

USER MANUAL

Kostad Mobile DC-Charger

Operating instructions



1 About this guide

These operating instructions describe the charging station and inform you how to use it. Keep these operating instructions for later use.

Read these operating instructions before handling the charging station and follow the instructions. This will ensure hazard-free and fault-free operation as well as a long service life of the charging station.

1.1 Information for the person responsible for the installation

Follow local and industry-specific safety and installation regulations. Those responsible for the installation must ensure the following:

- Planning and project work as well as all work on and with the charging station is only carried out by qualified personnel.
- The operating instructions are always available during all work.
- The technical data and the information on the permissible installation, connection, ambient and operating conditions are consistently observed.
- The specific erection and safety regulations as well as the regulations for the use of personal protective equipment are observed.

You will find safety instructions in the individual chapters of this document. For your own safety, for the protection of other persons and to avoid damage to property, it is essential that you comply with the safety instructions.

Observe the following safety instructions for all activities on and with the charging station.

For your personal safety and to avoid damage to property, always observe the safety-relevant instructions and the following five safety rules according to EN 50110-1 "Working in a de-energized state" during all work. Apply the five safety rules in the stated order before starting work.

Five safety rules

1. Enable - Also enable the auxiliary circuits.
2. Secure against being switched on again.
3. Determine the absence of voltage.
4. Earth and short-circuit.
5. Cover or fence off adjacent live parts.

After completing the work, cancel the measures taken in the reverse order.

1.2 Safety instructions

Safety in the workplace depends on the attention, precaution and common sense of all persons who install, operate and maintain the machine. In addition to observing the listed safety precautions, caution should always be exercised in the vicinity of the machine. Always be aware of your safety.

To avoid accidents, also note the following:

- General safety regulations of the respective country of operation
- Specific regulations of the operator and the area of use
- Specific agreements made with the operator
- Separate safety instructions supplied with the charging station
- Safety symbols and notices on the charging station and its packaging

1.3 Conversions or alterations

Any modification concerning the charging station must be discussed with the manufacturer in advance and his approval must be obtained. All documentation, including these operating instructions, must be updated accordingly.

**Note**

In case of unauthorized conversions and modifications of the system, any liability and warranty of the manufacturer expires!

1.4 Copyright

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3 Glossary

AC

Alternating current.

CCS

Combined Charging System. An international charging standard for electric vehicles.

CHAdeMO

A DC fast charging standard for electric vehicles.

DC

Direct current.

Owner

The rightful owner of the charging station.

EV

Electric vehicle.

HMI

Human Machine Interface; screen of the charging station.

Users

The driver of an electric vehicle who uses the charging station to charge the battery of his vehicle.

OCPP

Open Charge Point Protocol. Open standard for communication between charging stations and back-end systems.

PE

Protective conductor (earthing).

RFID

RFID is a wireless identification technology that uses radio waves to transmit data over a very short distance between the RFID reader and the RFID tag.

Site operator

Person or company managing the charging station (not necessarily the owner).

4 Introduction

4.1 Foreword

The Kostad Mobile DC-Charger is an easy-to-install DC fast charging system for electric vehicles. Thereby is an electrical installation with high electrical currents. This manual describes the general operation and daily operation of the DC Charger.

4.2 Purpose of this manual

As a reference for site operators who are responsible for operating the charging station on site, carrying out day-to-day inspection and maintenance work and taking measures for simple troubleshooting as instructed by a Kostad-certified technician.

The user interface design has been thoroughly evaluated with user groups to optimize intuitive operation and achieve the best user experience.

4.3 Appropriate use of the charger

The outputs of the charging station are used exclusively for charging electric vehicles that are compatible with the supported charging standards.

4.4 Danger signs

The following symbols are used on the unit and in this manual:



DANGER

Warning of electrical voltage
Indicates a hazard that could result in serious injury or death.
can lead to death by electric shock.



WARNING

General warning sign
Indicates a hazard that can cause serious injury or death, as well as damage to the installation, other equipment and/or environmental pollution.

4.5 Safety instructions



ATTENTION

If a charging station is damaged, proceed as follows:
Do not use the damaged charging station.
Contact the owner / site operator.



WARNING

Operation after damage or accidents

If there is a fire in or near the charging station;
If the charging station has been exposed to water or any other liquid; If the charging station is damaged in any way.

Do not use the charger. Contact the owner / site operator.



CAUTION

Plug locked

Do not apply force to the locked cable during charging. This may damage the inlet and locking mechanism in the vehicle or the charging station.



ATTENTION

When connecting or disconnecting a connector

Handle the cables and plugs with care. Do not drop the cables or plugs. Put them back in their respective holders. Insert only one plug into the appropriate inlet of the electric vehicle. Do not insert the plug by force.



CAUTION

User safety

Make sure that no user comes into contact with the internal electronics of the charging station.

5 Product description

5.1 Overview of the system

The components relevant for use are shown in Figure 1:

- A. Display / HMI
- B. RFID card reader
- C. Emergency stop
- D. Air outlet
- E. Mains-side supply cable (AC)- Backside
- F. Air inlet
- G. Charging outputs DC

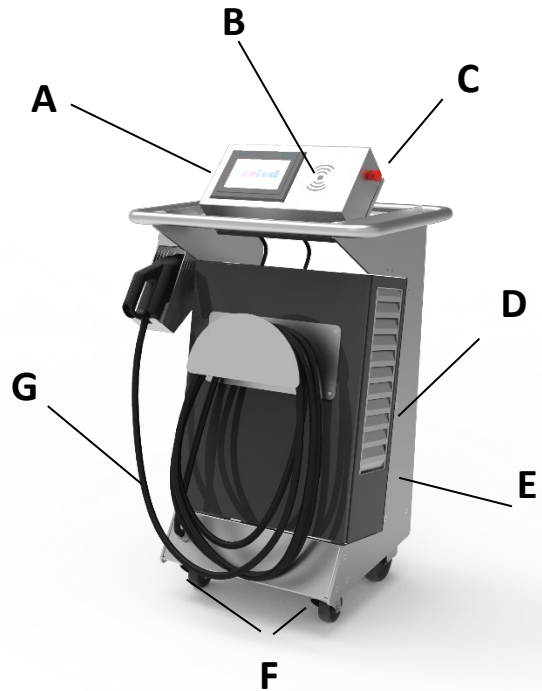


Fig 1:
View Kostad Mobile DC-Charger

5.2 Hardware configurations

The Kostad Mobile DC-Charger supports the following DC charging standards:

Abbreviation	Description
CJ	One CCS and one CHAdeMO output up to 80 A / 22 kW; No simultaneous charging possible
C	One CCS output with output current/power; 80 A / 22 kW
J	One CHAdeMO output with output current/power; 80 A / 22 kW

5.3 Standard use

By default, the Kostad Mobile DC-Charger is supplied from the mains.



Fig 2:
Kostad Mobile DC-Charger

6 Installation

6.1 Spatial specifications

Space required for installation and maintenance of the Mobile Charger

Size of the charging station W x D x H: 706 x 536 x 1159 mm.

Additional 300mm each on the left and right to ensure working at the charging station without obstacles. Please note that air inlets and air outlets are not covered by any fabrics or materials.

