Operating manual

SMA EV CHARGER BUSINESS

ENGLISH

EVC-Business-BE-en-12 | Version 1.2

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1 Information on this Document

1.1 Validity

This document is valid for:

- EVCB-LB-3AC-10
- EVCB-LB-3AC-ECC-10
- EVCB-3AC-10
- EVCB-3AC-ECC-10

1.2 Target Group

This document is intended for qualified persons and end users. Only qualified persons are allowed to perform the activities marked in this document with a warning symbol and the caption "Qualified person". Tasks that do not require any particular qualification are not marked and can also be performed by end users. Qualified persons must have the following skills:

- Knowledge of how the product works and is operated
- Training in how to deal with the dangers and risks associated with installing, repairing and using electrical devices and installations
- Training in the installation and commissioning of electrical devices and installations
- Knowledge of all applicable laws, regulations, standards, and directives
- Knowledge of and compliance with this document and all safety information

1.3 Content and Structure of this Document

This document describes the mounting, installation, commissioning, configuration, operation, troubleshooting and decommissioning of the product as well as the operation of the product user interface.

You will find the latest version of this document and further information on the product in PDF format and as eManual at www.SMA-Solar.com.

Illustrations in this document are reduced to the essential information and may deviate from the real product.

1.4 Levels of warning messages

The following levels of warning messages may occur when handling the product.

⚠ DANGER
Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING
Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION
Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE
Indicates a situation which, if not avoided, can result in property damage.

1.5 Symbols in the Document

Icon	Explanation
	Information that is important for a specific topic or goal, but is not safety-relevant
☐	Indicates a requirement for meeting a specific goal
☑	Desired result
	Example
⚠ QUALIFIED PERSON	Sections describing activities to be performed by qualified persons only

1.6 Typographical Elements in the Document

Typographical element	Use	Example
bold	• Messages • Terminals • Elements on a user interface • Elements to be selected • Elements to be entered	• Connect the insulated conductors to the terminals **X703:1** to **X703:6**. • Enter **10** in the field **Minutes**.
>	• Connects several elements to be selected	• Go to **Settings > Date**.
[**Button**] [**Key**]	• Button or key to be clicked on or pressed down	• Select [**Enter**].
#	• Placeholder for variable components (e.g., parameter names)	• Parameter **WCtlHz.Hz#**

1.7 Designations in the Document

Complete designation	Designation in this document
EV Charger Business	EV Charger, charging station, product

2 Safety

2.1 Intended Use

The EV Charger Business is an AC charging station designed for private, semipublic and public sectors.

The product must only be used as stationary equipment.

The product is suitable for indoor and outdoor use.

All components must remain within their permitted operating ranges and their installation requirements at all times.

The product must only be used in countries for which it is approved or released by SMA Solar Technology AG and the grid operator.

Use SMA products only in accordance with the information provided in the enclosed documentation and with the locally applicable laws, regulations, standards and directives. Any other application may cause personal injury or property damage.

Alterations to the SMA products, e.g., changes or modifications, are only permitted with the express written permission of SMA Solar Technology AG. Unauthorized alterations will void guarantee and warranty claims and in most cases terminate the operating license. SMA Solar Technology AG shall not be held liable for any damage caused by such changes.

Any use of the product other than that described in the Intended Use section does not qualify as appropriate.

The enclosed documentation is an integral part of this product. Keep the documentation in a convenient, dry place for future reference and observe all instructions contained therein.

This document does not replace any regional, state, provincial, federal or national laws, regulations or standards that apply to the installation, electrical safety and use of the product. SMA Solar Technology AG assumes no responsibility for the compliance or non-compliance with such laws or codes in connection with the installation of the product.

The type label must remain permanently attached to the product.

Only applies to the products EVCB-LB-3AC-ECC-10 / EVCB-3AC-ECC-10

I Requirements for the operator of the product, who must fulfill them as a necessary condition for intended operation

In the meaning of Section 31, Measurement and Verification Act (MessEG), the operator of the charger (of the product) is the user of the measuring device.

The charger is only considered to be used as intended by and in compliance with the calibration regulations only if the ambient conditions in the meter installed in it are the same as the ambient conditions for which its type examination certificate was granted.

- When registering the charge points with the Federal Network Agency using the registration form, the user of the product must also register the port number specified for the charge points on the charger. Without this registration, operation of the charger in compliance with the calibration regulations is not possible. The required information about registration and the registration form are available under the following external link: https://www.bundesnetzagentur.de/DE/Sachgebiete/ElektrizitaetundGas/

Unternehmen_Institutionen/E-Mobilitaet/Ladep_Form/StartNEU/node.html Anzeige_Ladepunkte_node.html.
A quick reference guide for the operator of public charge points is also available under this link: https://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Energie/Unternehmen_Institutionen/E_Mobilitaet/Leitfaden.pdf?__blob=publicationFile&v=6.

- The user must ensure that the calibration validity periods for the components in the charger and the charger itself are not exceeded.
- The user of the product must ensure that charging devices are decommissioned promptly if operation in compliance with the calibration regulations is no longer possible due to malfunction or error indicators in the display of the calibration-relevant human-machine interface. The catalog of malfunction and error messages in the operating manual must be observed.
- The user of the product must make the data packets signed and read out from the charger-seamlessly, corresponding to the pagination, and permanently, (also) saved on the hardware dedicated to this purpose (dedicated memory) in the possession of the user - available to authorized third parties (operating obligation of the storage system). "Permanently" means that the data are not only saved until the business transaction has been completed. Instead, they must be saved at least until the expiration of any statutory periods of appeal for the business transaction. Substitute values may not be created for non-existent data.
- The user of the product must provide the measured values from this product that they receive and use in the course of business to measured value users in an operating manual approved by the CSA in electronic form. In particular, the user of this product must point out no. II "Requirements for the user of the measured values from the charging device."
- The user of the product is subject to the notification requirements pursuant to Art. 32 MessEG (excerpt): Art. 32 Notification requirement "(1) Those who use new or reconditioned measuring device must notify the authorities responsible in accordance with national law 6 weeks after commissioning at the latest...".
- Insofar as the authorized authorities consider it necessary, the measuring device user must provide the entire contents of the dedicated local memory or the memory at the CPO (charge point operator) with all data packets from the billing period.

II Requirements for the user of the measured values from the charger (e-mobility service provider (EMSP))

The user of the measured values must observe Art. 33 MessEG:

§ 33 MessEG (quote)

§ 33 Requirements for the use of measured values

(1) Values for measured variables may only be listed or used in the course of business or officially, or for measurements in the public interest, if a measuring device was used as intended to determine them and the values can be traced back to the respective measurement result insofar as the ordinance in accordance with Art. 41 (2) does not contain different stipulations. Other federal regulations adopted for similar protective purposes continue to be applicable.

(2) To the best of their ability, measured value users must make sure that the measuring device fulfills the statutory requirements and must have the person using the measuring device confirm that they fulfill their obligations.

(3) The measured value user must

- *ensure that the measured values listed in bills based on measured values can be easily understood by the recipient of the bills and*
- *provide suitable aids for the purposes listed in no. 1 if necessary.*

For users of measured values, this stipulation results in the specific following obligations of measured valued use that is in compliance with the calibration regulations:

- The contract between the EMSP (e-mobility service provider) and the customer must clearly stipulate that the supply of electrical energy is the exclusive subject of the contract: it is not the charging service duration.
- The timestamps on the measured values originate in a clock on the charger that is not certified in accordance with MessEG. For this reason, they must not be used to tarify the measured values.
- The EMSP must ensure that the sale of the e-mobility service takes place via chargers that enable the ongoing charging process to be observed, insofar as there is no corresponding local display on the charger. At the beginning and end of a charging session at least, trustworthy measured values in compliance with the calibration regulations must be available to the customer.
- After measurement is completed and at the time of billing at the latest, the EMSP must automatically provide the billing-relevant data packet, including the signature, (e.g., by storing its email address on a website) to the customer as a data file. As long as the customer did not expressly opt out, this must be done in a way that enables the data to be checked for authenticity using transparency and display software. The data can be provided via channels that have not been verified as compliant with the calibration regulations.
- The EMSP must provide the customer with the transparency and display software affiliated with the charger for verifying the authenticity of the data packets.
- The EMSP must be able to show with conclusive proof which means of identification was used to initiate the charging process affiliated with a specific measured value. In other words, the EMSP must be able to document that each business transaction and billed measured value was correctly matched to the personal identification data. The EMSP must inform the customer about this obligation in the appropriate form.
- The EMSP many only use value for purposes of billing that are present in a dedicated memory in the charger and/or the memory of the CPO. Substitute values may not be created for billing purposes.
- Through a corresponding agreement with the operator of the charger, the EMSP must ensure that the data packages used for billing purposes are saved for a period that is long enough to enable the associated business transactions to be fully completed.
- In the case of justified requirements notification for the purpose of carrying out calibration, results verification and measures for monitoring use, the EMSP must facilitate the authentication of the examples of the products used by the EMSP associated with this operating manual.
- All obligations listed above are applicable to the EMSP as the measured value user in the meaning of Art. 33 MessEG, even if the EMSP procures the measured values from the charger via a roaming service provider.

- The EMSP must ensure that the customer receives all the information necessary for the receipt of their permanent documentation. For this reason, the website, billing amount and the data of the charging process must be listed on the credit card bill or as the purpose of the account debit in the case of selective charging.
  If this necessary information is missing, this is not a case of intended use of the measuring device.
- If selective charging is used, the EMSP must clearly indicate to the customer how to display the price per unit stored in the data array to the customer in plain text.

2.2 IMPORTANT SAFETY INSTRUCTIONS

Keep the manual for future reference.

This section contains safety information that must be observed at all times when working.

The product has been designed and tested in accordance with international safety requirements. As with all electrical or electronical devices, some residual risks remain despite careful construction. To prevent personal injury and property damage and to ensure long-term operation of the product, read this section carefully and observe all safety information at all times.

⚠ DANGER

Danger to life due to electric shock when live components or cables are touched

High voltages are present in the conductive components or cables of the product. Touching live parts and cables results in death or lethal injuries due to electric shock.

- Do not touch non-insulated parts or cables.
- Disconnect the product from voltage sources and ensure it cannot be reconnected before working on the device.
- Wear suitable personal protective equipment for all work on the product.

⚠ DANGER

Danger to life due to electric shock in case of overvoltages and if surge protection is missing

Overvoltages (e. g. in the event of a flash of lightning) can be further conducted into the building and to other connected devices in the same network via the network cables or other data cables if there is no surge protection. Touching live parts and cables results in death or lethal injuries due to electric shock.

- Ensure that all devices in the same network are integrated in the existing overvoltage protection.
- When laying the network cable outdoors, ensure that there is suitable surge protection at the network cable transition from the product outdoors to the network inside the building.
- The Ethernet interface of the product is classified as "TNV-1" and offers protection against overvoltages of up to 1.5 kV.

⚠ WARNING

Risk of injury due to toxic substances, gases and dusts.

In rare cases, damages to electronic components can result in the formation of toxic substances, gases or dusts inside the product. Touching toxic substances and inhaling toxic gases and dusts can cause skin irritation, burns or poisoning, trouble breathing and nausea.

- Only perform work on the product (e.g., troubleshooting, repair work) when wearing personal protective equipment for handling of hazardous substances (e.g., safety gloves, eye and face protection, respiratory protection).

⚠ CAUTION

Risk of injury due to weight of product

Injuries may result if the product is lifted incorrectly or dropped while being transported or mounted.

- Wear suitable personal protective equipment for all work on the product.

NOTICE

Damage to the product due to sand, dust and moisture ingress

Sand, dust and moisture penetration can damage the product and impair its functionality.

- Only open the product if the humidity is within the thresholds and the environment is free of sand and dust.
- Do not open the product during a dust storm or precipitation.

NOTICE

Damage to the product due to cleaning agents

The use of cleaning agents may cause damage to the product and its components.

- Clean the product and all its components only with a cloth moistened with clear water.

3 Scope of Delivery

Check the scope of delivery for completeness and any externally visible damage. Contact the Service if the delivery is incomplete or damaged.

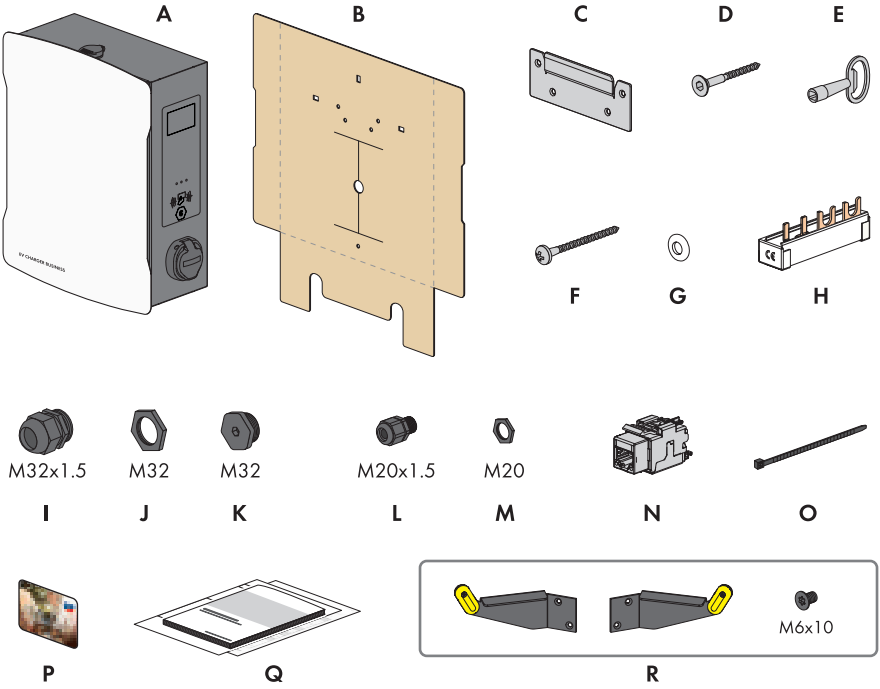


Figure 1: Components included in scope of delivery

Position	Quantity	Designation
A	1	Charging station
B	1	Drilling template
C	1	Wall mounting bracket
D	4	Countersunk screw M5x60
E	1	Product key
F	1	Button head screw M5x60
G	1	Spring washer M6
H	1	Busbar, fork 10 mm², 4 lugs
I	2	Cable gland M32x1.5
J	2	Counter nut for cable gland M32

Position	Quantity	Designation
K	2	Sealing cap M32
L	1	Cable gland M20x1.5
M	1	Counter nut for cable gland M20
N	1	RJ45 module
O	2	Cable tie
P	2	RFID card
Q	1	Manual
R	1	**Only for products EVCB-3AC-10 / EVCB-3AC-ECC-10:** Cable bracket left and right, 4 mounting screws M6x10

4 Scope of delivery, charging stand

Check the scope of delivery for completeness and any externally visible damage. Contact the Service if the delivery is incomplete or damaged.

One-sided charging stand

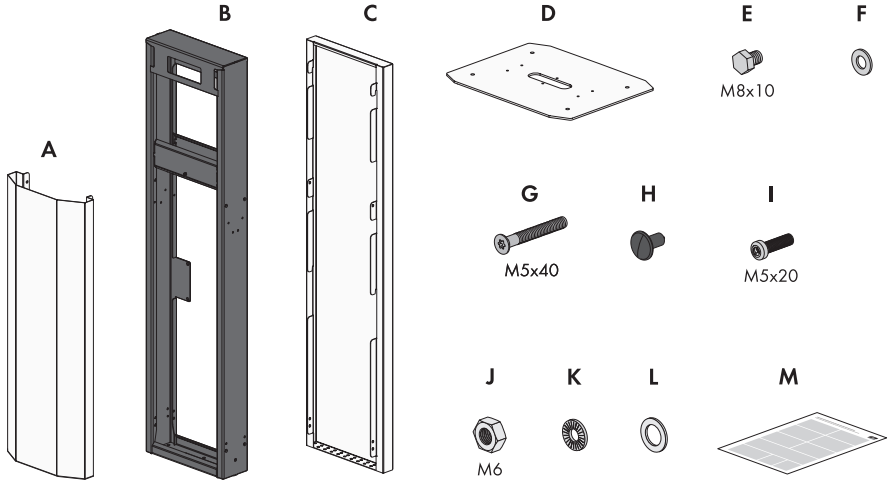


Figure 2: Components included in scope of delivery

Position	Quantity	Designation
A	1	Cover, front
B	1	Middle section
C	1	Cover, rear
D	1	Base plate
E	6	Bolt M8 x 10
F	6	Washer M8
G	8	Countersunk head screw M5x40
H	8	Fir tree clip
I	1	Flat-head bolt M5x20
J	1	Nut M6
K	1	Serrated lock washer M6
L	1	Washer M6
M	1	Manual

Double-sided charging stand

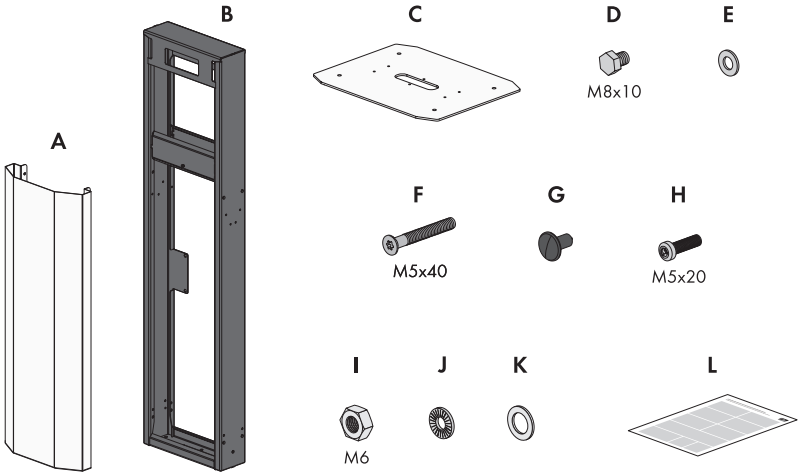


Figure 3: Components included in scope of delivery

Position	Quantity	Designation
A	2	Cover (front and rear)
B	1	Middle section
C	1	Base plate
D	6	Bolt M8 x 10
E	6	Washer M8
F	8	Countersunk head screw M5x40
G	8	Fir tree clip
H	1	Flat-head bolt M5x20
I	1	Nut M6
J	1	Serrated lock washer M6
K	1	Washer M6
L	1	Manual

5 Product Overview

5.1 Product Description

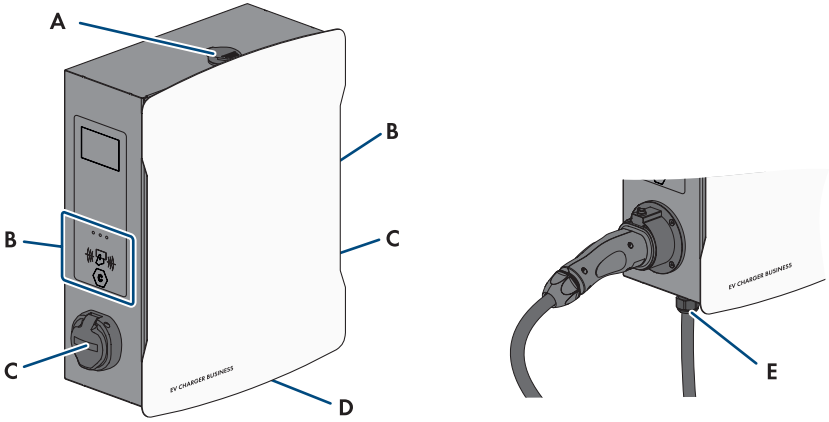


Figure 4: Design of the product

Position	Designation
A	Enclosure lock
B	RFID card reader with status LEDs
C	Charging socket
D	Type label The type label clearly identifies the product. The type label must remain permanently attached to the product. You will find the following information on the type lable: • Device type (Model) • Serial number (Serial No. or S/N) • Date of manufacture • Device-specific characteristics
E	Charging cable

5.2 Symbols on the Product

Icon	Explanation
	Beware of electrical voltage The product operates at high voltages.

