



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/support-lumina/>

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

Table of content

Safety instructions	6
Use of the charging station	8
Preparation for use	8
Completion of charging	9
Emergency stop	9
Procedure in the event of irregularities, faults and fire	9
General rules for safe operation	10
Health and Safety	10
Disposal and environmental protection	11
Device configuration	12
Available variants	12
Initiating the device	13
Changing the configuration	13
LED bar	14
Configuration panel	15
Communication	15
Features	15
Access to the configuration panel	16
Navigation in the configuration panel	17
Dashboard	17
Network	17
Overview	17
Wi-Fi	18

Table of content

GSM	19
OCCP	20
Connection	20
Mains	22
Authorization	23
Accessories	24
Modbus	25
Charging network	26
Overview	26
DLB Overview	26
System	28
Overview	28
Update	28
Users	28
Time	29
Technical data	30
Reboot	30
Cleaning	31
Operation	32
Operation and maintenance of charging stations	32
Technical tests	32
Measurement of the resistance of the Main Earthing Terminal– MET grounding	33
Continuity measurement of the protective conductors	33
Testing insulation resistance	34
Measurement of resistance of the working grounding	34
Testing the insulation resistance of the electrical installation	

Table of content

supplying power to the charging station	34
Testing resistance of the charging station insulation	35
Adapter–vehicle simulator	35
Measurement of the effectiveness of protection against electric shock	35
Protection against electric shock in TT systems.	36
Testing the operation of residual current devices	37
RCD Tests	37
RCM B Tests	38
Functional tests	39
PP contact - detection of the plug and charging cable.	39
CP contact - communication line between the vehicle and the charging station.	39
Servicing the charging station	40
Instructions for replacing the 230 V socket fuse in ENELION LUMINA	41
Technical description	43
Troubleshooting	46
Alerts	46
Frequently Asked Questions	46

Safety instructions

The Enelion charger (hereinafter referred to as the device, charger, or charging terminal) is a charging station designed for electric vehicle charging within the meaning of the 'Act on Electromobility and Alternative Fuels' dated January 11, 2018, in paragraphs 5, 12, 13, and 27 of Article 2 of the aforementioned act.

The installation and servicing of the device must be carried out by qualified and authorized individuals, and repairs may only be performed by the manufacturer or entities authorized by the manufacturer. During the warranty period, only authorized service centers and the manufacturer are allowed to perform warranty repairs.

Interference with mechanical, electrical, and electronic components, as well as the device's software, is strictly prohibited and may void the warranty. Exceptions are actions described in the following instruction manual or those agreed upon in writing with the manufacturer.

The manufacturer is not responsible for property damage resulting from prohibited interference with the product.

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

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

The electrical installation to be used during device operation must comply with the legal standards applicable at the installation and operation location of the device.

The manufacturer is not responsible for damages caused by an electrical installation that does not comply with legal standards.

The device does not have a built-in power switch.

The device is activated when the power supply voltage is applied. Power disconnection must be ensured by appropriate devices in the electrical installation described in the installation manual. Except in emergency situations, the device should not be switched off during the charging process.

It is prohibited to power on the device when the device housing is open.

It is prohibited to use a charger that is mechanically damaged or indicates a critical error.

Objects not intended for this purpose must not be placed in the charger socket. The only object intended for insertion into the charger socket is a functional power cable with the appropriate power and type for the electric vehicle, terminated with a functional type 2 plug according to EC 621962.

The use of extension cords, adapters, and charging cable extensions is prohibited.

The manufacturer is not responsible for loss of health or life resulting from non-compliance with the above recommendations.

During the warranty period, the manufacturer

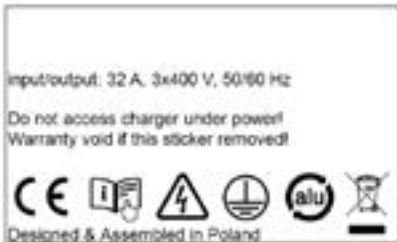
allows the purchase of support packages for the device (extended warranty/service) subject to a qualifying review before purchasing the package. Details can be obtained from the Enelion sales department.

The charging station does not support ventilation functions.

The nameplate present on the device is an integral part of it and must not be removed or damaged, as this may result in the loss of the manufacturer's warranty.



