Green Motion DC Air 44/66 Installation manual

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Powering Business Worldwide

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Content overview

1. Introduction

Thank you for installing the Green Motion DC Air 44/66 EV charger.

Before you start

This manual contains important instructions that must be followed during installation, operation and maintenance of the Eaton Green Motion Air 44/66 electric aircraft charger. All instructions must be read before installing and operating the equipment. This manual should be retained for future reference. Please note that the Green Motion Air 44/66 electric aircraft charger must only be installed by professional and qualified personnel, i.e. an Eaton technical support representative or a professional installer. There are no user serviceable parts inside the Green Motion Air 44/66 electric aircraft charger. Failure to observe the above will void the guarantee provided and Eaton cannot be held legally accountable.

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Technical disclaimer

All drawings, descriptions and illustrations contained in this document serve to provide a clear overview and/or technical explanation of the present product and its various components and accessories. In line with our goal to continuously improve the products and the customer service we provide, all specifications contained in this document are subject to change without notice.

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1.1 Field of applications

This installation manual is intended for professional and qualified personnel. It describes how to securely install and commission the Eaton Green Motion DC 44, Eaton Green Motion DC 66, and Eaton Green Motion Air EV chargers:

Eaton Green Motion DC Air 44/66 EV charger overview

Power input	Green Motion DC 44	Green Motion DC 66
Input voltage AC	3 x 400 V, 50 Hz	
Maximum input current AC	3 x 64 A (44 kW)	3 x 96 A (66 kW)
Power factor	> 0.99	
Power supply system	3 Phase	
Earthing system	TN, TT	
Power output		
Output power[1]	up to 44 kW	up to 66 kW
Output voltage	50 V - 500 V	
Maximum output current	110 A	165 A
Output type	CCS2 or CHAdeMO	
Efficiency	≤ 96%	
User interface and control		
Network interface	3G/4G Ethernet (RJ45) cable	
Software licenses	Eaton Scan & Charge Eaton Charging network manager	
Energy metering (DC output)		
MID	Yes	
LNE	Yes	
Warranty		
Warranty	2 years	

[1] The actual power output may vary due to external factors, such as the available grid power, capacity of the electrical installations, and the electric vehicle.

1.2 Symbols used in this manual

1.2.1 Related icons

Imminent dangers causing serious injuries. Danger of death.

Hazardous behaviors that could cause serious injuries.
Hazardous behaviors that could cause death.

Behaviors that could cause minor injuries to people or minor damages to things.

An electric shock can be fatal.
Avoid touching internal or external parts normally live while the system is powered on.

Read the instructions. These instructions are intended for professional installers. Professional and qualified personnel must be an expert in the field and is therefore responsible for commissioning the system in accordance with the manufacturer's instructions and local legislation.

The notes preceded by this symbol relate to technical issues and ease of operation.

The EU Directive on Waste Electrical and Electronic Equipment (WEEE).

1.3 Conventions used in this document

This manual adopts the following type conventions and acronyms to refer to Green Motion DC Air 44/66 EV charger or its parts:

Unless specified otherwise, all mentions of EV (electric vehicle), EV charger, or EV charging include electric aircrafts and the Green Motion Air charger, respectively.

ALL CAPITALS highlight critical points that require careful attention.

All abbreviations used in this document are listed in Table 1.

Table 1. Glossary

Abbreviation	Description
AC	Alternating current
CAN	Controller Area Network
CCS	Combined Charging System
CHAdeMO	CHArge de MOve
DC	Direct current
DCBM	Direct current billing meter
EMC	Electromagnetic compatibility
EMI	Electromagnetic interference
FW	Firmware
HW	Hardware
IEC	International Electrotechnical Commission
IP	Internet Protocol
LAN	Local area network
LCD	Liquid crystal display
N	Neutral
OV	Overvoltage
PE	Protective earth
PPE	Personal protective equipment
RCD	Residual current device
SW	Software
UI	User interface
WEEE	Waste electrical and electronic equipment
EV	Electric vehicle, including electric aircraft
CU	Control unit
DHCP	Dynamic Host Configuration Protocol
NAT	Network address translation
TCP	Transmission Control Protocol
PAT	Port address translation
SIM card	Subscriber identity module card

2. Cautions

These instructions are intended for professional and qualified personnel.

Before carrying out any operations, ensure you have read and understood this manual. Do not make changes and do not carry out maintenance operations not described in this manual. The manufacturer does not accept responsibility for injuries to people and property damages if the information within this manual has not been read and followed.

The operations described here must be carried out only by professional and qualified personnel.

The customer is civilly liable for the qualification and mental or physical state of the professionals who operate this equipment. They must always use the personal protective equipment required by the laws of the country of destination and anything else provided by their employer.

It is strictly prohibited to open the unit except as described in this manual. The installation of the equipment must be carried out by professional and qualified personnel. They must not be under the influence of alcohol or drugs, or have prosthetic heart valves or pacemakers.

For any doubts or problems regarding the use of the system, even if not described here, please contact your Eaton sales representative via: bgtechsupport@eaton.com

The unit must not be subjected to any type of modification. Eaton declines any responsibility if the rules for correct installation are not respected, and it is not responsible for the system upstream or downstream of the equipment it supplies.

The omission of protective devices is extremely dangerous and relieves the manufacturer of any responsibility for damage caused to people and property.

A first aid kit must be provided near the installation site so that it is readily available in case of emergency.

2.1 Operating environment and restrictions

Each system must be used exclusively for the operations it was designed for and within the operative ranges specified in the nameplate and/or in the relative technical datasheet, in accordance with the national and international safety standards.

Any use different from the intended use specified by the manufacturer is to be considered inappropriate and dangerous, and in this case the manufacturer declines all responsibility.

Check the regulations applied by the electricity provider.

The unit shall be connected to the distribution network in accordance with local rules.

The unit shall comply with all the technical specifications.

Improper or unauthorized use:

Although carefully constructed, like all electrical appliances the unit can catch fire.

The unit is intended for indoor or outdoor installation.

Recommended operating temperature range of the unit is -25 °C to +45 °C.

The unit must be transported and stored in indoor locations in the temperature range -25 °C to +45 °C.

The unit must be used in locations free from acids, gases or other corrosive substances.

The unit must be used and stored in locations with relative humidity below 95%.

The unit must be transported in conditions with relative humidity below 95%.

The unit must be used at an altitude not exceeding 2000 m above sea level.

2.2 Suggested protections during the installation

The equipment was built according to the highest safety standards and equipped with safety devices designed to protect operators and components.

For obvious reasons, the manufacturer cannot anticipate all potential types of installations and locations where the equipment will be installed; the customer must therefore clearly inform the manufacturer of specific conditions at the installation site. Eaton declines any responsibility if the unit is incorrectly installed.

The operators must be correctly instructed. The operators must therefore read and follow the technical instructions contained in the manual and in the enclosed documentation.

The instructions provided in this manual do not replace the safety regulations of the installation and operational technical data printed on the products, nor do they replace the current safety standards enforced in the country where the equipment is installed, and the rules dictated by common sense.

The manufacturer can provide theoretical or practical training to operators, either on their site or on the customer's premises, as specified at the time of drawing up the contract.

The equipment must not be used if any operational fault is identified.

Temporary repairs should be avoided; repair work must be carried out only with genuine spare parts, which must be installed according to the intended use.

The responsibilities deriving from the commercial components are delegated to the respective manufacturers.

Avoid touching the equipment housing during operation. The equipment housing could overheat during operation and cause burns on contact. The equipment may remain hot even after it is switched off.

In the event of fire, CO_2 foam extinguishers must be used, and self-vacuum systems must be used to put out fires in enclosed spaces.

If the noise level exceeds legal limits, the working area must be restricted, and anyone who has access to the area must wear ear defenders or ear plugs.

During the installation process, special attention must be paid to fixing the equipment and its components. At this stage, restricting or preventing access to the installation area is recommended.

Professional and qualified personnel are recommended to wear clothing and personal protective equipment (PPE) provided by their employer. Operators must not wear clothes or accessories that could start fires or produce static electricity, or any item of clothing that could affect personal safety. When carrying out any operation on the equipment, clothes and instruments must be suitably insulated.

Professional and qualified personnel must NOT access the equipment with bare feet or wet hands.

The maintenance engineer must always ensure that nobody else is able to reset or operate the equipment during maintenance and must report any fault or deterioration caused by wear or by aging, in order to restore the correct safety conditions.

The professional and qualified personnel must always pay attention to the working environment to ensure it is well lit and has a suitable escape route.

A first aid kit must be provided near the installation site so that it is readily available in case of emergency.

2.3 Protection from electric shock

An electric shock can be fatal.
Avoid touching internal or external parts normally live while the system is powered on.

Cables and connections must always be secured, in good condition, insulated and suitably sized.

2.4 Electromagnetic fields and interference

Electromagnetic fields may have harmful effects (unknown to date) on the health of people who are subjected to long exposure. Avoid standing less than 20 cm from the equipment for long periods of time.

The professional and qualified personnel must be an expert in the field, and are therefore responsible for commissioning the system in accordance with the manufacturer's instructions and local legislation. If electromagnetic interference is detected, the professional and qualified personnel should contact an Eaton technical support representative using the email address bgtechsupport@eaton.com

Connect the unit's external frame or other conductive parts to ground to ensure system protection and the highest level of safety for the operators.

National standards related to grounding must be complied with.

2.5 Warning decals and rating plate

The labels on the equipment must NOT be removed, damaged, soiled or hidden.

The labels must always be visible and in good condition.

The technical data shown in this manual do not replace those shown on the data plates on the equipment.

2.6 Residual risks

Despite the cautions and safety systems in place, some residual risks will still be present, which cannot be removed. These risks are listed in the following table, along with recommendations to prevent or mitigate them.

Table 2. Residual risks

Risk assessment	Recommended solution
Noise pollution caused by installations in unsuitable environments or where professionals work on a regular basis.	Reassess the installation environment or site.
Unsuitable ventilation in the location, causing equipment to overheat, leading to discomfort for people who are on the site.	Restore adequate ambient conditions and ventilate the site.
Protection from the elements, such as water ingress, low temperatures, high humidity, etc.	Maintain adequate ambient conditions for the equipment.
Surface temperature is high.	Do not obstruct openings on the equipment. Use suitable PPE or wait for the equipment to cool down before accessing it.
Dirt affects the system and prevents the safety labels from being read.	Adequately clean the equipment, the labels and the workplace.
Poor installation.	Request a training course.
During the installation stage, provisionally fixing the equipment or its components can be hazardous.	Take care and restrict access to the installation area.
Accidentally disconnecting the quick connectors while the equipment is operational or making incorrect connections can produce electrical arcs.	Take care and restrict access to the installation area.

3. General description

The following figures show different views of the Green Motion DC Air 44/66 EV charger.

3.1 Front and back views

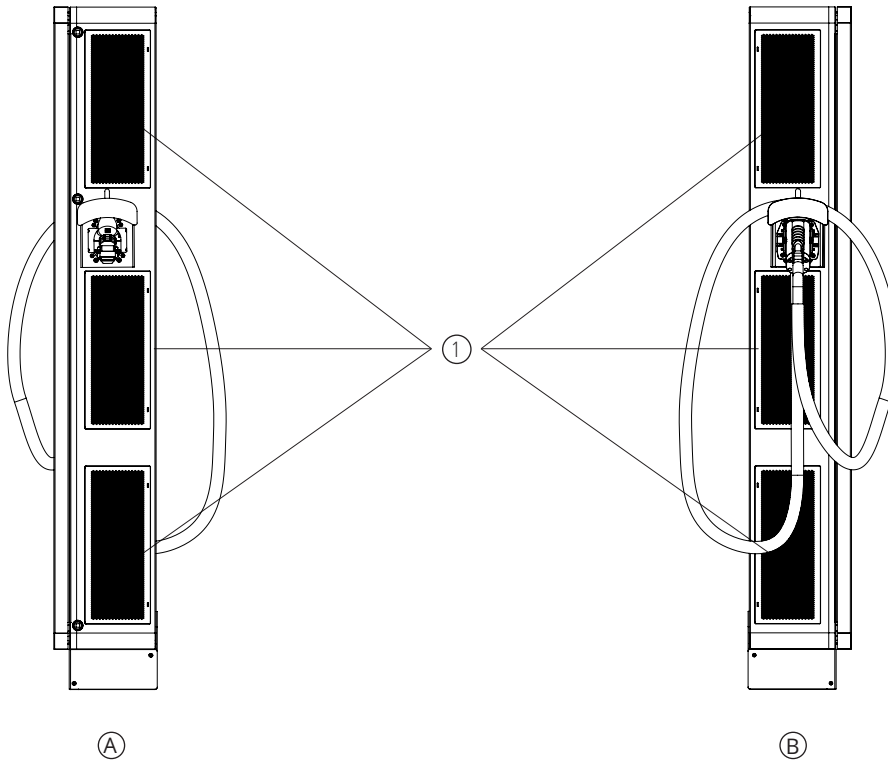**Figure 1. Front and back views of Green Motion DC Air 44/66 EV charger**
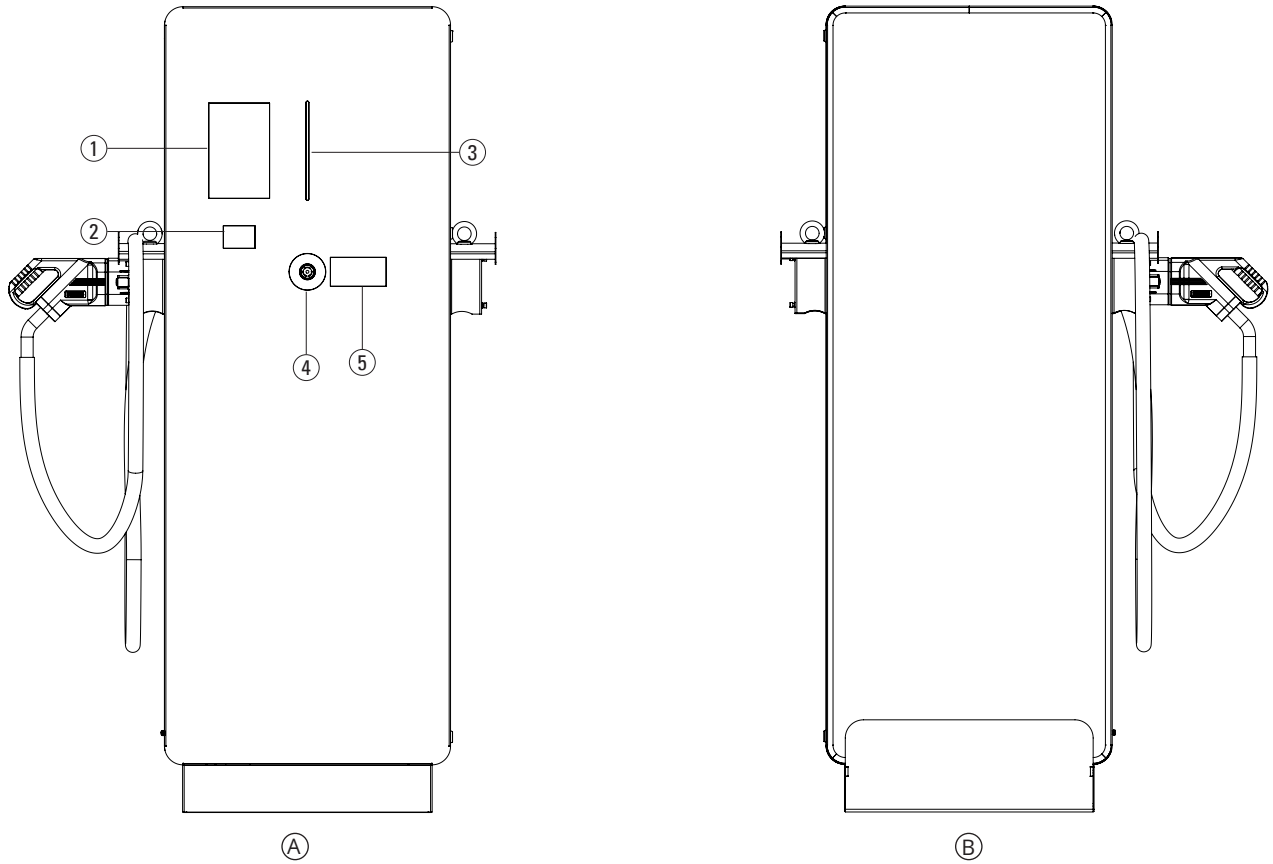
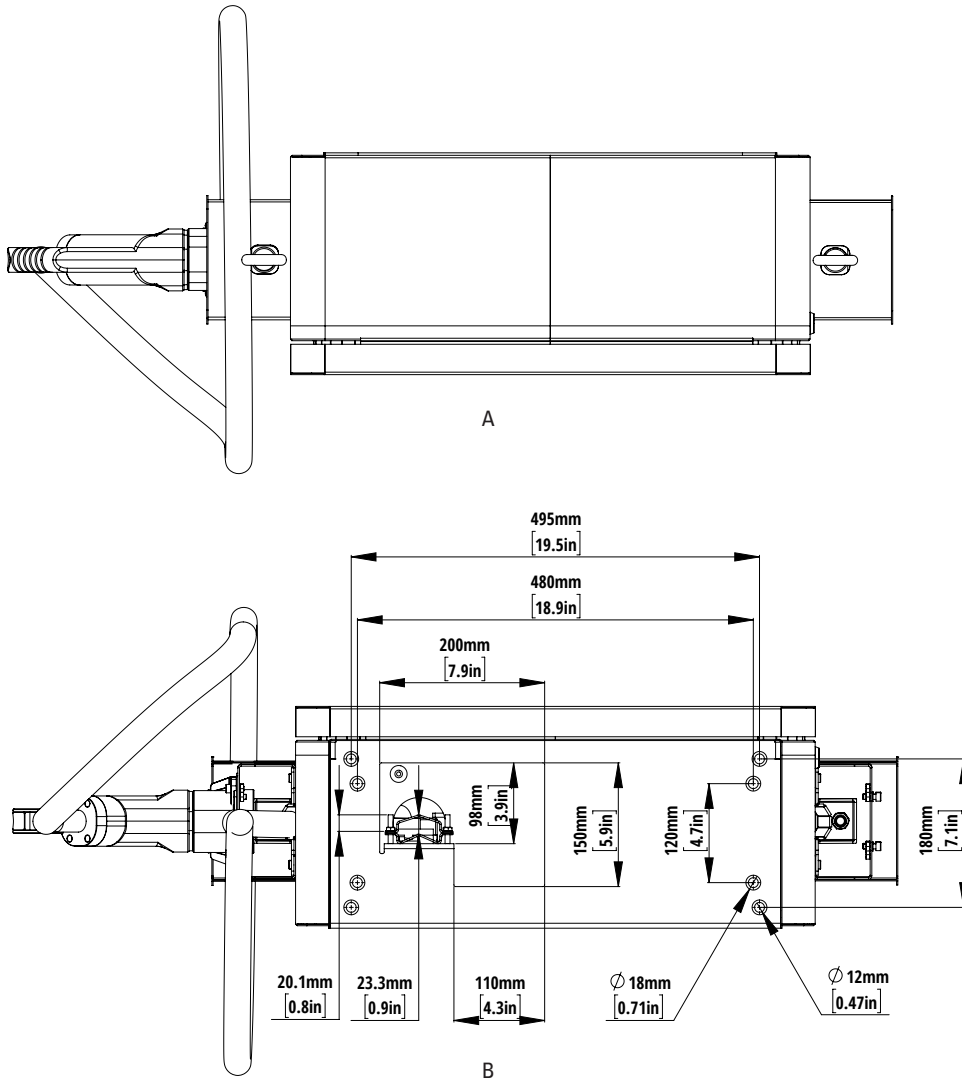| Tag	Description
Ⓐ	Front view
Ⓑ	Back view
①	Color touchscreen display
②	RFID reader
③	LED display
④	Emergency stop button
⑤	Energy meter