Icon	Explanation
	Observe the documentation
	WEEE designation Do not dispose of the product together with the household waste but in accordance with the disposal regulations for electronic waste applicable at the installation site.
	Protection class I All electrical equipment is connected to the grounding conductor system of the product.
	CE marking The product complies with the requirements of the applicable EU directives.

5.3 Interfaces and Functions

SMA flexibly combines all required components of the charger into an overall system. This enables you to integrate your charger into your charging park, building or energy management system.

Interfaces / Communication	
Network interfaces	• LAN (RJ45), 10/100 Mbit/s • Cellular (4G LTE)
Backend connection	• OCPP version 1.6 JSON

5.4 LED Signals

The LEDs indicate the operating state of the product.

LED signal	Explanation
Green	Shining: Charger is free, no vehicles connected Slowly flashing: Charger is free, one vehicle connected
Yellow	Shining: Charger is reserved, no vehicles connected Slowly flashing: Charger is reserved, one vehicle connected Rapidly flashing: Charger exchanging data with backend, waiting for authorization
Blue	Slowly flashing: Charging process authorized, vehicle being charged Rapidly flashing: Charging process authorized, vehicle not connected yet or just disconnected from the charger

5.5 System overview

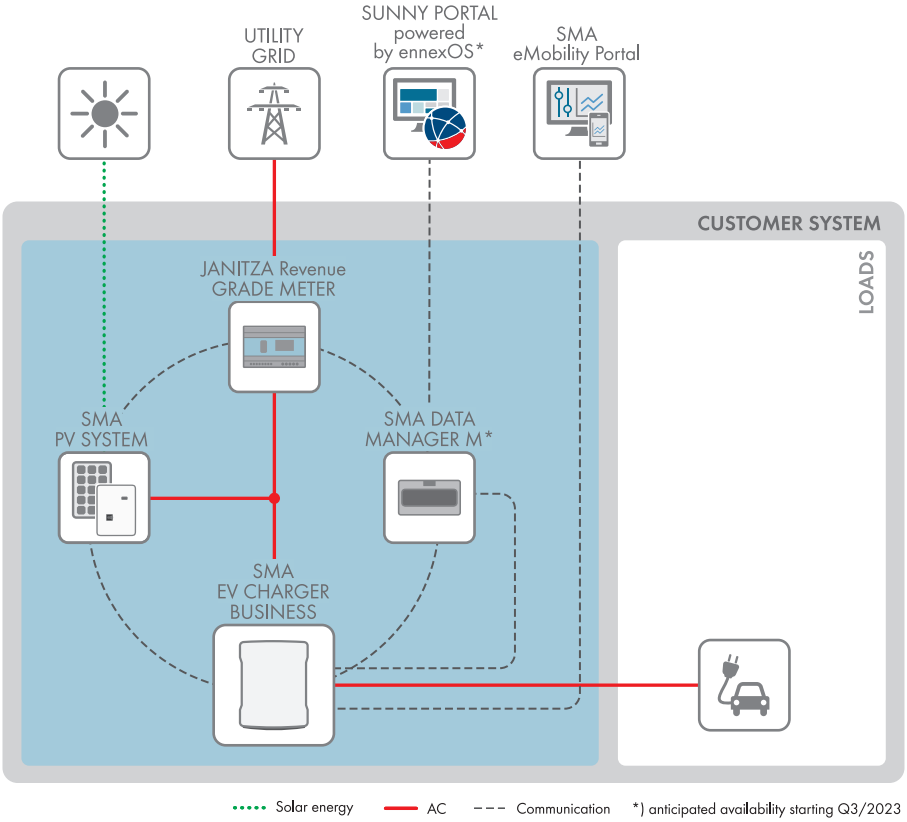


Figure 5: Design of the system

5.5.1 Circuitry Overview

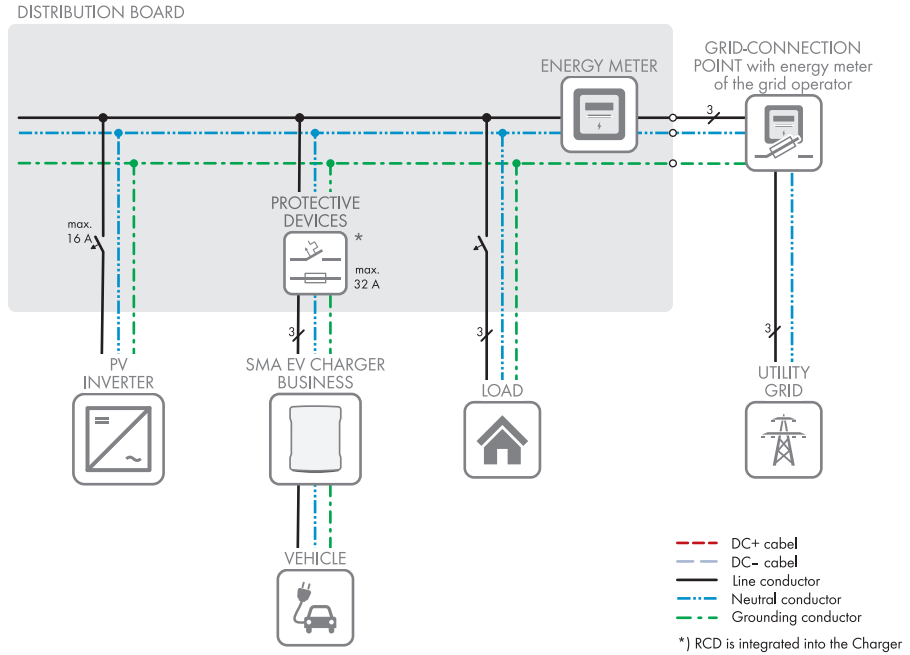


Figure 6: Circuitry overview (example)

5.5.2 Communication Overview

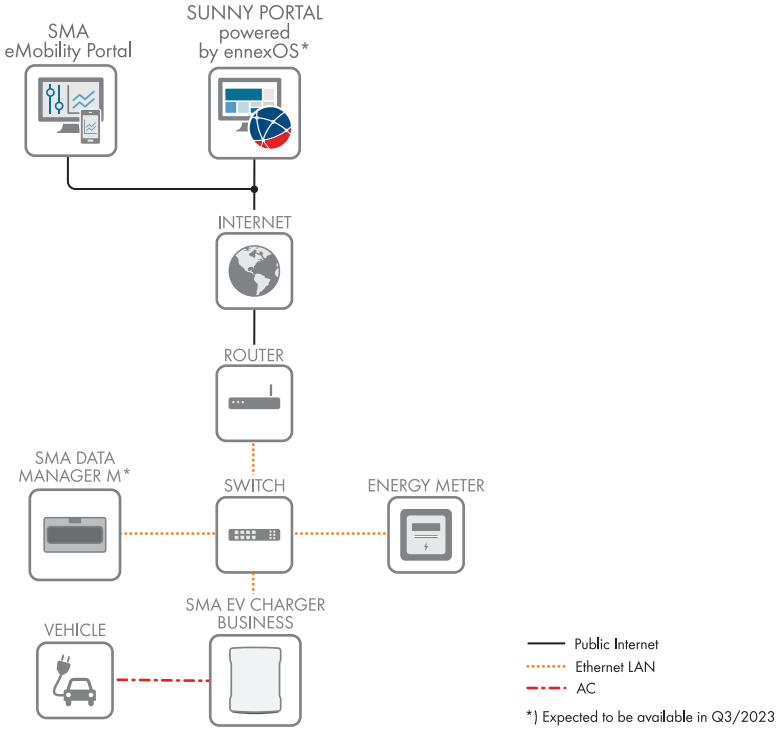


Figure 7: Design of system communication

6 Mounting

6.1 Requirements for Mounting

Requirements for the installation site:

⚠ WARNING

Danger to life due to fire or explosion

Despite careful construction, electrical devices can cause fires. This can result in death or serious injury.

- Do not mount the product in areas containing highly flammable materials or gases.
- Do not mount the product in potentially explosive atmospheres.

Requirements:

- ☐ A solid, flat support surface must be available for mounting.
- ☐ The support surface for installation must be made of a non-flammable material.
- ☐ Installation must be carried out so that the plug of the charging cable is always at a height of 0.5 m to 1.5 m above floor level.
- ☐ The mounting location must be suitable for the weight and dimensions of the product (see Section 17, page 92).
- ☐ The mounting location must not be exposed to direct solar irradiation. If the product is exposed to direct solar irradiation, the exterior plastic parts might age prematurely and overheating might occur. When becoming too hot, the product reduces its power output to avoid overheating.
- ☐ The installation site must be less than 2000 m above Mean Sea Level
- ☐ Mounting location must be selected so that the EV Charger and the vehicle can be connected with the charging cable. The charging cable must not be strained, squeezed or bent.
- ☐ No other device may be installed under the product.
- ☐ The mounting location should be freely and safely accessible at all times without the need for any auxiliary equipment (such as scaffolding or lifting platforms). Non-fulfillment of these criteria may restrict servicing.
- ☐ All ambient conditions must be met (see Section 17, page 92).

Permitted and prohibited mounting positions:

- ☐ The product may only be mounted in a permitted position. This will ensure that no moisture can penetrate the product.
- ☐ The product should be mounted in such way that display messages and LED signals can be read without difficulty.

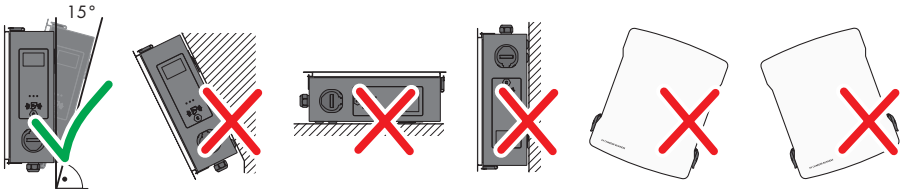


Figure 8: Permitted and prohibited mounting positions

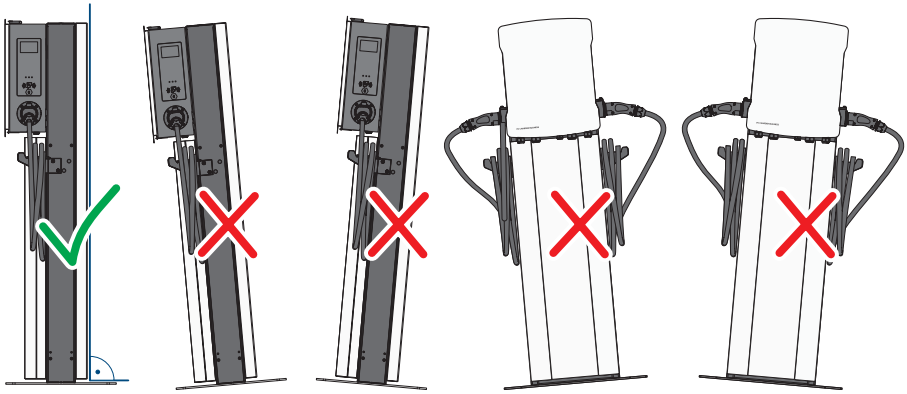


Figure 9: Permitted and prohibited mounting positions

Dimensions for wall mounting:

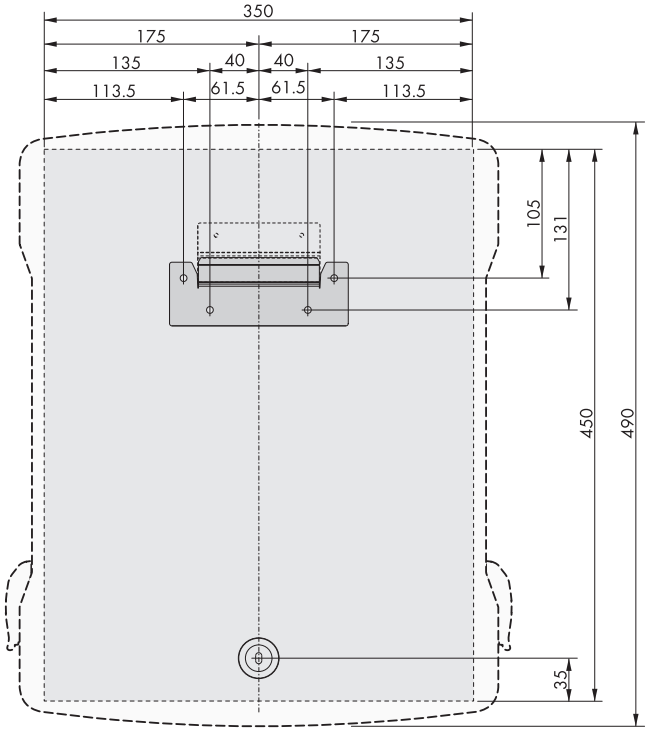


Figure 10: Position of the anchoring points(Dimensions in mm)

Accessories for charging stand mounting:

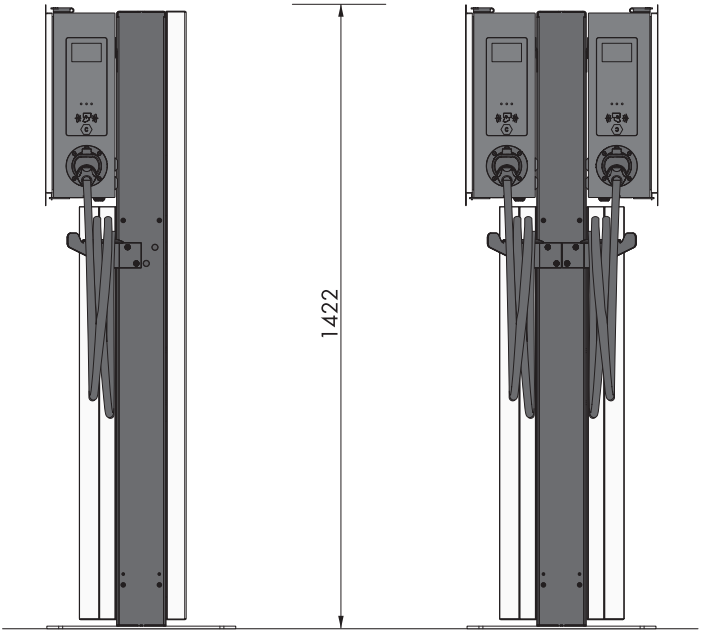


Figure 11: Charging stand dimensions (Dimensions in mm)

Recommended clearances for wall mounting:

- ☐ Maintain the recommended clearances to walls as well as to other charging stations, inverters or objects.
- ☐ If multiple products are mounted in areas with high ambient temperatures, increase the clearances between the products and ensure sufficient fresh-air supply.

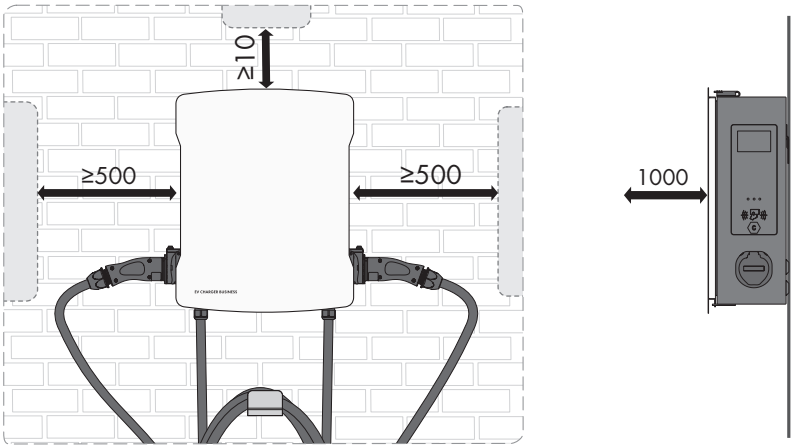


Figure 12: Recommended clearances(Dimensions in mm)

Recommended clearances for charging stand mounting:

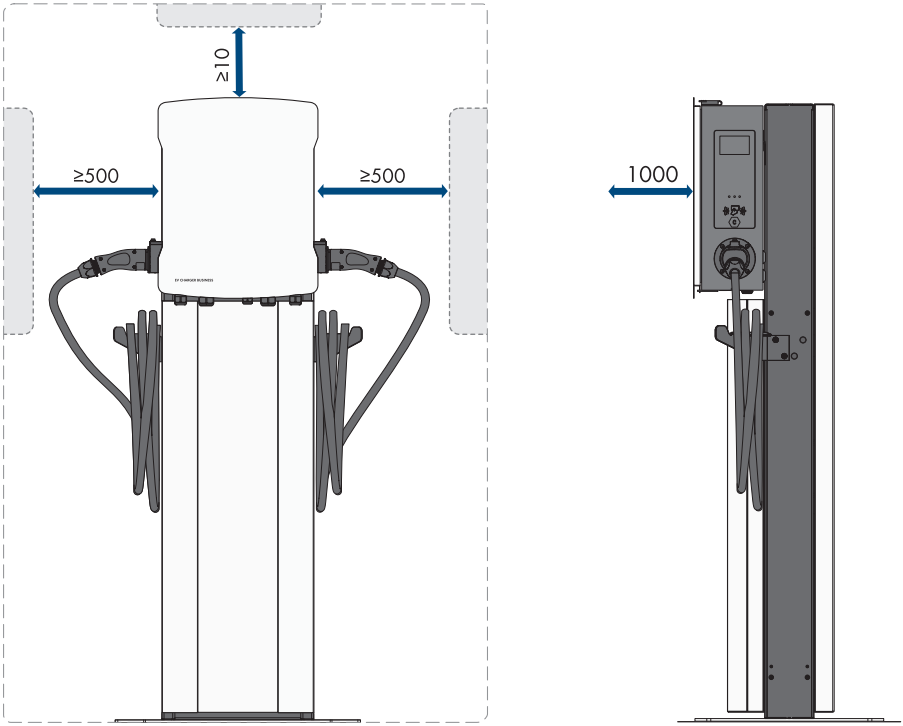


Figure 13: Recommended clearances(Dimensions in mm)

6.2 Wall Mounting

⚠ CAUTION

Risk of injury due to weight of product

Injuries may result if the product is lifted incorrectly or dropped while being transported or mounted.

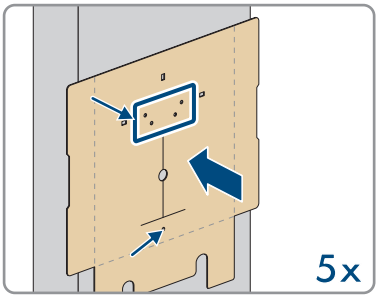
- Wear suitable personal protective equipment for all work on the product.

Additionally required mounting material (not included in the scope of delivery):

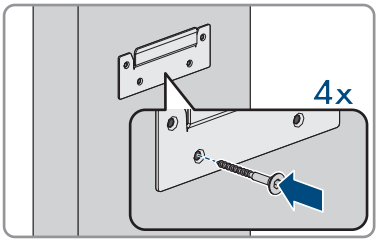
☐ Screw anchors for wall mounting

Procedure:

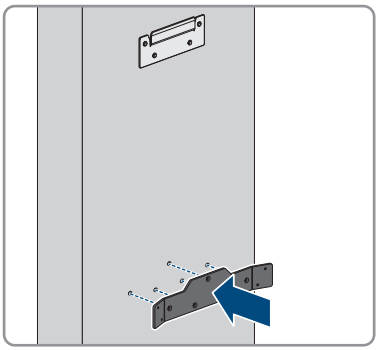
1. Mark the position of the 5 drill holes using the drilling template. Align the markings horizontally.



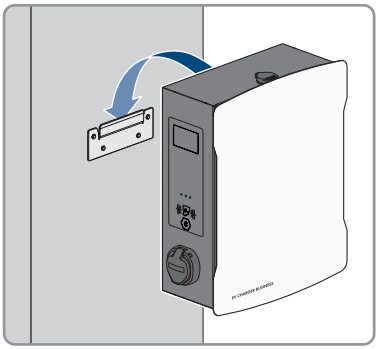
2. Drill the holes using a suitable drill bit.
3. Depending on the support surface, insert screw anchors (not included in the scope of delivery) into the drill holes.
4. Secure the wall mounting bracket using the 4 screws (M5x60) in the scope of delivery.