Three self-adhesive labels with information about the current value have been included in the set. Please select the appropriate one according to the specifications and affix it next to the nameplate.



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 Free Charge configuration, which means it starts charging as soon as a car is connected. To start charging:

1. Connect the cable to the charger¹,
2. connect the cable to the car,
3. make sure the lock is closed properly² 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

¹Applicable to devices with a socket.

²Not applicable to devices with Free Charge 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 Free Charge, 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 Free Charge 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 (CO₂) 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 charging current can be set in the range from 6 A (1.4 kW) to 32 A (7.4 kW).
 - **Three-phase power system** – three phases will be used for charging. The charging current can be set in the range from 6 A (4.1 kW) to 32 A (22 kW).
- **The charger power** – available power capacity: 1.4 kW do 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.
- 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/support-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 authorized 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
Authorization	Light Type
User acceptance	Running from left to right in green
User rejection	Running from left to right in red
Authorization 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

Download the free
Enelion App



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

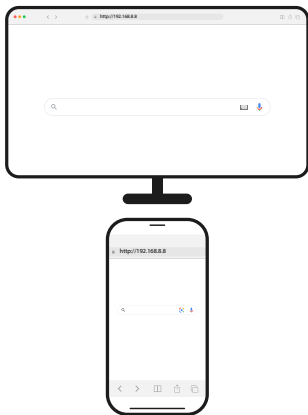
Communication

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

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

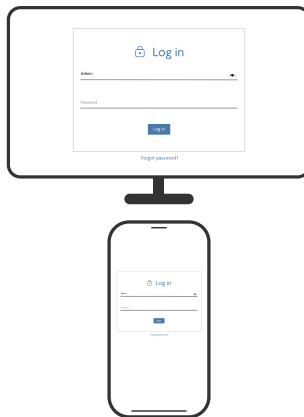
02.1 Access to the configuration panel

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.

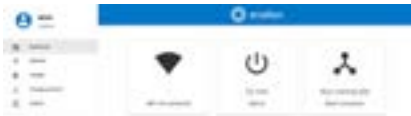
In case a password to the configuration panel is lost it is possible to reset the device to factory settings. To do so please choose **Forgot password?** link and confirm the choice.



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 ENELION LUMINA 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

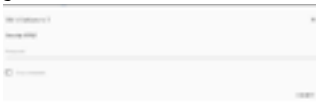
Wi-Fi

ENELION LUMINA enables Wi-Fi connectivity in the 802.11 b/g/n, 2.4 GHz standard. The Wi-Fi subpage allows you to manage the ENELION LUMINA 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 ENELION LUMINA 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

Ethernet

ENELION LUMINA can be equipped with an Ethernet module, which enables a wired internet connection with the charger. To connect to the internet, you need to go to the Ethernet network subpage and turn on the interface using the switch on the right side



The Ethernet section from the network tab

At the bottom of the page, there is a [Static IP Setting section](#) where, similar to the [Wi-Fi tab](#), you can set a static IP for the charger.

Once the Ethernet is enabled, the Wi-Fi connection will automatically turn off. To re-enable Wi-Fi, you must first disable Ethernet. Otherwise, a message will appear as shown in the illustration below.



Configuration Panel - Attempting to configure Wi-Fi while Ethernet is enabled.

05.4

GSM

ENELION LUMINA 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.

[Configuration panel](#)



GSM configuration window.

05.5

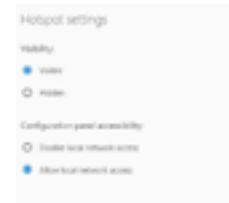
Hotspot

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.

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 be 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. Free Charge ID Tag is the tag used to OCPP authorization when Free Charge 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

07.2

Mains

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



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.



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.



If DLB has been activated but the station is not balancing charging power correctly, please ensure that the Charging Network section has been activated in the configuration panel and that the Lumina charger is communicating with at least one other station. Failure to perform these actions will result in appropriate messages appearing on the Dashboard.



Notification indicating the deactivated Charging Network section.



Notification indicating the charger connection not configured in the charger chain.

07.4 Authorization

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



Authorization section in 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 Free Charge 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 Free Charge 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.

07.5 Accessories

The **Accessories** section in the Charger tab allows for managing accessories supported by the station, which include: a 230 V relay socket, RCM B, and an external energy meter (MID).