3.2 Left and right views

Figure 2. Left and right views of Green Motion DC Air 44/66 EV charger

Tag	Description
A	Left view
B	Right view
1	Air filters

3.3 Top and bottom views

Figure 3. Top and bottom views of Green Motion DC Air 44/66 EV charger

A

B

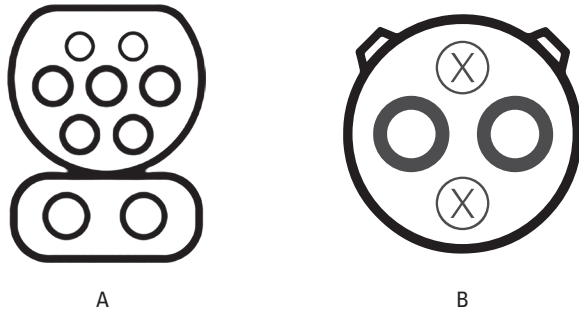| Tag	Description
A	Top view
B	Bottom view

3.4 Types of cables

The Green Motion DC Air 44/66 EV charger provides two types of cables and connectors:

1. Combined Charging System (CCS) for EU market. This is the default cable.
2. CHAdeMO. This cable is an option for DC 44/66, but is not available to any Green Motion Air configuration.

The maximum output power of the Green Motion DC Air 44/66 charger is 44 kW and 66 kW, respectively. However, the actual charging power may vary due to external factors such as the available grid power, electrical installations, EV model, battery state of charge, and environmental temperature. For this reason, Eaton disclaims any liability concerning the actual power output.

Figure 4. Illustration of connector types available with Green Motion DC Air 44/66 EV charger

Tag	Description
A	CCS Type 2
B	CHAdeMO

The unit can be equipped with either a single CCS2 or a single CHAdeMO charging cable as shown in the table below.

Table 3. Possible cable configurations available with the charger

Green Motion DC 44/66 Cable Options	CCS	CHAdeMO
Default	X	
Optional		X

Green Motion Air units are provided with a CCS2 cable only.

The Green Motion DC 44/66/Air EV chargers include a built-in LEM DCBM400 energy meter. For more specific information on the energy meter, consult the LEM documentation.

4. Relevant information prior to installation

The installation must be carried out only by professional and qualified personnel.

Installation, commissioning, maintenance or retrofitting of the EV charger must be performed by professional and qualified personnel who are responsible for complying with existing standards and local installation regulations.

During the installation, ensure that the equipment is powered off.

4.1 Tools required for installation

To perform installation, the installer should prepare the following tools:

* Screwdriver (T20, TX30, PZ2),
* Square key (8 mm),
* Open-ended wrenches,
* Drilling machine (depending on the mounting surface),
* Laptop,
* SIM card, in case of online chargers with 4G modem.

4.2 Package contents

The Green Motion DC Air 44/66 box should contain the following parts:

* Green Motion DC Air 44/66 EV charger,
* Hex socket screw plugs, 2 pcs (Bossard 1038583),
* Quick start guide,
* Safety guidelines.

4.3 Dimensions and weight

The table below shows the dimensions and weight of the Green Motion DC Air 44/66 EV charger.

Table 4. Dimensions and weight of Eaton Green Motion DC Air 44/66 EV charger

EV charger	Green Motion DC 44	Green Motion DC 66
Dimensions (H x W x D) in mm without cables	1775 x 832 x 266	1775 x 832 x 266
Net weight (without cables) in kg (approx.)	140	175
Cables		
CCS weight in kg	12	12
CHAdeMO weight in kg	14	14

Figure 5 shows the front and side views of the EV charger with dimensions.

Figure 5. Green Motion DC Air 44/66 EV charger front and side views with dimensions
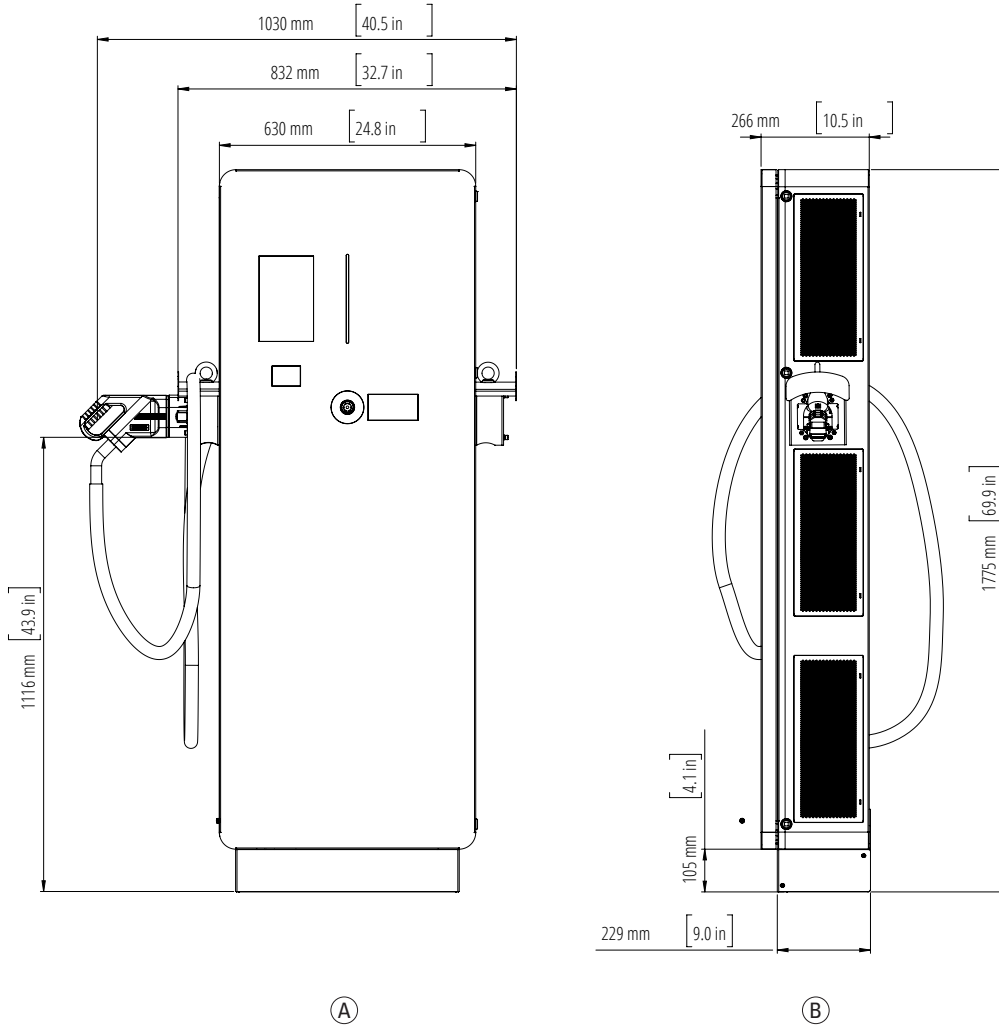
Tag	Description
Ⓐ	Front view
Ⓑ	Side view

4.4 Lifting, transportation and unloading instructions

Transportation and handling

Transportation of the equipment, especially on the road, must be carried out in such a way as to protect the system components (especially electronic components) from major impacts, humidity, vibrations, etc.

During handling, sudden or fast movements which could cause the system to sway dangerously must be avoided.

Refer to local regulations and laws for transportation and handling of the equipment.

Lifting

Eaton packs and protects each component by using devices that ease its transportation and handling. These operations must be carried out by professional and qualified personnel who specialize in loading and unloading components.

The ropes and vehicles used for lifting must be able to withstand the weight of the equipment.

Do not lift multiple units or parts of the equipment at the same time, unless otherwise stated.

The Green Motion DC Air 44/66 EV charger is not equipped with specific lifting tools.

The unit should be lifted with the lifting slings using the two eye bolts on the sides of the unit (see Figure 6).

Once the unit is mounted on the floor, replace the eye bolts with the provided hex socket screw plugs.

The screen and the housing should be protected during the operation to avoid damage and paint scratches.

Figure 6. Lifting instruction for the EV charger
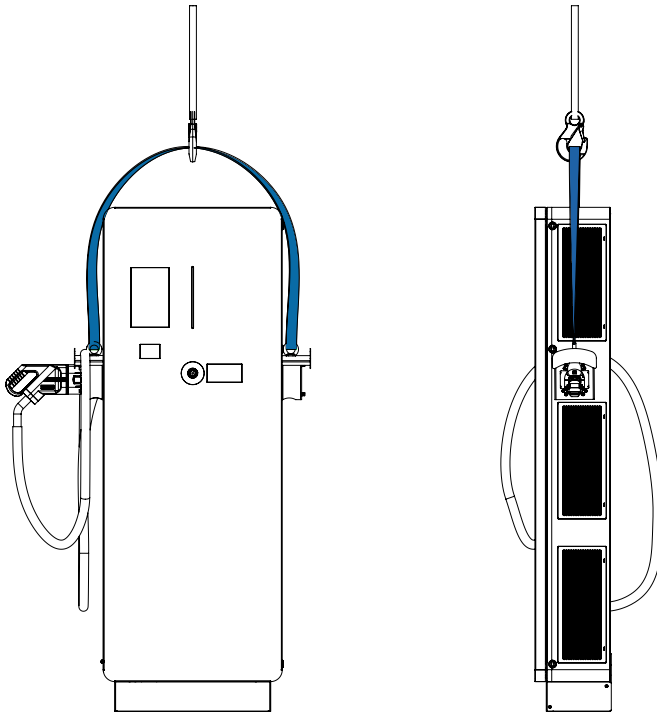
⚠️ Do not underestimate the weight of the Green Motion DC Air 44/66 EV charger. Check the technical specifications.

Manpower for transportation, handling and lifting must be considered due to the weight of the unit in accordance with the requirements of local regulations.

Do not move or stop the hanging load above people or things.

Do not let it drop with too much force.

Please refer to local regulations and laws for lifting of the equipment.

4.5 Unpacking

Remember that the packaging elements (cardboard, cellophane, staples, adhesive tape, straps, etc.) can cut and/or injure, if not handled with care. They must be removed with appropriate tools and must not be handled by non-responsible people (i.e., children).

The packaging components must be removed and disposed of in accordance with the local regulations and laws of the country of installation.

Check the integrity of the packaging before opening.

Open the packaging and remove the Green Motion DC Air 44/66 EV charger carefully to avoid damaging the external casing or the internal electronic parts.

Before commissioning, ensure that the external casing of the unit is in good condition and free from damage sustained during transportation.

5. Mounting and installation

5.1 Positioning the Green Motion DC Air 44/66 EV charger

The installation position of the unit must meet the following conditions:

- Manpower to install the unit must be considered due to its weight, in accordance with local regulations.
- The unit must be installed in a place with relative humidity below 95%.
- Recommended operating temperature range of the unit is -25 °C to +45 °C.
- Install the unit to ensure easy access to the controls and connections.
- The unit must be used at an altitude not exceeding 2000 m above sea level.
- Keep at least 300 mm of free space from the left and right sides of the unit to allow for adequate air circulation.
- The cable entries for power cables and the internet connection cable are through the bottom of the EV charger.

Do not mount the unit charger above or below flammable building materials.

Do not install the unit charger in areas where highly flammable substances are present.

Do not install the unit charger in areas subject to explosion hazard.

Make sure there is at least 300 mm of space for air circulation on both sides of the unit. Local regulations may require larger clearances. Make sure that the air circulation is unhindered and ensure that the air inlet and outlet are not blocked by snow or other objects.

5.2 Mounting

Green Motion DC Air 44/66 EV charger must be mounted on a concrete base and each EV charger must serve only one parking space or electric aircraft.

5.2.1 Site design

A site for electric vehicles (EVs) equipped with EV chargers can be designed in different setups. This section is intended to provide some valuable information on the placement of the EV chargers with respect to parking spaces.

The site design recommendations detailed below apply to ground-based EVs only.

As shown in the Figure 7, Eaton recommends installing the EV charger at the front and center of the parking space, and each EV charger should serve one parking space.

Figure 7. Optimal positioning of EV chargers

Tag	Description
①	EV charger
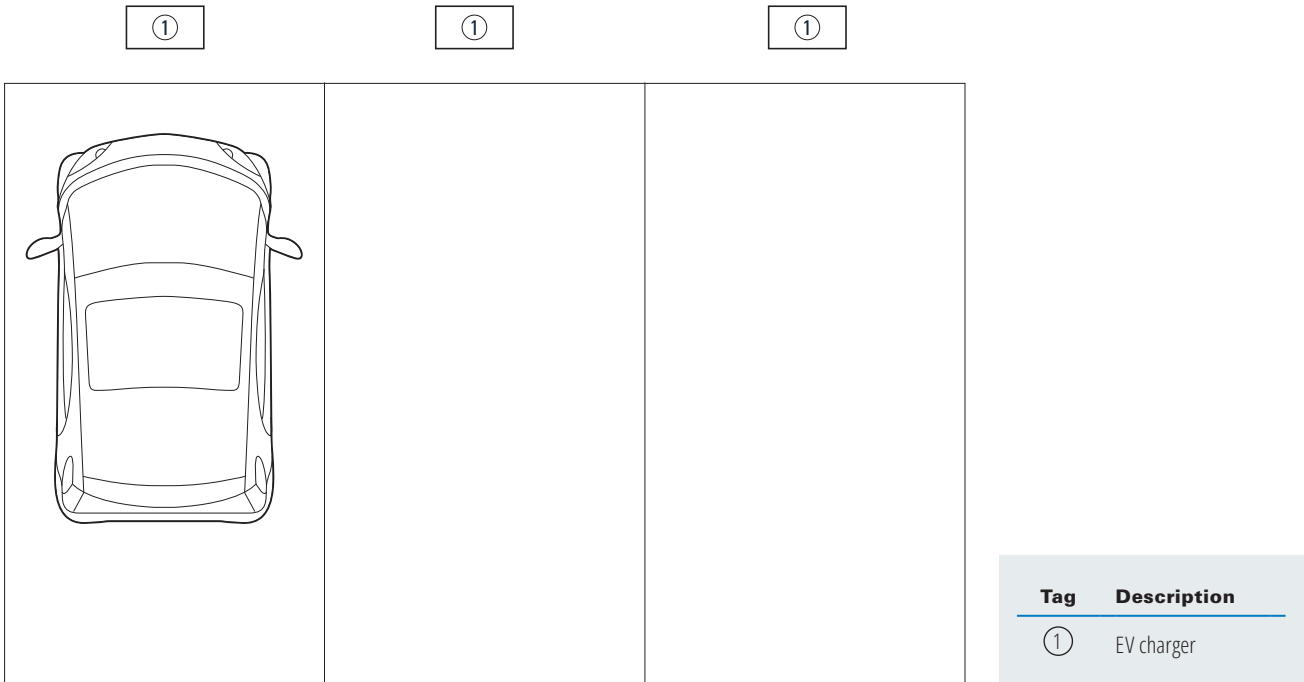
An alternative positioning for the EV chargers is shown in Figure 8.