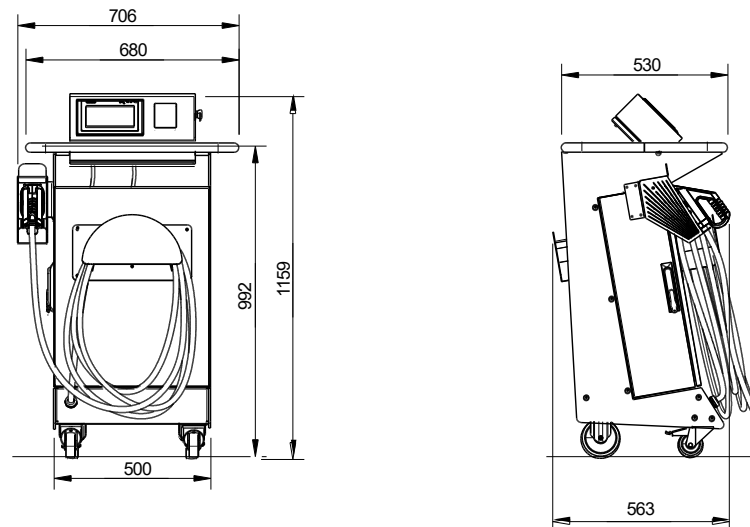


Fig 3: Kostad Mobile DC-Charger

6.2 Ventilation of the Mobile DC-Charger

The Mobile DC-Charger has an air inlet (bottom side) and an air outlet (right side).



Fig 4: Kostad Mobile Charger ventilation



ATTENTION

Keep the air inlets and outlets clean. Make sure that they are free of snow and leaves or other materials.

6.3 Conductor and cable cross-section

The cross-section of the earthing conductor depends, among other things, on its length and the type of installation. It is therefore necessary that this is determined and specified by the electrician commissioned by you.

The maximum cross-section is 4x16 mm². The maximum diameter of the mains cable is 21 mm.

6.4 Setting up the charging station

6.4.1 Prerequisite

The set-up phase includes all work required to prepare the site and get it ready for the installation and connection of the Mobile DC-Charger. The installation phase can begin as soon as:

- All necessary permits have been granted.
- The wall preparations have been made.
- The mains connection is available.

6.4.2 Mains-side voltage and power supply

The connection conditions listed below must be observed and technically executed on site by qualified and trained specialist personnel.

Version	Max. current	Total input current	Mains-side fuse protection	Cross-section
DC output 22 kW variant	40 A	40 A	3 x 63 A gG Fuse RCD circuit breaker type B	4 x 16mm ²
DC output 30 kW variant	63 A	63 A	3 x 63 A gG Fuse RCD circuit breaker type B	4 x 16mm ²



External RCDs are not included in the scope of delivery

Upstream RCDs are expressly excluded from the scope of delivery and must be provided by the installer.

6.4.3 Internet connection

The preferred method of communication is to use a 4G wireless modem integrated into the charging station. If no wireless signal is available, OCPP requires a wired internet connection. Please contact the Kostad Support Team for a specific configuration.

If the separate Internet connection is not used, please ensure that the cable entry opening is closed to ensure the IP54 protection rating of the cabinet.

6.4.4 Unpacking the Mobile DC-Charger

The packaging of the Mobile DC-Charger can be removed without tools. Be careful as the packaging could pollute the environment.

1. Remove the protective foam pad.
2. Take the Mobile Charger out of the packaging.

6.4.5 Usage instructions

1. Before each start-up, check all supply and charging lines. If the Mobile Charger is damaged, do not use it any more and contact Kostad Support Service.
2. Do not connect the Mobile Charger to the power grid until it is at its place of use.
3. Only place the Mobile Charger on a dry, firm surface.
4. Use the parking brakes of the Mobile Charger every time you use it
5. Before repositioning the Mobile Charger, check the routes and pay attention to your surroundings during the relocation.
6. In the event of damage, including after the charging station has fallen over, have the Mobile DC Charger checked by trained personnel before commissioning.

6.5 Locking system

The front door can be locked with a separately available half-cylinder lock. In the event that no on-site lock or locking system has been ordered, the Mobile DC-Charger is not delivered lockable.

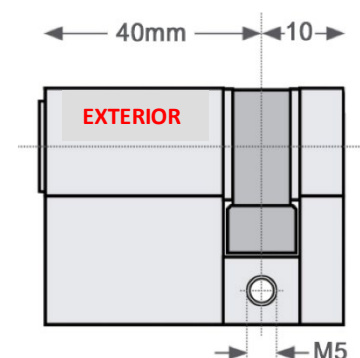
On request, the charging station can be equipped with a customized locking cylinder and delivered. It is possible to install a locking cylinder system, which must also be provided by the customer. This enables the operator to apply the general key principle for several charging stations and/or to manage the locking authorizations of his service staff.



ATTENTION

It is mandatory to secure the charging station against unauthorized interference.

Use a half cylinder lock with an external length of 40mm



6.6 Switching the charging station on and off

Switch the following component on to turn it on or off to turn it off:

1. 1F1 Circuit breaker

- Wait until the charging station has started up (approx. 3 minutes).
- After the charging station has booted up, the readiness for operation is displayed on the HMI.
- If necessary, open the Operator menu and make the desired settings. (OCPP, grid connection, etc.).

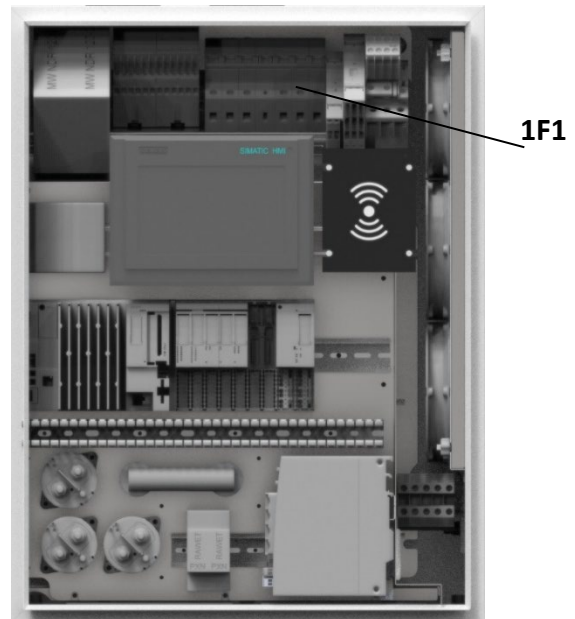


Fig 10: 1F1 Circuit breaker

6.6.1 Earth fault/insulation monitoring

The charging station is equipped with an insulation monitoring system that monitors the insulation of the charging cable and charge controller before and during the charging process. If this message appears before or during the charging process, the charging process is stopped immediately.

