ELNexus7kW Series

Type EVNET - 7KW-S/T2-1PH: 32A

Table of Contents

1. Overview

List of abbreviations:

EV: Electric Vehicle
PHEV: Plug-in Hybrid Electric Vehicle
EVSE: Electric Vehicle Supply Equipment
OCPP: Open Charge Point Protocol, a control protocol used for communication between chargers and servers
AC: in reference to Alternating Current
DC: in reference to Direct Current
PE: Protective Earth
Tethered: in reference to an EVSE with an integral charging cable of fixed length
Socketed: in reference to an EVSE possessing a socket that accepts Mode 3 charging cables
RCD (AC/DC): Residual Current Device, a safety device, designed to interrupt power in the event that a fault leakage current to ground occurs
CB/MCB: in reference to Circuit Breaker or Main Circuit Breaker
CT (also CT clamp): Current Transformer, an electrical device for non-contact measurement of current in a conductor

1.1. Product description and features

1.1.1. Description

The EVNET-7KW-S/T2-1P:32A, EVNET for short, is a single-phase electric vehicle charging station, available in socketed and tethered models. With a compact design, advanced smart charging and safety features, and a maximum current of 32A (7.4 kW supplied power), the EVNET is ideally suited for home and public charging of EVs and PHEVs. This smart charger supports remote monitoring and configuration via a mobile app, which allows the user to control how and when their vehicle is being charged.

1.1.2. What’s in the box?

The EVNET comes packaged in a carton containing the main charger unit, access RFID card, and neoprene screw cover pads (x4). The tethered model is packaged with a 5-meter charging cord with a Type 2 connector and an appropriate cable gland for mounting to the main body.