Figure 8. Alternative positioning of EV chargers
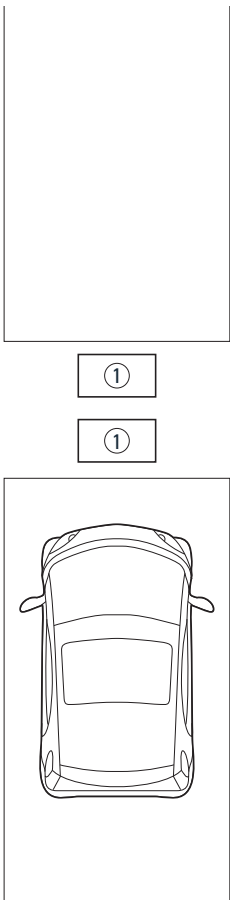
The minimal distance recommended between the EV chargers positioned back-to-back is 600 mm.
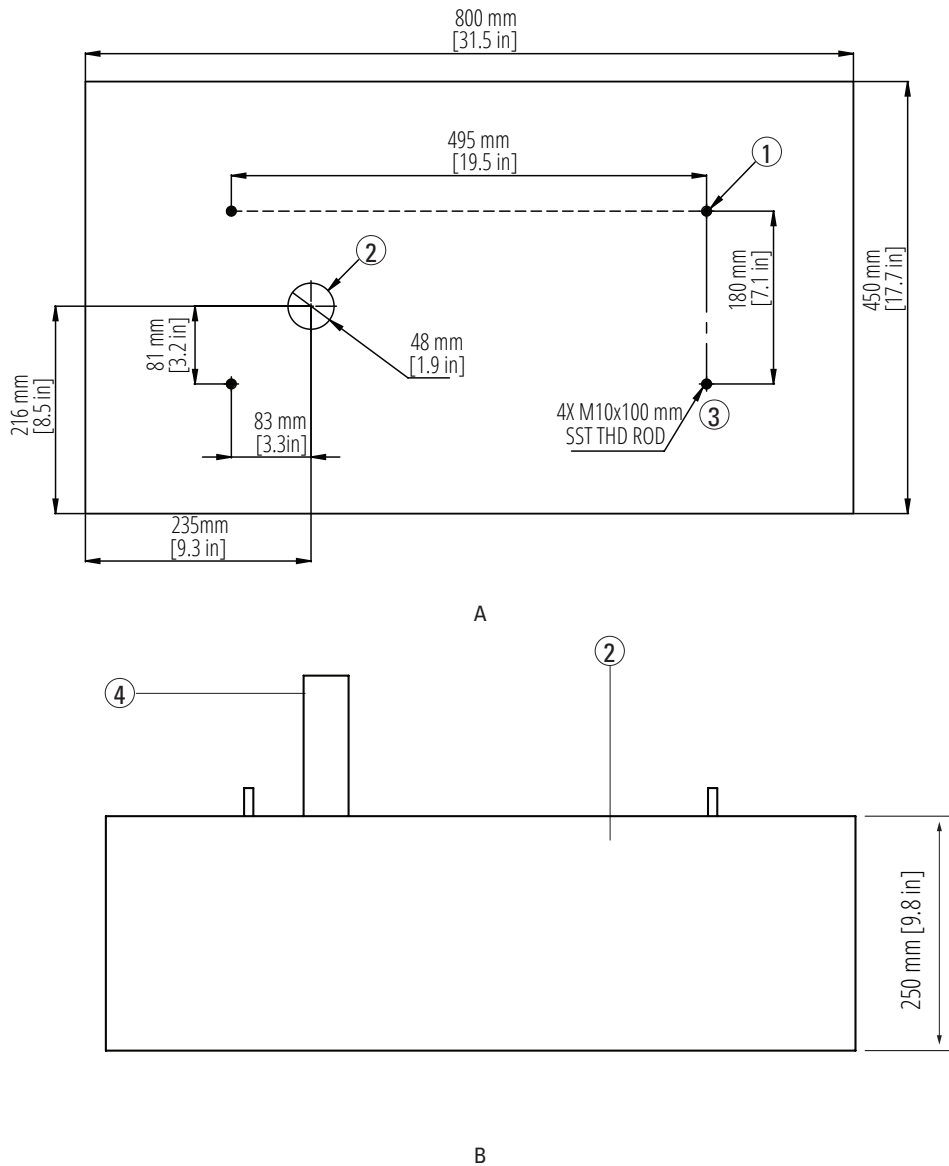
5.2.2 Mounting the Green Motion DC Air 44/66 EV charger

When choosing the location of the EV charger, consider a 300 mm free space requirement to the left and right sides of the EV charger for air circulation.

Fix the column using 4 x M10 stainless steel threaded rods on an 800 mm x 450 mm x 250 mm concrete base. The power input electrical cable has to be fed through the concrete base through a hole with 48-mm diameter.

Below is a schematic representation of the concrete base of the EV charger column.

Figure 9. The top and front views of the concrete base of the EV charger with dimensions

Tag	Description
A	Top view of concrete base
B	Front view of concrete base
1	Opening for electrical cable
2	Concrete base
3	M10 stainless steel rod
4	AC power supply cable

See a schematic representation of the Green Motion DC Air 44/66 EV charger mounted on a concrete base in Figure 10.

Figure 10. View of the EV charger mounted on a concrete base
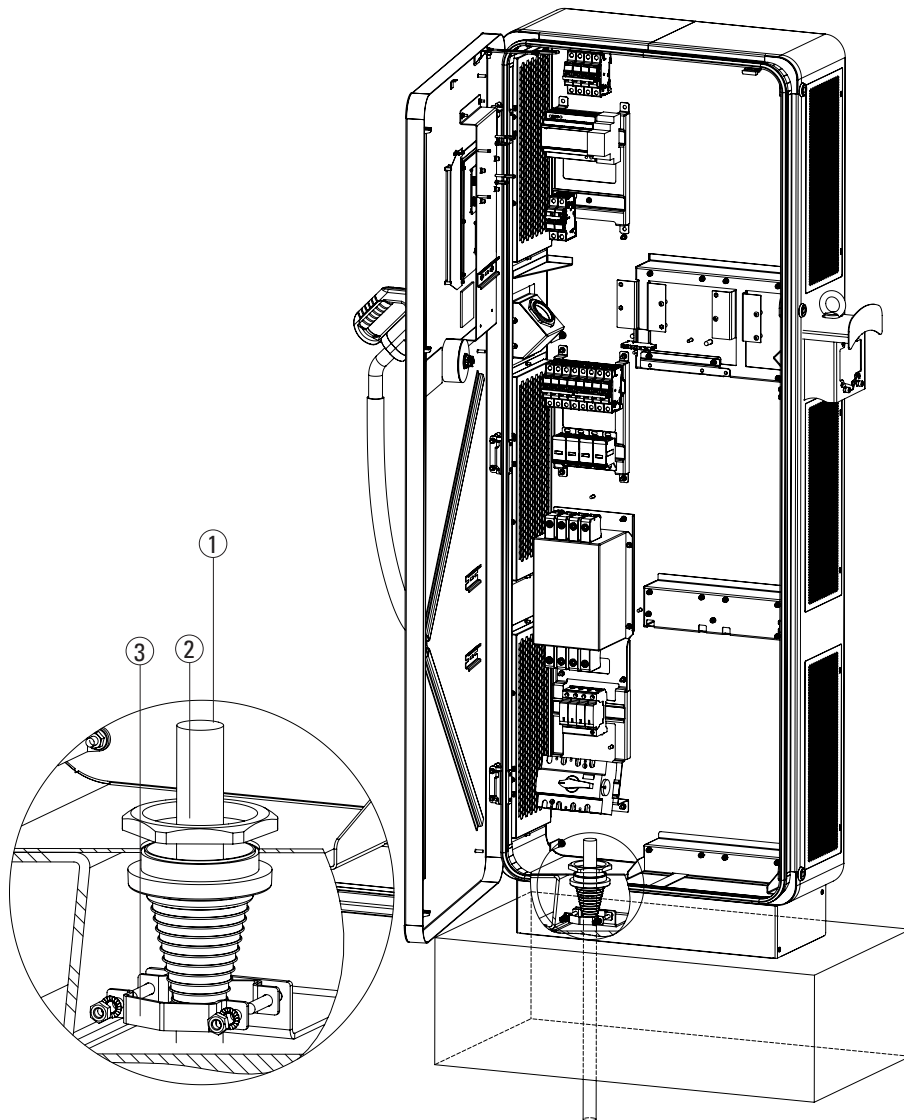
Tag	Description
①	AC power supply cable
②	Cable gland
③	Cable clamp

6. Electrical connections and wiring

6.1 Cautions

Installation, commissioning, maintenance or retrofitting of the EV charger must be performed by professional and qualified personnel who are responsible for complying with existing standards and local installation regulations.

For safety reasons, an appropriately rated input load disconnector must be provided for each individual product. No load should be connected directly to the product during wiring.

Connect only one EV charger for each circuit breaker and residual current device (RCD). The circuit breaker serves as a mains disconnector.

The protective earth conductor must have a cross-section at least equal to or greater than the cross-section of the cables for connection to the public grid (AC), and in accordance with the requirements of local regulations.

Before starting connection operations, ensure that the external AC-line main switch is disconnected, and that circuit breakers are open.

Any operation that requires opening the EV charger can lead to electric shock hazards.

6.2 Standard wiring

To connect the EV charger to the electrical panel, professional and qualified personnel should consider the following guidelines and consult Table 5.

Table 5. Overview of parameters for dimensioning of the protective devices and power supply line

	Green Motion DC 44	Green Motion DC 66
Output power	up to 44 kW	up to 66 kW
Input voltage (phase-to-neutral/phase-to-phase)	230 V/400 V	230 V/400 V
Maximum input current	64 A	96 A
Power supply system	3 phase	3 phase
AC rotary switch terminal max. cross-section	35 mm2	50 mm2

Power losses on the power supply line must be less than +/-10% of the rated power in accordance with IEC 60038 and local standards. For this reason, the cable sections or line length must be reassessed by professional and qualified personnel in accordance with maximum power loss regulations. Also, when dimensioning the power supply line, observe the possible reduction factors and the increased environmental temperatures inside the connection area of the EV charger (see temperature rating of the supply terminals). Under certain circumstances, this can increase the cable cross-section and change the temperature resistance of the power supply line.

Professional and qualified personnel must define the types of RCD and circuit breaker in accordance with local standards.

DC leakage protection is provided by means of electrical galvanic separation and an internal Insulation Monitor Device.

Eaton recommends that DC EV chargers installed in a TT system are equipped with an RCD upstream in accordance with IEC 60364-7-722.

Eaton recommends that DC EV chargers installed in a TN system where a fire hazard is present are equipped with an RCD upstream in accordance with IEC 60364-7-722.

Eaton's support teams can help with the selection of the proper RCD to be used.

In case of connection in TN-C-S networks, earth rods must be used.

It is not possible to install the unit in an IT grid configuration.

Always refer to local regulations which may differ from and can supersede the international regulations
listed here.

The circuit breakers and the power cable minimal cross-sections shall be over-dimensioned to ensure the functionality of the EV charger at higher temperatures.

During installation, other important issues such as selection of a suitable line circuit breaker must be considered:

• The temperature where the circuit breaker is located does not exceed its reference value.

• The circuit breaker can withstand the maximum current without tripping under the worst temperature conditions.

Refer to local standards and regulations for further details.

When dimensioning the line circuit breaker, the increased ambient temperatures in the distribution cabinet must also be considered. Under certain circumstances, this can make a reduction of the charging current specification necessary in order to increase the system availability.

The nominal current must be determined in accordance with the type plate data in coordination with the desired charging power and the supply line.

Figure 11. Green Motion DC Air 44/66 EV charger wiring
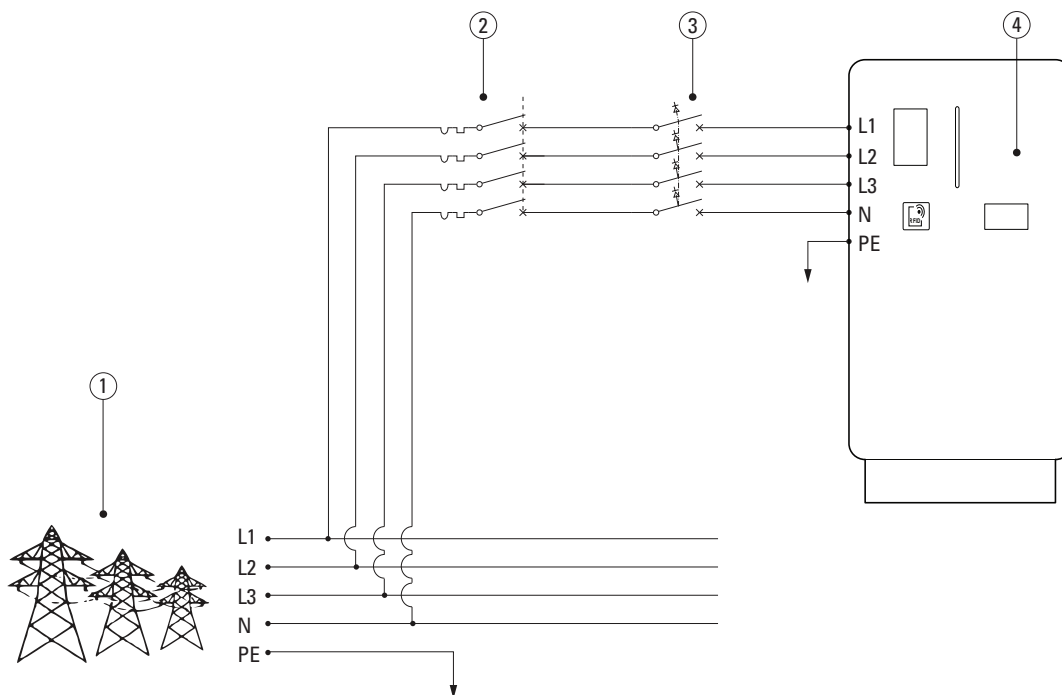
Tag	Description
1	Supply network
2	Circuit breaker
3	RCD
4	Green Motion DC Air 44/66 EV Charger

A detailed connection diagram of the Green Motion DC Air 44/66 EV charger in Figure 12 shows the main components, including the input switch, EMI filter, surge protection, power module, energy meter and the charging outputs. the power modules and the charging outputs. The third 22 kW power module (PM) is represented by a dashed line, which means that it is only available in the Green Motion DC 66 EV charger version.