The 230 V relay socket can be turned on or off, and you can also set a delay for the socket's shutdown to a specified time.

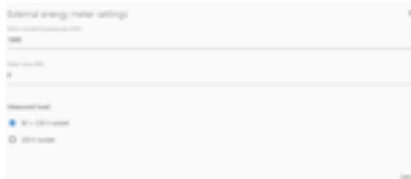
If an RCM B module is installed in the charger, it can be enabled using the switch on the right side. Here, you can also check the RCM B status.

To use an external energy meter, it needs to be activated. In cases where a different constant value than the default for the meter is used or a change in the displayed value of the meter is needed, it can be configured in the settings by clicking the Edit icon.

In the 'Meter Value' section, you should set the current value of the meter, and in the 'Meter constance' section, the number of rotations of the energy meter per kilowatt-hour.



Accessories section under the Charger tab.



External electric energy meter settings.

The **230 V socket** can be metered using a **single-phase external pulse counter**. To do this, in the 'External energy meter' tab, select the '230 V socket' option and connect the power supply according to the installation instructions.



The load on the 230 V socket is not included in the DLB charger load. The 230 V socket can be considered as an external load when the Enelion Energy Guard is installed in the network to which the charger is connected.

07.7

Modbus

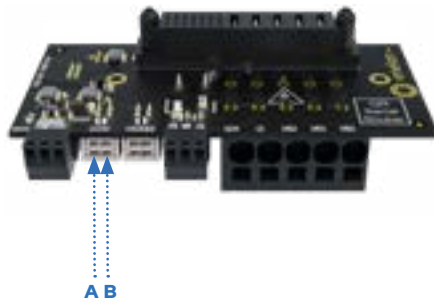
The Enelion ENELION LUMINA charging station features a Modbus communication protocol, configured as a slave device.

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.

Status	
Connection status	Network type
Number of connected stations	1
Name	The server as host
User	0

Overview section of the Charging network tab.

08.2

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 the 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.

Energy Guard

Serial number	4803-0308
Network type	DLB
Maximal current all 1	102 A
Maximal current all 2	168 A
Maximal current all 3	102 A
Maximal power	48 kW 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

	01	02	03
Total current available for charging	168 A	168 A	168 A
Total current available for charging	168 A	168 A	168 A
Current available per charger	102 A	102 A	102 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 in the following manner: the charging station that has transferred the most energy to a vehicle since it last left the charging queue (indicated by the 'Recent energy transferred' field) is moved to the queue, and the charging begins with the station that has been waiting in the queue the longest.

In the queue, we can see the serial number of the waiting station and its waiting time.

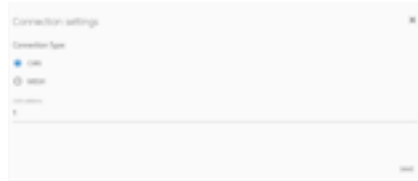
08.3 Configuration

In the charging network settings, you can choose the type of connection for ENELION LUMINA chargers in the network. You can choose between a wireless Mesh connection or a wired CAN connection. To make your selection, click on the Edit icon and choose the appropriate type of connection. It's not possible to connect the chargers simultaneously using both CAN and Wi-Fi mesh.



Connection selection in the configuration panel.

If the devices are connected via CAN, each of them must have its unique network number ranging from 1 to 99. The method of connecting the chargers using cables is described in the installation manual.



CAN connection configuration.

The second option you can choose is a connection via a wireless network. Below is the configuration window. All chargers in the network must use the same ID and password for the Mesh network. It's important to note that there can be only one main 'root' device in the network. To change the settings of the wireless Mesh network, click on the Edit icon and enter the preferred values in the fields. Finally, click Save and wait for the devices to connect to each other. The network topology is presented in the **Overview** section.



Mesh connection settings section.

09

System

The **System section** allows for managing the ENELION LUMINA 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. ENELION LUMINA will start the update process, and the configuration panel will count down for about 3 minutes and then restart with the new software version.

In the **Update section**, there is also an option to update the system using the OTA (Over the air update) function. Information about an available update will appear on the dashboard and in the system update tab.



Update section of the System tab.

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



An example of update details

ENELION LUMINA 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.



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 ENELION LUMINA 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 ENELION LUMINA and synchronize it with the time of the device from which you access the configuration panel.



Reboot section of the System tab.