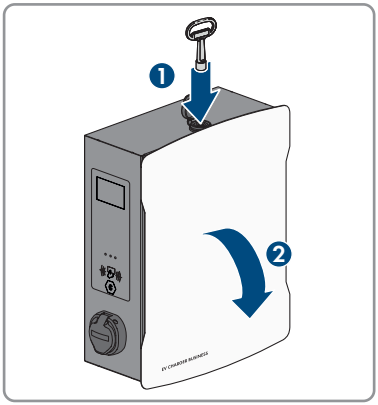
5. **Optional:** Secure the cable holder to the wall with the 5 screws (6x50) in the scope of delivery of the cable holder set (TX30).



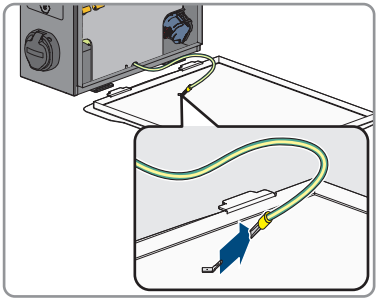
6. Hook the product onto the wall mounting bracket.



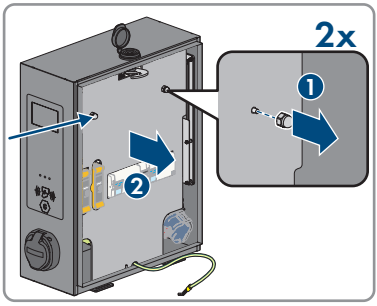
7. Open the enclosure cover with the supplied key.



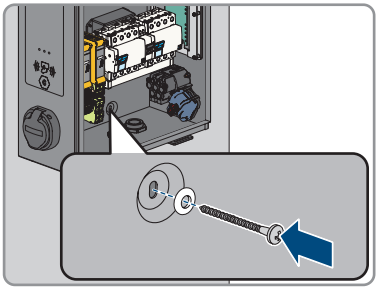
8. Pull off the grounding cable at the cover.



9. Remove the safety cover. To do so, loosen the 2 nuts. For the products EVCB-LB-3AC-ECC-10 and EVCB-3AC-ECC-10, safety seals are on the 2 nuts.



10. Secure the product with the conical spring washer and screw (M5x60) in the scope of delivery (PH5).



11. Ensure that the product is securely in place.

6.3 Mounting the charging stand

⚠ CAUTION

Risk of injury due to weight of product

Injuries may result if the product is lifted incorrectly or dropped while being transported or mounted.

- Wear suitable personal protective equipment for all work on the product.

i For a concrete foundation produced by the operator, billing, design and production are exclusively the responsibility of the operator or the company that carried out mounting on behalf of the operator.

Procedure:

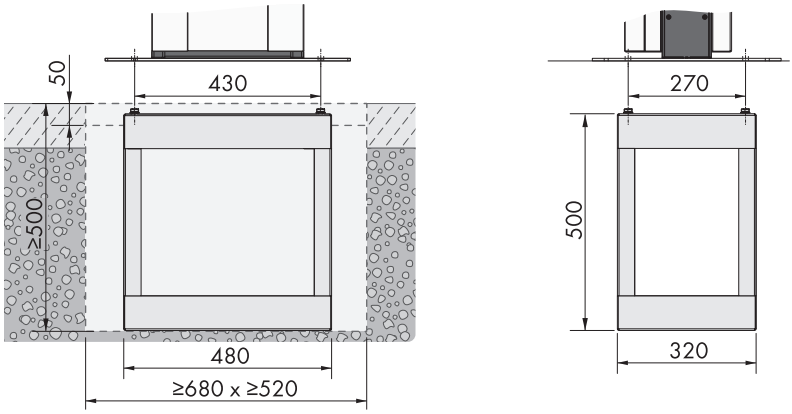
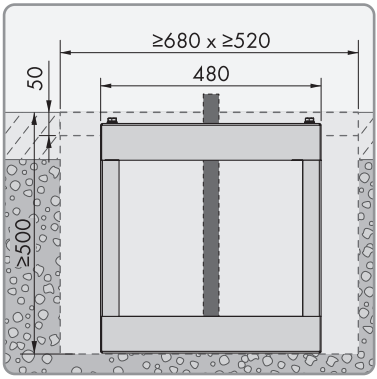
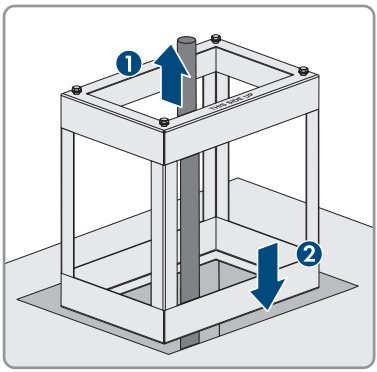


Figure 14: Dimensions of the foundation hole (Dimensions in mm)

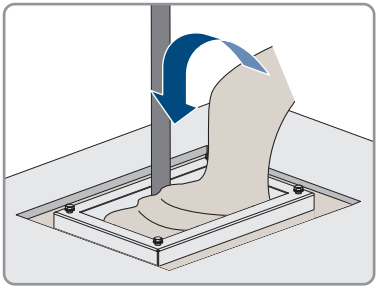
1. Ensure that the AC cable is long enough to connect to the product.
2. Excavate the foundation hole with the following dimensions: width ≥680 mm x height ≥500 mm x depth ≥520 mm.



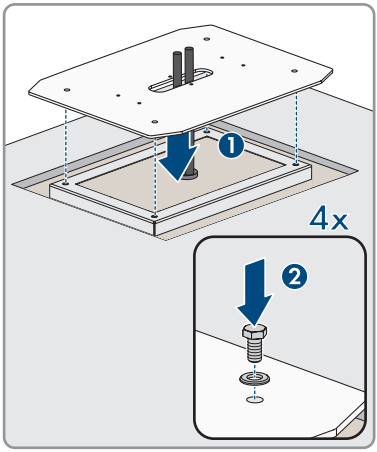
3. Insert the embedded section of the charging stand into the hole and guide the AC cable upwards.



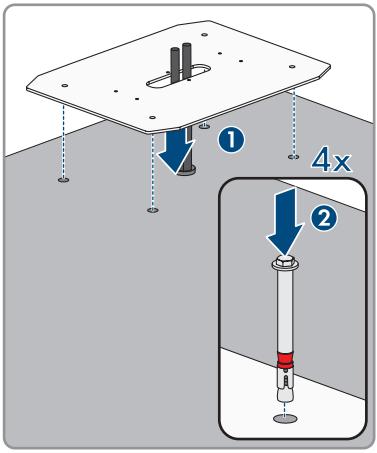
4. Stabilize the embedded section of the charging stand using class C30/37 concrete.



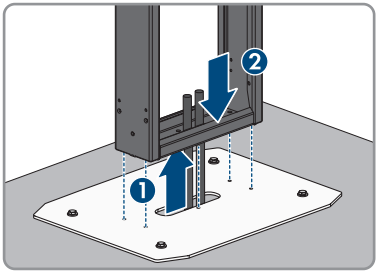
5. Let the concrete completely cure before starting to assemble the charging stand.
6. Position the base plate on the 4 holes of the embedded section of the charging stand. Secure the base plate with the 4 screws (M10x20) and the 4 washers in the scope of delivery of the charging stand (SW16).



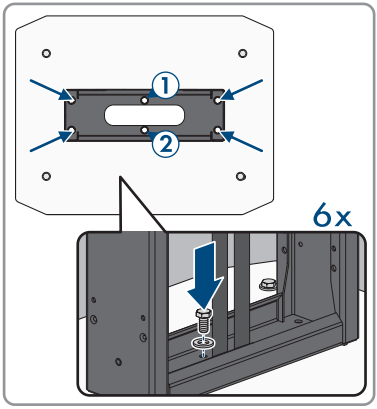
7. **Optional:** You can also directly fasten the base plate to a suitable support surface. To do so, drill 4 holes and secure the base plate using 4 heavy-duty anchors (M10x108, not in the scope of delivery) (SW16).



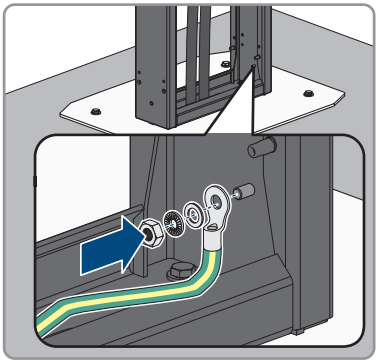
8. When putting on the middle section, guide the AC cable through the middle section of the charging stand. Position the middle section on the 6 holes in the base plate. Pay attention to the weight.



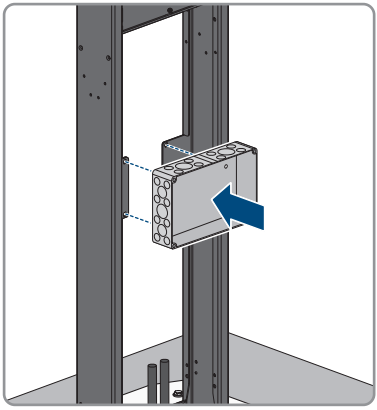
9. Use the 6 screws (M8x10) and washers to secure the middle section of the charging stand (SW13, torque: 25 Nm). First secure the two screws at the center of the middle section.



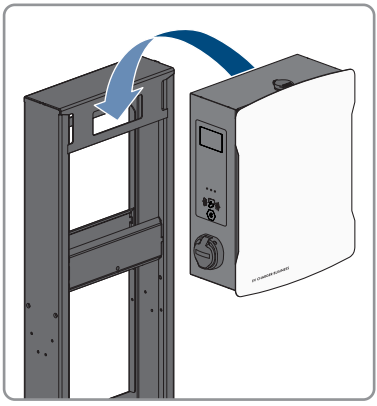
10. **Additional ground:** Connect the PE to the grounding bolts of the charging stand. Secure the crimped terminal lug to the grounding bolts. To do so, use the washer (M6), serrated lock washer (M6) and nut (M6) in the scope of delivery of the charging stand.



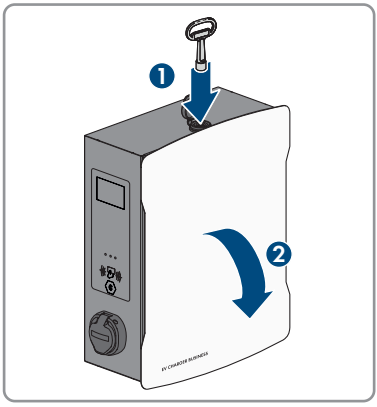
11. **Optional:** You can position an empty enclosure (not in the scope of delivery) on the middle section of the charging stand (width 254 mm x height 180 mm x depth 84 mm).



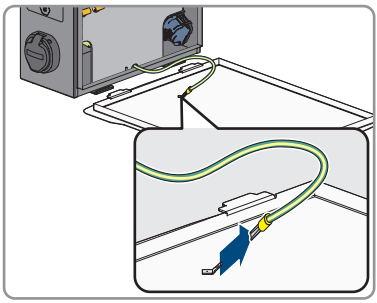
12. Hook the product onto the charging stand.



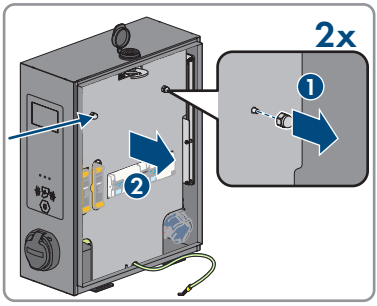
13. Use the product key to open the enclosure cover.



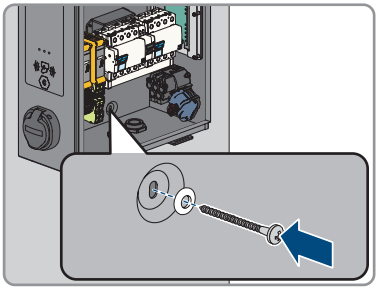
14. Pull off the grounding cable at the cover.



15. Remove the safety cover. To do so, loosen the 2 nuts. For the products EVCB-LB-3AC-ECC-10 and EVCB-3AC-ECC-10, safety seals are on the 2 nuts.

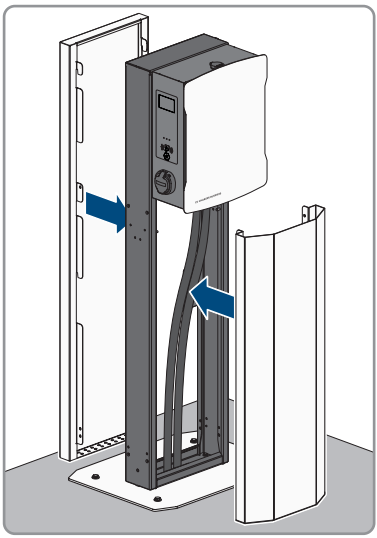


16. Secure the product with the screw (M5x20) in the scope of delivery of the charging stand (TX25, torque: 5 Nm).

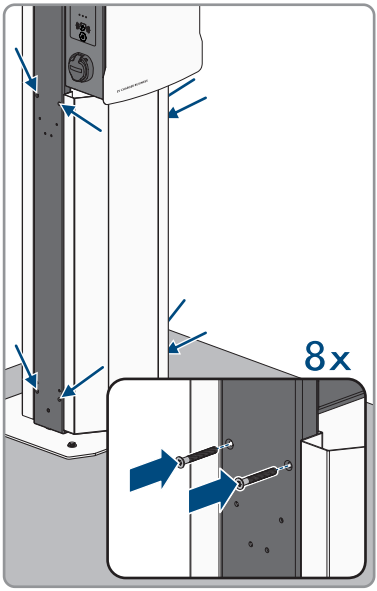


17. Ensure that the product is securely in place.
18. Connect to the public utility grid (see Section 7.2, page 38).
19. Connect the network cable (see Section 7.3, page 41).

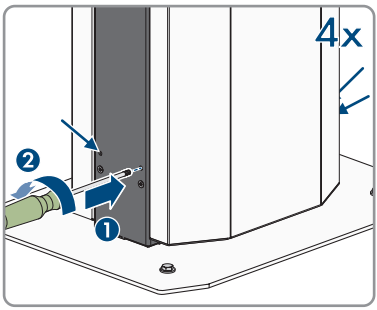
20. Hook the cover at the front and rear of the middle section of the charging stand. In the middle section of the charging stand, there are two carrier pins onto which the covers must be hooked.



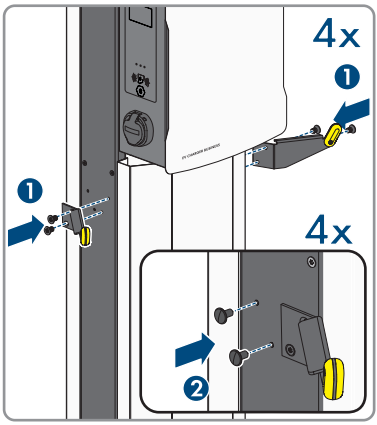
21. Secure the two covers to the front and rear with the 8 screws (M5x40) in the scope of delivery of the charging stand (TX25, torque: 5 Nm).



22. Lock the covers. To do so, insert a screwdriver through the opening and rotate the set screw counterclockwise until the stop (TX25, torque: 5 Nm). Repeat the procedure at the remaining 3 positions.



23. Depending on the product version, secure the cable holder to the side of the charging stand (M6x10). Seal all unused openings with the fir tree clips.



7 Electrical Connection

7.1 Overview of the Connection Area

7.1.1 View from Below

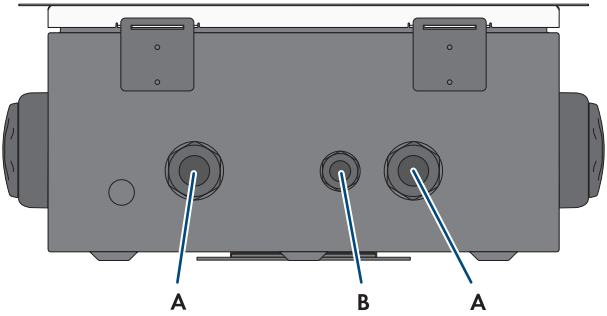


Figure 15: Bottom view of product

Position	Designation
A	Opening for cable gland M32 for connecting the utility grid
B	Opening for cable gland M20 for connecting the network cable

7.1.2 Interior View

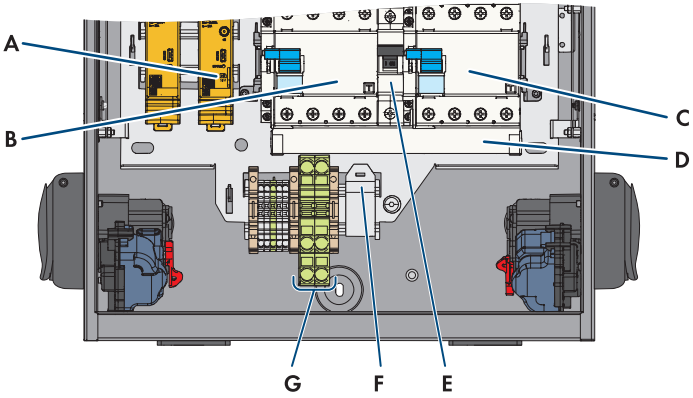


Figure 16: Connection area inside the EV Charger Business

Position	Designation
A	SIM card
B	Residual-current device

C	Residual-current device
D	Busbar
E	Miniature circuit breaker (energy self-sufficiency)
F	RJ45 module
G	Grounding conductor (PE) connection

7.2 Connecting the Utility Grid

⚠ QUALIFIED PERSON

AC cable requirements as follows:

- ☐ External diameter: 18 mm to 25 mm
- ☐ Conductor cross-section: 6 mm² (flexible/rigid) or 10 mm² (flexible/rigid)
- ☐ Insulation stripping length: 12 mm
- ☐ Sheath stripping length: 20 cm
- ☐ The cable must be dimensioned in accordance with the local and national directives for the dimensioning of cables. The requirements for the minimum wire size derive from these directives. Influencing factors for cable dimensioning are, for example, the nominal AC current, the type of cable, the routing method, cable bundling, ambient temperature, and maximum desired line losses.

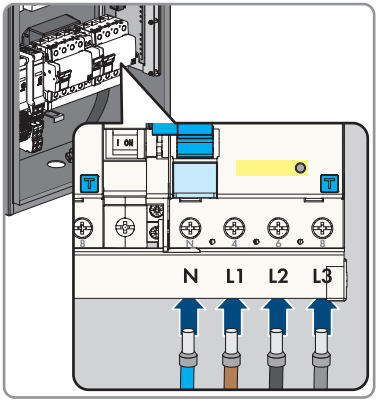
Residual-current monitoring unit:

The charger has an external residual-current device type A, which has a rated residual current of 30 mA. A DC residual-current device of 6 mA is also already integrated into the charger. Each charger in the system must be connected to the utility grid via a separate residual-current device and miniature circuit breaker (see Section 8.3.4.5, page 55).

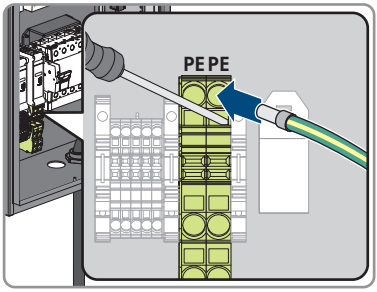
Procedure for maximal charge power of 22 kW:

1. Turn off the miniature circuit breaker.
2. Dismantle the AC cable by 20 cm.
3. Strip 10 mm to 12 mm of the insulation from the insulated conductors.
4. Thread the AC cable through the cable gland into the product. To do so, slightly loosen the swivel nut (M32).

5. Connect conductors N, L1, L2 and L3 to the right residual-current device according to the labeling (PZ2, torque: 2.5 to 3 Nm).