1.1.2.1. Illustrated Dimensions

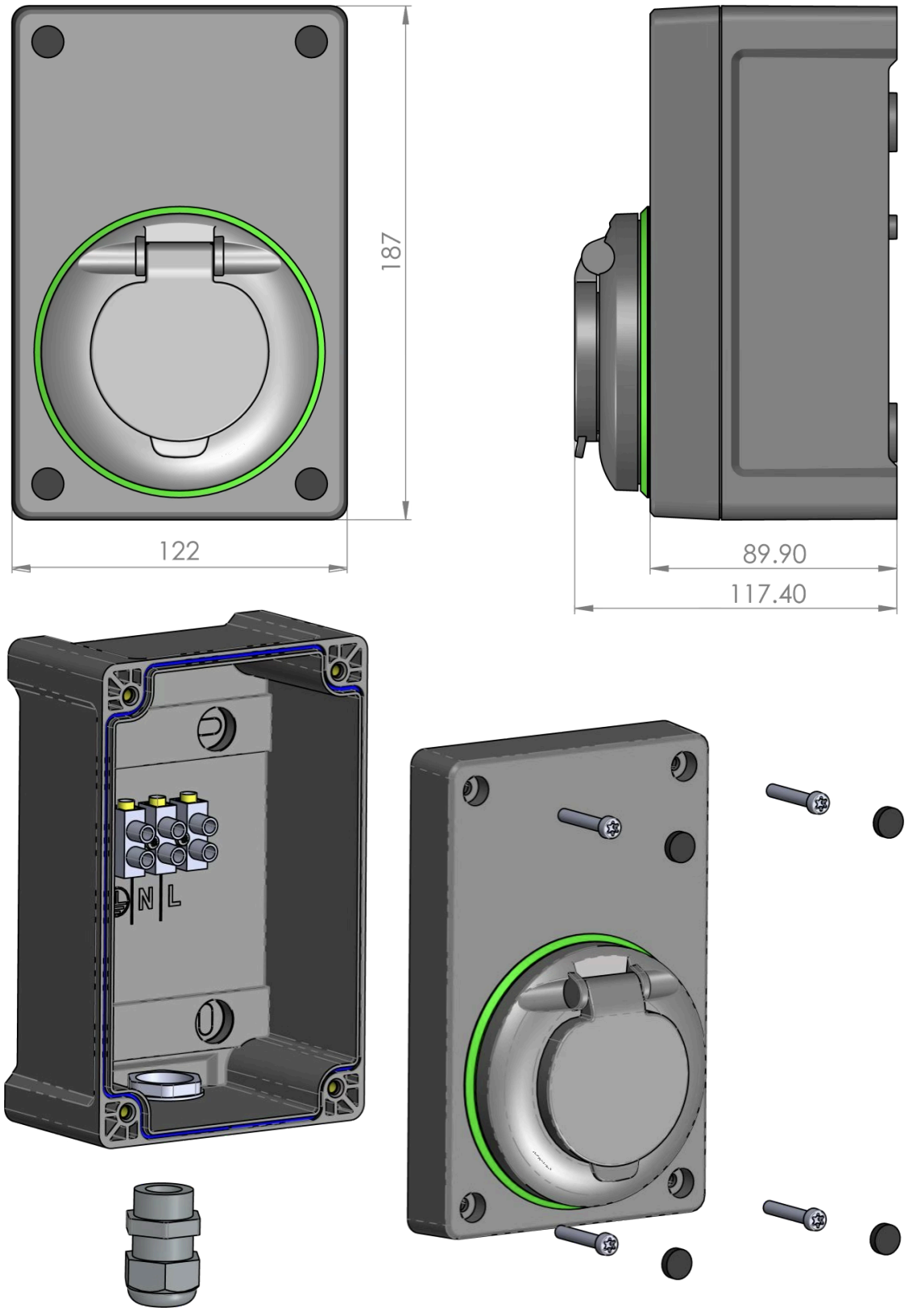


Fig 1 *Dimensions and disassembled view of socketed EVNET (ELNexus 7 kW Series)*

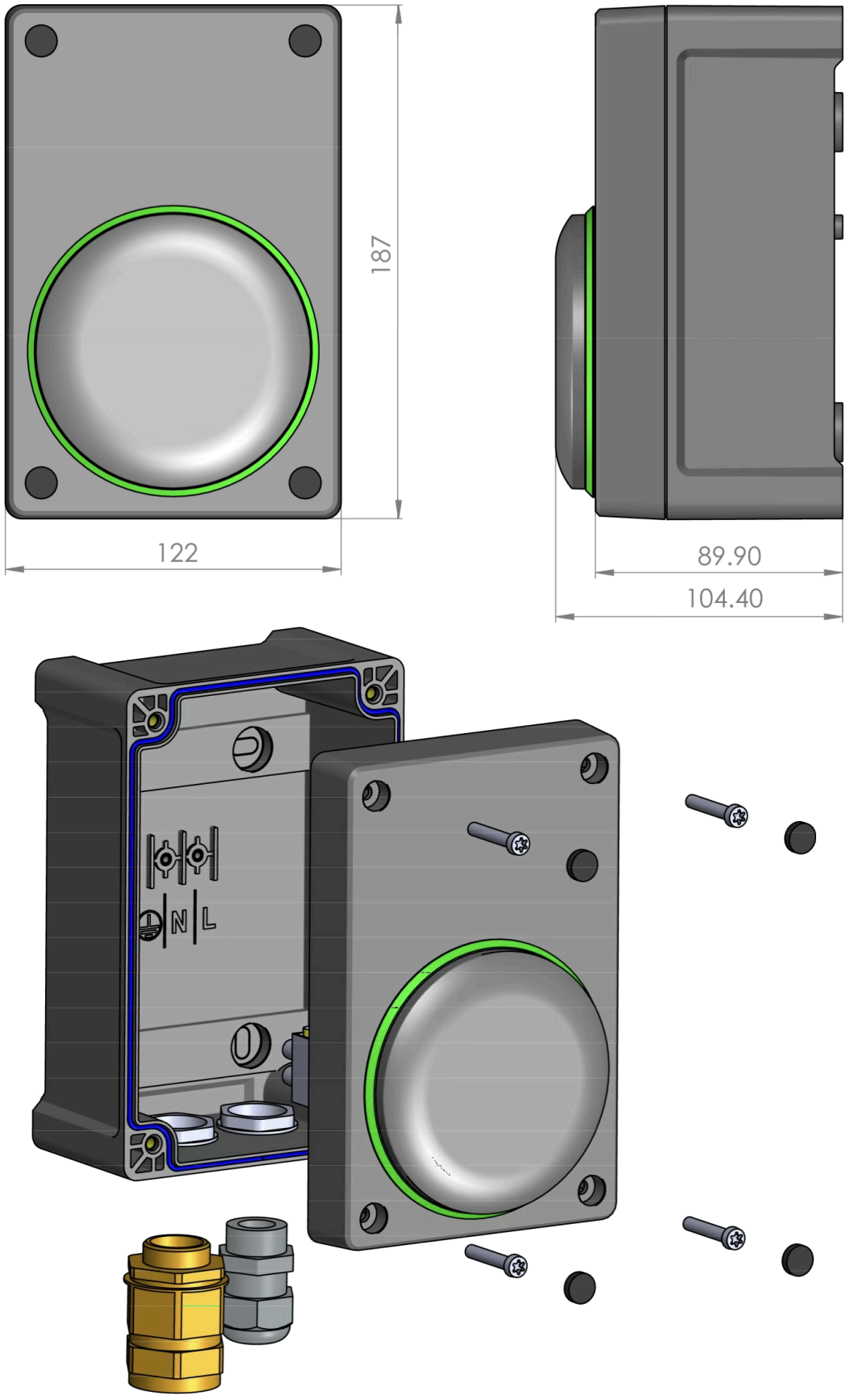


***Fig 2** Dimensions and disassembled view of tethered EVNET (ELNexus 7 kW Series)*

1.2. Features

Smart and efficient charging

The EVNET belongs to a class of EVSE called smart chargers, because its entire functionality can be controlled remotely and automatically. This is enabled by the OCPP 1.6J protocol support embedded in the charger. This is a universally accepted control protocol for charging stations, meaning that any OCPP-based server can talk to, control, and remotely update the EVNET, independent of service provider and other factors.

The main benefits of smart charging are the ease of use and flexibility it offers, because it enables the user to control the time, duration, and amount of charging that is delivered to their EVs. In locations where electricity rates are variable throughout the day, this translates into substantial energy bills savings, as the charger can be configured to take advantage of lower energy prices during off-peak periods. Additionally, the EVNET has been designed to function with home solar installations. Thus, it can be set to provide charging only when excess energy is being generated, providing a very efficient utilization of energy resources. Smart charging also enables multiple chargers in a location to communicate with each other, and best utilize the available power to optimally charge several EVs.