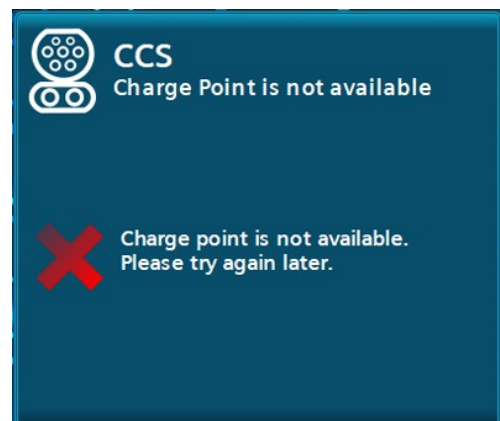


Fig 11: Earth fault/insulation monitoring

Insulation fault before switching on the car's battery contactors

If an insulation fault occurs before the car's battery contactors are switched on, the charging process in progress is aborted. An error message is displayed on the control panel. A message is sent to the service. The charging output is permanently shut down and can only be reactivated by service or operator personnel.

6.7 Authorization procedure

The following authorization procedures are supported by the charging station.

6.7.1 Free loading / no authorization

Charging does not require authorization. A charging process is started automatically after a plugged-in cable is detected. The charging process is terminated by pressing the STOP button.

6.7.2 Free charging with RFID card

Charging requires any RFID card readable by the system for authorization. The charging process is terminated by presenting the same RFID card in front of the card reader.

- Standard RFID cards or RFID systems
- Supports all NFC forum tags (type 1-4)
- NFC Peer to Peer Communication
- ISO 14443 A/B, Mifare, DESFire, ISO 18092 (NFC)

6.7.3 OCPP (online / offline)

Loading requires authorization. In the offline state, an RFID card is needed to match it with a whitelist or the cache.

If there is an unintentional disconnection of the APN, the charging station switches internally and automatically in this mode. After a successful reconnection, the charging station automatically switches back to online mode. In online mode, the charging station can also be started by a remote command. It is terminated by presenting the same RFID card, an RFID card from the same group or by a remote command (online only).

For more information, see chapter "OCPP 7.2 (page 27)".

6.8 Quick guide to the charging process

The charging procedure is described below:

6.8.1 Plug in the charging cable

1. Park the electric vehicle with the charging input within reach of the plug and switch off the vehicle.
2. If "Free charging" is activated at the charging point, charging starts immediately after the connection with the vehicle.

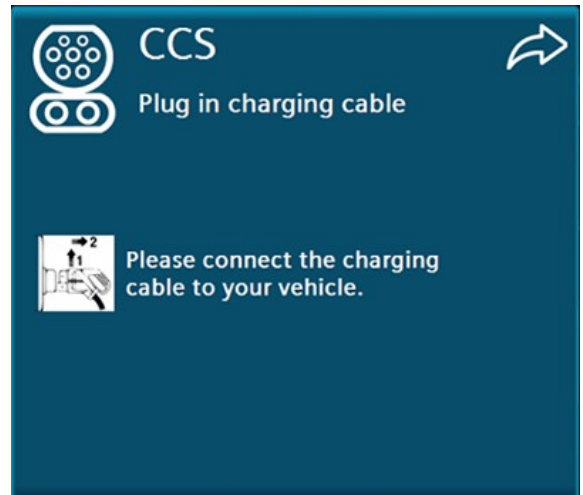


Fig 12: Ready for operation status

6.8.2 Waiting for authorization

- Depending on the authorization method: Hold your RFID card in front of the card reader or press the < START> button displayed.
- If "Free loading" is activated, this step is skipped.

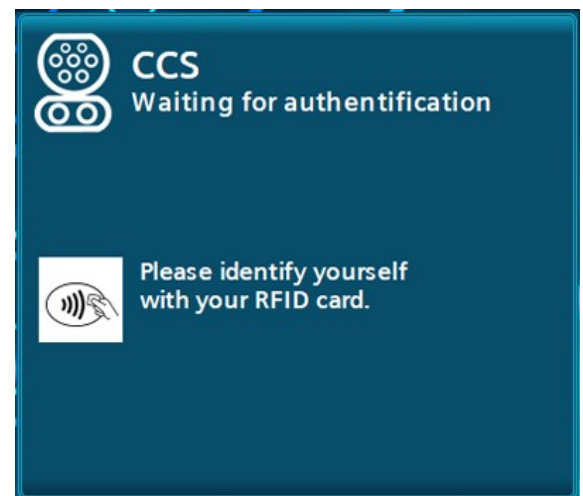


Fig 13: Waiting for valid authorisation

6.8.3 Prepare

A wait symbol is displayed during DC charging for the duration until the energy transfer (including cable check).

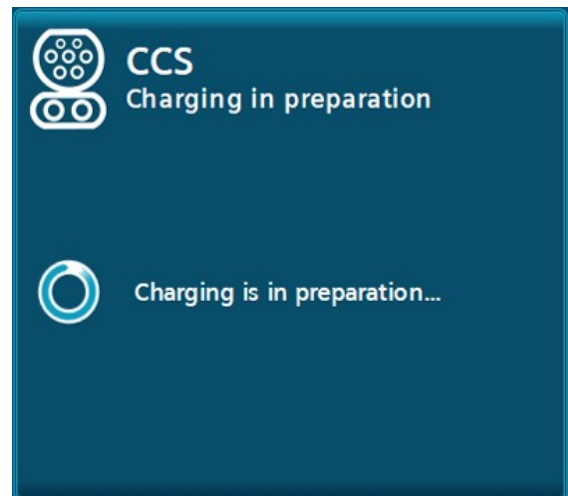


Fig 14: Example of the waiting time when starting DC charging

6.8.4 Charging in progress

After starting a charging process, there is an automatic switch to the main menu or to the screen saver (screensaver mode). Tapping the screen or reading an RFID card again automatically switches to the charging process(es) in progress.

For each charging process in progress, the following data is displayed, depending on availability:

- The state of charge of the vehicle battery (SOC) in percent
- The current voltage, current and/or power values
- The charged energy (in kWh)
- In certain configurations, the maximum released energy (in kWh)
- Charge time/~end time up to 80 % SOC and charge time/~end time up to 100 % SOC.
- The current duration of the charging process

The information reported by the vehicle itself (e.g. SOC or charging time) is displayed according to availability.

- ① Charging status textual
- ② Charging status graphically
- ③ Time until 100 % charge level reached
- ④ End time
- ⑤ Current charging time (39 sec)
- ⑥ Charged energy [/ max. available energy by operator]
- ⑦ End time
- ⑧ Time until 80 % charge level reached
- ⑨ Actual values: voltage, current and power values

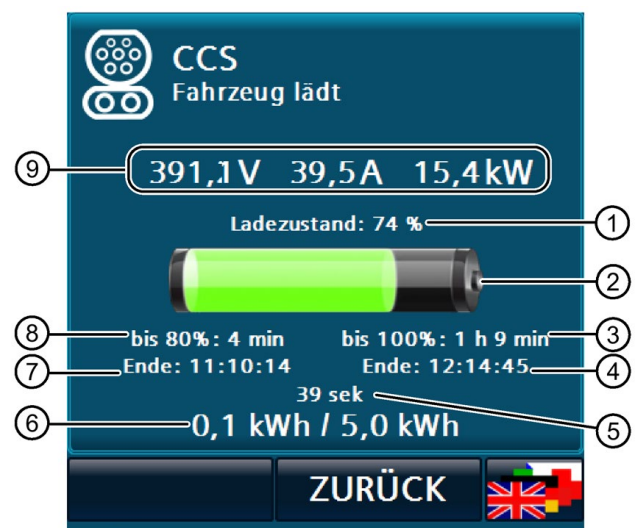


Fig 15: DC charging process "Vehicle charging"

6.8.5 Charging process interrupted (by the vehicle)

If an ongoing charging process is interrupted by the vehicle (without terminating the transaction), the energy charged to date is displayed.