6. Connect PE to the terminal block in accordance with the labeling.

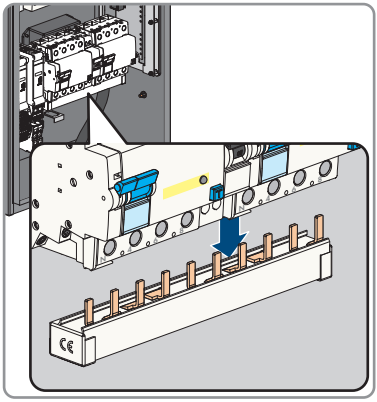


7. Ensure that all conductors are correctly connected.
8. Tighten the swivel nut on the cable gland hand-tight.

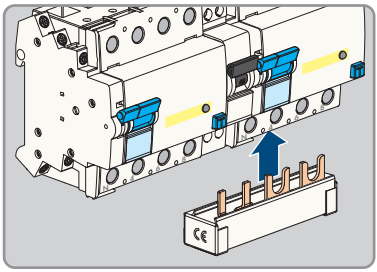
Procedure for maximal charge power of 2 x 22 kW:

1. Turn off the miniature circuit breaker.
2. Dismantle the AC cable by 20 cm.
3. Strip 10 mm to 12 mm of the insulation from the insulated conductors.

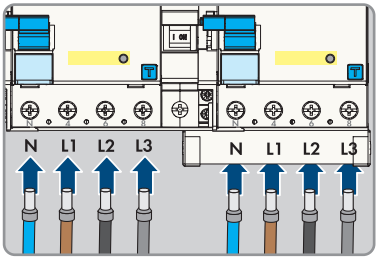
4. Loosen the busbars from the two residual-current devices (PZ2) and remove them.



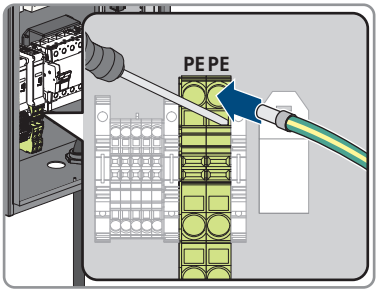
5. For energy self-sufficiency, connect the supplied busbars to the right residual-current device.



6. Guide the two AC cables through the cable glands into the product. Also loosen the two swivel nuts (M 32).
7. Connect conductors N, L1, L2 and L3 to each residual-current device according to the labeling (PZ2, torque: 2.5 to 3 Nm).



8. Connect the respective PE to the terminal block in accordance with the labeling.



9. Ensure that all conductors are correctly connected.
10. Hand-tighten the two swivel nuts of the cable glands.

7.3 Connecting the Network Cables

⚠ QUALIFIED PERSON

⚠ DANGER

Danger to life due to electric shock in case of overvoltages and if surge protection is missing

Overvoltages (e. g. in the event of a flash of lightning) can be further conducted into the building and to other connected devices in the same network via the network cables or other data cables if there is no surge protection. Touching live parts and cables results in death or lethal injuries due to electric shock.

- Ensure that all devices in the same network are integrated in the existing overvoltage protection.
- When laying the network cable outdoors, ensure that there is suitable surge protection at the network cable transition from the product outdoors to the network inside the building.
- The Ethernet interface of the product is classified as "TNV-1" and offers protection against overvoltages of up to 1.5 kV.

Additionally required material (not included in the scope of delivery):

☐ 1 network cable

Network cable requirements:

The cable length and quality affect the quality of the signal. Observe the following cable requirements:

☐ Cable type: 100BaseTx

☐ Cable category: minimum Cat6

☐ Plug type: RJ45 of Cat6 or higher

☐ Shielding: S/UTP, F/UTP or higher

☐ Number of insulated conductor pairs and insulated conductor cross-section: at least 2 x 2 x 0.22 mm²

☐ Maximum cable length between 2 nodes when using patch cables: 50 m

☐ Maximum cable length between 2 nodes when using installation cables: 100 m

☐ UV-resistant for outdoor use.

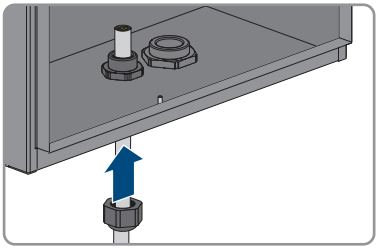
Router requirements:

☐ DHCP support via the Internet router, with MAC binding is recommended. If DHCP is not supported, an IP address from the address range of the router must be assigned manually to each device.

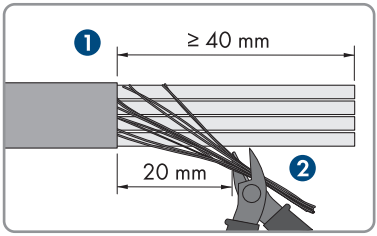
☐ Fast Ethernet with 100 Mbit/s data transfer rate

Procedure:

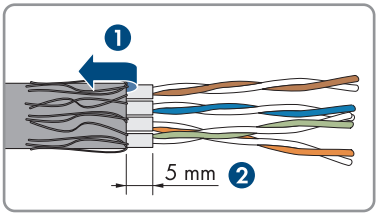
1. Disconnect the product from voltage sources (see Section 11, page 79).
2. Guide the network cable through the cable gland and into the product. To do so, slightly loosen the swivel nut (M20).



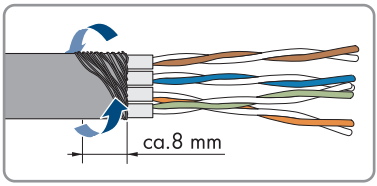
3. Strip off the insulation from the network cable (min. 40 mm) and shorten the braided shield to approx. 20 mm.



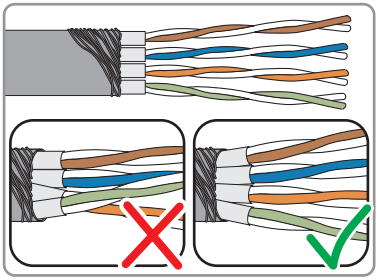
4. Fold the braided shield downward and shorten the shielding to 5 mm.



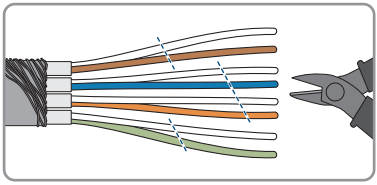
5. Evenly wrap the braided shield around the cable sheath to approx. 8 mm.



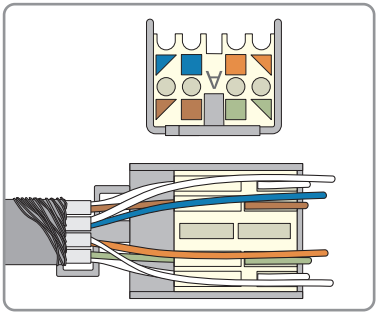
6. Sort the insulated conductors into pairs, making sure that they do not cross each other.



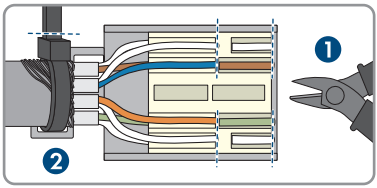
7. Trim the insulated conductor pairs at an angle.



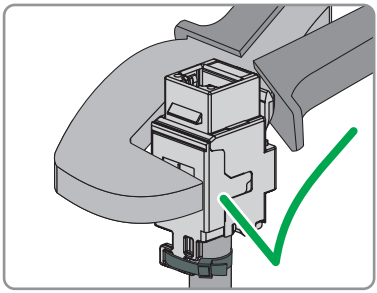
8. Place the insulated conductor pairs in the module.



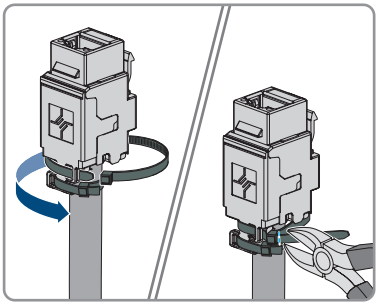
9. Make sure that the insulated conductors protrude by a maximum of 0.5 mm. Secure the supplied cable tie for strain relief and cut off the end.



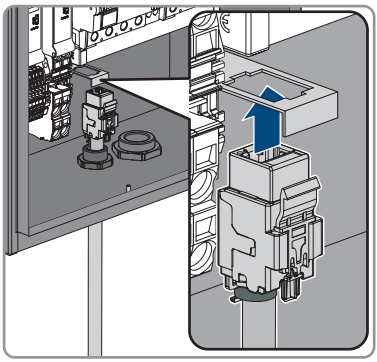
10. Press the two module pieces together with the help of pliers.



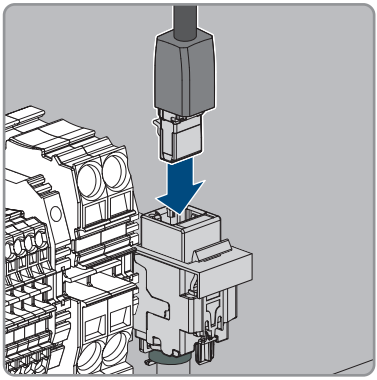
11. Secure the second supplied cable tie and cut off the end.



12. Clamp the RJ45 module in the holder.



13. Connect the network cable of the charge controller to the RJ45 module.



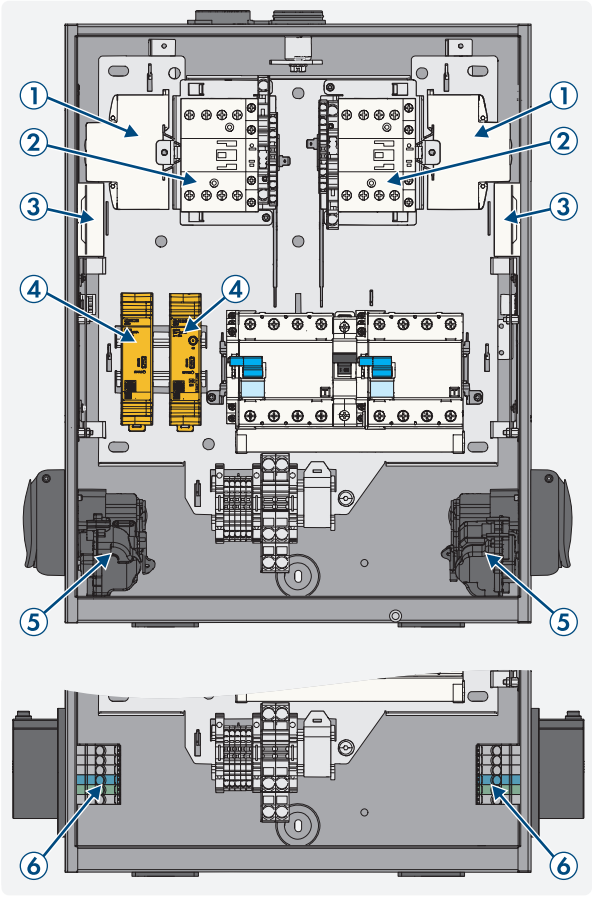
14. Tighten the swivel nut on the cable gland hand-tight.

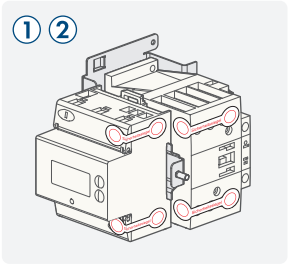
8 Commissioning

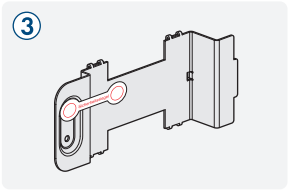
8.1 Check the

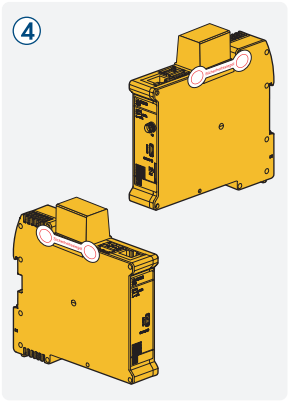
Only applies to the products EVCB-LB-3AC-ECC-10 / EVCB-3AC-ECC-10

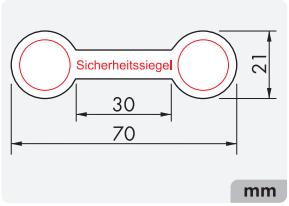
The security seal must be checked at the following points in order to ensure that the product is used in compliance with the calibration regulations.

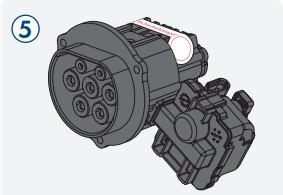


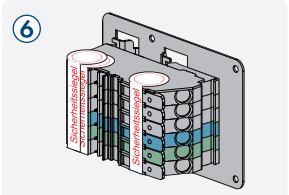












Position	Designation
1	Meter, charge points 1 and 2
2	Power contactor, charge points 1 and 2
3	Charge controller, charge points 1 and 2

Position	Designation
4	QR code with following charge point information: Public key of log book, offset factor and the MID meter used
5	Charging socket
6	Public key of charge point

8.2 Commissioning the Product

⚠ QUALIFIED PERSON

Requirements:

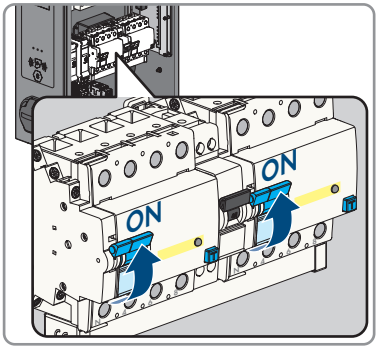
☐ The AC circuit breaker must be correctly rated and mounted.

☐ The product must be correctly mounted.

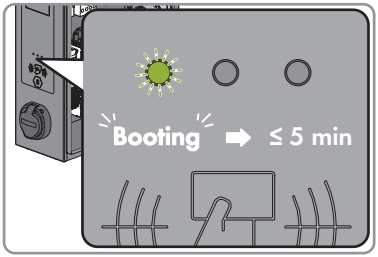
☐ All cables must be correctly connected.

Procedure:

1. Close unused enclosure opening with filler plugs.
2. Ensure that all cable glands have seal inserts and that the seal inserts have not moved.
3. Switch on the two residual-current devices.

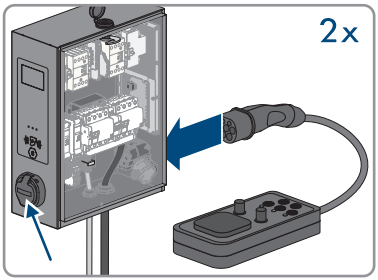


4. Switch on the internal miniature circuit breaker for energy self-sufficiency and the external AC miniature circuit breakers.
5. Wait until the product is ready for operation. The procedure takes approx. 5 minutes.

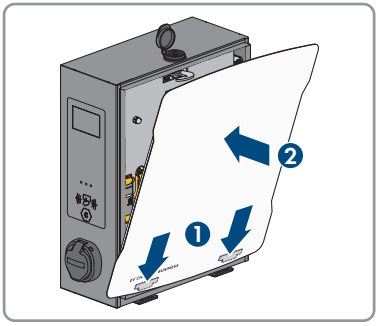


☑ The LED is glowing green.

6. Secure the safety cover with the 2 nuts.
7. Test the charger in accordance with IEC 61851 and complete the test report. For an example of a test report, see the product page at www.SMA-Solar.com.



8. Close the enclosure cover.



9. If necessary, rectify any defects found.

Also see:

- Event messages ⇒ page 82

8.3 Configuring the Product

⚠ QUALIFIED PERSON

8.3.1 Requirements

To configure the product, the following requirements must be fulfilled:

- ☐ The product is installed in accordance with the applicable standards and regulations.
- ☐ The products were tested in accordance with IEC 61851.
- ☐ The product was commissioned in accordance with DIN VDE 0100-600 and is ready for operation.
- ☐ The charge controller is equipped with firmware version ≥ 5.20.
- ☐ The cover of the product is open.

8.3.2 Connecting the Charge Controller

⚠ QUALIFIED PERSON

To change the configuration of the charge controller, it is possible to access the web interface of the charge controller via the network interface: SMA Solar Technology AG recommends access via LAN/Ethernet. Ensure that you have administrator rights in the operating system.

Access via LAN/Ethernet

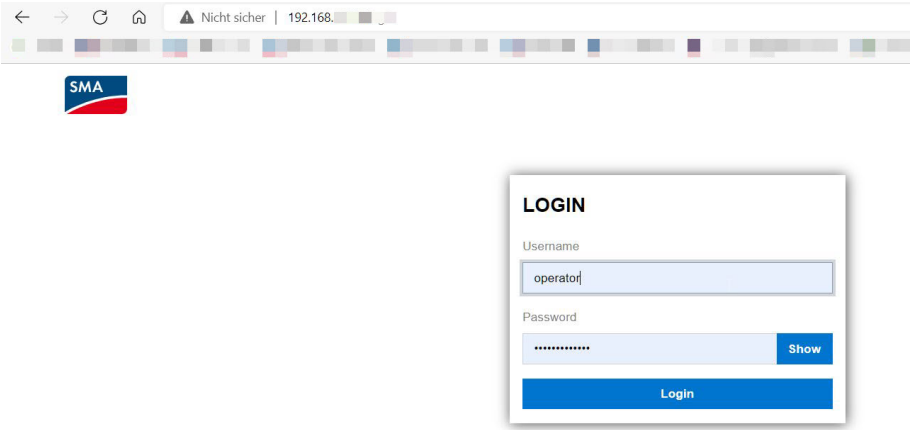
Procedure:

1. If the charge controller receives the IP address of a DHCP server (default configuration), for example, this can be part of a network router, the IP address there must be researched. For a static IP configuration, use a configured static IP address.
2. If this is not possible, a permanent, static second IP address is configured on the Ethernet interface of the controller. This IP address is **192.168.124.123**. To do so, you must manually configure your PC to an IP address in the same address space and with the same subnet mask. For example, you can use the address **192.168.124.100** and the subnet mask **255.255.255.0**.

Logging in on the web interface

Procedure:

1. Open the web interface of the charge controller. To do so, use the IP address assigned by the product in the web browser.
2. Input the login data of the default setting into the login field to log in. SMA Solar Technology AG strongly recommends changing the password to a secure password during the first session (see Section 8.3.8, page 66).