Figure 12. Detailed connection diagram of the EV charger
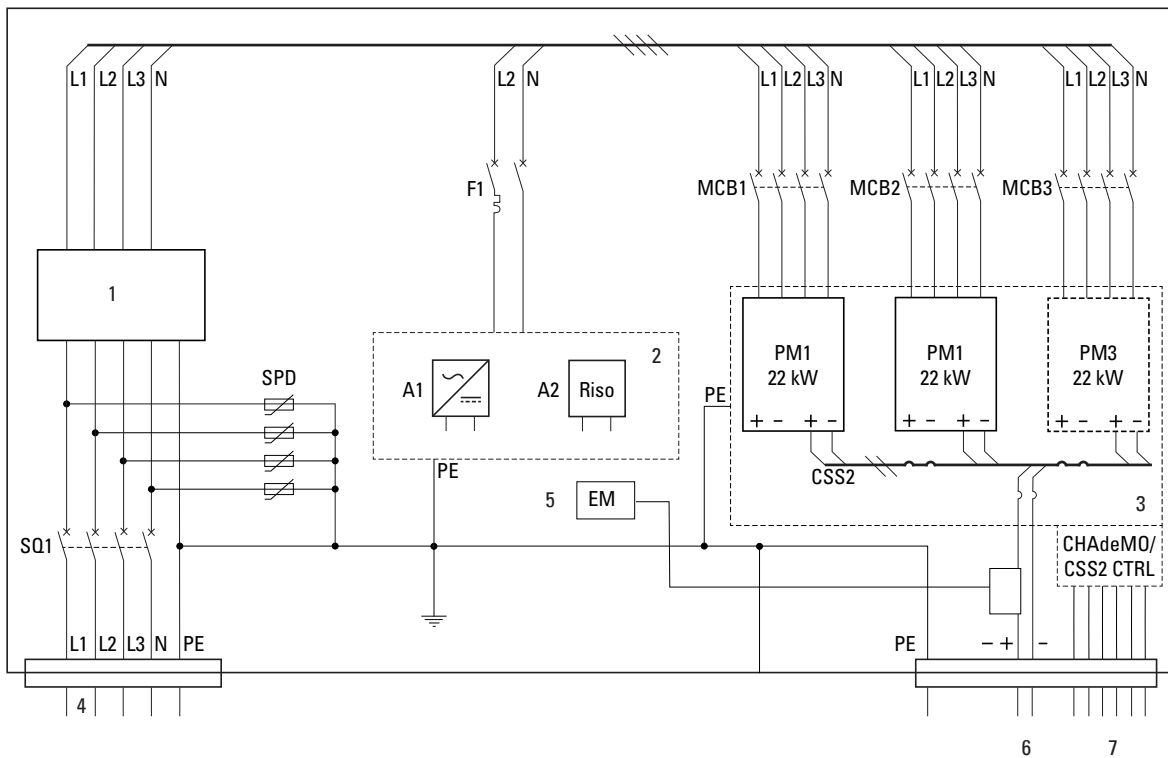
Tag	Description
1	EMI filter
2	Auxiliary control
3	AC-DC power modules
4	Input, 3 x 400 V_{AC}
5	Energy meter
6	Output CSS or CHAdeMO
7	CHAdeMO/CCS control interface

Eaton recommends the use of the equipment in Table 6 as protective devices.

Table 6. Eaton recommendations for protective devices for Green Motion DC Air 44/66 EV charger

	Green Motion DC 44	Green Motion DC 66
Type of protective device	80 A breaker for 3-phase 64 A charging current	125 A breaker for 3-phase 96 A charging current
Eaton product recommendation	AZ-3N-C80	AZ-3N-C125
Article number	211803	211813

## 6.3 Electrical connection and terminals

⚠️ Before starting the connection operations, ensure that the external AC-line main switch is disconnected, and circuit breakers are open.

The Green Motion DC Air 44/66 EV charger must not be used in an IT electrical distribution system.

Follow the next steps to connect the EV charger to the power supply:

Step 1. Insert the AC power supply cable and the communication cable through cable gland in the bottom-left part of the unit and fix using the provided metal clamp.

Step 2. Connect the AC power supply cable from the supply network to the rotary switch located at the bottom left part of the charger. Connect the protective earth (PE) cable to the bolted joint at the floor of the unit.

Step 3. Verify that the phase (L1, L2, L3) and neutral (N) cables from the AC supply network are connected to the power terminals of the rotary switch respecting the correct assignment.

Step 4. Verify the electrical continuity of the protective earth connection between the front door and the unit housing (see Figure 13), and that the entire EV charger is properly grounded.

Figure 13. Location of the openings for the AC supply network and communication cables
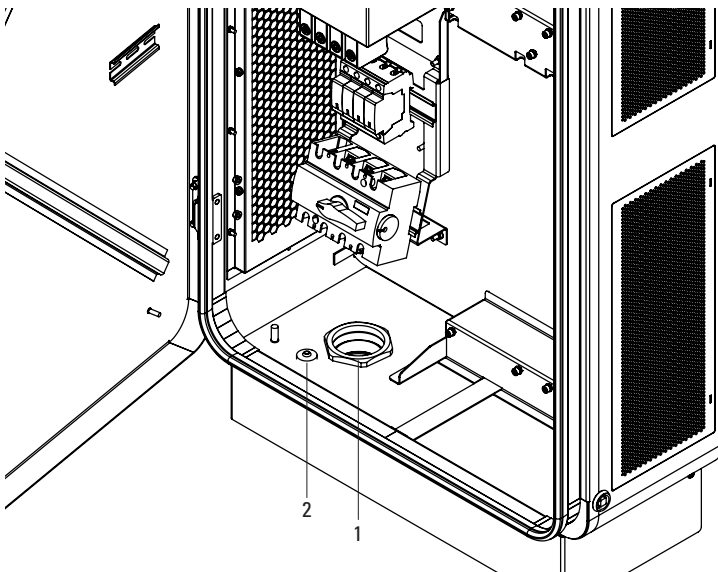
Tag	Description
①	Opening for the AC supply network cable
②	Opening for the Ethernet cable

Figure 14. AC supply network connection inside the Green Motion DC Air 44/66 EV charger
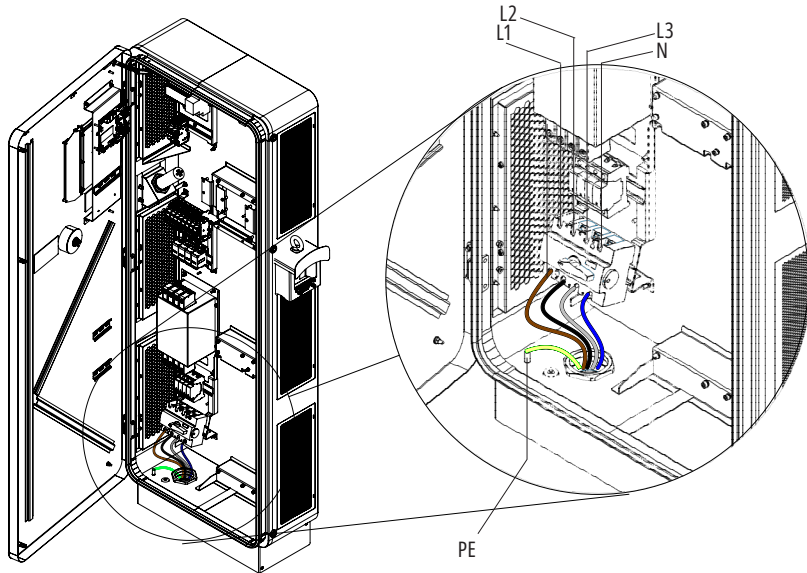
Please connect the three phases (L1, L2, L3), neutral (N) and earth (PE) cables from the AC supply network to the terminals of the rotary switch located at the bottom left part of the charger as illustrated in Figure 14, respecting the correct phase assignment and in accordance with the local cable coloring regulations:

- Phase (L1) → L1 terminal
- Phase (L2) → L2 terminal
- Phase (L3) → L3 terminal
- Neutral (N) → N terminal
- Earth (PE) → PE bolted joint

Be careful not to confuse the phases with neutral. If this happens, a system failure may occur.

Verify the correctness of the phase sequence.

6.4 Earth connection (MANDATORY)

Check that the AC supply network earthing cable is properly connected to the bolted joint inside the housing (see Figure 14).

Verify the electrical continuity between the front door and the EV charger housing. Check for continuity by measuring between areas not covered by insulating material (paint, rubber, dirt, etc.)

7. Commissioning

Professional and qualified personnel must be an expert in the field, and is therefore responsible for commissioning the system in accordance with the manufacturer's instructions and local legislation.

Please fill out the installation checklist available on www.eaton.com and ensure that all the points in the checklist have been properly executed (see Chapter 5).

7.1 Unit switch-on

Before switching on the EV charger, check the effectiveness of the safety measure(s) of the system in accordance with the local regulations.

Electrical systems or devices must be checked by the installer of the system before commissioning and switching on the unit.

Before switching on the product, please do the following:

Step 1. Verify that the unit is correctly mounted on the concrete base and is correctly fixed to the floor in accordance with local regulations.

Step 2. Verify that the electrical connections have been made correctly in accordance with local regulations.

Step 3. Verify that the protective earth (PE) connection (MANDATORY) has been made correctly in accordance with local regulations.

Step 4. Perform checks on the continuity of the connections of the protective conductor, insulation resistance, phase rotation, RCD triggering current, triggering time, etc., in accordance with local regulations.

Step 5. Turn on the rotary switch inside the unit.

Step 6. Verify that the front door of the housing is closed and secured with the square-key cam locks.

If the verification steps listed above were successful, proceed as follows:

Step 7. Close the external AC mains isolator switch and /or turn on the main circuit breaker.

Step 8. Wait for the display to turn on.

Step 9. The unit is ready for use. Follow the instructions on the touchscreen display.

Step 10. If applicable, you can configure the router to connect to the Eaton Charging network manager.

If the checks listed above were successful, proceed as follows:

Step 1. Close the main AC supply network circuit breakers.

Step 2. Wait for the display to turn on.

Step 3. Visit the link or scan the QR code to fill out the installation checklist form at:
https://content.eaton.com/en-gb-installation-checklist-ev-chargers

**Figure 15. QR code for the installation checklist online form**

7.2 Online EV charger

Green Motion DC Air 44/66 EV charger uses a software management system, Eaton Charging network manager which controls the EV charging stations network. Refer to the Eaton Charging network manager user manual, available on www.eaton.com, for further details.

The Eaton Green Motion DC Air 44/66 EV charger communicates with the remote database via the cloud infrastructure.

Figure 16. Simplified illustration of the EV charger communication
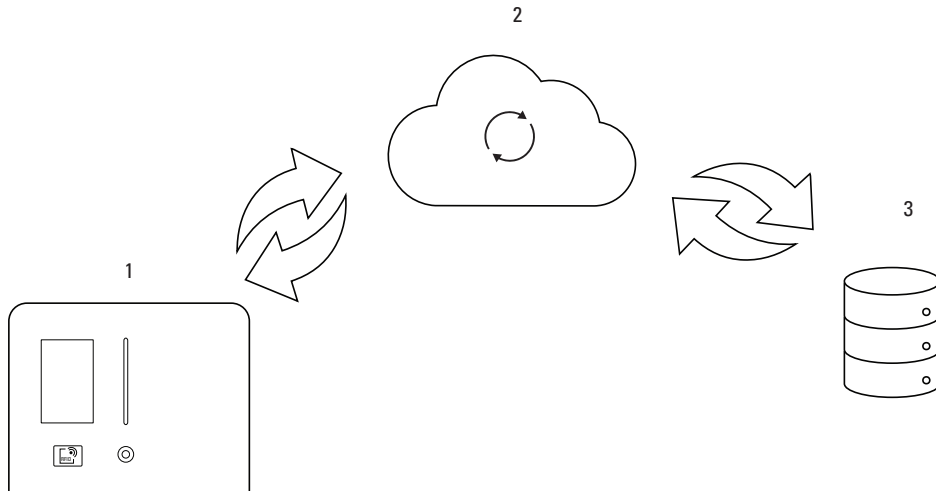
Tag	Description
①	Green Motion DC Air 44/66 EV charger
②	Cloud
③	Remote database

It is possible to establish the communication via internet in two ways:

1. LAN: In this case the unit(s) are connected via Ethernet cable to a local modem/router that provides internet connection.
2. SIM card: In this case a SIM card is installed in the EV charger's modem/router that provides internet connection.

⚠ To configure the router/modem the EV charger must be powered and in standby mode.

⚠ Commissioning and configuration of the router of the EV charger must be performed by professional and qualified personnel who are responsible for complying with existing standards and local installation regulations.

⚠ **WARNING - Any operation requiring the opening of the charger can lead to electric shock hazards.**

Please refer to Chapter 10.1 of this manual to open the Green Motion DC Air 44/66 EV charger housing.

It is possible to configure the network settings of the router located inside the EV charger. The router is located inside the EV charger, mounted on the DIN rail on the door of the housing as shown in Figure 17.

Figure 17. Location of the modem/router in the EV charger
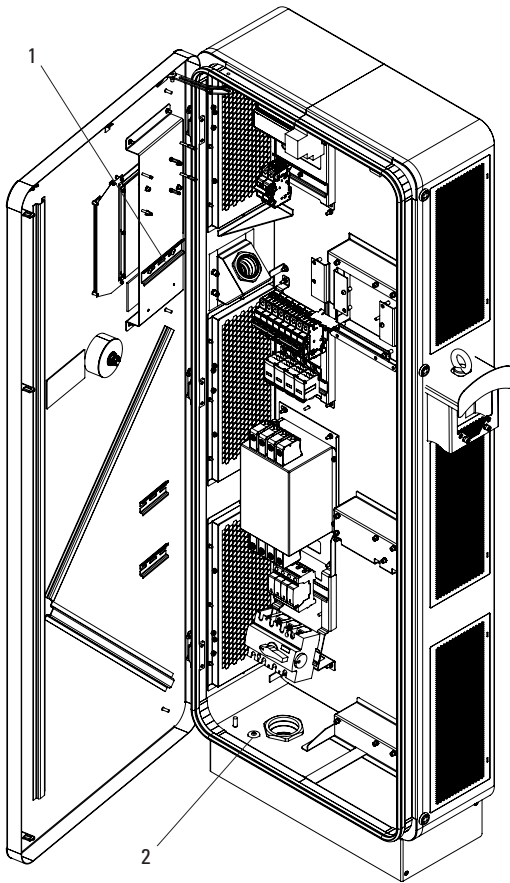
Tag	Description
①	Location of the modem/router
②	Ethernet cable entry

7.2.1 Configure online EV charger connection via LAN

The EV charger router is pre-configured. However, some final setup steps are required to complete the installation.

If you face any difficulties during setup, you can contact Eaton technical support for assistance via email at BGTechSupport@eaton.com.

Follow the steps below to configure the router of the unit for connection via LAN:

Step 1. Connect your laptop with the router via the ethernet cable as it is shown in Figure 18. On the RUTX09 wire the internet signal cable inside a LAN (2).

Figure 18. Teltonika RUTX09 modem/router
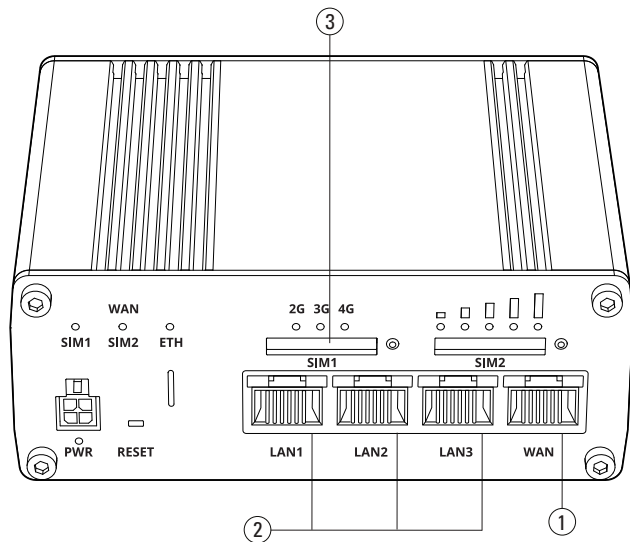
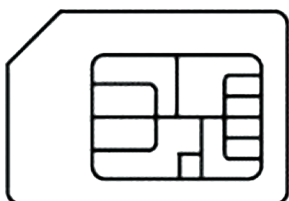| Tag	Description
1	WAN Ethernet port
2	LAN Ethernet ports
3	SIM card slot

Step 2. Ensure the laptop is below the same subnet of the RUTX09 modem/router. The default IP address of the router is 192.168.52.1. The default IP address as well as the login credentials can be found on the printed label, on the bottom side of the router unit.

Step 3. Connect to the modem/router. If a step-by-step configuration menu "Setup Wizard" appears, ignore it and go directly to the menus described below.

Step 4. Go to the Network> WAN menu.

Step 5. Activate the WAN network and deactivate the other networks.

Step 6. Press Save & Apply.

Step 7. Authorize the management of the router from the WAN (Only in a private network). Go to System> Administration> Access control.

Step 8. Check Enable Remote HTTP and Enable Remote HTTPS.

Step 9. Connect the WAN ethernet port of the Teltonika RUTX09 router via an ethernet cable to a local modem. The ethernet cable can be routed through the dedicated opening on the bottom-left or rear-left side of the Green Motion DC Air 44/66 EV charger. See Figure 17.

7.2.2 Configure online EV charger connection via SIM card (optional)

The communication via SIM card is intended as optional. Please contact your Eaton service representative to enable it.

The SIM card is a mini-SIM 2FF format. The connection will be established automatically with the Eaton Charging network manager. Sometimes the SIM PIN can create connection issues. If this happens, please contact your Eaton service representative.

Figure 19. Example of a SIM card

Always make sure the EV charger is on standby mode before inserting or removing the SIM card.