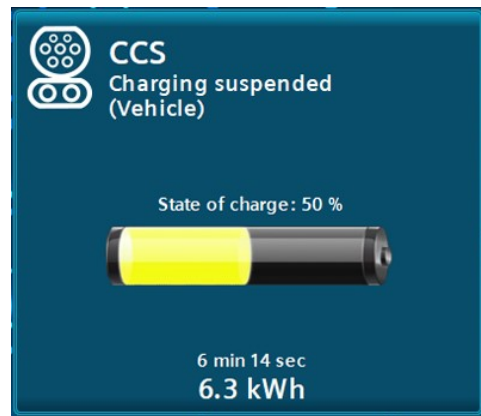


Fig 16: DC charging process "Charging process interrupted by vehicle".

6.8.6 Charging process interrupted (by the station or the operator)

If an ongoing charging process is interrupted by the station itself or the operator, the available power is reduced to 0 kW. Possible causes can be e.g. temperature loads on the station or supply contracts of the operator.



Fig 17: DC charging process "Charging process interrupted by charging station / operator".

6.8.7 Charging process completed

When charging is complete, you will be prompted to disconnect from the vehicle. You will be shown the charging duration and the charged energy (in kWh). In certain configurations, the configured maximum energy per charge is also displayed.

This menu is displayed until the charging point is recognized as free. I.e. the plug is no longer plugged in (for older CHAdeMO models (< CHAdeMO V 1.1), the display duration may differ. Remove the charging plug from the vehicle and reinsert it into the plug holder on the charging station.

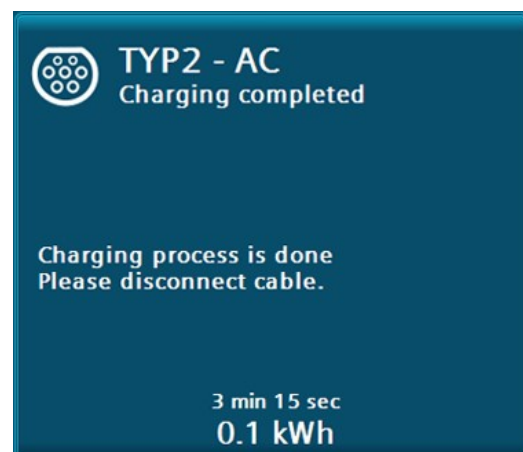


Fig 18: Charging process completed on Example of the AC charging output

**ATTENTION***Locked connection*

For CCS charging, the electric vehicle locks the plug. If the user wants to remove the plug from the vehicle, it may be necessary to unlock all doors of the EV or to press the "Unlock Charge Connector Button" on the vehicle key, if present.

**ATTENTION***End of charging*

The charging process is stopped without user interaction:

When the charging station's electric vehicle indicates that charging is complete. When the maximum charging time set by the site operator/owner has been reached. If the battery is not fully charged, a new charging process can be started.

6.8.8 Authentication after loading

If charging is not terminated with the RFID card or with an RFID card from the same group with which charging was started, the charging cable remains locked to the station. Hold the RFID card in front of the card reader with which charging was started or terminate charging remotely (with OCPP).

If the master card functionality is used, you can also use these cards to release the charging station lock.

The group function is a function of the OCPP protocol and is managed and the responsibility of the operator (CPO).

6.8.9 Charging point reserved

If the charging station is connected to a backend, the individual charging points can be reserved for specific users. As soon as a reservation is pending, this charging point is no longer available. The reservation expires as soon as the expiry time has been exceeded or the corresponding user has authorised himself at this charging point.

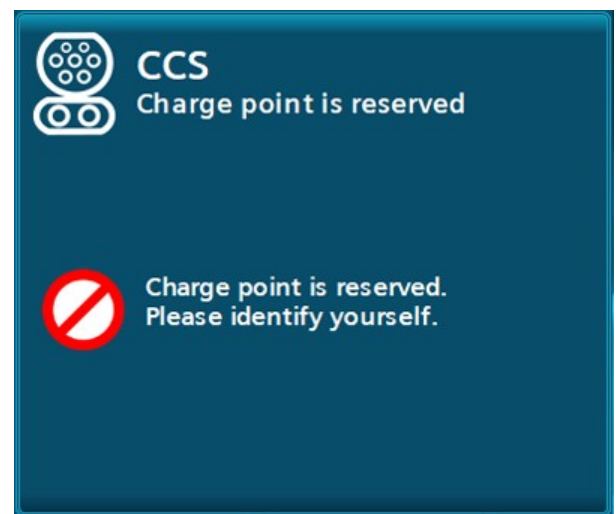


Fig. 19: Charging point reservation using the DC charging outlet "CCS" as an example

6.8.10 Charging point not available

The availability can be determined by the backend depending on the configuration. If the charging station is not connected to a backend, the charging points are always available in an error-free state.



Fig. 20: Charging point not available using the "CCS" DC charging outlet as an example

6.8.11 Error

If an error occurs at this charging point, the "Not available" view is displayed with error information. Each error is pending for at least 10 seconds. An error is only automatically reset if an existing connection with the vehicle is disconnected. If the error could be acknowledged automatically, this charging point can be used again. After acknowledgement, it automatically changes to its ready-to-operate state "plug in charging cable".



Fig 21: Charging point not available with error code

6.8.12 Help display for the user

Short help texts are available in the main menu to explain how to operate the unit. You can call up the displays by pressing the "Help" button. Press the "Back" button in the menu bar to close the displays. You are returned to the previously opened page. Navigation (scrolling) is made possible by the touch functionality of the display.



Fig 22: Example of help

6.8.13 Changing the display language

Pressing the button to change the display language opens a pop-up for display language selection.



All available display languages are shown in the selection field with the respective language abbreviation, ISO designation and with language abbreviations (endonyms) to distinguish the local designations endonym.

You can select the desired display language.

After selection, the back button takes you back to the previous display. The display language is changed to the language now selected. The display language can be changed from any view.

7 Service area

7.1 Service menu

The access button to enter the service area can be found on the menu bar of the main view, the dedicated error pages (e.g. EMERGENCY STOP Active) or the start screen.



Selecting the access button opens a login dialogue window in which you must enter your login information in order to access the service area. The user name is not case-sensitive. The time display (in the user screen below) is only shown after a restart after the first successful synchronisation.

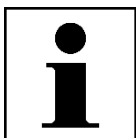
You are currently offered two display languages in the service area. They are set automatically when you enter the service area. If the display language in the user area is set to German, German is selected as the service language. If another language is selected, English is selected as the service language.

By pressing the button to change the display language, you can select the desired display language.