The EVNET requires an internet connection to execute its smart functions. It can be configured to support a primary and secondary network interface. For example, it can maintain a wireless network connection, but fall back to GSM or wired Ethernet in case of poor connectivity or router failure. If no network connection can be established, the EVNET is capable of operating in a configurable “offline plug-in charge” mode, whereby it works as a simple EVSE, providing the maximum permissible charging power when an EV is connected.

Access control

As the EVNET is intended for both residential and public applications, it has a number of access control functionalities, such as RFID (“smart card”) authorization, mobile app authorization, and full control by the OCPP server backend. Thus, a user can configure the access to their charger(s) from basic unrestricted to higher levels of control, based on their application.

Rugged compact design

The EVNET is designed to have a small footprint and to be easily installed in various locations, both indoors and outdoors. Despite its miniature size, it is a fully-fledged single-phase charger and can deliver the maximum permissible power. Models are available as either socket- or tethered-type, giving clients flexibility in designing their EV charging experience.

Built with safety and security in mind

The EVNET is designed with multiple safety interlocks in order to prevent the hazards associated with high-current, high-power devices, such as electrical shocks, fires, and equipment damage. It monitors the state of the electrical network, and using a CT clamp, can monitor total installation consumption. The EVNET has a built-in AC/DC RCD, and will prevent leakage currents from causing damage to people and devices.
Additionally, EVNET socketed chargers feature an electromechanical lock, which secures the Type 2 connector while the socket is energized and prevents the plug from being accidentally disconnected under power. A tamper sensor, embedded in the device, is used to detect unauthorized disassembly.