Follow the steps below to configure the modem/router of the unit for connection via SIM card:

Step 1. Connect your laptop with one of the LAN ports of the router via an ethernet cable. See Figure 18.

Step 2. Ensure the laptop is below the same subnet of the RUTX09 modem/router. The default IP address of the router is 192.168.52.1. Contact your Eaton service representative for further details for the router credentials using the email address bgtechsupport@eaton.com

Step 3. Connect to the modem/router. If a step-by-step configuration menu "Setup Wizard" appears, ignore it and go directly to the menus described below.

Step 4. Go to the Network> WAN menu.

Step 5. Activate and edit the MOB1S1A1 network. If necessary, enter the APN and the PIN code of the SIM card.

Step 6. Press Save & Apply.

Step 7. Insert the SIM card in the SIM card slot on the modem/router.

7.2.3 Closing the door after configuring the EV charger

WARNING – failure to close and secure the front door after configuring the EV charger presents a risk of electric shock.

Please refer to Chapter 10.1 of this manual on how to properly close and secure the housing of the EV charger.

7.3 How to start charging

To start a charge, simply connect the appropriate charging cable to the car socket. Hold the RFID card in front of the reader.

If the card is recognized, the LED starts flashing blue and then it shows the charge level (battery state of charge). Refer to the description in Chapter 9.1

If the CHAdeMO plug is used, it is mandatory for the user to select the plug on the screen. Refer to Chapter 9.1

If the card is not authorized, the charging session will not start and a red light is displayed on the EV charger status display.

If the charging cable is disconnected from the car and there is no power consumption within two minutes, the user is automatically de-authenticated.

8. Device setup and network configuration

The Green Motion DC EV charger should be configured based on the installation site parameters and networking options along with expected use case options. The EV charger configuration parameters can be divided into two sections: device settings and network interface settings.

The EV charger offers multiple networking options:

- To connect to the internet (online CPO software or Eaton Charging Network Manager) via:
  - Ethernet,
  - LTE 4G (4G version).
- To connect to an external energy meter via the Modbus TCP interface,

The Green Motion Building EV charger can be configured via the web portal using the configuration page. The web portal is accessible from a laptop, connected via Ethernet to the internal Teltonika RUTX09 modem/router.

☞ The web portal supports Chrome, Opera, and Firefox web browsers. It does not support the Safari browser.

8.1 Accessing the configuration page via Ethernet

To access the configuration page via Ethernet, follow the steps below:

Step 1. Turn the EV charger OFF using the circuit breaker.

Step 2. Access the internal Teltonika router inside the unit (see Chapter 7.2.1 Configure online EV charger connection via LAN).

Step 3. Connect a laptop with an RJ-45 cable to any of the LAN ports of the Teltonika router (see Figure 19).

**Step 4.** Turn the EV charger ON using the circuit breaker. Wait for the LED indicator on the EV charger to turn green.

Step 5. Using a web browser, navigate to the address: http://192.168.52.11. You may see a warning message before you get to the configuration page. You can safely ignore this warning and proceed further as shown on the figures below:

Figure 20. Privacy warning
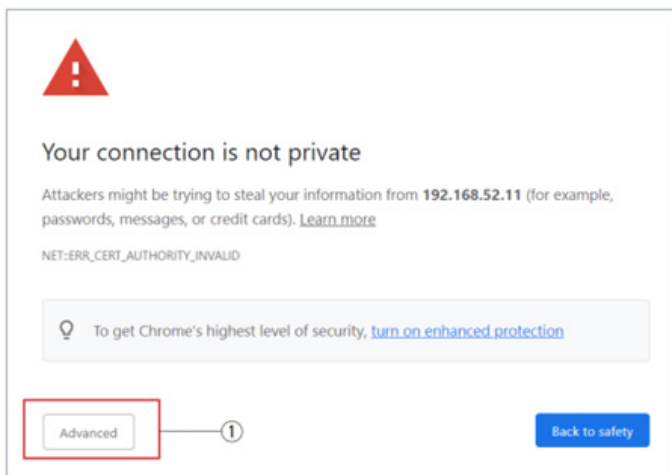
Step 5.1. Click the "Advanced" button (1). The new screen displays the advanced options.

Figure 21. Privacy warning - advanced options
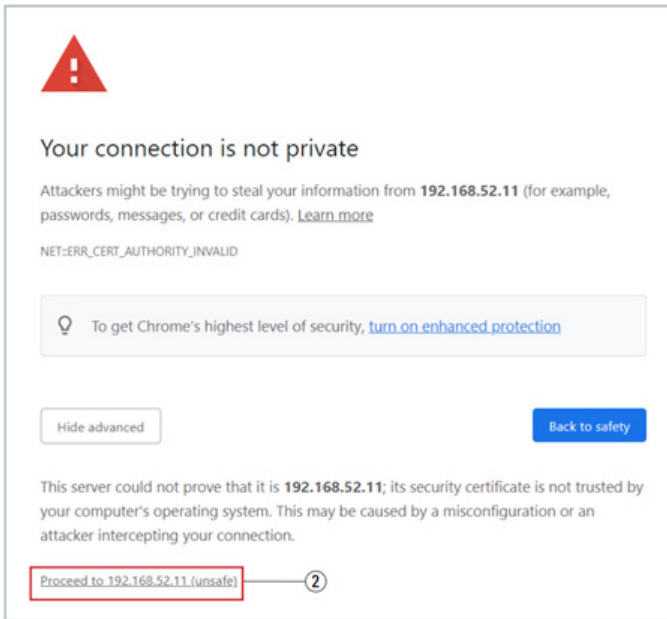
**Step 5.2.** Click the "Proceed to 192.168.52.11 (unsafe)" hyperlink (2) to proceed to the configuration page.

Accessing to the configuration page requires a username and password. By default, the username and password are both set to **admin**.

Four languages are available for the display of this page, French, English, Deutsch and Italian. Please select yours on the selector button named "Language".

8.2 Configuration page

Change the password and/or username after the first login. Please refer to Section User settings" to modify/set your login identifier.

Figure 22. Configuration Page – Login
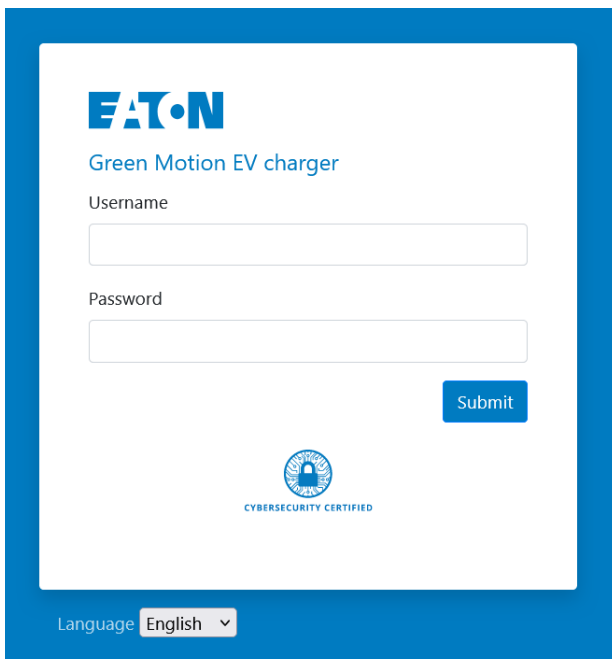
Change the password and/or username after the first login. Please refer to Section User settings to modify/set your login identifier.

If the user forgets their login identifiers there are two ways to recover the access:

· Perform a factory reset of the EV charger (See Section 9.4 Factory Reset)

· Contact your CPO software provider. If you are using Eaton Charging network manager, please contact bgtechsupport@eaton.com.

Figure 23. Configuration page (quick view)

When connecting the EV charger, configuration session is active for 30 minutes. After 30 minutes, the EV charger must be restarted for the configuration session to be resumed.

The "Remaining Time" field at the top of the page keeps track of the time remaining to complete the configuration.

There are two views of configuration:

· **Quick view:** Gives access to basic configuration of the EV charger network

· **Advanced view:** Gives access to full configuration and three extra sections, Maintenance, Reporting and Hardware

Figure 24. Configuration Page Header – Quick/Advanced view

8.2.1 User settings

This section is to modify/set the login identifiers.

Figure 25. User Settings

Table 7. Login credentials requirements

	Description
Username	Minimum 3 characters, special characters accepted.
Password	The password must contain 8 characters, at least 1 upper case, 1 lower case, 1 special character and 1 numerical.

☞ Once the login identifiers have been saved you cannot use anymore the precedent one.

Please be careful when changing username/password and be sure to be able to remember those. The default password can be recovered through an OCPP key (contact your software provider) or a factory reset.

8.2.2 Reboot and Apply Settings

It is recommended to save and apply the settings as soon as the configuration section is completed. If the configuration does not have an 'Apply' button, a reboot is required for completing the process and for the changes to take effect.

Alternatively, you can switch the EV charger OFF and ON after changing a configuration without pressing the 'Apply' button.

Figure 26. General tab page footer – reboot and apply

8.3 Device settings

8.3.1 General

This section contains the configuration related to the identification of the charger.

Enter an appropriate name tag for the device in the "Tag" text box. A naming convention may include EV charger location, priority, and other information that helps identify a particular unit.

In certain scenarios, you may want to allow users to charge their electric vehicles without requiring any authentication. This is particularly useful for private parking spaces, residential garages, or other controlled environments where user authentication is unnecessary. By enabling the free mode, the EV charger will automatically start and end charging sessions as soon as an EV is connected, without relying on RFID authentication.

To configure the charging station for free mode:

1. Go to the line Authorisation to Charge
2. Select "Free (Plug and Start)"

Note that by default the EV charger is expecting authentication.

Figure 27. General

Table 8. Description of the fields in the tab General

	Description
Tag	"Label" of the charging point. Default is GMDC44_ + last 6 digits of the serial number.
Model	Model of the charging station. For example: GMDC44 On-line CCS CHAdeMO RJ45 4G RFID 4 - GMDC44: Green Motion DC 44kW - 44kW: range of power - CCS and CHAdeMO: type of plugs -RJ45 and 4G: network -RFID: authentication
Serial Number	"Serial number" of the charging point.
Release	Name of the firmware release.
Firmware	Version of the firmware release.
Authorization to charge	It defines how the charging station will authorize the charge. - Free (Plug and Start): No RFID badge or authentication is required - Via authentication: the charger needs to identify the user by different manners (RFID badge, Mobile app connected to CPO Software) The link "Edit" is a direct access to modify this option.
OCPP connection	It defines how the charging station will behave. - Activated: monitored and controlled by a Charging Management System, requires an internet connection. - Deactivated: the charger does not need an internet access.

8.3.2 Grid settings

This section contains the configuration related to the grid settings.

Figure 28. Configuration page – grid settings
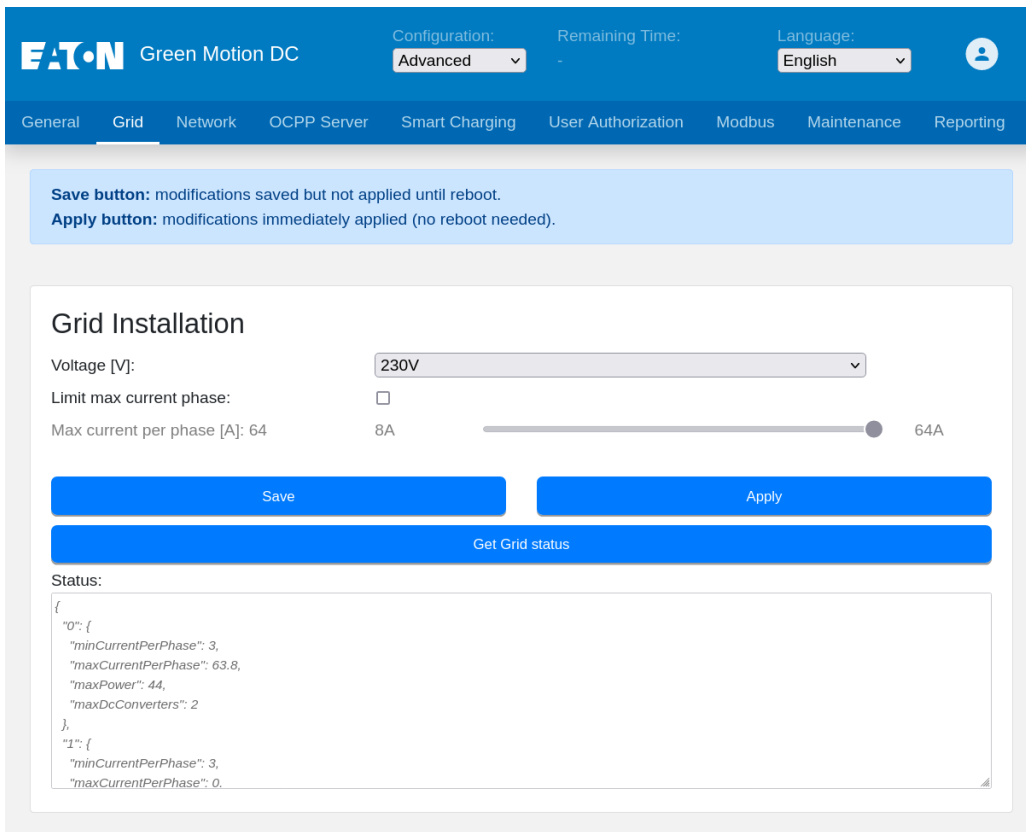
8.3.2.1 Charging current limitation

The maximum charging current provided by the EV charger can be reduced by enabling the current limiting feature. Once enabled, the current limit can be adjusted using the slider.

Table 9. Grid Installation settings

	Description	Remarks
Voltage	Grid side voltage.	This setting is only visible in advanced mode.
Limit max current per phase	Enable / disable current per phase grid limitation.	
Max current per phase	Upper limit of the current strength.	Editable only when enabled. This field indicates max/min value based on internal calculation.
Status	L3 debug information regarding grid configuration.	

8.3.3 Network

This section contains the configuration related to the network settings.
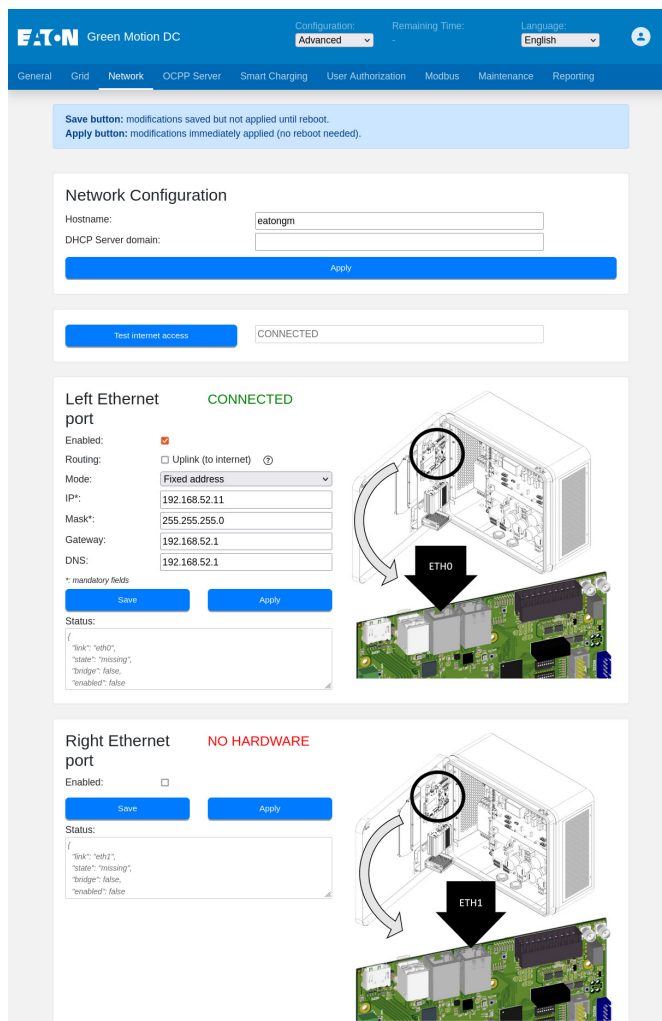
Figure 29. Configuration page – network

Table 10. Network Configuration

	Description
Hostname	Host name used on the local network. By default, hostnames is eatongm.
DHCP server domain	local by default

Clicking the Test internet access button sends a ping to www.google.com to check if the EV charger has access to the internet.