When exiting the service menus, the display language set before entering the service menu is automatically set.



Fig 23: Prompt to enter new password/user name



NOTE

Access Service Menu

The default user name and the default password are provided to the operator by the manufacturer by default and must be changed by the operator immediately.

For more information, see chapter "User 7.9 (page 36)".

Username:	operator
Password:	Oa2020!

7.1.1 Basic menu

After successful login, the basic menu opens.

The upper 4 buttons lead to deeper menu structures, which are described further in the sub-chapters of the same name.

The "Exit Service Menu" button takes you back to the main view and the current user is automatically logged out. Re-entering the service area requires a new login.

In the service menu "Station configuration" you can make various settings. The possible settings and parameters are described below. Press the Back button to return to the basic menu.

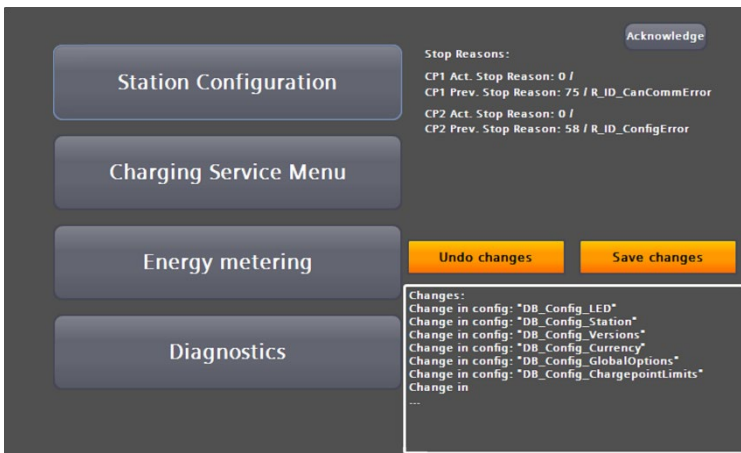


Fig 24: Basic menu



Fig 25: Station configuration

In the service area "Operator settings", set the charging station numbers, the charging station name and the number of charging points. The serial number and the power are displayed, but cannot be changed. You can disable or enable the display of the "Info" button and the alternative login.

You can parameterise the behaviour of the charging station in the "Operator settings" service area. Under Authentication you can set how a user is authorized to load. The following selection options can be set:

- Out of service: Charging is not possible at this station.
- Free operation / free charging: Start by inserting the charging plug. Stop by pressing the stop button on the display.
- Free operation / Free charging with RFID any RFID card readable by the system is accepted.
- Internal whitelist with RFID
- Payment Terminal For more information, see the chapter "Payment Terminal".
- OCPP (depending on configuration) If there is an unintentional disconnection of the APN, the charging station switches internally and automatically to the selection in this mode. After a successful reconnection, the selection is automatically used again. For more information, see the chapter "OCPP".

The screenshot shows the "Operator Settings 1" configuration screen. It includes the following fields and controls:

- Serial-No.:** KOS009200XXXXYY
- Station ID:** 0
- Station Type Name:** (empty)
- Authentication:** Free Mode -> no authentication necessary (dropdown)
- Customer Background:** Inactive (button)
- Storage Card SD\Customer\Background.pdf**
- Max. Infeed Power:** 22 kW
- Screensaver Mode:** Off (dropdown)
- Night Mode:** Normal, like Screensaver Mode (dropdown)
- Customer Screensaver exists:** No
- Internal Screensaver exists:** No
- Idle time before activation:** 300 sec
- Page display duration:** 30 sec
- Number of screensaver pages:** 1 pages
- LEDs heartbeat interval:** 0 sec
- LEDs heartbeat duration:** 0 sec
- Play sound on read RFID Card:** Active (button)
- Page 2** (button)
- Back** (button)

Fig 26: Operator settings 1

The screenshot shows the "Operator Settings 2" configuration screen. It includes the following fields and controls:

- CHAdEMO:** Ignore 'Max Charging Time' for non dynamic control. Inactive (button)
- Operating Schedule:** Inactive (button)
- Function:** (empty)
- Alternative Screensaver exists:** No
- Storage Card SD\Customer\NonOperatingHours.pdf**
- Number of alt. screensaver pages:** 1 pages
- Alternative Screensaver Mode:** Invalid (dropdown)
- Alternative Night Mode:** Normal, like Screensaver Mode (dropdown)
- Idle time before activation:** 300 sec
- Page display duration:** 30 sec
- LEDs heartbeat interval:** 0 sec
- LEDs heartbeat duration:** 0 sec
- Cabinet Fan:** (empty)
- Allow night mode:** Inactive (button)
- RFID - IdTag:** (empty)
- Invert UID-character sequence:** Inactive (button)
- Back** (button)

Fig 27: Operator settings 2

7.1.2 Custom wallpaper and screensaver

When this option is selected, a customized free background image is displayed instead of the standard background image. This image must be in PDF format and located on an SD card in the "Customer" folder. The file name must be "Background.pdf" (i.e.: "/Customer/Background.pdf").

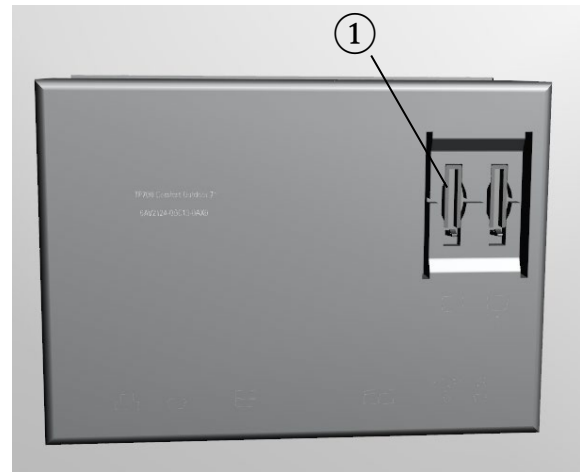


Fig 28: Position of the customer SD card slot ①

The background image and the screen saver must be in PDF format (PDF version 1.7 or higher according to ISO 32000-1: 2008).

Display resolution: 800 x 480 Pixel (Portrait)	Wallpaper: 800 x 480 Pixel	Screen saver: 800 x 480 Pixel
--	--------------------------------------	---

Only one page is expected in the file for the background image. Several pages can be created in the file for the screen saver.

The following naming scheme for file names on the SD card must be observed

Background image: /Customer/Background.pdf
Screensaver: /Customer/Screensaver.pdf

7.1.3 Maximum feed-in power

Set the maximum feed-in power to the real connected load. If you specify a higher power than available, the fuses in the supply branch may blow.

7.1.4 Screensaver mode

You can select the following screensaver modes:

- NO screensaver
- PDF (also multi-page, SD card/Customer/Screensaver.pdf)
- Display illumination off

7.1.5 Night mode

You can select the following night modes:

- Normal (like Screensaver Mode)
- Display illumination off
- Display illumination off, LEDs off

7.1.6 Rest period before display

Here you set the duration until the screensaver is activated.

7.1.7 Page display duration

If you are using a multi-page PDF file, you can define the display duration of a page here.