The charger utilizes both sound and light signaling to report its state and possible faults, enabling the quick and safe detection of problems.

1.3. Device specifications

Model	EVNET-7KW-S-1PH: 32A	EVNET-7KW-T2-1PH: 32A
Power	7360 W	
Nominal voltage V_n **Working voltage range** **Power consumption (max.)**	230 VAC, 1-phase ± 20 % deviation from V_n 5.2 W, 8.2 VA	
Maximum charging current I_{max}	32A	
Protection features	• RCD Type A + DC sense (6mA) • Neutral voltage (70 V_{rms}) • Overcurrent (Overcurrent protection trip when I_L> 1.2 x I_{max}) • Temperature (limiting 72°C -78°C, fault at 79°C) • Undervoltage (shutdown at 115V_{rms}±10 V_{rms}) • Overvoltage(shutdown at 300V_{rms}±10 V_{rms}) • • Reverse phase or phase-to-phase: the hardware can safely handle mains misconnection • Tamper sensor: the hardware can detect unauthorized opening of the charger body	
LED Indication	• RGB LED light ring around the type II connector or tethered cap	
Vehicle connection	Tethered cord, terminated by EV plug Type II (5m length)	Type II EU Socket with cover and electromechanical actuator lock
Backend Connectivity	**WLAN:** 802.11 b/g/n/e/i (2.4GHz) **Ethernet:** via internal RJ45 port **GSM:** 2G (optional: 3G, LTE CAT M1, CAT NB1)	
Backend protocol and smart charging capabilities	OCPP 1.6J - Power profiles supported:Default, TxProfile, MaxProfile	
Auxiliary connectivity	**Bluetooth (BLE 4.0)**: for configuration and diagnostics only	
Wireless capabilities	**Access Point:** integrated web server for settings and diagnostics (web client)	
	Station: for backend connectivity	
	Note: Supports simultaneous Access point and Station functionality	
RFID	NFC ("smart card") protocol	
Earth disconnection (PEN conductor)	Neutral-to-Earth fault: V_{N-PE}> 70V_{rms} Line to Neutral 207V up to 253V	
Measurements	RMS Voltage, RMS current, Active power, Active energy	
Dimensions (HxWxD)	187 x 122 x 118 mm 7.4 x 4.8 x 4.6 in	
Weight	0.9 kg / 2 lb (without cord)	
IP Rating	IP54	

Temperature	Operational Limiting Range: -40°C - +70°C
	Transportation Limiting Range: -40°C - +85°C
	Storage Limiting Range: -40°C - +85°C
Humidity	Annual: <95% non-condensing
Mechanical Class	M1
Electromagnetic Class	E2
Environmental Class	3K7

1.3.1. EMI compliance and other standards

The EVNET is compliant to the following standards and directives:

- **General:**IEC 61851-1:2017 Part 1, BS 7671:2018, **RCD:** IEC/EN 61008-1
- **EMC:** IEC 61851-21-2:2018 Part 21-2 (Emissions Class B, Immunity – Residential Environments); Class B for EN 55032:2015, EN 61000-3-2: 2014, EN 61000-3-3: 2013, EN 61000-4-2: 2009, EN 61000- 4-4: 2004, EN 61000-4-5:2014;EN 61000-4-8: 2009, EN 61000-4-11: 2004
- **Radio equipment:** Radio Equipment Directive 2014/53/EU, EN 62311:2008; **GSM module** - EN 60950-1:2006 &A11:2009&A1:2010&A12:2011&A2:2013 , ETSI EN 301 489-1 V2.2.0, EN 301 511V12.5.1 (2017-03); **WiFi module** - EN 301 489-1 V2.2.0 (2017-03), EN 301 489-17 V3.2.0 (2017-03), EN60950-1: 2006 & A11: 2009 & A1: 2010 & A12: 2011 & A2: 2013, EN 300 328 V2.1.1 (2016-11)