Table 11. Ethernet port

	Description
Enabled	Enable local network. Required for any communication.
Routing	Only available in "Advanced" mode Define the NAT configuration, it's possible to do a port forwarding to another interface via this feature. The options available depends of the "Mode" and are: **Uplink (to internet)** The uplink port is part of a network, possibly connected to the Internet, and this option: Allows network and internet sharing with Downlink ports. **Downlink (to node)** The downlink port manages a subnet with other nodes, and this option: Routes sub-network traffic to Uplink ports. Changes default fixed address to avoid conflicts. Keeps the port active beyond commissioning period.
Mode	Only for advanced user DHCP server: network server that automatically provides and assigns IP addresses, default gateways and other network parameters to client devices. DHCP client: this is the endpoint receiving DHCP server configuration information. Fixed address: to use for fixed IP address. By default, it is set to Fixed address.
IP	IPv4 address in the local network Default: 192.168.52.11
Mask	Mask for the subnetwork Default: 255.255.255.0
Gateway	IPv4 address to the modem / router
DNS	IPv4 address to the modem / router DNS service

8.3.4 OCPP Server

This section contains the configuration related to communications protocol and OCPP connection, see Figure 31.

The Green Motion Building EV Charger connects to the Eaton Charging Network Manager (CNM) backend using the OCPP 1.6-J protocol. The section is pre-configured, and no changes are required when connecting to CNM.

Figure 30. Configuration page – OCPP
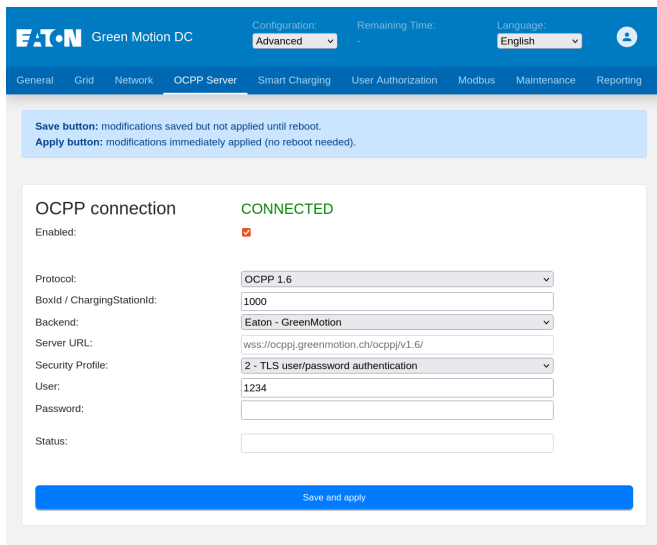
In case the EV charger is used by a Charge Point Operator (CPO) with a third-party backend server, the default configuration parameters must be updated with the parameters provided by the CPO according to the following steps:

Step 1. Set up the correct Charging station Id for the charger. This identification must be also registered at the third-party backend OCPP server.

Step 2. In the field "Backend" select the OCPP Server you wish to establish a connection with. If the backend you want to use is not listed, select "Custom".

Step 3. In the "Server URL" text box, enter the URL of the third-party backend OCPP server. The BoxId / Charging station Id will be added automatically at the end of the "Server URL".

Step 4. Select a security profile for the OCPP from the drop-down menu. It is recommended to use security profile 2: TLS-based credential authentication.

Step 5. In the "User" text box, enter the username to access the OCCP server.

Step 6. In the "Password" text box, enter the password to access the OCCP server.

Step 7. Click "Save and apply" at the bottom of the tab.

☞ The security profile must match the profile used on the backend server.

Table 12. Fields of the OCPP Server tab

	Description
Enabled	Enable connection with OCPP server.
Protocol	Version of the OCPP protocol. Default is 1.6J
BoxId / ChargingStationId	Identifier of the charging point. Only editable in Advanced view.
Backend	List of pre-configured OCPP backends
Server URL	URL used for backend connection. "BoxId/ChargingStationId" are appended to the end of the URL.
Security profile	OCPP Security profile level. Level 0,1,2 are supported. Levels 0 and 1 display a security warning message.
User	OCPP username
Password	OCPP password
Status	OCPP error messages if connection not stablished.

8.3.5 Smart Charging

The smart charging permits to the owners to schedule and optimize charging times based on factors such as electricity rates, grid demand, and the vehicle's energy needs. The goal is to maximize the use of energy source and minimize strain on the power grid, ultimately leading to a more cost-effective operation. The smart charging gives the ability to limit the power/current of the charging station during specified period.

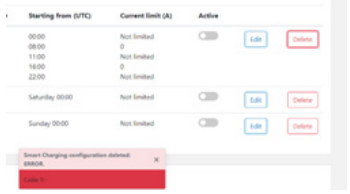**Figure 31. Configuration page – smart charging settings**
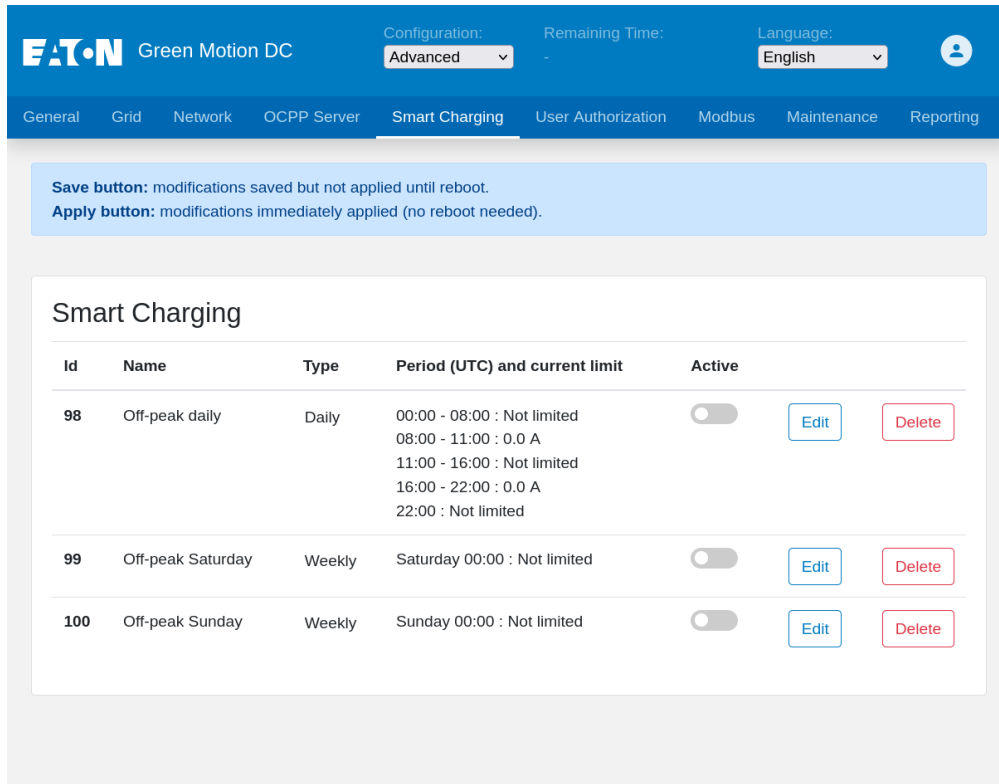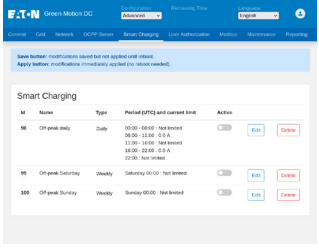
Table 13. Fields of the Smart Charging table

	Description	Remarks
Id	Smart charging profile Id unique for each profile	Read-only, Id is used to edit/delete via OCPP backend
Name	Short name of profile, used to define the purpose	Read-only, predefined profile name convention: | Profile Id	Description
---	---
98	Off-peak daily
99	Off-peak Saturday
100	Off-peak Sunday
123	LoadBalancing
999	MobileApp	
Type	Daily: the schedule restarts every 24 hours, at the same time Weekly: the schedule restarts every 7 days, at the same time and day-of-the-week	Read-only

	Description	Remarks
Period (UTC) and current limit	This field is linked to 'Current limit (A)'. The limit is the max that the charging station will use. The vehicle can use less. Example: Behaviour No current limitation from 00:00 to 08.00 No current delivered from 08.00 to 11:00	Read-only, the time is defined in UTC and limit is in ampere.
Active	3 profiles are always present by default and disabled. To activate them press on the switch button.	Activate/Deactivate the profile
Edit	Each profile can be modified. Only advanced user should modify the values. Please refer to 'Smart charging Profile Configuration' for more details.	Edit/Modify the profile
Delete	Delete the profile if the profile exists and has been already saved.	If there is no profile active on the charging station, pressing the 'Delete' button will return an Error because the profile is not running/active. Three profiles are always displayed to support editing, by default there are not active: 98: Off-peak daily 99: Off-peak Saturday 100: Off-peak Sunday

8.3.5.1 Smart Charging Profile Configuration

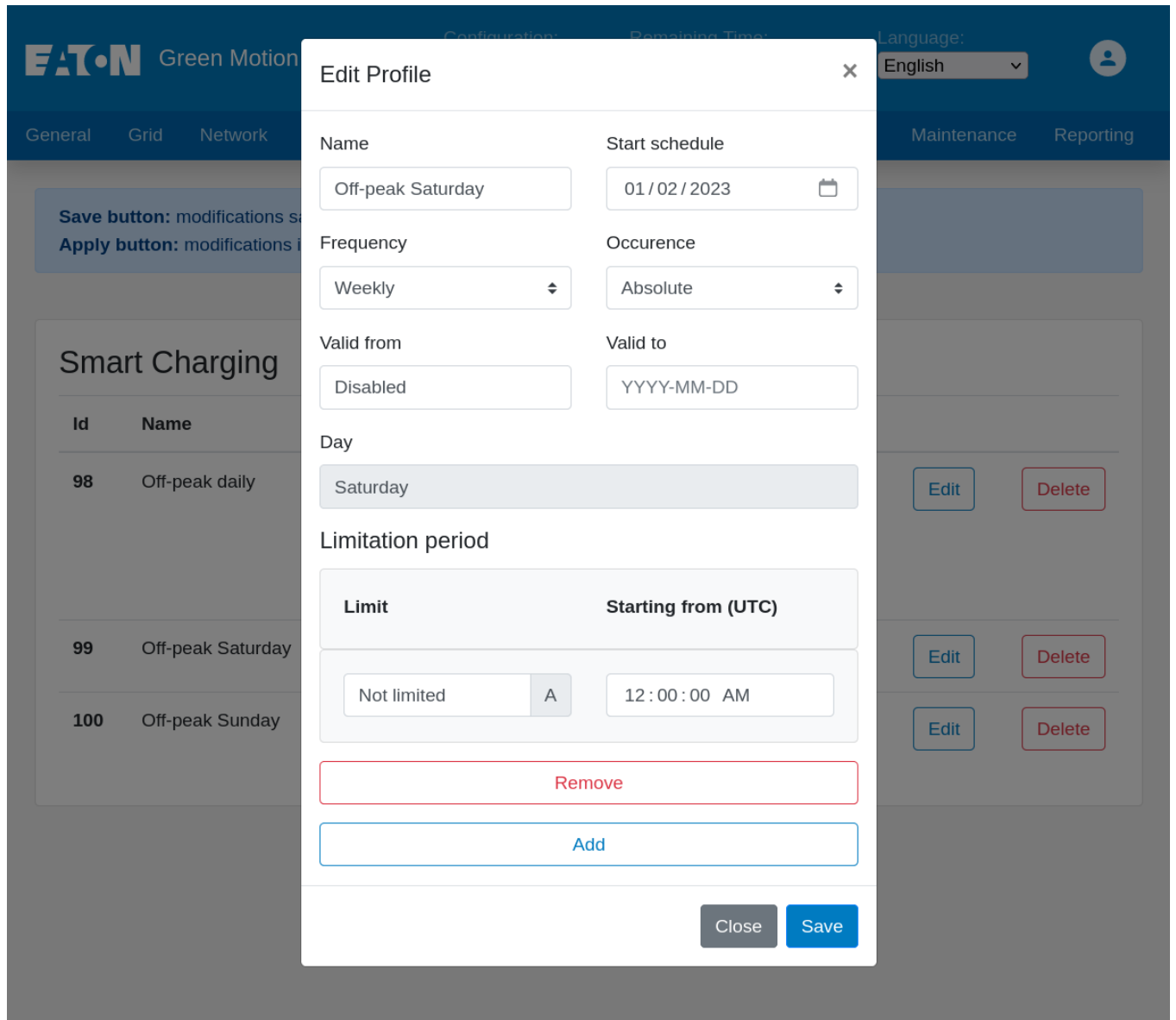**Figure 32. Smart Charging Profile configuration**

Table 14. Fields in the Smart Charging Profile edition

|	Description
Name	Name of the profile. By default, non-predefined profiles are displayed as Profile XX, where XX is the profile ID.
Frequency	Type of recurrence of a charging profile. Daily: the schedule restarts every 24 hours, at the same time Weekly: the schedule restarts every 7 days, at the same time and day-of-the-week
Occurrence	Absolute: Schedule periods are relative to a fixed point in time defined in the schedule. Recurring: The schedule restarts periodically at the first schedule period.
Start schedule	Starting point of an absolute schedule. If absent the schedule will be relative to start of charging.
Valid from	Point in time at which the profile starts to be valid. If absent, the profile is valid as soon as it is received by the Charge Point.
Valid to	Point in time until the profile is still valid.
Limitation period – Limit	Charging rate limit during the schedule period in Amperes.
Limitation period – Starting from (UTC)	Start of the limitation period. The value of StartPeriod also defines the stop time of the previous period.
Remove	Remove last schedule period
Add	Add another schedule period

8.3.6 User authorization

The user authorization to start charging is granted to users using the local RFID card reader. This section describes the authorization configuration.

8.3.6.1 Online mode

In online mode, the EV charger can be configured in Free mode (Plug and Start) with no authentication or with Authenticated Users using the OCPP server for authentication. Users can use an RFID card or a dedicated mobile app linked to the server for access.

Free

In Free mode (Plug and Start), users can start and stop charging without authentication.
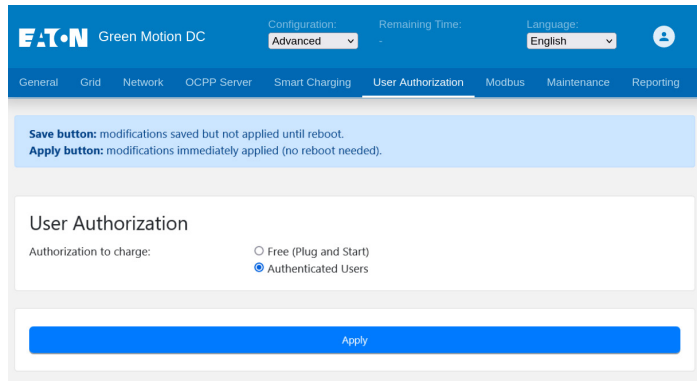
Authenticated Users

Users need to authenticate with an RFID tag, used to query the authorization from the OCPP Charging Station Management System.

Further configuration defines if the device shall store authorization data locally while connected and use that information when temporarily disconnected from the OCPP Charging Station Management System.
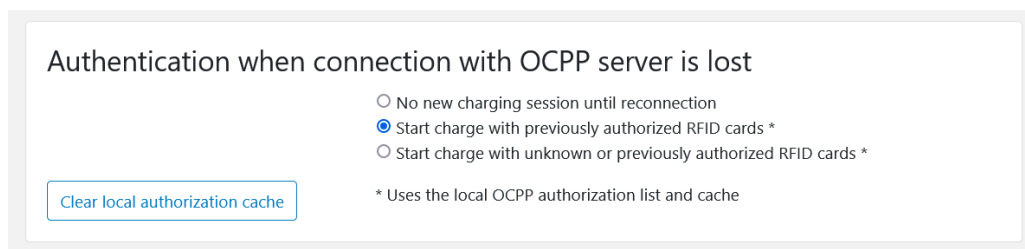
a. No new charging session until reconnection

During disconnection, users are not allowed to start charging. No local authorization data is stored nor used.

b. Start charge with previously authorized RFID cards

During disconnection, the device uses authorization data available locally. Users previously authorized when the charging station was connected will continue to be accepted and will be able to perform a charge. Other users will not be authorized to charge. Once reconnected the charging station will synchronize the transaction with the Charging Station Management System.

c. Start charge with unknown or previously authorized RFID cards

If the device is disconnected, the device uses locally available authorization data. Users previously authorized when the charging station was connected and users whose authorization status is unknown are authorized to start charging. The purpose here is to allow regular users to charge, with the risk being that this mode permits users without credit or without any valid pass to perform a charge. Once reconnected the charging station will synchronize the transaction with the Charging Station Management System.