7.1.8 Number of pages screensaver

If you are using a multi-page PDF file, you must enter the page number of the document here.

7.1.9 Sound when RFID card is read

If you have activated this option, reading an RFID card gives an acoustic feedback.

7.2 OCPP

In this area you can parameterise the OCPP-J 1.6 client on several pages.

Further documentation on the OCPP description can be found on the Internet.

On the basic page, the communication settings are made and all OCPP-related parameters are saved.

To parameterise a back-end connection, proceed as follows:

1. Enter the IP address or the name to be resolved in the "Hostname" field. If necessary, enter a port
2. after a preceding ':'. The final slash is added automatically.
3. Enter the server path under "HTTPString". The final slash is added automatically.
4. Enter the name intended for this charging point under ChargepointID. This is automatically appended to the "HTTPString".
5. Check the displayed composite address, pay attention to upper and lower case.
6. By pressing "Accept connection data", the entered data is accepted and all OCPP parameters are automatically saved.
7. If the authorisation mode in the operator settings is set to OCPP, a connection to the backend is established immediately.

The screenshot shows the OCPP configuration interface. It includes a URL template: `ws://Hostname/HTTPString/Chargepointid`. The Hostname field contains `backend.chargesphere.com/`. The HTTPString field contains `WebSocket/`. The ChargepointID field is empty. There are two radio buttons: OCPP is activated and OCPP Server is connected. A 'Secure Connection' section has a 'No' button. At the bottom, there are 'Apply new connection config' and 'Station data' buttons. A 'Changes' box lists updates to 'DB_OCPP_Connection', 'DB_OCPP_ProfileConfiguration', and 'DB_OCPP_StationInfo'.

Fig 29: OCPP basic settings

By pressing the <Apply new connection data> button, the entered connection data is taken over. I.e. an already active connection would be disconnected. Regardless of the following connection status (connected/not connected), all OCPP parameters are stored fail-safe.

Only OCPP 1.6J is currently supported.

The following OCPP profiles can be used:

- Core
- Local Auth List Management
- Reservation
- Smart Charging
- Remote trigger
- Firmware Management (partial)
- User (backend adjustments)

If changes are made to the parameters on the following pages, this is indicated in the lower third of this screen. You must accept or discard these changes via the corresponding buttons so that they are stored in a fail-safe manner. Some parameters require a restart of the charging station to be activated.

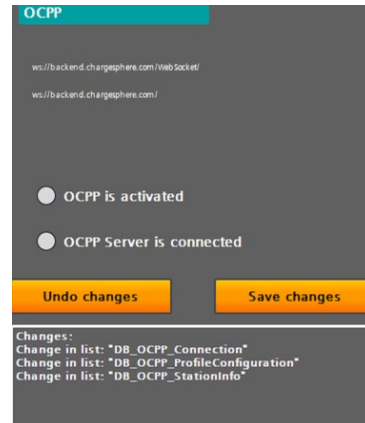


Fig 30: Accepting/rejecting the parameter changes



Fig. 31: OCPP parameters

7.2.1 Local authorization list (whitelist) with RFID card

Charging requires a locally stored RFID card for authorization. The charging process is terminated by presenting the same RFID card in front of the card reader.

The RFID functionality allows you to limit user access to the charging functionality of the charging station. Users identify themselves using an RFID card on the charging station's RFID card reader. When the selected authorization method releases the user, a charging process can be started. In the "RFID Reader" area, you can add RFID cards that have already been read to an internal (local) whitelist or remove them from this list. This is an OCPP-independent list (see Authorization Methods).

You can also delete the entire internal (local) whitelist.

Furthermore, it is possible to use a master list. RFID cards that are assigned to this list can end a charging process at any time. To do this, the corresponding charging point must be selected for display in charging mode.

If a master card is then held in front of the reader, the charge is terminated. This works independently of the authorization method, i.e. also with authorization by the CPO via OCPP. This functionality is intended for petrol station operators, for example, who thus have the option of cancelling charging processes. RFID cards in the master list generally cannot start a charging process.

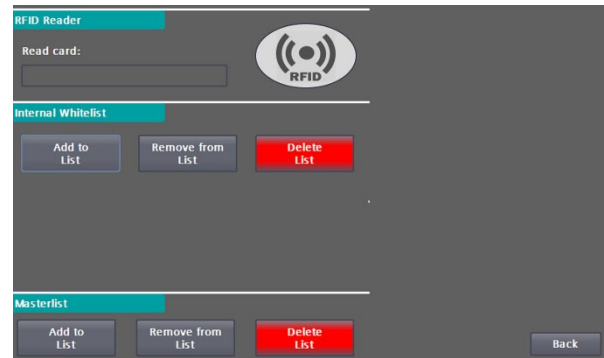


Fig 32: RFID reader menu

In the RFID reader menu, the currently read card is displayed in hexadecimal. If the currently read card is included in the internal (local) whitelist, this output field is highlighted in green with the UID.

If you want to check whether and in which list a certain RFID card is present, then hold this RFID card in front of the RFID card reader. After the RFID card has been read, you will see next to the list heading whether the UID is present in this list. If it is not present in this list, nothing will be displayed.

7.3 Administering the lists

You can administer the whitelist and the master list in the same way as follows.

7.3.1 Procedure for adding RFID cards to a list

1. Select <Add to List>. The button starts flashing. If you want to cancel the function, press this button again. The button then stops flashing.
2. Hold the desired RFID card in front of the RFID card reader.
3. The UID of the read card is displayed in hexadecimal under "Read card". <Add to list> is automatically deselected.
4. If you want to add more cards, repeat this procedure.

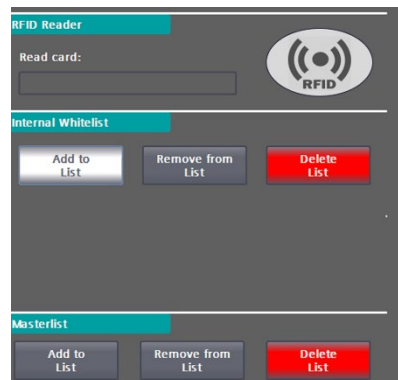


Fig 33: Administering RFID cards via whitelist

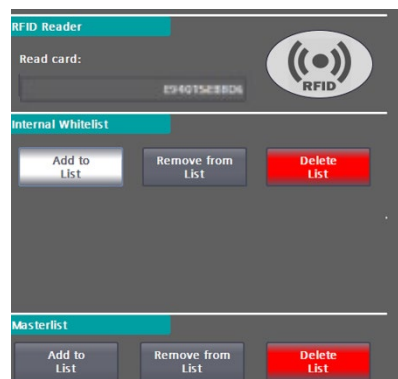


Fig 34: Administering RFID cards via Masterlist

7.3.2 Procedure for deleting an entire list

1. Select <Delete Entire List>.
2. Select <Yes> in the prompt pop-up. If you cancel the function then confirm the query with <No>.
3. If you have confirmed with <Yes>, the entire list is deleted.

7.3.3 Accept or reject changes

If you have made changes to the lists, these are displayed in the lower third of the screen. The changes can be accepted or discarded with the corresponding buttons. If the data is not accepted, it is only valid until the next restart.