[Configuration panel](#)

09.5 Logs

The list of events that occurred in the ENELION LUMINA 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 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 ENELION LUMINA, will help the Enelion technical support diagnose their causes.

09.6

Reboot

The **Reboot** button allows you to restart the ENELION LUMINA. After two minutes, the configuration panel will display the **Dashboard section**.



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°C to $+55^{\circ}\text{C}$. 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 -30°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.



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

The inspection is not obligatory. Mechanical elements such as the socket, charging cable, plug lock, plug, plug holder, and other fixed components only require a superficial examination. They are not expected to wear out or need replacement during the operational period of the station. During the inspection, it is important to pay attention to potential corrosion hotspots, signs of water presence, precipitated salts, or other phenomena that could indicate a deterioration in the condition of the station. If any damage to components like the socket, charging cable, plug, plug holder, or any other fixed component is observed, this should be reported to the charging station operator.

02 Technical tests

The manufacturer recommends performing an inspection of the device once every 12 months for safety and maintenance reasons.

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.

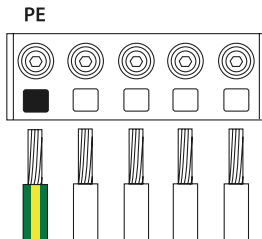
Below are some recommendations for the performance of the most important tests.

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.



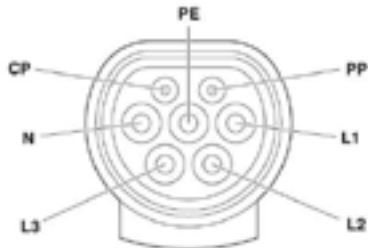
At this point, a ground resistance measurement should be made.

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 over current 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 k Ω and the phase-neutral resistance values to approximately 750 k Ω . 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 M Ω . Measurements should be made between the leads as specified in the attached table.

Resistance in [M Ω]

L1- L2	L1- L3	L2- L3	L1- N	L2- N	L3- N	L1- PE/ PEN	L2- PE/ PEN	L3- PE/ PEN	NPE
-----------	-----------	-----------	----------	----------	----------	-------------------	-------------------	-------------------	-----

[M Ω]

Testing resistance of the charging station insulation

03.2

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 M Ω , the typical resistance value exceeds even 100 M Ω .

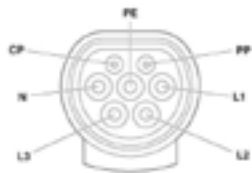
Minimum allowable resistance value = 1M Ω
Measurement combinations

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 k Ω), significantly affect the results of insulation resistance measurements (results below 80 k Ω) depending on the polarization. For this reason, this adapter and other adapters that have voltage indicators, which may affect the

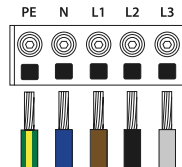
measured resistance value, should not be used for insulation measurements. It is permissible to use adapters that do not contain additional circuits, being adapters for the measurement system. Otherwise, the measurement should be carried out directly on the contacts of the socket/plug of the station, observing appropriate safety rules.



Measurement of the effectiveness of protection against electric shock

04

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:

$$Z_s \cdot I_a \leq U_0 \text{ for } t \leq 0,4s$$

Z_s – 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 (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 RCM B 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 RCM B, meets the safety requirements presented in the above standard. Special attention should be paid to the names of the devices: the
- 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 RCM B 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:

$$\text{RCD A} = 0,35 / \Delta n \leq I \Delta r \leq 4 / \Delta n,$$

$$\text{RCD B} = 0,5 / \Delta n \leq I \Delta r \leq 2 / \Delta n,$$

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 RCD A differential current:

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

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

$2I \Delta n$	$4I \Delta n$	$10 \Delta n$	$I \Delta n \geq 5A$
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 RCM B Tests

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

Measurement of the actual sensitivity of RCM B:

$$RCM B = 0,5I\Delta n \leq I\Delta r \leq 2I\Delta n,$$

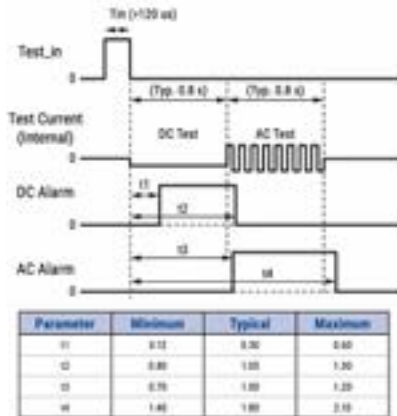
Where: $I\Delta n = 6mA$ - nominal sensitivity of the device

Measurement of the operating time of the device:

The built-in RCM B 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.