The local authorization cache has a capacity to store up to 200 RFID cards. To clear this cache, utilize the Clear Authorization Cache button.
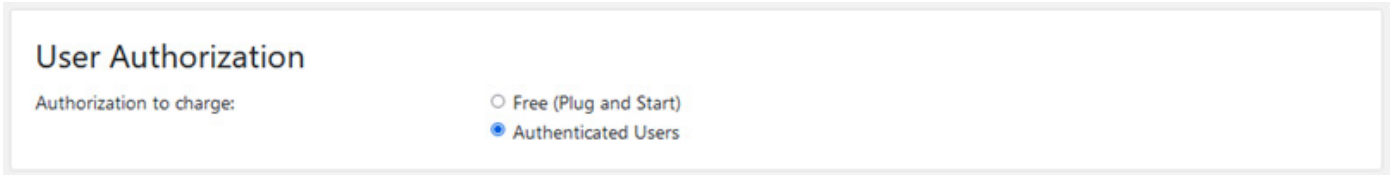
8.3.6.2 Offline mode

In this mode, the charging station operates independently without any connection to a Charging Station Management System (CSMS). No internet connection is required for the charging station to function effectively. The EV charger can be configured in Free mode (Plug and Start) with no authentication or with Authenticated Users using a local RFID cards list (distinct from OCPP local data).

Free

When Free (Plug & Start) is selected, the EV charger bypasses the need for authentication. Charging automatically begins as soon as the car is connected to the charger.
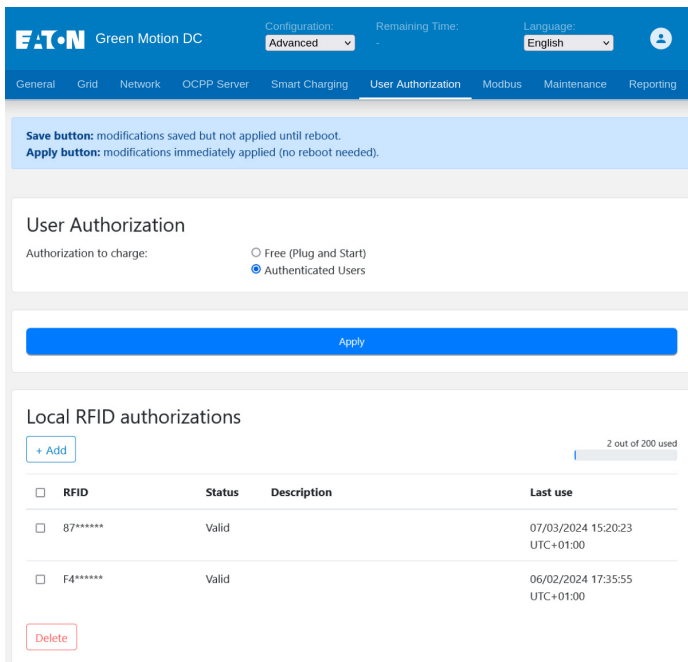
Authenticated Users

Authentication required by RFID. User must be added in the 'Local RFID authorization list'.

The idea is to accept only users added locally on the charging station. Please refer to the following section to add/remove RFID cards.

Figure 33. User Authorization in offline mode

8.3.6.3 Add RFID cards locally

Step 1. Click on +Add

Step 2. If you have an RFID card, physically swipe it on the designated reader. If swiping the card is not an option, manually input the serial number associated with the RFID card.

Step 3. (Optional) Click on Operator if you want to use this card in the future to enter pairing mode where swiped cards are added or removed immediately.
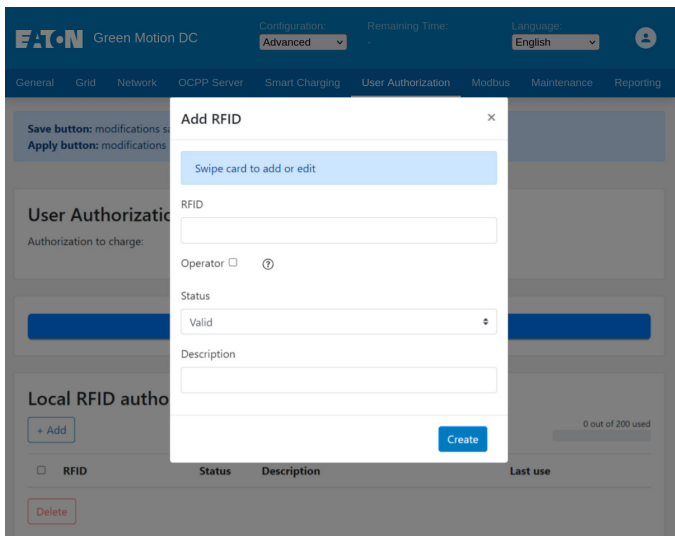
Step 4. (Optional) Add a Description of the Card. If you want to provide additional context or details about the card, enter a description.

Look for a text box where you can input the description.

Step 5. Click on ADD RFID

If successful, a confirmation message will appear (e.g., "Success! RFID card added.")

Figure 34. Adding RFID card

8.3.7 EMS Modbus TCP Service

This section contains the configuration related to the EMS Modbus TCP/IP service, see Figure 36.

The Green Motion Building EV chargers can be seamlessly integrated into the Eaton Building Energy Management Software (BEMS) to enable an end-to-end solution. EV chargers communicate with BEMS using the Modbus TCP/IP communication protocol.

Steps to configure the EV charger to work with Eaton BEMS solution:

Step 1. Go to "EMS Modbus TCP service."

Step 2. Check the "Enabled" checkbox. A set of new configuration options will appear.

Step 3. Confirm the pop-up message.

Step 4. Enter the parameters of the EMS installation:

- The IP address on which an EMS is accessible as a client. This IP address will be authorized.
- Enter Modbus TCP Port parameters.

Step 5. Click Apply at the bottom of the configuration page.

Figure 35. Configuration Page – EMS Modbus TCP Service

Table 15. Modbus TCP/IP configuration

	Description
Enabled	Enable the service.
Port	Port used for the TCP connection. By default: 502
Failsafe timeout	Failsafe delay after EMS disconnection. By default: 30s
Failsafe max current	Charger max current when failsafe timeout has elapsed after EMS disconnection. By default: 6A
IP-based access control	Authorize selected IPs to connect.
Authorized IP list	Only available if access control is enabled. IP addresses of the clients allowed to connect. List IP addresses separated with a comma. Example: 192.168.1.1, 192.168.1.3

Refer to Eaton secure configuration guidelines for installing the product securely. You can download the guidelines from the product page at www.eaton.com/greenmotion.

8.3.8 Maintenance (Advanced Mode)

This section contains the configuration related to the maintenance and reserved to the advanced view, see Figure 37.

Figure 36. Configuration Page – Maintenance

Table 16. Commissioning Settings

	Description
Download	Download a configuration file with all current variables of this charging station except those unique, confidential or factory generated. The downloaded configurations are: - Main - OCPP - Wi-Fi - Ethernet Password and Username are excluded.
Upload & Apply	Upload a configuration containing variables to update.

This section will download all configuration from this charging station in a file named <Serial number>.json.

8.3.9 EMS Reporting (Advanced Mode)

This section contains the configuration related to the reporting.

Figure 37. Configuration Page – Reporting

8.3.10 Hardware (Advanced Mode)

Table 17. DC Configuration

	Description
Number of converters	Number of DC converter installed
Enabled converters	Tick the check box for each converter to enable or disable it individually.
EVACharge MAC address	MAC address on the EVACharge. If the value is empty or displays the default MAC at boot, the system will insert the MAC address found at boot. Save DC config button will raise an error the text entered isn't a MAC address.

8.3.11 Energy meter

The EV charger is equipped with the DC Billing (energy) Meter, LEM DCBM Series. The configuration page shows the connection status of the meter, used log capacity and the current status of the measurements, errors and warnings.

Table 19. Energy meter

|	Description	Remarks
Enabled	Enable DCBM	Enabled by default for charging stations with DCBM
IP Address	IP of the DCBM	By default "192.168.52.12"
Timezone	Time zone of the charging station for certification details	By default "Universal". A pop-up appears to syncronize the time zone with the commisioning computer.
Serial number	Serial number of the DCBM	
Firmware	Firmware version of the DCBM	
Logbook	DCBM internal static memory use percentage	Once the static memory is 100% full, the DCBM is unable to produce new certificates and needs to be replaced.
Warnings	Latest warnings of the system	
Errors	Latest errors of the system	
Measurements	Displays the following information: • Voltage • Current • Power • Temperature H • Temperature L • Energy/Import Total • Energy/Export Total • Timestamp	

8.4 Port usage

Table 18. External

Port	Protocol	Usage
20,21	FTP	Used for File transfer Firmware update/Get Diagnostic
22	SFTP	Used for File transfer Firmware update/Get Diagnostic
53	DNS	The Domain Name System (DNS) is a hierarchical and distributed naming system for computers, services, and other resources in the Internet or other Internet Protocol (IP) networks
80	HTTP	Used for File transfer Firmware update/Get Diagnostic
83	mit-ml-dev (MIT ML Device	Server port used by Boxproxy protocol
123	NTP	Used for time synchronization
443	HTTPS	Websocket connection
502	Modbus	Connection with external energy meter (EM) or energy meter system (EMS)
8082	HTTP/HTTPS	Configuration page for the charging station
2535	UDP	Used for broadcasting master information (only open in load balancing master mode)

8.5 Remote shutoff DC

For remote shut-off of the EV charger, an external dry contact can be connected according to the schematic in Figure 38.

Figure 38. Connection of a dry contact to the Control unit (PCB) of the Green Motion DC charger
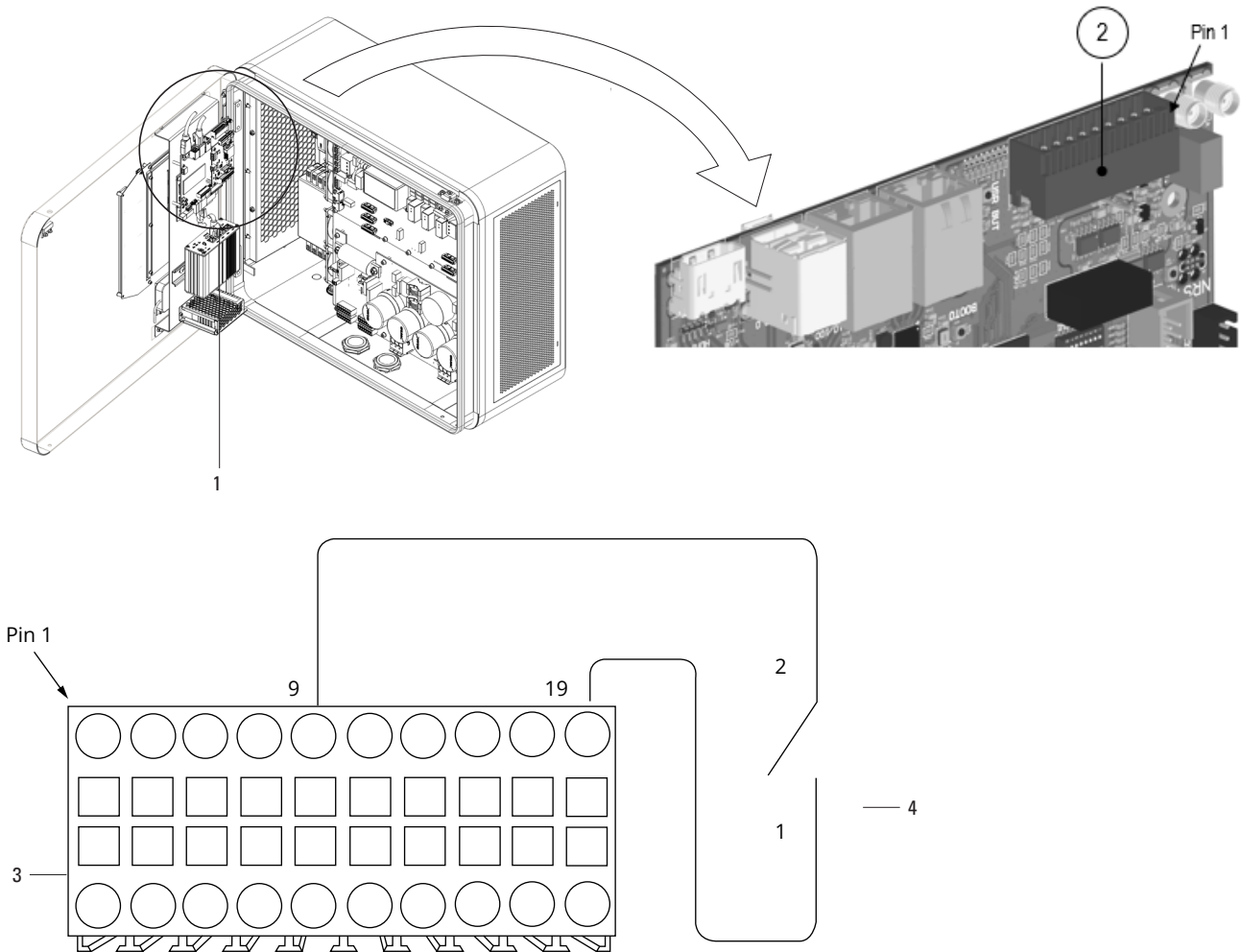
Tag	Description
①	Control unit (PCB) GMCU-MPB2
②	Header J7
③	J7 Mating Connector
④	External NO Dry Contact

The dry contact should normally be in an open mode.

To connect your dry contact to the Green Motion DC charger, follow these steps:

Step 1. Open the Green Motion DC charger. See Section 8.5.

Step 2. Access the Control unit. See Section 8.5.

Step 3. Locate the header J7 and mating connector.

Step 4. Locate Pin 9 and Pin 19 on J7 mating connector.

Step 5. Connect the dry contact on Pin 9 and Pin 19 of J7 mating connector by passing through the communication cable gland in the bottom of the DC charger.

Step 6. Carefully attach the cables with the ones already present and close the Green Motion DC charger.

9. Indicators and User interfaces

9.1 Indicators and User interfaces

The Green Motion DC 44/66 EV charger has four different indicator and user interface means, as shown in Chapter 3.1:

• LED indicators,

• Color touchscreen display.

• Emergency stop button

• Energy meter (DC output)

9.1.2 LED indicator

Green Motion DC 44/66 EV charger is equipped with a LED indicator located on the door (see Figure 1). Table 19 summarizes the possible LED indications during the operation.

Table 20. LED indications of Eaton Green Motion DC 44/66 EV charger

Visual state	Description	Status
	No light	Stopped or not powered
	Incremental green light Flashing green light Steady green light Breathing green light	Integrity check Start-up stage Ready for use Waiting for user interaction
	Steady white + flashing red dot light	No internet / No server connection
	Flashing blue light Breathing blue light Steady blue light	Charge start-up stage Vehicle in charge Vehicle charged / Reserved
	Steady Cyan light	No power available / Charge stopped by schedule
	Steady yellow light	Not in service / Maintenance
	Breathing orange light	Updating stage
	Red light on	Error in charging / Hardware fault /Emergency switch on
	No light + flashing red light	Integrity check failed
	Flashing purple / white	RFID add card / Master card detected
	Purple lift up	RFID new card added
	Purple lift down	RFID card removed

During charging, the LED indicator shows the state of charge of the vehicle, as illustrated in Figure 39.
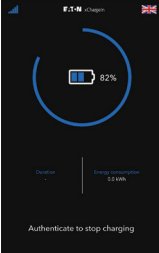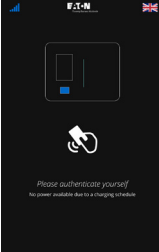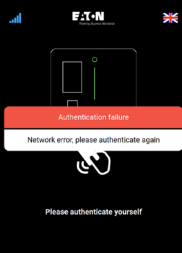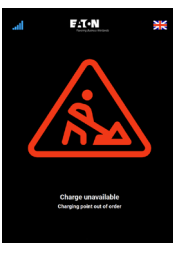
Figure 39. LED indicator of the state of charge

| A | B |
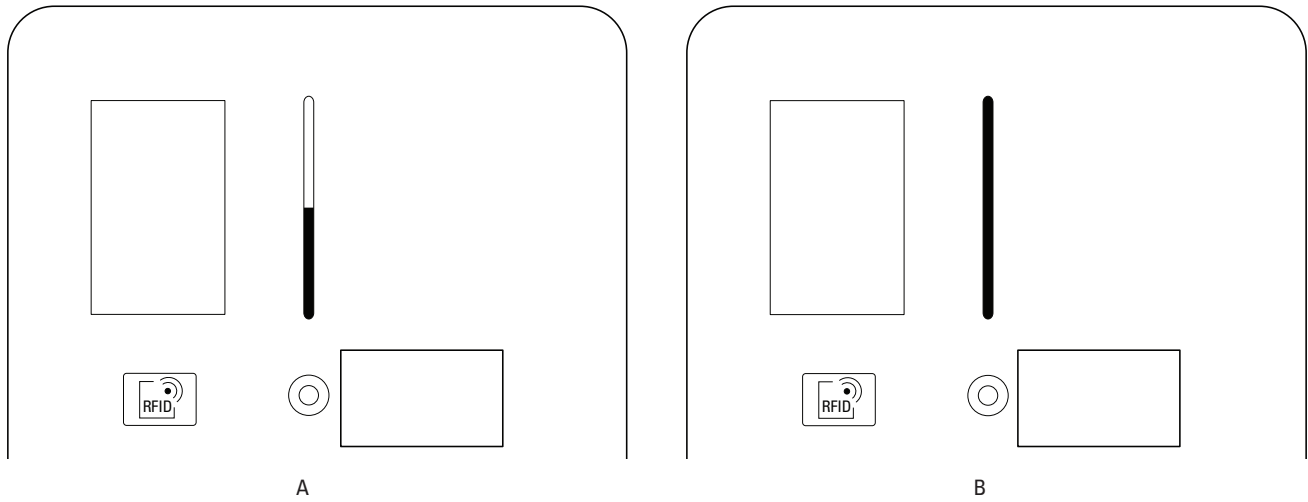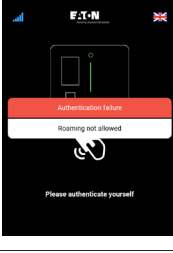
Tag	Description
Ⓐ	Vehicle battery state of charge at 50%
Ⓑ	Vehicle battery state of charge at 100%
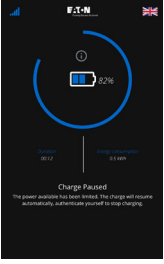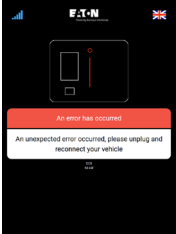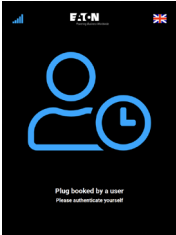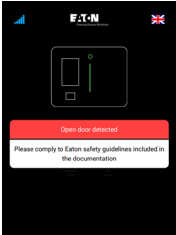
9.1.3 Color touchscreen display

Green Motion DC Air 44/66 EV charger is equipped with a color touchscreen display located on the front door. See Figure 39. Information that the display shows is usually self-explanatory. Table 20 provides an example of the screens at startup phase. Due to continuous improvement, it is possible that changes will be implemented in the future to enhance the user experience.