7.4 Performance management

In "Power management" you configure the settings required for external power management via Modbus/TCP.

External performance management is independent of CPO performance management via OCPP. It can be done by the operator using a proprietary S/W control without using an OCPP connection to a CPO backend.

As the operator, you can activate and deactivate the function, but not make any further settings. Further intervention in the system may be necessary, e.g. firewall or routing settings.

The power management is used to dynamically control the available power of the entire charging station or the individual charging outlets. This

works independently of other power controls, e.g. Smart Charging via OCPP, and only has a limiting effect, i.e. the respective minimum power is used from all functions for power limitation.

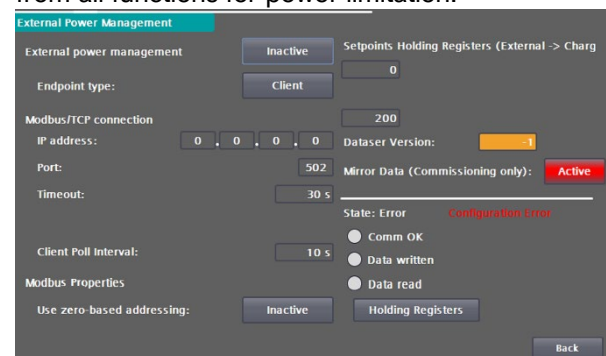


Fig 35: External performance management menu

Active / Inactive

- Inactive: An existing connection is terminated. The function is no longer used. Services are no longer limited via this function.
- Active: A connection is established with the set parameters. Power management is activated.

Endpoint type

- **Server:** The charging station acts as a Modbus/TCP server. Holding registers are used. If query cycles of a client are detected that are too fast, a RESET of the master functionality is carried out. The cycle must be ≥ 1 second. Only one client is accepted at a time. The data may only be retrieved as a whole.
- **Client:** The charging station acts as a Modbus/TCP client. The client uses Modbus functions 03 for reading holding registers and 16 for writing holding registers. The data is always read/written in its entirety. This is the preferred variant, as ideally no further firewall and routing settings need to be made.

Partner IP address

- "Charging station as server": This IP is used if "Accept only defined partner IP" is activated. (Access protection)
- "Charging station as client": This IP specifies the Modbus/TCP server. This must be accessible in the subnet.

Port

- "Charging station as server": Requests are responded to on this port.
- "Charging station as client": Requests are made to this port.

Allowed ports: 502-510

Timeout

- "Charging station as server": If no data traffic is detected within this time, the communication is considered interrupted. A RESET of the server functionality is carried out. If data has been received correctly once, it will continue to be used.
- "Charging station as client": If no request telegrams can be successfully sent for this time, the communication is considered interrupted. A RESET of the client functionality is carried out. If data has been received correctly once, it will continue to be used. The timeout must be greater than the polling interval.

Adjustable values: 3-43200 seconds (12h)

Accept only defined partner IP

If the charging station works as a server, you can activate this function to filter the requests. If this function is activated, only requests from the partner IP are accepted (recommended setting). If the function is deactivated, requests from any IP are accepted.

Client Poll Interval

Use this cycle to initiate write and read requests. The poll interval must be greater than or equal to one second and less than the timeout value.

Adjustable values 1-43199 seconds (1s-12h)

Use zero-based addressing

If the remote station uses zero-based addressing ("address offset"), (register shifted by 1), then this can be activated here. This value may only be set when the connection is deactivated.

Start holder register setpoints (partner -> charging station)

The holding registers for setpoints and actual data must not overlap. This value may only be set when the connection is deactivated.

Allowed values: 0-9873 (9998 - 125)

Start holder register actual data (charging station -> partner)

The holding registers for setpoints and actual data must not overlap. This value may only be set when the connection is deactivated.

Allowed values: 0-9873 (9998 - 125)

Data mirroring (only for commissioning purposes)

To facilitate commissioning, it can be set here that the setpoint holding registers are copied to the actual data registers. The data is not copied to the data structures on the charging station. This value may only be set when the connection is deactivated.

Data structure version

Version number of the data interface. This must always be output to the start holding registers so that the data can be transferred. The currently set version is also output in the start holding register of the actual data.

Specifications for the data structure:

- Only whole words are read and written, i.e. a word must also be defined for a bit.
- The data length of the data structure for setpoints and actual data must be the same.
- A maximum of 125 words may be exchanged.

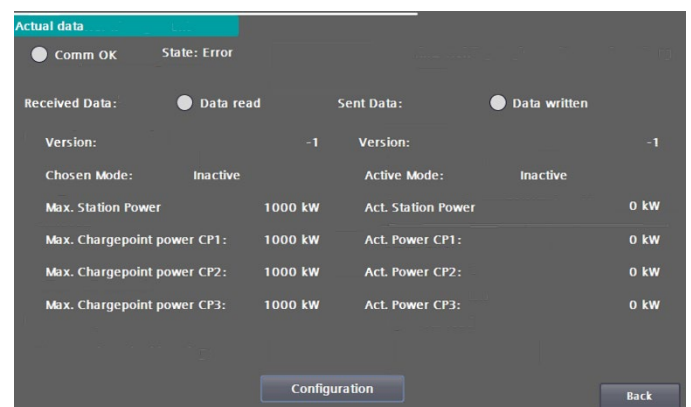


Fig 36: Data structure of external performance management for actual values

The following table shows the individual elements of data set #1 (ID1) as a telegram version.

Charging station	
Int	Telegram version (=ID=1)
Uint	Mode 0=Off, 1=Feed-in limitation, 2=Charge point limitation
Uint	Maximum feed line in kW
Uint	Charging point1 Maximum power in kW
Uint	Charging point2 Maximum power in kW
Uint	Charging point3 Maximum power in kW
Management system	
Int	Telegram version (=ID=1)
Uint	Active mode 0=Off, 1=Feed-in limitation, 2=Charge point limitation
Uint	Act. Feed line in kW
Uint	Charging point 1 current power in kW
Uint	Charging point 2 current power in kW
Uint	Charging point 3 current power in kW

7.5 Operating schedule

You can use the operating schedule to specify operating times for the charging station. These times are treated with the highest priority, i.e. these times also apply when OCPP is activated and any backend commands are thus ignored or rejected.

If a time threshold is exceeded during a charging process, the charging process is terminated with the reason code "R_ID_StoppedByOperationSchedule". The status of the charging pole is set to "Not Available". A charging process is only possible again when the operating schedule releases the charging pole again.

The operating schedule has no influence on the

power provided by other functions (e.g. OCPP SmartCharging or external energy management). All time information in the mask refers to the set local time.