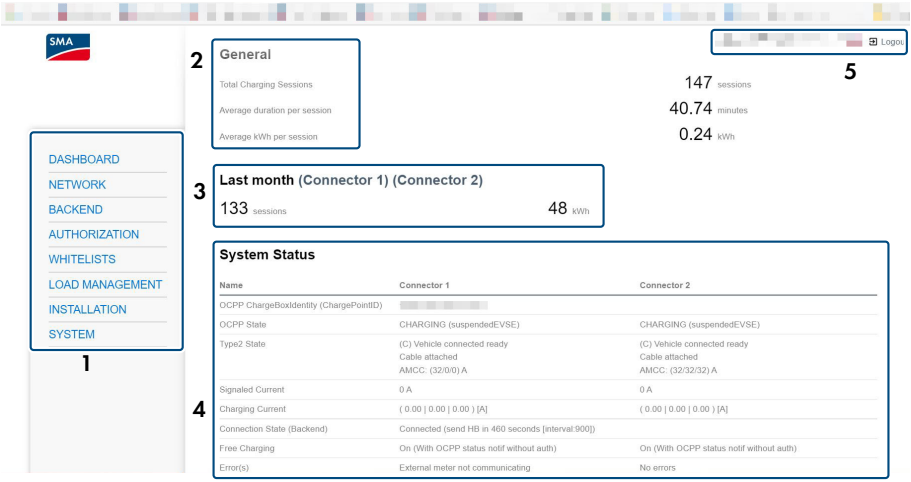


Login data of default setting:

- Username: **operator**

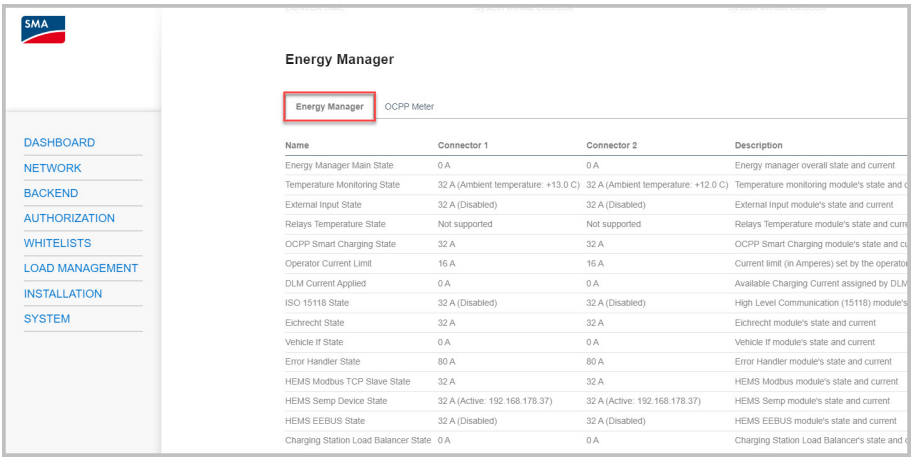
- Password: **service.kraft**

8.3.3 Overview of the User Interface



Position	Designation
1	Navigation Area
2	General information
3	Charging history (to download)
4	Status area
5	System information (software version, language setting and logout)

Energy Manager

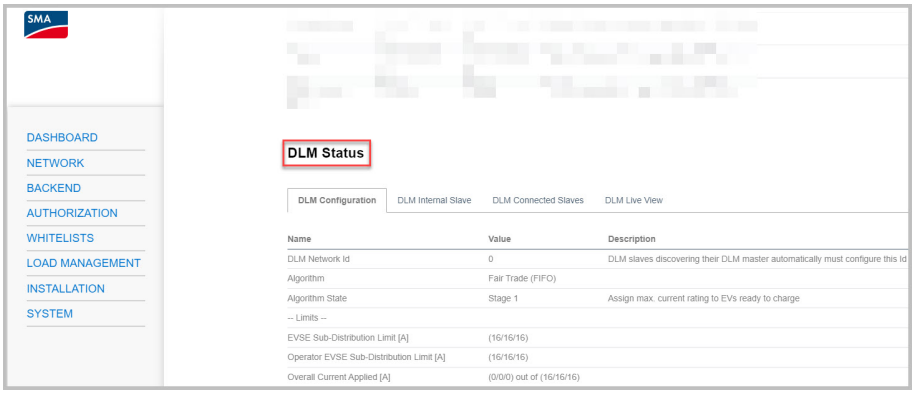


Under **[Energy Manager]**, there is a complete overview of the configured and calculated currents. The charge controller always determines the lowest value at the connected vehicle.

OCPP meter

Under **[OCPP meter]**, you will find the current values of the connected meter.

DLM Status



Under **[DLM Status]**, information about the current dynamic load management and the current energy distribution can be viewed as a curve.

The live view of dynamic load management is only visible when it is enabled.

8.3.4 Parameter Settings

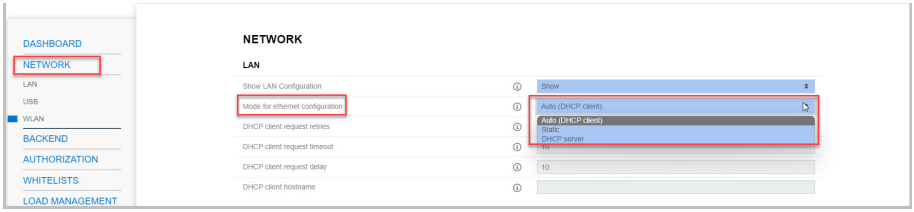
8.3.4.1 Setting the network via Ethernet

The settings of the network address must be coordinated with the responsible IT administration.

The charge controller in the product does not have an on-chip Wi-Fi module. As a result, a USB Wi-Fi adapter is required in order to use Wi-Fi.

SMA Solar Technology AG recommends using the Ethernet connection for stable network communication.

Procedure:

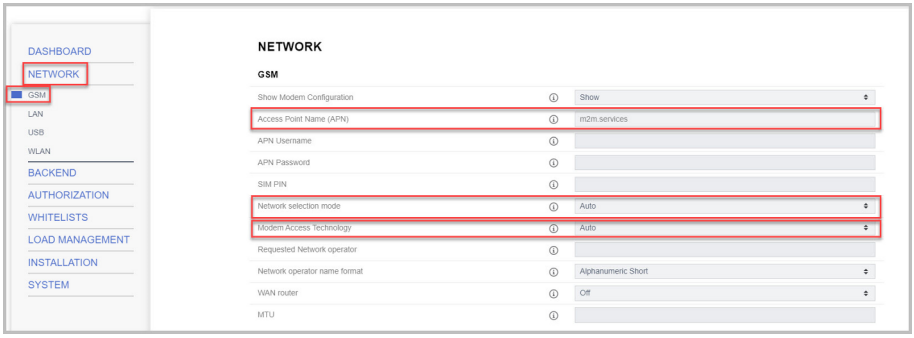


1. In the navigation area, select **[Network]**.

2. Under **[LAN]** and the parameter **[Mode for ethernet configuration]**, different modes can be selected.
   - ☑ In **[Auto (DHCP client)]** mode, the IP address of the charge point is automatically assigned by the DHCP server in the network.
   - ☑ In **[Static]** mode, the IP address of the charge point can be statically assigned.
   - ☑ In **[DHCP-Server]** mode, the charge point automatically assigns an IP address to other DHCP client charge points in the network.
3. Make sure that all chargers share the same network and have the same firmware version.
4. Make sure that each charger has its own IP address. An IP address must not be assigned more than once.
5. To save the changes, select **[Save]** and **[Restart]**.

8.3.4.2 Setting the network via cellular phone

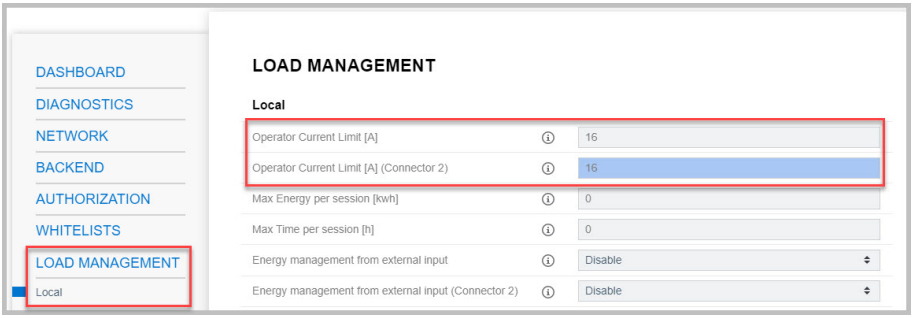
Procedure:



1. In the navigation area, select **[Network]**.
2. Under **[GSM]** and the parameter **[Access Point Name (APN)]**, the value **[m2m.services]** must be input.
3. For the **[Network selection mode]** parameter, **[Auto]** must be selected.
4. For the **[Modem Access Technology]** parameter, **[Auto]** must be selected.
5. To save the changes, select **[Save]** and **[Restart]**.

8.3.4.3 Setting the charging current

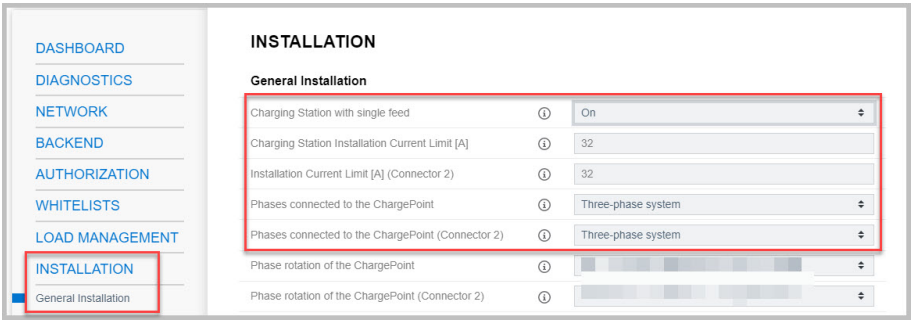
Procedure:



1. In the navigation area, select **[Load Management]**.
2. Under the parameters **[Operator Current Limit [A]]** and **[Operator Current Limit [A] (Connector 2)]**, set the charging current to be provided for the respective charge point.
3. To save the changes, select **[Save]** and **[Restart]**.

8.3.4.4 Setting the current limit

Procedure:



1. In the navigation area, select **[Installation]**.
2. Under **[General Installation]** and the parameters **[Charging Station Installation Current Limit [A]]** and **[Installation Current Limit [A] (Connector 2)]**, set the current limit.
3. Make sure that the maximum electrical current is not higher than the rated current for the charge point, depending on the AC wiring and the miniature circuit breaker.
4. For the parameters **[Phases connected to the ChargePoint]** and **[Phases connected to the ChargePoint (Connector 2)]**, set whether the charge point is a single-phase or three-phase connection. To do so, select **[Single-phase system]** or **[Three-phase system]**.
5. To save the changes, select **[Save]** and **[Restart]**.

8.3.4.5 Setting the phases and phase position

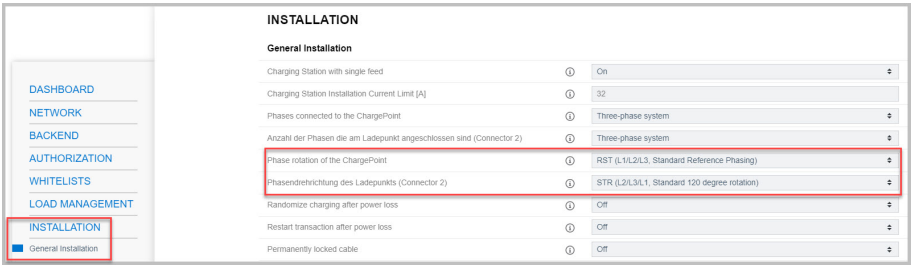
Normally, charge points are designed as single-phase or three-phase. A vehicle can be charged via line conductor L1 (single-phase), line conductors L1 and L2 (two-phase) or line conductors L1, L2 and L3 (three-phase). The phase position to each other is always 120°.

To enable load management to optimally distribute the charging current and avoid an unbalanced load, the phase position or phase rotation information must be set for each charge point. To improve the distribution of single- or two-phase loads from the point of view of unbalanced load limitation, the phases are rotated in the sub-distribution.

Example:

Charge point 1	
Charge point	Grid
L1	L1
L2	L2
L3	L3
Charge point 2	
Charge point	Grid
L1	L2
L2	L3
L3	L1
Charge point 3	
Charge point	Grid
L1	L3
L2	L1
L3	L2

Procedure:



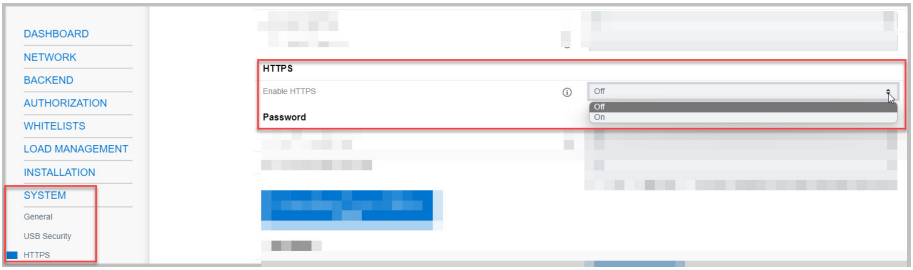
1. In the navigation area, select **[Installation]**.

2. Under **[General Installation]** and the parameters **[Phase rotation of the ChargePoint]** and **[Phase rotation of the ChargePoint (Connector 2)]**, set the number of phases and the phase position.
3. Make sure that the number of phases and the phase position of the charger are correctly set before charging for the first time.
4. To save the changes, select **[Save]** and **[Restart]**.

8.3.4.6 Enabling HTTPS

Procedure:

1. In the navigation area, select **[System]**.



2. Under **[HTTPS]**, set the **[Enable HTTPS]** parameter to **[On]**.
3. To save the changes, select **[Save]** and **[Restart]**.
4. **Web browser signals a security vulnerability**

   After HTTPS has been enables, a message might appear indicating that the connection to the web interface is not secure. SMA Solar Technology AG guarantees the security of the web interface.

   - Continue loading the web interface.

   ☑ The login page of the web interface opens after a few seconds.

8.3.5 Setting Up the Backend

8.3.5.1 Setting up the backend via Ethernet

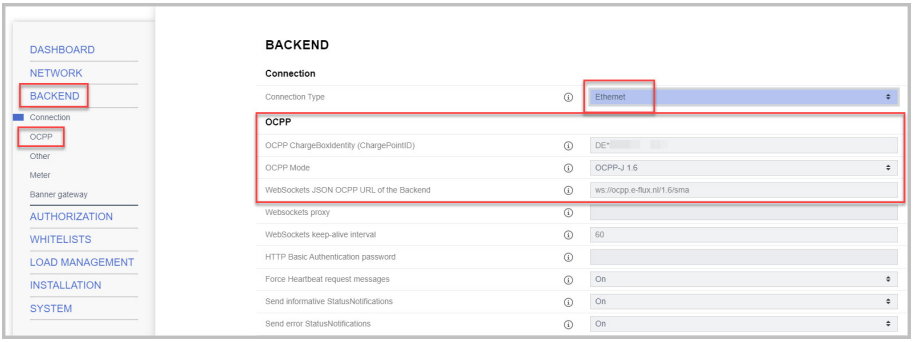
Each charge point is connected to a router via LAN/Ethernet and through it, to the backend. Find out which configuration you must make in order to connect your charge point(s) to the backend via Ethernet and the router.

Requirements:

☐ The charge point is connected to the local network.

☐ The network is configured (see Section 8.3.4.1, page 52).

Procedure:



1. In the navigation area, select **[Backend]**.
2. Make sure that under the **[Connection Type]** parameter, the value **[Ethernet]** is selected.
3. Under Backend, select **[OCPP]**.
4. For the parameter **[OCPP ChargeBoxIdentity (ChargePointID)]**, input the ChargePointID provided by the backend for the corresponding charger.
5. For the parameter **[OCPP Mode]**, select the value **[OCPP-J 1.6]**.
6. For the parameter **[WebSockets JSON OCPP URL of the Backend]**, the following must be input: **[ws://ocpp.e-flux.nl/1.6/sma]**.
7. To save the changes, select **[Save]** and **[Restart]**.
   ☑ In the dashboard overview, the connection status to the backend is displayed.

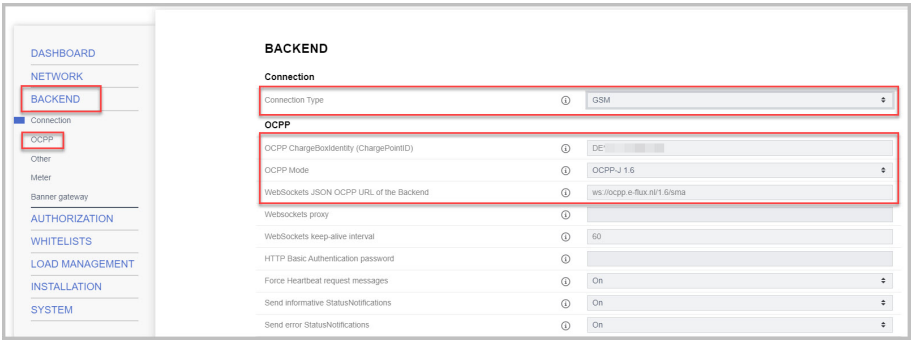
8.3.5.2 Setting up the backend via cellular phone

Each charge point is connected to the backend via the cellular phone network (4G LTE). Find out which configuration you must make in order to connect your charge point(s) to the backend via cellular phone.

Requirements:

☐ The charge point is connected to the local network.
☐ The network is configured (see Section 8.3.4.2, page 53).
☐ The SIM card from the backend operator or cellular phone provider is present and activated.
☐ Insert the SIM card into the SIM slot of the charge controller (see Section 7.1.2, page 37).

Procedure:



1. In the navigation area, select **[Backend]**.
2. Make sure that under the **[Connection Type]** parameter, the value **[GSM]** is selected.
3. Under Backend, select **[OCPP]**.
4. For the parameter **[OCPP ChargeBoxIdentity (ChargePointID)]**, input the ChargePointID provided by the backend for the corresponding charger.
5. For the parameter **[OCPP Mode]**, select the value **[OCPP-J 1.6]**.
6. For the parameter **[WebSockets JSON OCPP URL of the Backend]**, the following must be input: **[ws://ocpp.e-flux.nl/1.6/sma]**.
7. To save the changes, select **[Save]** and **[Restart]**.
   ☑ In the dashboard overview, the connection status to the backend is displayed.

8.3.6 Dynamic load management

8.3.6.1 Basic Information

Dynamic load management provides the option to adjust the charging current of several charge point optimally to the available current. Dynamic load management is designed to be local load management. The charge point are connected to each other via a network connection and are configured according to the requirements via the user interface.

Additional devices like gateways, controllers or interface adapters are not necessary. Therefore, load management is easy to extend. Additional charge points can be added and integrated into the network simply.

Local load management can also be integrated into an existing or planned energy management system via standard interfaces like EEBus, Modbus TCP/IP and OCPP. This makes overload charging at a PV system or integration into building/control technology easy to implement.

Local load management can alternatively be supplemented by local load measurement. This is often desirable if the new charging infrastructure to be procured is connected to the existing building connection of a property, for example, and the building junction box will be shared. The possible power reserves of the power connection for the charging infrastructure are usually unknown. Or the power connection needs to be optimally used and not cause additional costs (peak shaving).

To accomplish this, an (additional) energy meter at the building junction box is simply integrated into the charge point network via Modbus TCP and taken into account when the current is calculated.

Technical requirements

The building junction box, supply line or branch of a sub-distribution can be limiting factors of the charging current at charge points. This limitation initially represents the upper limit of the total current to be distributed. Therefore, in a sub-distribution at a charge point that has 32 A (22 kW) available, for example, only the following installations without dynamic load management can be implemented:

Example without load management:

- Without load management, the charge point would always make the maximum charging current available. In other words, each electric vehicle would be guaranteed to be charged with the maximum current over the entire time of the charging process. But not many vehicles do this. A current of 32 A is not used for the entire charging time or parking time during which the vehicle is connected, either. But the maximum current of 32 A is permanently reserved for the charge point when the vehicle is connected to the charge point.
- Due to the continuous reservation of the charging current, theoretically only a 22 kW charge point can be connected to the sub-distribution without exceeding the connected load. If the need for charging infrastructure increased, the sub-distribution would have to be extended or renewed.

Example with load management:

- With the help of load management, the problems described above can be solved. The load management system can distribute the reserves of unused charge points to other charge points and enable the installation of charge points whose theoretical total power exceed the actual available power of the electricity supply.
- The currents are monitored with phase accuracy. The system takes into account whether the vehicle is charging on a single line conductor or line conductors. The phase rotation of the charge points to each other is also considered. This leads to the optimal distribution of the available currents.

Load management operating modes

The load management system has various operating modes and options for optimizing the load on the basis of availability and consumption. Depending on how a system is structured, alongside the charge points there are sometimes loads that cannot be controlled (e.g., loads in a property or building/commercial establishment) and of course have an influence on the total amount of available current.

For this reason, the most common configurations are:

- Load management without additional loads (and therefore without external measurement)
- Load management with additional, partially unknown loads and external measurement

Both cases are there to distribute charging current optimally and to avoid overstepping a definable load limit in order to prevent overload.