Table 21. Examples of information available from the color touchscreen display

Display of the EV charger	Description
	Touchscreen display. Touch the screen to wake up.
	Authentication screen. Before any operation, ensure that the 4G sign is colored in blue. If the bar graph is RED, there is no connection to the server. Choose your language by touching the flag. Present the RFID badge on the RFID reader to initiate authentication.
	Select the appropriate plug type.

Display of the EV charger	Description
	State of charge of the vehicle.
	No power available due to a charging schedule.
	Authentication failed due to network issues. Try again. Check that the 4G sign is colored in blue.
	Charger is out of order. Maintenance is needed before putting the charger back in service.
	Contact the technical support to put the charger in service
	This charger is not part of your eMSP and you do not have roaming rights. You can not charge with your RFID card. If available use Scan&Charge.
	After checking that there is no more risk, release the emergency stop button on the front door.

Display of the EV charger	Description
	Charge Paused. The power available has been limited. The charge will resume automatically, authenticate yourself to stop charging
	Unplug and reconnect the vehicle to correct the error.
	Charging station is already booked by a user. If you are not the one who booked it you cannot start charging.
	Open door detected. Door needs to be closed before starting a new charge session.

10. Maintenance

Installation, commissioning, maintenance or retrofitting of the EV charger must be performed by professional and qualified personnel who are responsible for complying with existing standards and local installation regulations.

Before starting connection operations, make sure that the external AC-line main switch is disconnected, and circuit breakers are open.

Any operation that requires to open the EV charger can lead to electric shock hazards.

In case the unit shows a failure and the emergency stop button is pushed, check the integrity of the unit, cables and connectors before starting the maintenance process.

Opening the EV charger, as well as performing any configuration changes, must be performed by a qualified electrician in accordance with local safety and electrical regulations and laws.

Disconnect the unit from the power supply and wait at least 10 minutes to allow its components to cool down and any static electricity storage devices to discharge, before carrying out any maintenance on the unit. The housing could overheat during its operation or be heated by direct sunlight, so that it can cause burns by contact. To avoid injuries by heat, please use suitable PPE or wait for the equipment to cool down before accessing it.

10.1 How to open/close the housing of the Green Motion DC Air 44/66 EV charger and wire the display

Before attempting to open the EV charger, ensure the external AC-line main switch is opened, and circuit breakers are open.

Wait at least 10 minutes after disconnecting the unit from the power supply to allow its components to cool down and any static electricity storage devices to discharge, before operating on the unit.
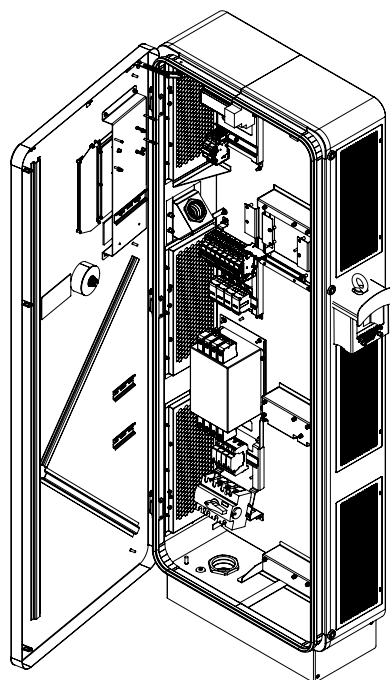
Follow these steps to open the housing of the EV charger.

When removing the door, be careful not to damage any cables connected to the display and the electronic boards.

Step 1. Using the square key 8 mm, unlock the three cam locks located on the right side of the EV charger (see Figure 40).

Figure 40. Location of the three cam locks at the right side of the unit

Step 2. The front door can be opened sideway.

10.2 How to put the unit as out of order

The Green Motion DC Air 44/66 EV charger can be set as out of order by following the steps below:

1. On-site method: Press the emergency stop button.
2. Remote method: Access the Eaton Charging network manager and set the unit as out of order.

10.3 Replace the SIM card

To replace the SIM card, proceed as follows:

Step 1. Remove the existing SIM card from the card slot. See Chapter 7.2.2.

Step 2. Insert the new SIM card into the card slot. See Chapter 7.2.2.

10.4 Cleaning or replacing filters

Please make sure that the fans are turned off and that the EV charger is not in use during the maintenance operation. Moving fans can be dangerous and cause finger injuries.

Before starting connection operations, make sure that the external AC-line main switch is disconnected, and circuit breakers are open.

Check the filters on a yearly basis to ensure they are not obstructed and they work properly. In case of obstruction, filters need to be replaced as soon as possible. In case of obstruction, Eaton recommends not to use the unit and to wait for the replacement of the filters.

Before starting the operation, please contact your Eaton service representative for the new filter reference.

Follow the steps below to replace the filters:

Step 1. Open the housing by unlocking the cam locks as described in Chapter 7.1.

Step 2. The filters are located on both left and right sides of the unit, behind the air flow grids. Using a 2.5 mm hex key, remove the 2 screws attaching each filter cartridge to the unit. See Figure 41.

Figure 41. Location of the filter on the left side of the unit
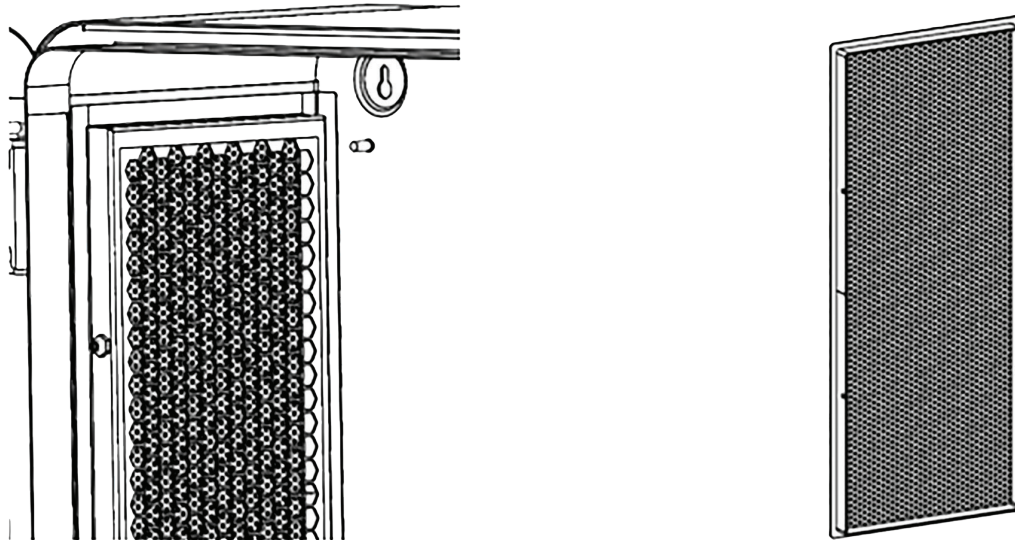
Step 3. Screw the new filters on the back of the air flow grid.

Step 4. Close the door and restart the unit.

10.5 Dismount

⚠ Before starting any maintenance operations, ensure the system has been switched off, and that the AC-line external main switch has been set to off. Disconnect the unit from the power supply and wait at least 10 minutes to allow its components to cool down and any static electricity storage devices to discharge, before removing the unit. The housing could be heated by direct sunlight and it can cause burns by contact. Please use suitable PPE or wait for the equipment to cool down before accessing it.

To uninstall the unit:

⚠ **Step 1.** Disconnect any load if present.

Step 2. Open the housing by unlocking the cam locks as described in Chapter 7.1.

Step 3. Disconnect the EV charger from the AC supply network (see Figure 41)

Step 4. Disconnect the communication cables and external controls where present.

Step 5. The product can now be removed for disposal or repair.

10.6 EV charger updates

It is mandatory to install and maintain the units with the latest system updates to enable new features and bug fixes, or the guarantee conditions may be voided.

For units that are online, this must be done via the Eaton Charging network manager software platform. Please refer to the Eaton Charging network manager user manual, available on www.eaton.com, for further details. For units that are offline, please contact your Eaton service representative using the email address bgtechsupport@eaton.com

10.7 Disposal

When the unit reaches the end of its service life, the end user should contact professional and qualified personnel for disposal instructions.

Please refer to www.eaton.com/recycling for further details.

The EU Directive on Waste Electrical and Electronic Equipment (WEEE) (Directive 2012/19/EU) establishes common rules on the management of electrical and electronic equipment and minimizes its impact – from design until disposal – on the environment. As a manufacturer of electrical and electronic equipment, Eaton actively supports the requirements of the WEEE Directive.

In compliance with the EU standard EN 50419 for marking of electrical and electronic equipment, we include the crossed-out wheeled bin symbol on our products. This symbol alerts users that these products should be recycled in accordance with local environmental regulations and not discarded with household waste. When end users recycle WEEE they are helping to ensure that they are neither incinerated nor sent to landfill, minimizing the potential negative impact on human health and the environment.

Any device that is no longer needed must therefore be returned to the distributor or disposed of via an authorized collection and recycling center in the area. Eaton encourages all its customers and end users to make responsible decisions when disposing of products.

Eaton is not responsible for the transportation of the device to the collection point or recycling center.

11. Troubleshooting

This section contains information and procedures for solving problems that may occur with the Green Motion DC Air 44/66 EV charger.

Check the warnings or error messages and act as indicated in Table 21.

If the problem persists, contact your Eaton technical support representative using the email address bgtechsupport@eaton.com

Table 22. List of alarms and troubleshooting

Possible problems	Solutions
Router does not connect during configuration	Check that the EV charger is powered and in standby mode.
The EV charger does not start	Check the LED status color and read the indication on the touchscreen display.
	Check the power supply on the electrical panel, switch off and reset the circuit-breaker to restart it.
The EV charger indicates that the emergency stop button is pushed	Check that the unit is not damaged, the installation and commissioning are correctly done.
	Check the LED status color and read the indication on the touchscreen display.
	The emergency stop button is located on the front of the EV charger. Pull it out until it clicks into open position.
	If the unit was set as out of order, it is possible now to change the physical status directly from the Eaton Charging network manager.
The EV charger visual indicators are red	Check the LED status color and read the indication on the touchscreen display.
	Try to disconnect the car from the EV charger and retry.
	Check the emergency stop button, it should be pulled out.
Antenna bar graph (4G sign on touch screen display) is red	Check the LED status color and read the indication on the touchscreen display.
	Check that the connection of the EV charger to the backend is available/network is available.
Authentication refused	Check the LED status color and read the indication on the touchscreen display.
	Check that the user is recognized, and authorized user subscribed to the charging point operator database.
	Check that the connection of the EV charger to the backend is available.
The socket visual indicators are red	Check the LED status color and read the indication on the touchscreen display.
	Check the power supply on the electrical panel, switch off and reset the circuit-breaker to restart it.
The charging cable cannot be released from the vehicle	Check the LED status color and read the indication on the touchscreen display.
	In some cases, the user must unlock the plug from the car's dashboard or use the key control (long press may be required).
	In case the user is not able to remove the cable, press the emergency stop button to release the cable.
	The emergency stop button can then be set to the initial position, after inspection.
The car does not charge	Check the LED status color and read the indication on the touchscreen display.
	Check the condition of the CCS or CHAdeMO cable.
	Check the power supply on the electrical panel, switch off and reset the circuit-breaker to restart it.
	Try starting and moving the vehicle, then try charging again.
Billing information is not shown on the screen	Contact the Eaton service helpdesk

12. Technical data

12.1 Rating plate

To locate the rating plate on the equipment, refer to Figure 42.

The technical specifications shown in this manual do not replace those that appear on the rating plate attached to the equipment.

The labels attached to the equipment must NEVER be removed, damaged, soiled or hidden for any reason.

The information displayed on the rating plate is as follows:

1. Manufacturer
2. Model
3. Ratings
4. Certification marks
5. Warnings
6. Serial number

The labels must NOT be hidden with foreign objects (rags, boxes, equipment, etc.); they must be periodically cleaned and always kept clearly visible.

Figure 42. Location of the rating plate
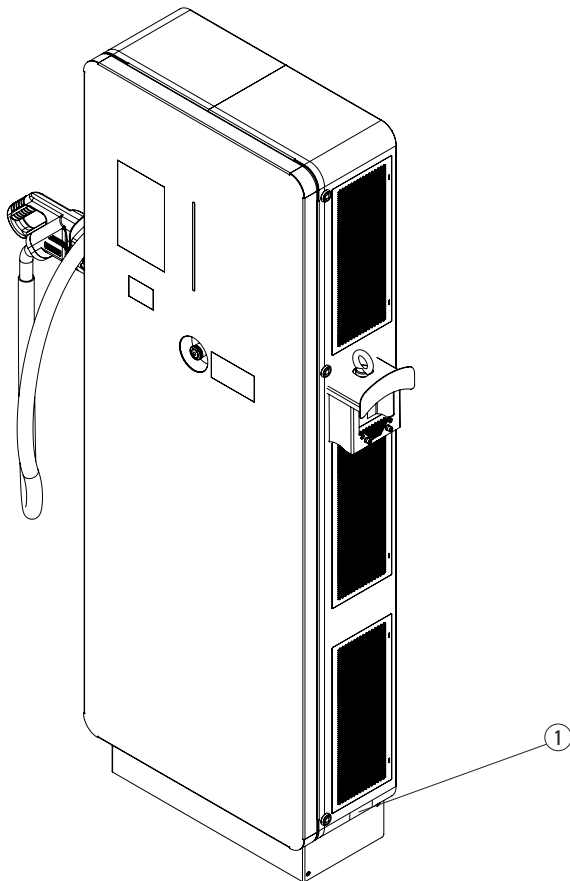
Tag	Description
①	Rating plate

12.2 Technical datasheet

The latest version of the technical datasheet is available for download from www.eaton.com/greenmotiondc44_66.

Green Motion DC Air 44/66 EV charger complies with the standards listed in Table 22.

Table 23. List of standards the EV charger complies with

Certifications and standards	
General	
Low-voltage compliance	IEC 61851-1, IEC 61851-23, IEC 60664-1, IEC 61439-1, IEC 61439-7
Cable	IEC 62196-1, IEC 62196-3
Electromagnetic compatibility	EN IEC 61851-21-2, EN 61000-6-1, EN 61000-6-3, EN 301 489-1
Restriction of Hazardous Substances	EN IEC 63000
Communication	
CCS2	ISO 15118, DIN 70121
CHAdeMO	0.9 / 1.2

13. Contact support information

Should any technical problems arise during the operation of the Green Motion DC Air 44/66 EV charger, contact your
Eaton technical support representative for assistance using the email address bgtechsupport@eaton.com.
The following information should be provided when contacting the Eaton technical support representative:

- Product model and serial number,
- Fault messages.

Follow us on social media to get the latest product and support information.