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 Free Charge.

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.

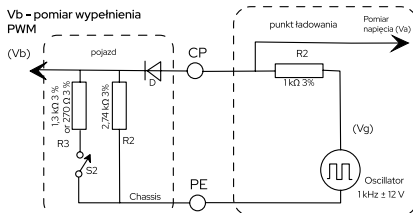
Below is a table indicating the permissible cable capacity expressed in [A] for a given resistance Rc.

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: RCM B 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.

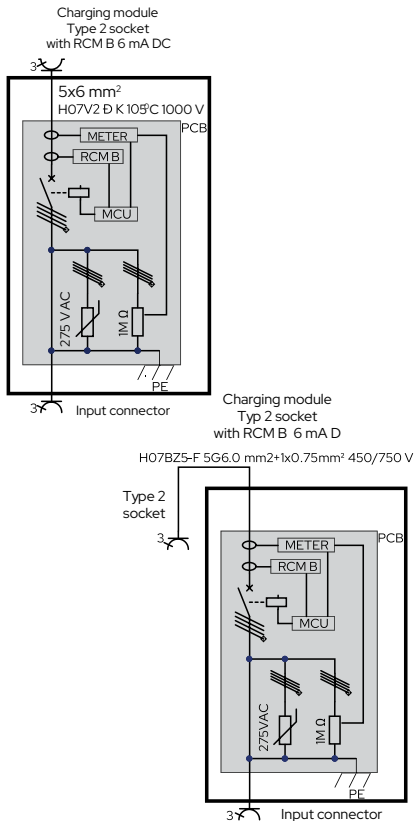
07 Servicing the charging station

The main component of the ENELION LUMINA charging station – the head unit – is not subject to service repairs. Fault rectification involves replacing the head unit. There is no possibility to replace the socket or charging cable.

The manufacturer allows for the repair of public, universally accessible charging stations without the need for re-inspections by the Office of Technical Inspection (UDT), provided the charger's parameters remain unchanged.

The manufacturer permits modular repairs, i.e., the replacement of the entire module or device instead of repairing individual components.

Here are schematic diagrams of charging modules for reference:



06

Instructions for replacing the 230 V socket fuse in ENELION LUMINA

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

Additional 230 V 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.



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.

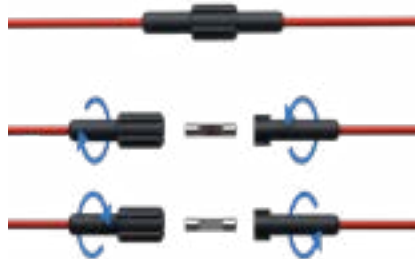


Turn off charger before replacing the fuse.



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 250 V 10 A Medium Acting)

Technical description

Charging Station/General Access Charging Station

Charging point, an element of public road transport infrastructure

Housing	Polycarbonate, Anodized aluminum, Powder coating*
Ingress protection rate	IP54
Impact protection	IK10
Flammability class	UL94-V0
Charging connector type	ENELION LUMINA ALU CABLE – Type 2 connector with 5.2 m cord ENELION LUMINA ALU SOCKET – Type 2 socket ENELION LUMINA SOCKET – Type 2 socket
Residual current protection	Embedded residual current monitor – Enelion RCM B 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 Ethernet (10/100Base-T, IEEE 802.3)*
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/ Free 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 ($\pm 10\%$) (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 230 V 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



THIS DOCUMENT CONTAINS INFORMATION THAT IS SUBJECT TO CHANGE WITHOUT NOTICE.

© 2024 ENELION

Miarki Szlak 52 , 80-717 Gdańsk, Poland

Copyright, Enelion sp. z o. o.

The manual may change as the product develops.
All rights reserved.

Revision: V 8.2

Number of pages: 48

Released: April 18, 2024



enelion

Enelion sp. z o.o. | Miałki Szlak 52
80-717 | Gdańsk | Poland

sales@enelion.com

enelion.com