2. User Manual

2.1. Using the charger and the app

After the EVNET charger has been correctly installed and set up, it can be controlled via the ELNexus mobile app. Setting up the app is outlined in the following steps and images:

1. Install and open the ELNexus app on your mobile device.

2. If you have an ELNexus registration, enter your credentials to log into the app. Else, click on “Sign Up” and follow the instructions to create an account. You can later fill in and edit your profile information from within the app **(1,2).**

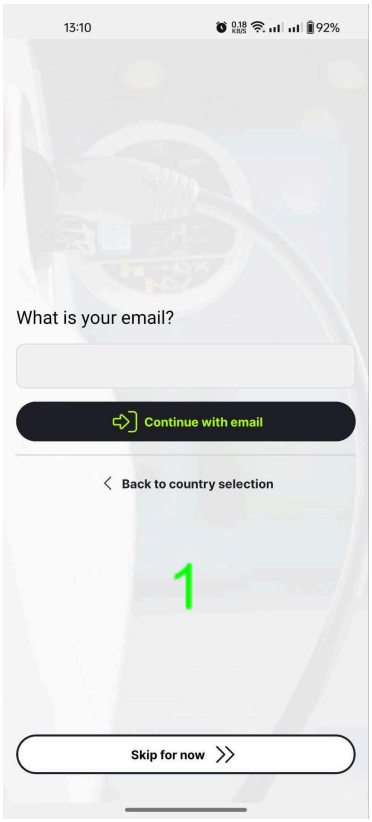
3. In the app, locate the “Home Charging” option in the lower left corner. If this is your first EVNET, a setup screen will follow. To connect your new EVNET to the app, you will need its ID, either as a QR code, or as a text string, and the designated PIN number. Follow the on-screen instructions to add the station to your account **(3,4).**

4. On the home charging main screen, your newly installed EVNET will appear, along with information about its status and any active charging sessions **(5).**

5. You will be able to configure the EVNET from the configuration tab in the upper right corner.

6. The “Configuration” screen contains 8 submenus **(6)**:

a. Name: you can change the name of the station as it appears on the app
b. Location: you can set the accurate location of the EVNET on the map
c. Photo: you can add a custom photo of your newly installed EVNET to appear on the main page
d. SMART Charging **(7)**: enables configuration of smart charging features. Follow the on-screen options to choose the type of smart charging option and configure its details.
e. Authentication **(8)**: allows you to configure the type of authentication the charger requires to begin a charging session
f. Power Management **(9)**: you can use power management to set the maximum available current for the charger. The maximum default value is 32A, and it can be set to a lower value in 1A increments.
g. Keep-Awake mode **(10)**: To charge an EV with a delay or schedule, the EVNET needs to prevent the EV’s onboard computer from going into an idle state. To keep the EV awake, the EVNET can continuously charge it at relatively low power (6A or 1.4 kW) and increase the power at the right time, known as “Minimum Power Mode”. Alternatively, the EVNET can provide short bursts of power to the EV at regular intervals to prevent it from falling asleep until the scheduled session begins, also known as “Pulse Charge Mode”. Depending on the EV make and model, one or both of the modes will be able to maintain the car in an active state to accept full power charging at predetermined times.
h. LED Ring Brightness: the RGB LED ring on the face of the EVNET can be configured at three brightness levels to provide a suitable level of illumination relative to its environment.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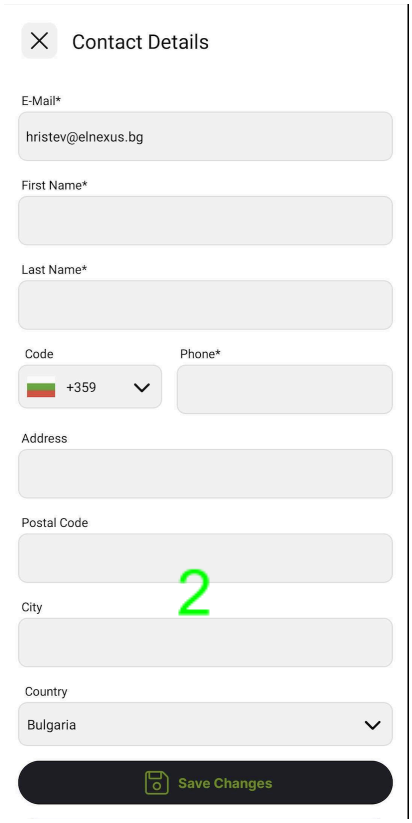
What is your email?
Continue with email
Back to country selection
Skip for now
1