Connection example of load management without external power measurement

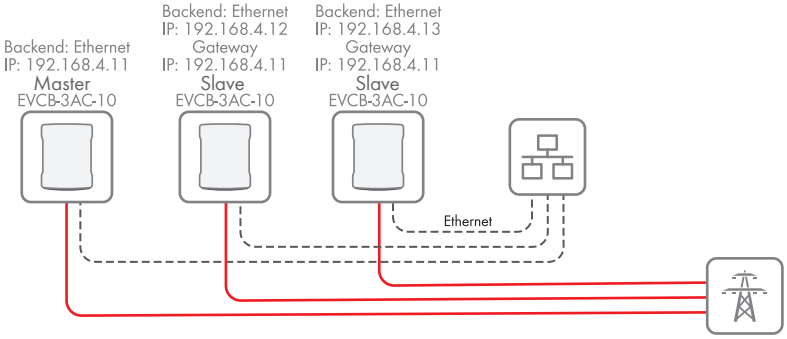


Figure 17: Connection example of 3 chargers without external power measurement

Connection example of load management with external power measurement

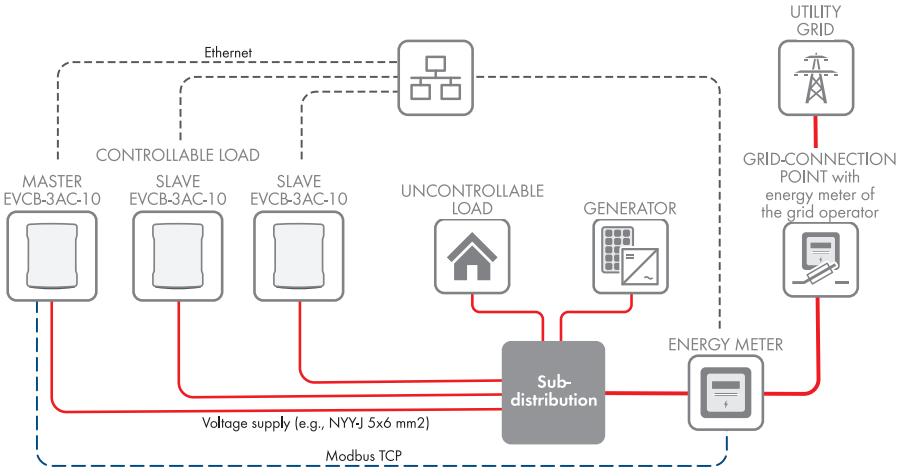
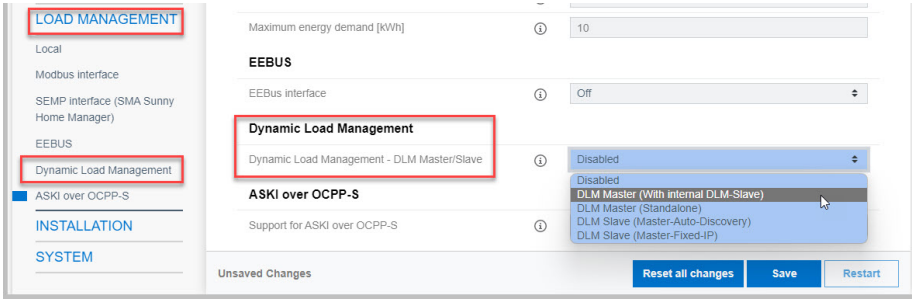


Figure 18: Connection example of 3 chargers with external power measurement

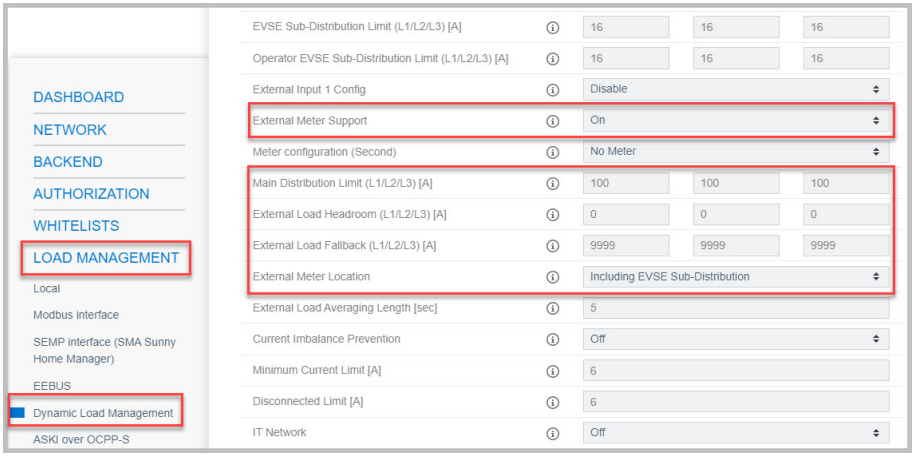
8.3.6.2 Setting load management without external meters

Procedure:

1. In the navigation area, select **[Load Management]**.



2. Under **[Dynamic Load Management]** and the parameter **[Dynamic Load Management - DLM Master/Slave]**, select the value **[DLM Master (With internal DLM slave)]**.



3. Set the parameter **[External Meter Support]** to **[Off]**.
4. Set the available current at the building junction box at the parameter **[Main Distribution Limit (L1/L2/L3) [A]]**.
5. Set the safety distance to the maximum value at the parameter **[External Load Headroom (L1/L2/L3) [A]]**.
6. Set the assumed load in case of error at the parameter **[External Load Fallback (L1/L2/L3) [A]]**. If the value **[9999]** is input, all charge points will be switched off in case of error.
7. Set the type of dynamic load management at the parameter **[External Meter Location]**.
8. To save the changes, select **[Save]** and **[Restart]**.

8.3.6.3 Setting load management with an external meter

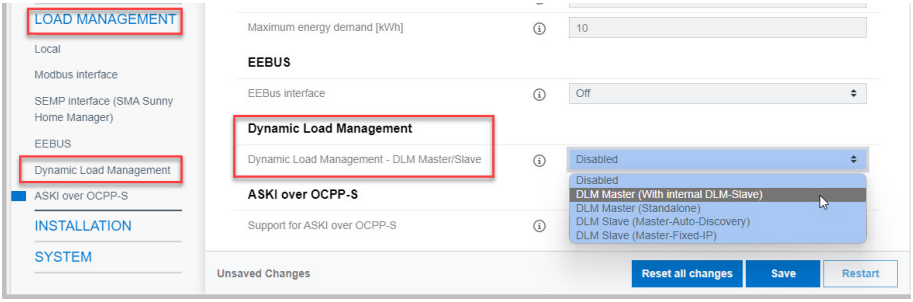
For external metering, the following meters can be used via Modbus TCP:

Manufacturer	Model	Information
SMA	Commercial Energy Meter	Planned for 2023
Janitza	UMG 512/96 PRO	Port 502

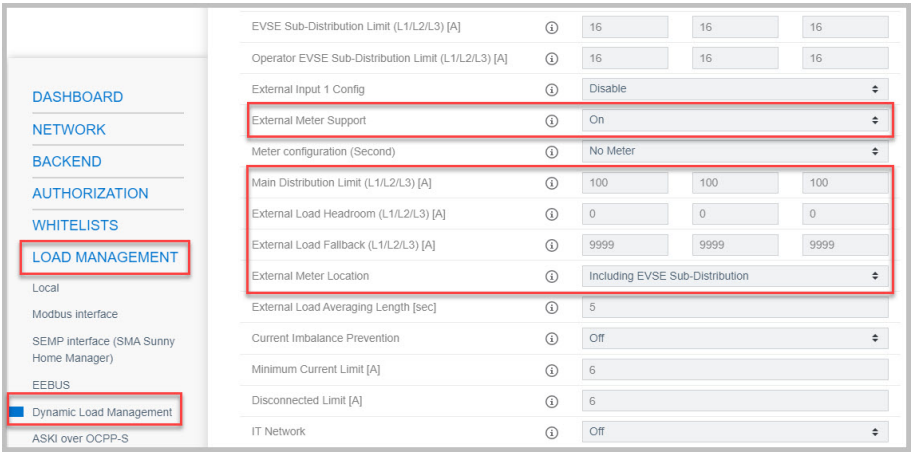
Manufacturer	Model	Information
Janitza	UMG 604 PRO	Port 502, as of firmware 5.32, Modbus TCP can also be used for EDMM-10
Janitza	UMG 605 PRO	Port 502
Phoenix Contact	EEM-MB371/MB370	Port 502
Siemens	7KM2200	Port 502, Modbus TCP can also be used for EDMM-10
TQ	EM300-LR	Port 502
TQ	EM410/EM420	Port 502

Procedure:

1. In the navigation area, select **[Load Management]**.

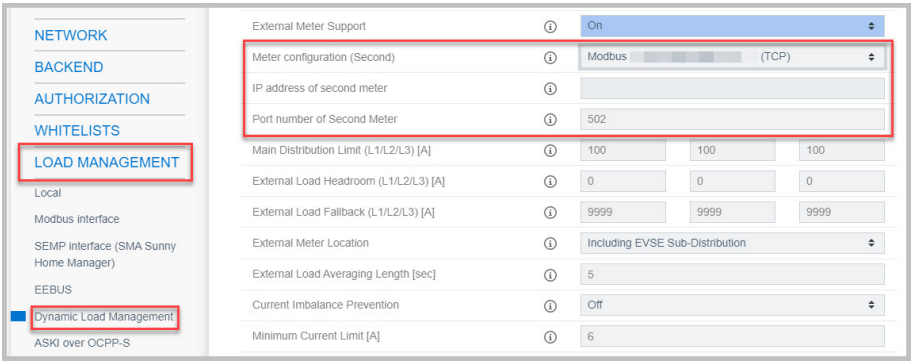


2. Under **[Dynamic Load Management]** and the parameter **[Dynamic Load Management - DLM Master/Slave]**, select the value **[DLM Master (With internal DLM slave)]**.



3. Set the parameter **[External Meter Support]** to **[On]**.

4. Set the available current at the building junction box at the parameter **[Main Distribution Limit (L1/L2/L3) [A]]**.
5. Set the safety distance to the maximum value at the parameter **[External Load Headroom (L1/L2/L3) [A]]**.
6. Set the assumed load in case of error at the parameter **[External Load Fallback (L1/L2/L3) [A]]**. If the value **[9999]** is input, all charge points will be switched off in case of error.
7. Set the type of dynamic load management at the parameter **[External Meter Location]**.



8. Under the parameter **[Meter configuration (Second)]**, select the meter for external measurement.
9. Set the value for the parameter **[IP address of second meter]**.
10. Set the value for the parameter **[Port number of Second Meter]**.
11. To save the changes, select **[Save]** and **[Restart]**.
    ☑ On the dashboard under **[Second Meter]**, the external meter can be checked.

8.3.7 RFID Administration

8.3.7.1 Reading in an additional RFID card

RFID (radio frequency identification) chips are one of the most important means of authentication at chargers. The UID (unique identification) of an RFID chip is key for identification. It is a unique code that represents the identity of the chip.

The SMA EV Charger Business supports all Mifare variants currently available in the market. SMA Solar Technology AG recommends using cards in the Mifare DESFire series: for example, EV1 or EV3.

Local Whitelist

The Local Whitelist is a backend-independent list that is only saved on the charge controller. The UIDs on the list are always authorized to charge. They do not require a query to the backend.

OCPP Whitelist

The OCPP Whitelist is a local buffer of the backend on the charge point. All the RFIDs from charging card that have been approved by the backend are regularly transferred to the charge point here.

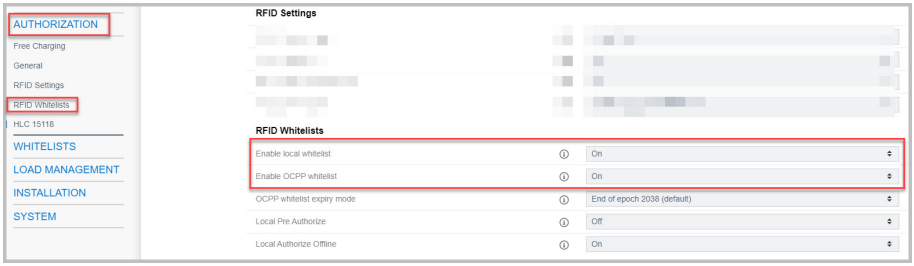
This ensures that a charging process can also be authorized if the charge point does not establish connection to the backend. In addition, the cache can help to speed up authorization.

If this option is disabled, a query is always sent to the backend for every query to the charge point (i.e., always when an RFID is presented to the RFID reader). The charging process is not authorized until the query is accepted.

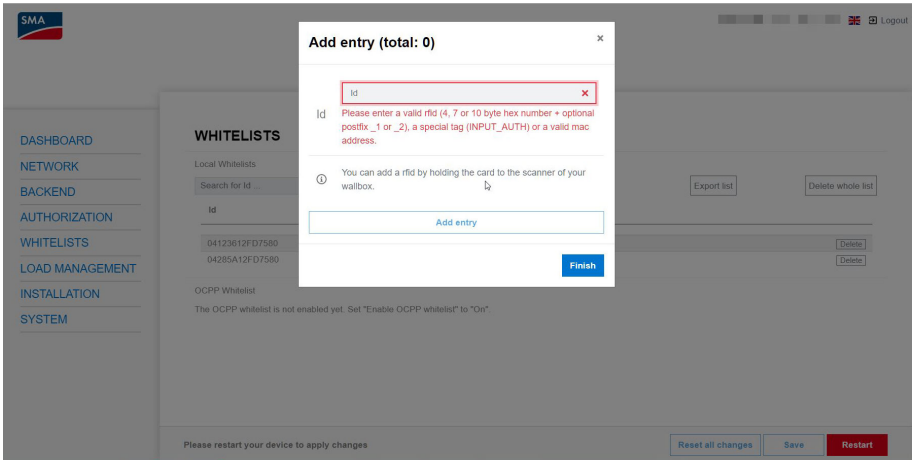
Disable the OCPP Whitelist if you do not have a backend connection.

Procedure:

1. In the navigation area, select **[Authorization]**.



2. Under Authorization, select **[RFID-Whitelists]**.
3. Set the parameter **[Enable local whitelist]** to **[On]**.
4. If there is a backend connection, set the parameter **[Enable OCPP whitelist]** to **[On]**.
5. In the navigation area, select **[Whitelist]**.

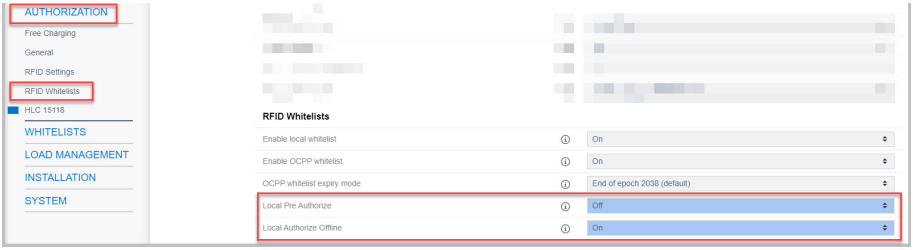


6. Select **[Add entry]**.
   ☑ The **[Add entry]** window opens.
7. When the LED of the RFID card reader glows green, hold the RFID card up to the **right** card reader (card icon) (see Section 5.1, page 17).
   ☑ The LED of the RFID card reader glows blue. The RFID card has been imported. In the **[Add entry]** window, the relevant RFID number has been input.
8. Select **[Add entry]** to confirm the RFID number.
9. Repeat the process for additional RFID cards.
10. To save the changes, select **[Save]** and **[Restart]**.

8.3.7.2 Enable the charging process in case of backend failure

Procedure:

1. In the navigation area, select **[Authorization]**.
2. Under Authorization, select **[RFID Whitelists]**.



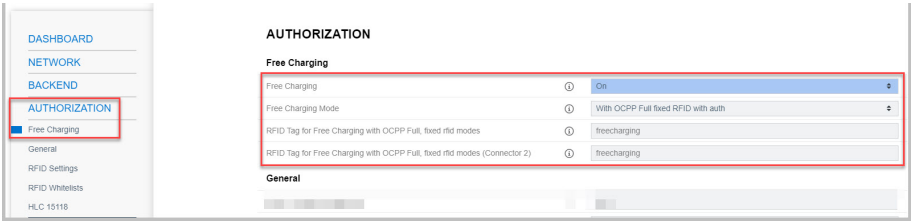
3. Set the parameter **[Local Pre Authorize]** to **[Off]**.
4. Set the parameter **[Local Authorize Offline]** to **[On]**.
5. To save the changes, select **[Save]** and **[Restart]** .

8.3.7.3 Enable free charging

With this function, basically anyone can charge at a charge point. The user group is not limited. Charging is free.

Procedure:

1. In the navigation area, select **[Authorization]**.
2. Under Authorization, select **[Free Charging]**.



3. Set the parameter **[Free Charging]** to **[On]**.

4. Set the parameter **[Free Charging Mode]** to **[With OCPP Full fixed RFID with auth]**.
5. To save the changes, select **[Save]** and **[Restart]**.

8.3.8 Changing the Password

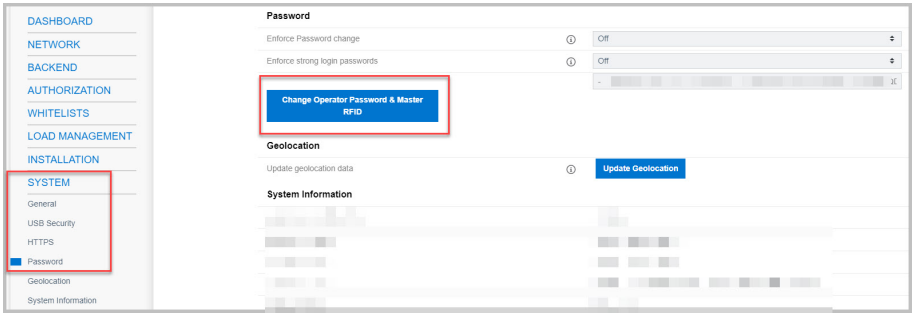
Never lose this password, as you cannot access the web interface without it.

The **password guidelines** recommended by SMA Solar Technology AG are also applicable for users of SMA inverters and system managers.

- 8 to 12 characters
- At least 1 lower and 1 upper case letter
- At least 1 digit
- Possible special characters: ?_!-

Procedure:

1. In the navigation area, select **[System]**.



2. Under **[Password]**, select **[Change Operator Password & Master RFID]**.
   ☑ The **[Change Operator Password & Master RFID]** window opens.
3. In the **[Change Operator Password & Master RFID]** window, change the password.
4. Use **[Save]** to save the new password.
   ☑ The password has been changed.
5. Input the access data on the configuration sheet in the scope of delivery.

9 Setting Up the SMA eMobility Portal

9.1 Providing the Master Data

Requirements:

☐ The charger is ready for operation

☐ The charger is configured and is connected to the Internet

After commissioning and configuration via the web interface, the charger is ready for operation. Ex factory, two RFID cards are already configured. They can be used to authorize and activate the charging processes of the corresponding charger.

SMA Solar Technology AG offers the eMobility Portal under www.emobility.sma.de for managing chargers.

A one-time setup must be carried out in order to use the eMobility Portal. To accomplish this, various master data and charger are required. SMA Service will take care of setup.

The required data can be provided using a web form available at www.my.sma-service.com. The web form for setting up the eMobility Portal must be completed and submitted. As soon as SMA Service has completed setup, you will receive a confirmation e-mail.

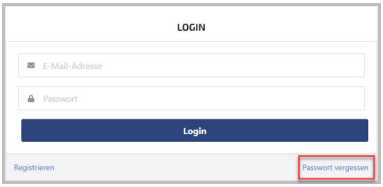
9.2 First Login

Requirement:

☐ You have received confirmation of setup by SMA Service.

Procedure:

1. Log in to the customer portal at www.emobility.sma.de.
2. Select **[Passwort vergessen]** on the home page of the portal to set a password for the user account.

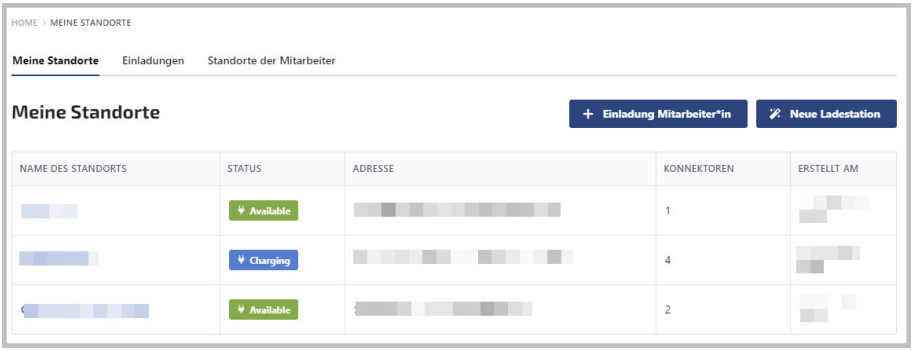


☑ It is now possible to log in to the portal.

