malfunction occurs, the charging head needs to be replaced. There is no possibility to replace the socket or charging cable.

Here are schematic diagrams of charging modules for reference:

Moduł ładujący
Gniazdo Typ 2
z układem RCM B 6mA DC

5x 1x6 mm2
H07V2 –K 105°C 1000V
PCB
METER
RCM B
MCU
275VAC
1M Ω
PE
3~ Złącze wejściowe

37

Moduł ładujący
Gniazdo Typ 2
z układem RCM B 6mA DC

H07BZ5-F 5G6.0 mm2+1x0.75mm² 450/750V

Wtyczka
TYP 2
3

METER
RCM B
MCU
PCB

275VAC
1M Ω

PE

3 Złącze wejściowe

06 Instructions for replacing the ENELION LUMINA Schuko fuse

Applies to ENELION LUMINA charging stations equipped with an additional Schuko 230V socket

Additional Schuko 230V socket allows you to connect a load of no more than 10A.
Switching on is controlled remotely via the application and the configuration panel.

The electrical circuit of the socket is protected against overload by the use of an additional fuse which is located in the housing on the cable in the backplate of the charger.

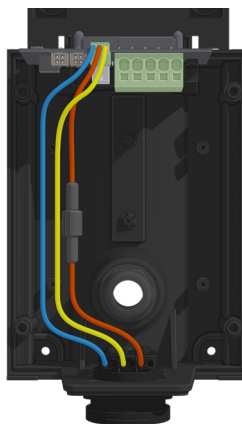A spare fuse is included in the box.

⚠️

Always replace the fuse with the fuse model specified by the manufacturer.

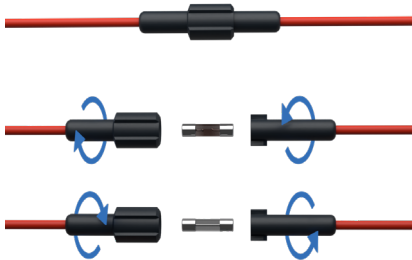The use of a fuse with a higher rated current may damage the device and lead to fire.

⚠️

Turn off charger before replacing the fuse.

The fuse is located in the housing on the cable in the backplate part of the charger.

1. Unscrew the fuse housing.
2. Remove the blown fuse from the housing
3. Insert a new fuse specified by the manufacturer.
4. Screw on the fuse housing.

Fuse: 0234010.MXP (Cartridge Fuse 250V 10A Medium Acting)

Technical description

Charging Station/General Access Charging Station	
Charging point, an element of public road transport infrastructure	
Housing	Polycarbonate, Anodized aluminum*
Ingress protection rate	IP54
Impact protection	IK10
Flammability class	UL94-V0
Charging connector type	• ENELION ENELION LUMINA Socket – Type 2 socket • ENELION ENELION LUMINA Cable – Type 2 connector with 5.2 m cord
Residual current protection	Embedded residual current monitor – Enelion RCMB 6 mA DC
Energy metering	Integrated 3-phase energy meter >99% accuracy
Certified electricity meter (MID)	Impulse* – possible to install inside the housing
User interface	• multi-color LED strip EVC status indication; • dedicated app
Online communication unit	• Integrated LTE/4G modem • Wi-Fi 2.4 GHz b/g/n – direct access point to the station with an option to hide the AP and connect the station to local Wi-Fi network
OCPP	compliance with OCPP 1.6 J protocol
Minimal signal quality requirements	• Wi-Fi: –60 dBm • GSM: –85 dBm
Authorization	• built-in RFID/NFC reader - Mifare Classic/ ree Charge • dedicated app
Current /Charging power	• up to 7.4 kW at 32 A 1-phase • up to 22 kW at 32 A 3-phase (TN system)
Charging voltage	3 x 400 V AC/ 230 V AC (±10%)

* option

Supply voltage	• 3 x 400 V AC/ 230 V AC (±10 %) (TN/IT) • Possibility of connecting the cable from the top, bottom and the back of the station
Other features	• configuration with no additional tools • remotely controlled Schuko outlet (max. 2000W/10A)* • remote start / stop, delay and charging schedule • temperature and humidity monitoring inside device
Operating temperature	–30°C / +55°C
Maximum altitude for installation	2000 m
Height	390 mm
Depth	133 mm
Width	155 mm
Depth	133 mm
Weight	3.3 kg / 8.9 kg (depending on device-version)
Compliance	2014/53/EU (RED) 2011/65/EU (RoHS) 2014/30/EU (EMC) 2014/35/EU (LVD)
Compliance UK	UK SI 2016 No. 1101 UK SI 2016 No. 1091 UK SI 2017 No. 1206 UK SI 2012 No. 3032 The following BSI and ETSI standards and technical specifications have been applied: ETSI EN 300 328 V2.2.2:2020-03; EN 62196-2:2017-06; EN IEC 61851-1:2019-10; EN IEC 61851-21-2:2021-09; EN 62196-1:2015-05; ETSI EN 301 511 V12.5.1:2017-10 ETSI EN 300 330 V2.1.1:2017-08; ETSI EN 301 489-1 V2.2.3:2020-07; ETSI EN 301 489-17 V3.2.4:2021-05

* option

Troubleshooting

01   Alerts

There are three Types of alerts:

- warning – the charger will pause charging, but it will also try to return to return to the charging state on its own. The LED strip will blink in yellow.
- error – the charger will blink in red indicating an issue that required human interaction. The alert can be cleared by reconnecting a car.
- critical – the charger will flash in steady red color, indicating an issue that required servicing of the charger.

For detailed error information check **Alerts section** in the configuration panel.

02   Frequently Asked Questions

ENELION LUMINA CHARGER DOESN'T CONNECT TO THE Wi-Fi NETWORK

Make sure the Wi-Fi password was entered correctly and that the proper security method was chosen **Authentication Type box**. Positioning the Wi-Fi router closer to the charger may also prove helpful.

ENELION LUMINA CHARGER DOESN'T CONNECT TO THE GSM NETWORK

Make sure the GSM network settings were entered correctly and that the charger is in the network signal range.

I CANNOT ACCESS THE CONFIGURATION PANEL

Make sure you are connected to the charger's Wi-Fi Hotspot. Please check if you use correct IP address: 192.168.8.8.

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 Logs page from **Diagnostics section**).

Customer service

Download the latest user manuals, useful documents and videos for your product on **enelion.com**

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