Contact Details
E-Mail*
hristev@elnexus.bg
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Last Name*
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+359
Phone*
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City
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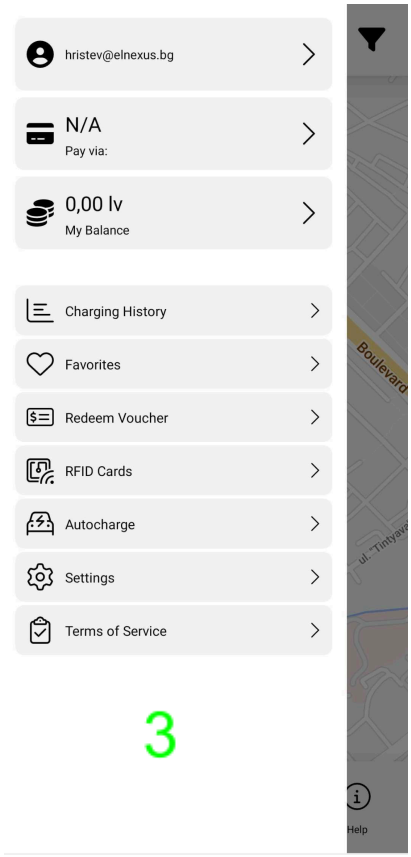
Country
Bulgaria
Save Changes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Terms of Service
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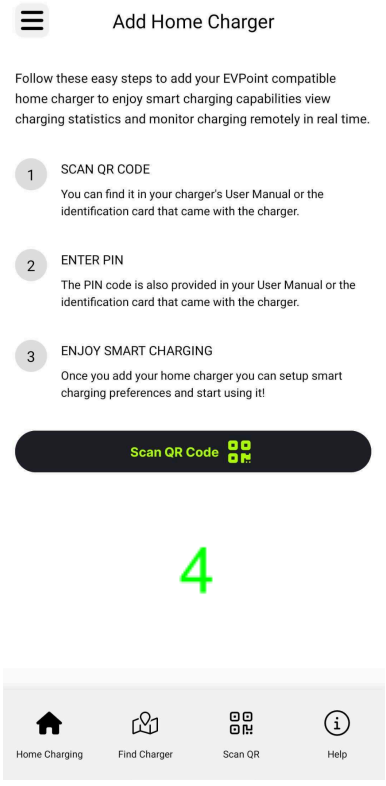
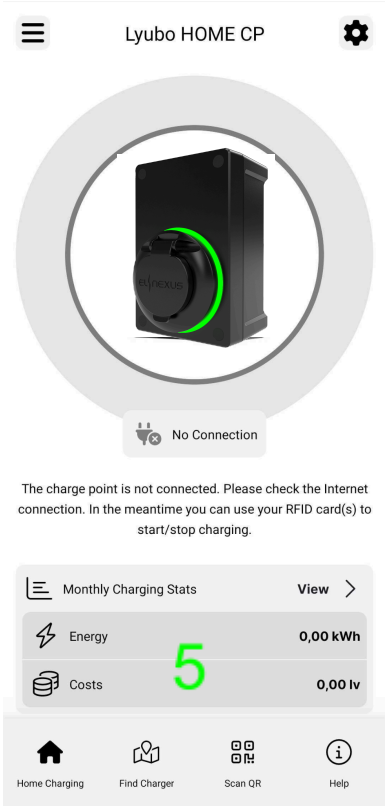