9.3 Overview of the User Interface

You will receive the role “Account Admin” from SMA Solar Technology AG. With this role, you have the options for using the portal described here.

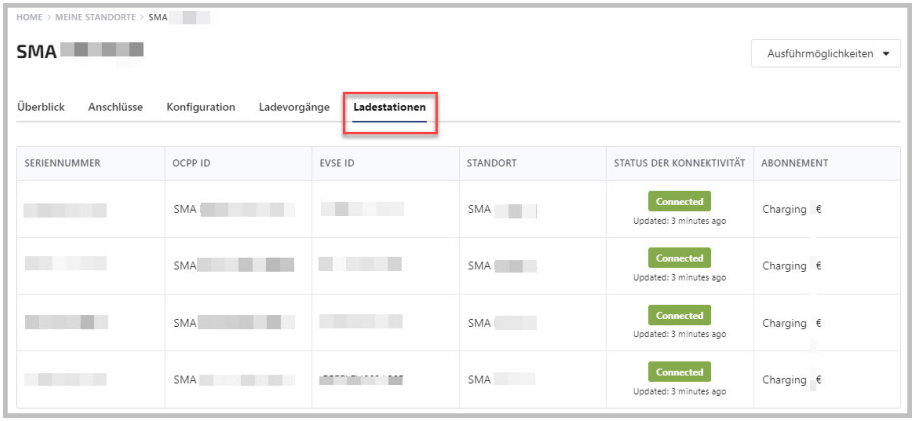
My Locations



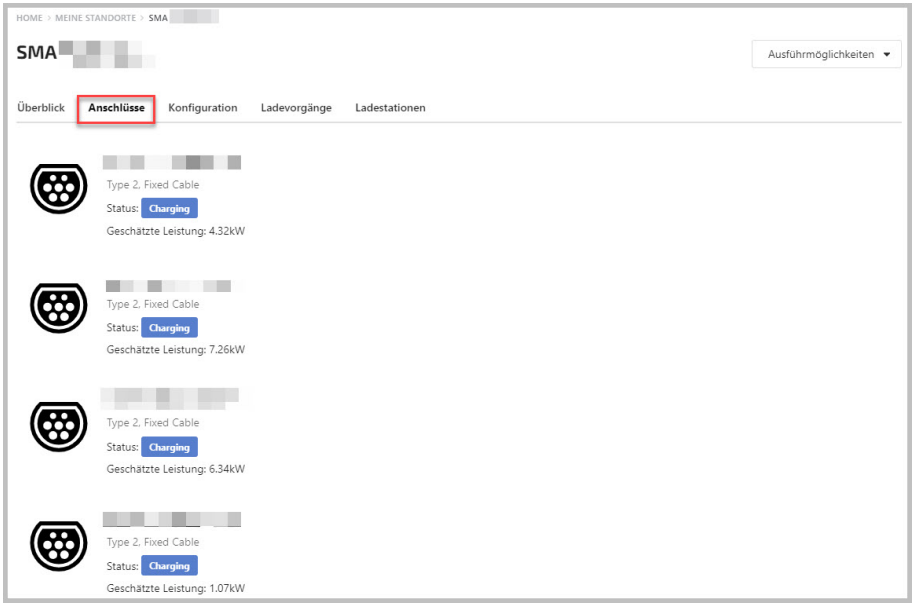
The configured locations are displayed in the menu under **[Meine Standorte]**. The menu items **[Einladungen]** and **[Standorte der Mitarbeiter]** currently have no function.

Charging stations

The chargers are shown after selecting the location.

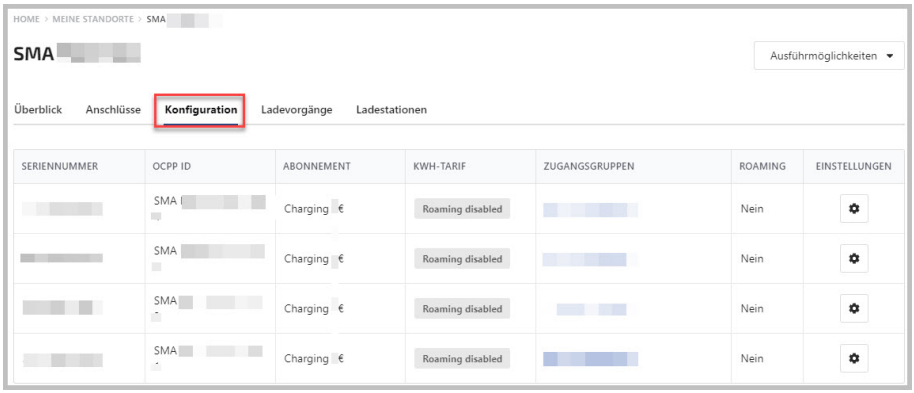


Which charger is in operation and its status are shown in the menu under **[Ladestationen]**.



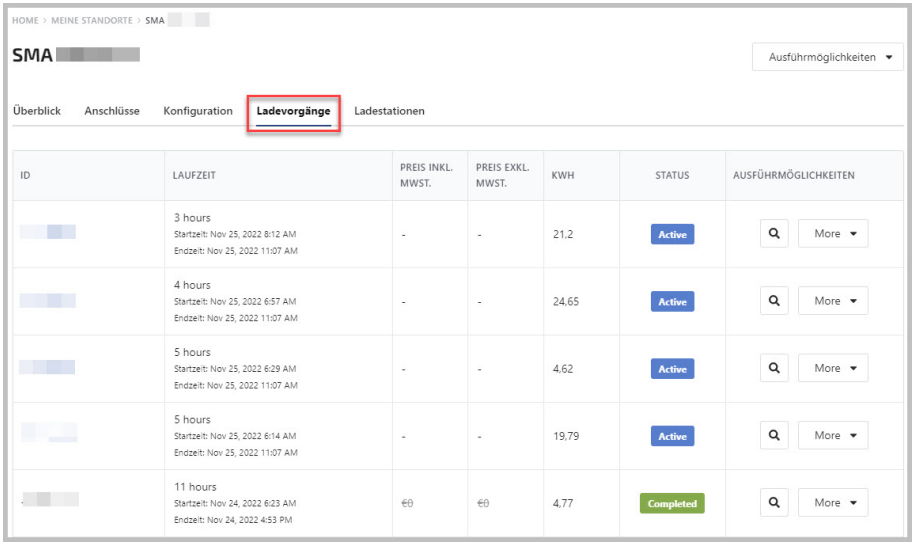
The status of the charger connections (connectors) is shown in the menu under **[Anschlüsse]**. Each charger has two connectors.

Configuration



The access groups assigned to the charger are displayed in the menu under **[Konfiguration]**. "Roaming" currently has no function.

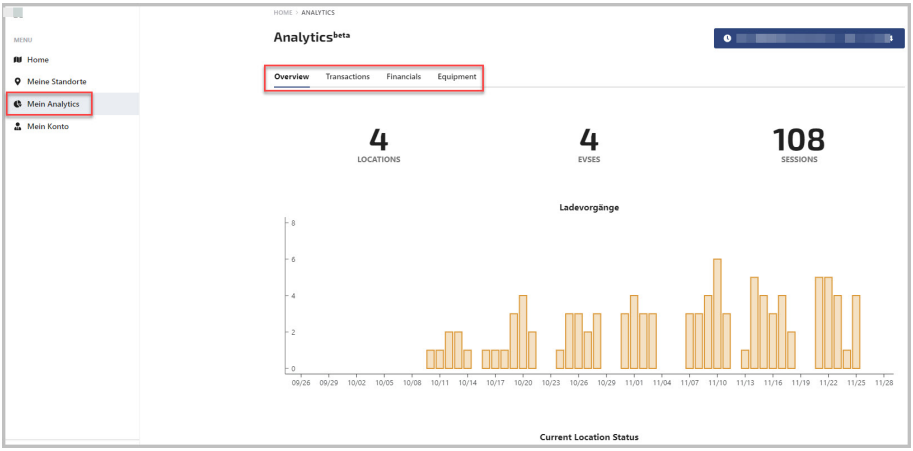
Charging Processes



All active and completed charging processes at the charger are displayed in the menu under **[Ladevorgänge]**.

Analytics

Various diagrams about the charging processes (e.g., charged energy and duration) are displayed in the menu under **[Mein Analytics]**.

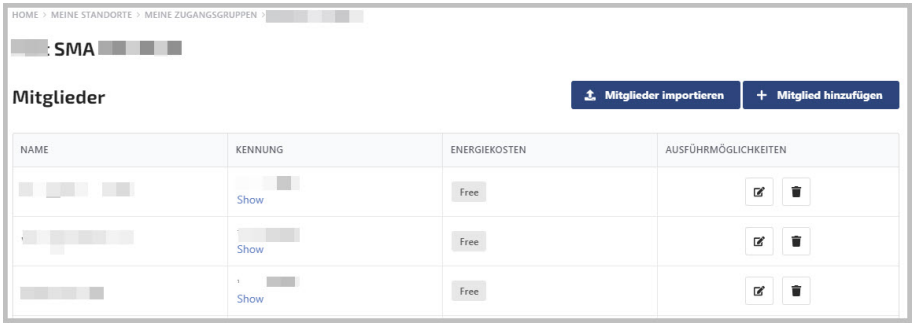


The portal provides the analytics for individual chargers and analytics for all chargers of the organization (if the multiple chargers are assigned to the account).

Information: If the menu item **[Mein Analytics]** is not displayed, the Account Analytics feature flag is missing. SMA Service can enable the functions.

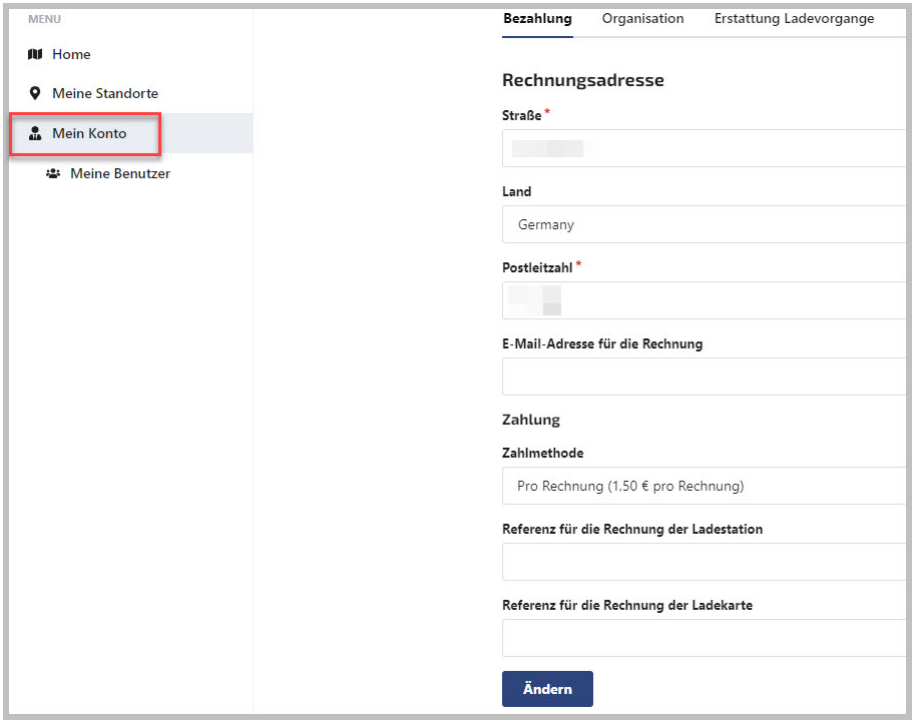
My Access Groups

Each charger is assigned to one or multiple access groups. The access group defines the authorizations for charging for the RFID cards assigned to the group ("members").



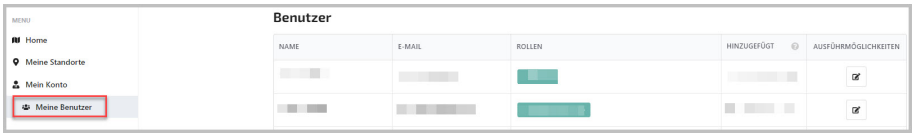
Names can be assigned and additional RFID cards added (via the token UID) in the menu under **[Zugangsgruppen]**.

9.4 My Account



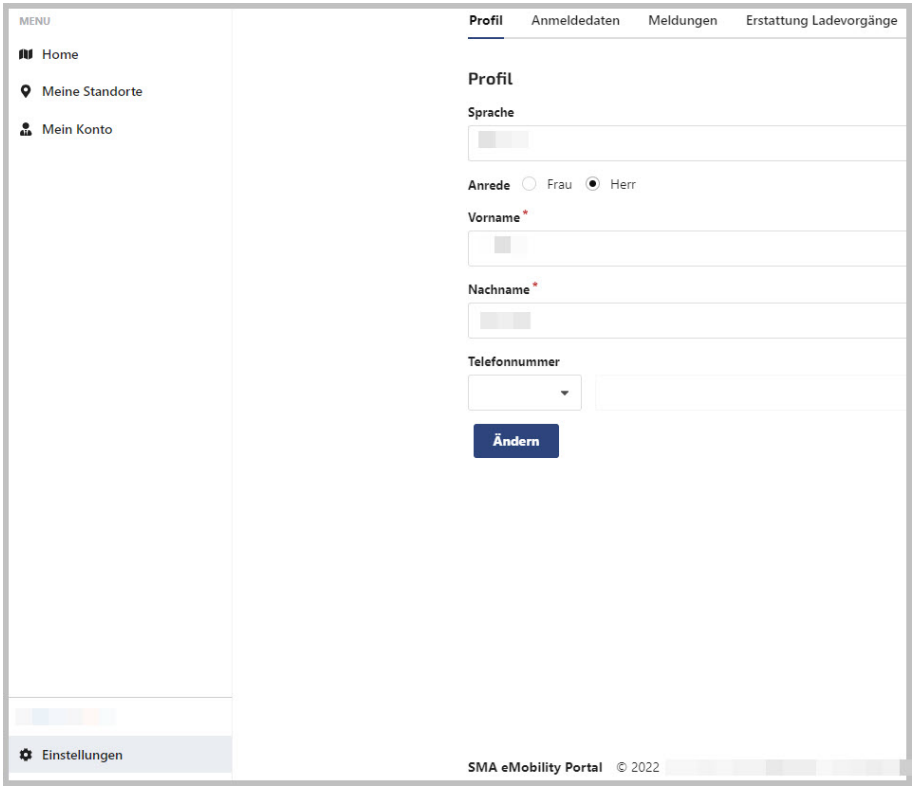
The Account Admin can set the master data on the organization and the settings for payment and reimbursement of charging processes in the menu under **[Mein Konto]**. The settings for payment are currently not functional, since billing is not supported at this time.

My Users



The user accounts that have been set up for the organization and the role that is assigned to them are displayed in the menu under **[Meine Benutzer]**. Normally, the Account Admin as the user and the installer as the "field service technician", if any, are shown here.

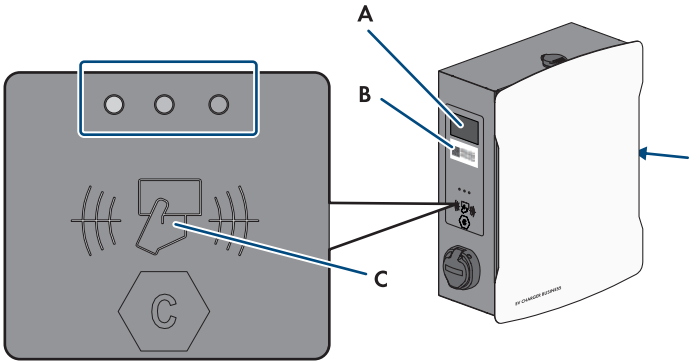
9.5 Settings



The profile settings can be changed and the password as well as other user settings can be made in the menu under **[Einstellungen]**.

10 Operation

10.1 Overview of Display and Control Elements



Position	Description
A	Viewing area for the meter (with red status LED) Charging process: • Display start • Display date • Time • Rep • Charging time (date alternates with charging time) • Display stop After charging process: • Display date • Time • Rep (last charging process) • Charging time (last charging process)
B	Public key (only for EVCB-LB-3AC-ECC-10 and EVCB-3AC-ECC-10) • QR code public key (“public key”) • Public key
C	Viewing area for charge controller with status indicator (LEDs) and reading field for RFID authorization

10.2 Starting the Charging Process

An LED indicator that is rapidly flashing at the selected charge point (green, yellow and blue) indicates that a disturbance is present.

It is not possible to charge at this charge point.

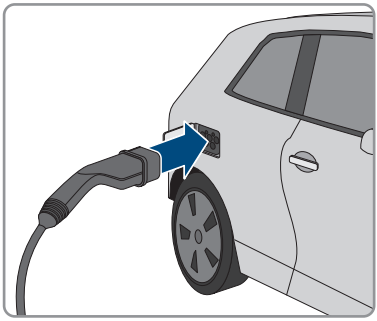
- Troubleshooting (see Section 13, page 82).
- Contact the installer.

Requirement:

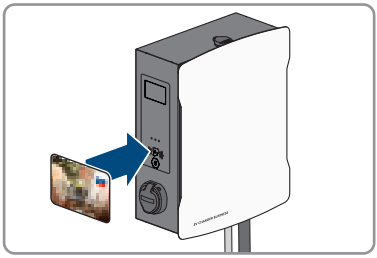
☐ The charger is ready for operation and the green LED indicator is flashing.

Procedure:

1. Connect the charging cable to the vehicle.

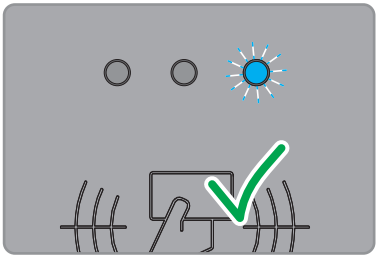


2. Depending on the product design, connect the charging cable to the charger.
3. Hold the RFID card up to the RFID card reader.



☑ The charging cable is locked.

☑ The LED indicator is slowly flashing blue.



☑ The charging process begins.

10.3 Ending the Charging Process

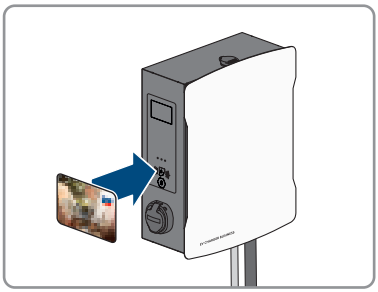
The charging process can only be ended with the same RFID card that it was started with.

In case of grid failure, the mechanical lock on the charging cable at the charger (SMA EV Charger Business with charging socket) automatically opens.

Alternatively, the charging process can also be ended at the vehicle (see the manufacturer's manual).

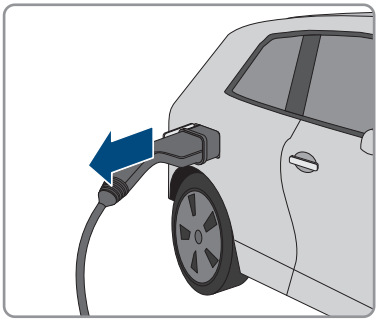
Procedure:

1. To end the charging process, hold the RFID card in front of the RFID card reader.



   ☑ The charging process is stopped and the charging cable lock is opened.
   ☑ The LED indicator is slowly flashing green.

2. Unlock and disconnect the charging cable at the vehicle.



3. Depending on the product design, remove the charging cable from the charger.

Also see:

- Event messages ⇒ page 82

10.4 Verifying the Charge Data

The products EVCB-LB-3AC-ECC-10 and EVCB-3AC-ECC-10 are in compliance with the calibration regulations.

With transparency software, users have the option to verify validity of the digitally signed measured values of charging processes. This ensures that the billed values are the same as the actual measured values and have not been manipulated by third parties.

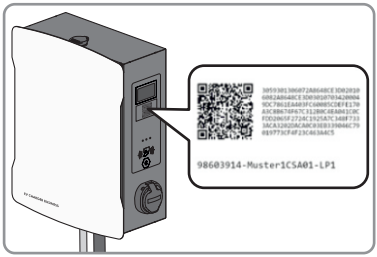
Requirements:

☐ Digitally signed record in a format supported by the transparency software.