Add Home Charger
Follow these easy steps to add your EVPoint compatible home charger to enjoy smart charging capabilities view charging statistics and monitor charging remotely in real time.
1
SCAN QR CODE
You can find it in your charger's User Manual or the identification card that came with the charger.
2
ENTER PIN
The PIN code is also provided in your User Manual or the identification card that came with the charger.
3
ENJOY SMART CHARGING
Once you add your home charger you can setup smart charging preferences and start using it!
Scan QR Code
4
Home Charging
Find Charger
Scan QR
Help


Lyubo HOME CP
No Connection
The charge point is not connected. Please check the Internet connection. In the meantime you can use your RFID card(s) to start/stop charging.
Monthly Charging Stats
View
Energy
0,00 kWh
Costs
0,00 lv
5
Home Charging
Find Charger
Scan QR
Help

2.2. Offline use

The EVNET requires an internet connection to communicate with the mobile app server. However, it remains functional in the event of a network outage, based on the way it has been configured.

In offline mode, the EVNET can be configured to provide basic charging (see Installation Guide, Section 2.5.1). It will then operate as a plug-in charger, offering the maximum allowable charge current to the EV/PHEV once the vehicle has been connected.

2.3. RFID/NFC authorization

The EVNET is supplied with an RFID "smart" card or tag, which has been preconfigured for charging authorization. To enable a charging session with the smart card, connect a vehicle to the station and bring the card in proximity to the RFID logo on the station's front side. If the EVNET detects a valid token, it will indicate with a beep and begin the charging session. This functionality is available both for online and offline use.

Nowadays, many mobile devices on the market feature NFC technology and can be configured to act as authorization tokens for the EVNET, whereby they replace the need to carry and additional physical object to permit a charging session.

The charger can be configured to work with one or more authorization tokens by accessing its web client (see Installation Guide, Section 2.5.1).

2.4. RFID/NFC authorization

Socketed EVNET chargers are equipped with an electromechanical actuator lock, which is designed to secure the Type 2 cord to the charger socket and prevent accidental disconnection under power, which may result in arcing and malfunction. In the event of a power outage during an active session, the device is capable of immediately unlocking the plug, so that the charging cable can be easily removed. Occasionally, the actuator may be unable to lock or unlock the charging cable if it is not plugged-in completely, if there is a strain on the cord, or if mechanical debris is blocking the actuator pin. The charger will make five attempts to lock or unlock the actuator, and if it unable to, will enter a fault state. If the user encounters a reluctant plug, it is advisable to check if the connector is fully inserted and that it is not experiencing excessive strain or pulling force.

2.5. Maintenance and cleaning

The EVNET is designed to be maintenance-free during its lifetime. It is not intended to be repaired or serviced by the end user and any defects or issues should be addressed to the installer and manufacturer technicians.

The EVNET should be regularly cleaned with a dry or damp cloth by wiping the surfaces. Do not use soaps or solvents, such as petroleum or methylated spirits, acetone, etc, to clean the surfaces, because they can damage the surface finish and compromise the structural integrity of the device.

Do not use pressure or steam washers to clean the EVNET, as it is not designed to withstand high-pressure water jets, which could result in water ingress and internal damage or short circuits.

3. Appendix I: Error state description with error codes and light indication explained

EVNET RGB Light Ring Status Indicators					
Status	**Online Illumination**		**Offline Illumination**		**Description**
Available					Device is available to start a charging session. In the online state, it is connected to the OCPP backend. Offline, it may be set up as Plug-in Charge”
Preparing					The charger is preparing to start a charging session. Occurs when an EV is plugged in and the charger is waiting for authorization to being charging.
Charging					The EVNET is charging the EV as per app settings.
SuspendedEV					The EV has caused the EVNET to stop the charging session.
SuspendedEVSE					The EVNET has stopped the charging session.
Finishing					The EVNET is preparing to terminate the charging session.
Unavailable					The charger is not available. This may have been set by the OCPP backend for diagnostic or service purposes.
Faulted					The EVNET has encountered a problem and is in a fault state. More information can be accessed via the web client (see 2.5.1).
Note: The two adjacent patches indicate whether the status lights are constantly lit (identical colors) or blinking - switching between the two different colors					

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National Phone: +359 898 901 903

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