☐ Public key of the charger.

Procedure:

1. At each of the charging sockets of the charger, there is an RFID display with a public key that is valid for it. The public key is required for verification of the measured data after the completed charging process.



2. Write down the public key on the display at the side of the charger, or photograph or import it via QR code.
3. Authenticate it at the charger and start the charging process.
   ☑ The starting time of the charging process and the starting value of the meter status are displayed via the RFID display at the beginning of the charging process.
4. End the charging process.
   ☑ The starting and ending values of the meter and the current time are displayed. The charger generates a digitally signed record from the starting and ending values. It is digitally signed with a private key of the charger. The correctness of the signature can subsequently be verified via the public key at the charger.

Invoice and test data

i Make sure that the public key of the charger can be verified and the source of the key is trustworthy. This can be the key that is physically applied to the charger or the digitally saved value at the Federal Network Agency. A public key that is printed on the invoice can possibly be incorrect and lead to incorrect test results.

i The data packages of completed charging process may get lost if the data transmission of the signed OCMF data packages to the backend system fails in the longer term. The charger saves the signed OCMF data package only in an internal ring buffer with a fixed size. This ring buffer is not directly accessible to customers. Contact the operator of the charger.

Account creates and transmits an XML file as part of the invoice. It can be opened and verified with a transparency software.

Download transparency software and run an invoice check

The transparency software is subject to continuous adaptations and changes such that the listed steps may deviate from the current version of the software.

Procedure:

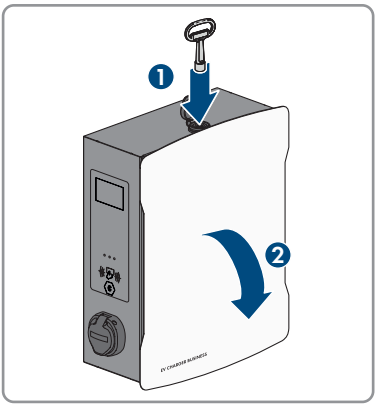
1. Download the current version of the transparency software (https:/www.safe-ev.de) to the computer and unpack it to any folder.
2. Make sure that the JAVA framework is installed in the current version.
3. Install the JAVA framework via the JAVA web installer.
4. Open the transparency software with a double click.
5. Select the measured values provided to you via **[Datei]** and **[Öffnen]** and input the public key into the charger.
   ☑ Subsequently, the file and signature formats will be automatically detected.
6. If the file and signature formats are not automatically detected, manually enter them in the text field.
7. Make sure that the displayed measured values match the data that are printed on the invoice.
8. Make sure that the public key is correct and matches the public key of the charger.
9. If verification of the measured values is incorrect, the transparency software indicates that the check was not successfully completed.
   ☑ The reason for the error or unsuccessful check is displayed.

11 Disconnecting the product from voltage sources

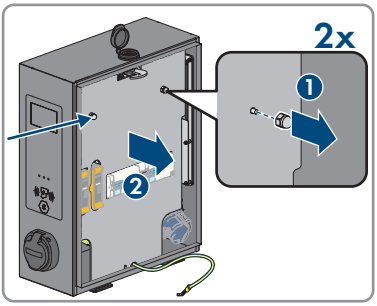
⚠ QUALIFIED PERSON

Procedure:

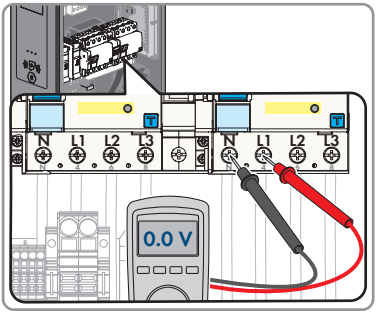
1. Disconnect the external miniature circuit breaker and secure it against reconnection.
2. Disconnect the charging cable from the vehicle and if necessary, from the charger.
3. Open the product and remove the enclosure cover.



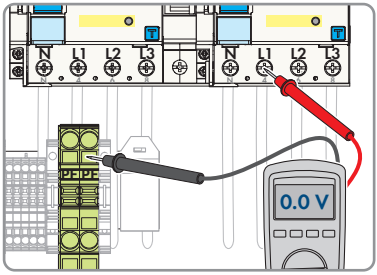
4. Loosen and remove the 2 nuts of the safety cover.



5. Use an appropriate measuring device to ensure that no voltage is present (de-energized state) at the residual-current devices between L1 and N, L2 and N, and L3 and N.



6. Use an appropriate measuring device to ensure that no voltage is present (de-energized state) at the terminal block and the residual-current devices in sequence between L1 and PE, L2 and PE, and L3 and PE.



12 Clean the product

NOTICE

Damage to the product due to cleaning agents

The use of cleaning agents may cause damage to the product and its components.

- Clean the product and all its components only with a cloth moistened with clear water.

Procedure:

- Ensure that the product is free of dust, leaves and other dirt.

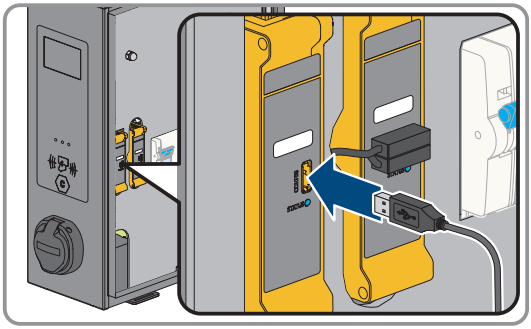
13 Troubleshooting

13.1 Event messages

Event message	Cause and corrective measures
LED flashing rapidly (green, yellow and blue).	⚠ QUALIFIED PERSON **Cause** Authorization was rejected. Error in charging system. Backend not available. **Corrective measures:** • Check the RFID card and re-import if necessary. • Inspect the charging system for errors. • Establish a connection to the backend system.
LED display is off.	⚠ QUALIFIED PERSON **Cause** No supply voltage. Overcurrent protective device off/defective. Control fuse off. Charge controller defective. **Corrective measures:** • Check the supply voltage at the input terminal. Check the overcurrent protective device. Switch on the control fuse. Check the charge controller.
Residual-current device trips.	⚠ QUALIFIED PERSON **Cause** Error in downstream load or in the supply line. **Corrective measures:** • Check loads. • Switch on residual-current device again. • Observe the procedure during commissioning.

Event message	Cause and corrective measures
Charging sockets have no current.	⚠ QUALIFIED PERSON **Cause** External and/or internal miniature circuit breakers and/or residual-current devices are not switched on. Charger not connected. **Corrective measures:** • Switch on the external and/or internal miniature circuit breakers and/or residual-current devices.
Charging plug remains locked.	⚠ QUALIFIED PERSON **Cause** Locking mechanism defective. **Corrective measures:** • Manual actuation at the charging socket with size 4 open-end wrench or with red lug (if available). • Switch off control fuse. Locking mechanism opens.
RFID identification does not work.	⚠ QUALIFIED PERSON **Cause** RFID card is unknown, has incorrect data format or was not imported. The connection cable of the card reader is loose. Power supply unit for the RFID card reader is defective. Charger is offline. No connection to backend system. **Corrective measures:** • Separate importing of the card with a computer and LAN interface is possible (see Section 8.3.7, page 63). • Check whether the RFID card reader is connected to the power supply unit. • Establish a connection to the backend system.
Electric vehicle requests fan.	⚠ QUALIFIED PERSON **Cause** The charging infrastructure does not support this request. **Corrective measures:** • Charging not possible.

Event message	Cause and corrective measures
No LAN access.	⚠ QUALIFIED PERSON **Cause** Network connection defective. **Corrective measures:** • Check status indicator, check network cable, check transfer connector (RJ45).

Event message	Cause and corrective measures
LAN access to charge controller not possible	**⚠ QUALIFIED PERSON** **Cause** No LAN access. **Corrective measures:** • USB cable Micro USB to USB type A is present. • Java Runtime Environment (JRE) at least in version 13 is installed on the computer. **Procedure:**  1. Use the USB cable to connect the charge controller to the computer at the CONFIG port. 2. The RNDIS network (remote network driver interface specification) is emulated. 3. Linux and MAC operating system automatically detect this virtual network. 4. For Windows operating systems, first the RNDIS/ CDC Ethernet-Gadget driver for the RNDIS network adapter must be installed on the computer. Normally, this happens automatically. At the same time, a corresponding field appears at the bottom left of the desktop. It displays the installation progress and confirms its completion. 5. After the driver has been successfully installed, the system recognizes the charge controller as a network adapter. Input **[http://192.168.123.123/ operator]** in the browser. This is the IP address of the charge controller.

Event message	Cause and corrective measures
Meter values are not displayed correctly.	⚠ QUALIFIED PERSON **Cause** Meter defective. Modbus connection incorrect. **Corrective measures:** • Check the wiring.
Moisture inside the product.	⚠ QUALIFIED PERSON **Cause** Condensation has formed. Aeration and ventilation do not work. **Corrective measures:** • Avoid disproportionately strong solar irradiation (with integrated temperature monitoring in the charge controller, the power is reduced if necessary to prevent overheating).
The enclosure is damaged.	⚠ QUALIFIED PERSON **Cause** Transport damage. **Corrective measures:** • Immediately after damage is found, submit a complaint to the transport company.

14 Decommissioning the Product

To decommission the product completely upon completion of its service life, proceed as described in this Section.

⚠ CAUTION

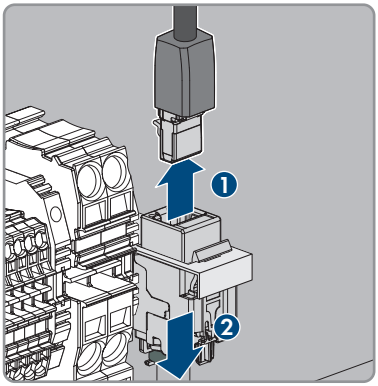
Risk of injury due to weight of product

Injuries may result if the product is lifted incorrectly or dropped while being transported or mounted.

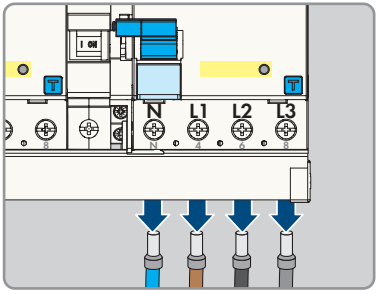
- Wear suitable personal protective equipment for all work on the product.

Procedure:

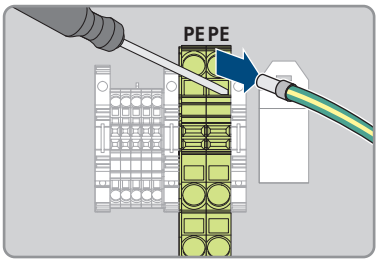
1. Disconnect the product from voltage sources (see Section 11, page 79).
2. If a network cable is present, unscrew the cable gland for the network cable and loosen the swivel nut.
3. Pull the network cable out of the network socket and remove the network socket from the product.



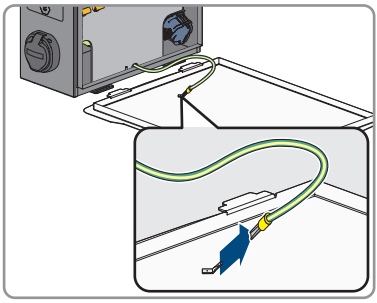
4. Guide the network cable through the cable gland and out of the product.
5. Depending on the design, unscrew the cable gland for the AC cable and loosen the swivel nut.
6. Depending on the design, loosen conductors L1, L2, L3 and N from the residual-current device (PZ2) and remove them.



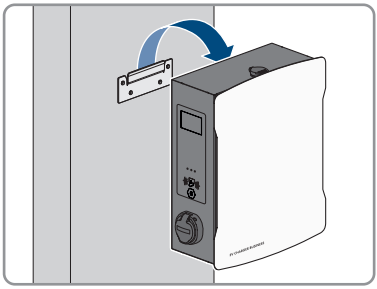
7. Disconnect the PE from the terminal block.



8. Depending on the design, guide the AC cable out of the product through the cable gland.
9. Remove the security screw.
10. Securely screw on the 2 nuts of the safety cover.
11. Connect the grounding cable to the cover.

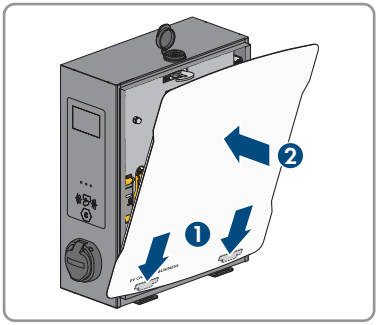


12. Carefully remove the product from the wall or charging stand.



13. Remove the bracket from the wall or charging stand. To do so, loosen the four screws using a suitable tool.

14. Put on the enclosure cover and close it.



15. If the product is to be stored or shipped, pack the product. Use the original packaging or packaging that is suitable for the weight and size of the product.
16. If the product is to be disposed of, dispose of the product in accordance with the locally applicable disposal regulations for electronic waste.

15 Maintenance

⚠ DANGER

Danger to life due to electric shock when live components or cables are touched

High voltages are present in the conductive components or cables of the product. Touching live parts and cables results in death or lethal injuries due to electric shock.

- Do not touch non-insulated parts or cables.
- Disconnect the product from voltage sources and ensure it cannot be reconnected before working on the device.
- Wear suitable personal protective equipment for all work on the product.

i The operator must have an electrically qualified person inspect the charger for proper condition at regular intervals.

i Damage to the product

SMA Solar Technology AG recommends a daily visual inspection by the charger user. The product and the associated components must not display any damage.

- In the case of damage to the product, contact the installer.

Procedure:

Semi-annual inspection (every 6 months):

1. Inspect the residual-current device.
2. Inspect the charging cable in accordance with VDE 0701/702.

Annual inspection of the overall system (every 12 months) in accordance with Deutsche Gesetzliche Unfallversicherung (DGUV) V3:

1. Ensure that the residual current operated circuit-breaker with integral overcurrent protection (RCBO) is working.
2. Ensure that the tripping time and operating current of the individual, active conductors are correct.
3. Ensure that the protection devices at the network input of the charger are working.

16 Procedure for Receiving a Replacement Device

⚠ QUALIFIED PERSON

Under fault conditions, the product may need to be replaced. If this is the case, you will receive a replacement device from SMA Solar Technology AG. If you received a replacement device, replace the defective product with the replacement device as described below.

Procedure:

1. Decommission the defective product (see Section 14, page 87).
2. Mount the replacement device and make the electrical connections as described in this document.
3. Commission the replacement device (see Section 8.2, page 47).
4. Configure the product (see Section 8.3, page 48).
5. If the defective product was registered in the SMA eMobility Portal, replace the defective product with the new product in the SMA eMobility Portal (see Section 9, page 67).
6. Pack the defective product in the packaging of the replacement device and arrange with SMA Solar Technology AG for it to be picked up.

17 Technical Data

Inputs and outputs (AC)

	SMA EV Charger Business	
Product types	SMA EV Charger Business with charging socket	SMA EV Charger Business with charging cable
Number and type of charge points	2 x charging socket type 2	2 x charging cable type 2
Nominal voltage	230 V AC / 400 V AC	
Rated frequency	50 Hz	
Maximum connected load	For 1 connection cable 22 kW For 2 connection cables 2 x 22 kW	
Rated Current	For 1 connection cable 32 A For 2 connection cables 2 x 32 A	
Rated surge voltage	4 kV	
Rated insulation voltage	500 V	
Relative rated short-circuit current	6 kA	

Communication

Interface	Ethernet RJ45 (LAN)
OCPP	OCPP 1.6 JSON
PLC (ISO 15118)	Available
EEBUS	Available
4G modem	Present for EVCB-LB-3AC-ECC-10 / EVCB-3AC-ECC-10

Protective devices

DC residual current detection per charge point	6 mA
Residual-current device per charge point	4-pole 40 / 0.03 A type A
Miniature circuit breaker	Ext. necessary, per cable max. C 32 A, 3-pole

Ambient conditions and operation

Operating temperature range	−25 °C to +40 °C (−13 °F to +104 °F)
Operating temperature range with integrated derating function	−25 °C to +75 °C
Storage temperature range	−30 °C to +70 °C

Degree of protection (in accordance with IEC 60529) / impact resistance	IP54 / IK08
Protection class (in accordance with IEC 62103) / Overvoltage category	I / III
Maximum permissible value for relative humidity	5% to 90%
Altitude above MSL	0 m to 2000 m

General data

Product types	SMA EV Charger Business with charging socket	SMA EV Charger Business with charging cable
Dimensions (W / H / D)	409 mm / 490 mm / 176 mm	430 mm / 490 mm / 176 mm
Weight	13.5 kg	21 kg
Connection cross-section	For NYY-J, max. 5 x 10 mm²	
Grid configurations	TN, TN-S, TT	
Display per charge point	LED, LCD display (meter)	

Features / accessories

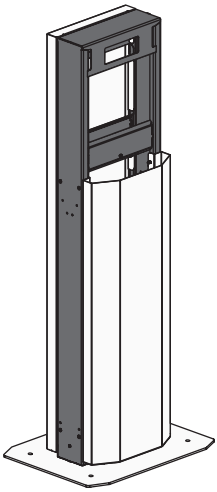
Product types	SMA EV Charger Business with charging socket	SMA EV Charger Business with charging cable
Integrated charging cable	not present	7.5 m (EVCB-3AC-10) 6.0 m (EVCB-3AC-ECC-10)
Integrated energy meter	MID-compliant (EVCB-LB-3AC-10 / EVCB-3AC-10) In compliance with the calibration regulations (EVCB-LB-3AC-ECC-10 / EVCB-3AC-ECC-10)	
Dynamic load management	Available	
Authorization	RFID	
Warranty	2 years	
Certificates and approvals	IEC 61851-1:2019	
System compatibility	SMA eMobility Portal SMA Data Manager M (planned as of Q2/2023)	
Charging stand	optional	
Foundation	optional	

RFID cards (MIFARE DESFire)	Available	
Type designation / Material number	EVCB-LB-3AC-10 / 202576-00.01	EVCB-3AC-10 / 202559-00.01
	EVCB-LB-3AC-ECC-10 / 204842-00.01	EVCB-3AC-ECC-10 / 204844-00.01

18 Accessories

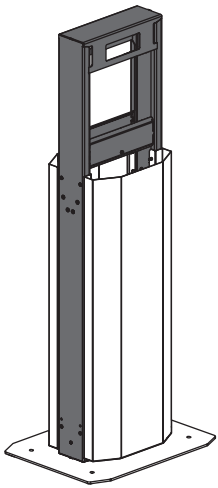
You will find the accessories for your product in the following overview. If required, you can order them from SMA Solar Technology AG.

A



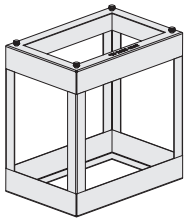
206470-00.01

B



206463-00.01

C



206465-00.01

Designation	Brief description
A	Charging stand for EV Charger Business (one-sided) SMA material number: 206470-00.01
B	Charging stand for EV Charger Business (two-sided) SMA material number: 206463-00.01
C	Embedded section for charging stand installation SMA material number: 206465-00.01

19 Contact

- Device type
- Serial number
- Mounting location and mounting height
- Detailed description of the problem

You can find your country's contact information at:

https://go.sma.de/service

20 EU Declaration of Conformity

within the scope of the EU directives

- Electromagnetic compatibility 2014/30/EU (29.3.2014 L 96/79-106) (EMC)
- Low Voltage Directive 2014/35/EU (29.3.2014 L 96/357-374) (LVD)
- Radio Equipment Directive 2014/53/EU (22.5.2014 L 153/62) (RED)
- Restriction of the use of certain hazardous substances 2011/65/EU (L 174/88, June 8, 2011) and 2015/863/EU (L 137/10, March 31, 2015) (RoHS)

SMA Solar Technology AG confirms herewith that the products described in this document are in compliance with the fundamental requirements and other relevant provisions of the aforementioned directives. More information on the availability of the entire declaration of conformity can be found at https://www.sma.de/en/ce-ukca.

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