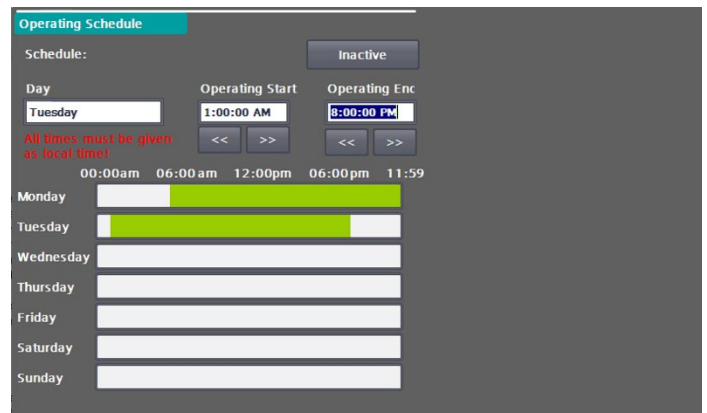


Fig 37: Operating schedule

You can only edit the operating schedule if it has been deactivated beforehand. To edit, select the day and either enter the start and end time in the input fields or change the values using the arrow keys (in 15-minute steps). The seconds are generally ignored by the software and set to 0 for the start of operation and 59 seconds for the end of operation. If the start time is after the end time, the release is inverted. In this way, operation can be enabled at night and disabled during the day, for example.

Public holidays (exceptions):

Via the public holiday entry, you can determine how a specified public holiday (or exception day) is to be handled (also a complete release or blocking of the ward).

In the public holiday table you can now enter the public holidays or exception days that are to be

handled separately. Public holidays in the future or still active public holidays are shown in green and days already in the past are shown in grey. You can delete the respective day via the <X> button. With activation, the editing process is completed and the operating times are set.

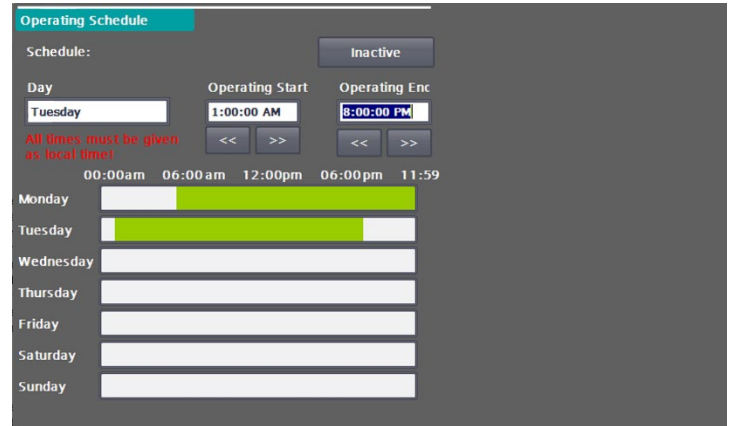


Fig 38: Operating schedule

7.6 Calibrate

This page is used to calibrate the touch functionality of the screen. This is usually required in the field after a display replacement. Follow the instructions on the display.

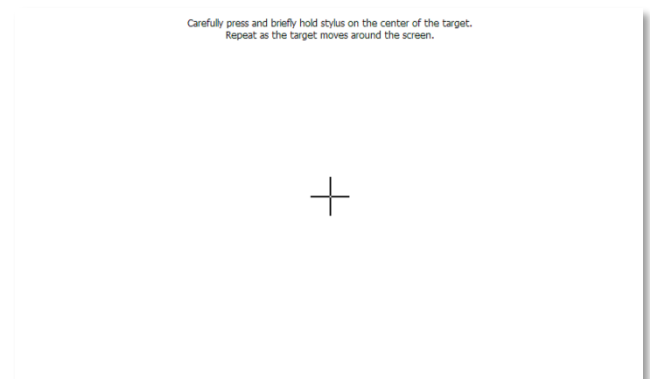


Fig 39: Calibration screen for the touch screen of the HMI

7.7 Cleaning picture

If you have activated the cleaning screen, you can clean the surface of the screen during the set time without making any unwanted adjustments. The progress bar shows you the time period still available for cleaning the screen. After the time period has elapsed, the menu is displayed again.



Fig 40: Plaster picture

7.8 System restart

You can use the "System restart" command to perform a system restart of the charging station (Power-on-RESET). All charging processes in progress are terminated.

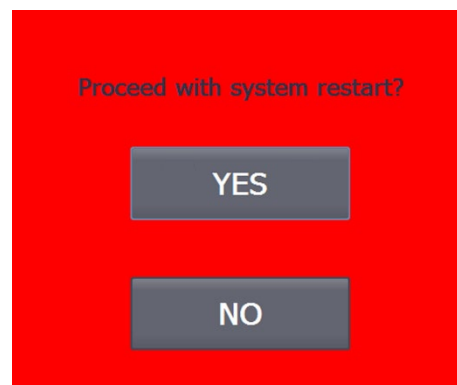


Fig 41: System restart prompt

7.9 User

In the user administration you can change the user name, password and the automatic logout time.

Condition for valid passwords:

- 6-24 characters
- Contains at least one digit
- Contains at least one special character

The default user name and the default password are provided to the charging infrastructure operator by the manufacturer by default and can be changed by the operator.

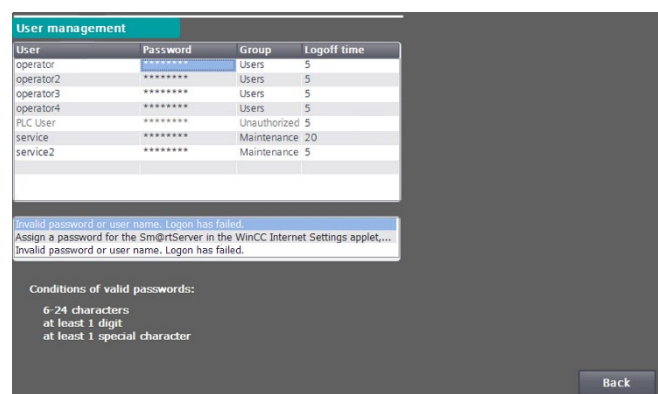


Fig 42: User administration

The operator is responsible for the safekeeping of the login information. If you forget your password before logging in for the first time, the manufacturer can send you this password again by e-mail. However, if you forget your changed password after logging in for the first time, please contact Kostad Support.

7.10 Time setting

In the configuration: "Time setting" enter the position and time zones of the charging station. The time is generally synchronised via NTP. The connection via the maintenance router is used for this. By default, the NTP server is reached at the address or reserve address as shown in the figure "Parameterisation of the Siemens NTP server in the Scalance router". The time display is shown after a restart only after the first successful synchronisation.

If you want to record the time zone via the position, you can enter the latitude and longitude. By pressing "Retrieve time settings", this coordination is used to determine the correct time zone on the Internet. If coordination is set here, the time zone settings are queried again at every restart, checked and possibly adjusted.

The changeable offset for day/night switching is used as follows:

- Day mode = local time > sunrise - offset
- Night mode = local time > sunset + offset

You can adjust the time zone settings in the corresponding fields. Press "Apply time zone settings" to apply the time zone settings. After a change, check the times in the "Act. Values

7.11 Stop causes

In the "Stop causes" menu, you can view the triggering and pending faults of the individual charging points or the charging station itself (charging point 0). You can navigate through the charging points using the arrow keys in the upper area.

The cause that triggered the error or was detected first is always at the top (orange). This error variable is also displayed in the basic menu of the service area. The name of the error variable is also displayed as plain text on the error screen at user level.

In addition to the text for the stop cause, you can also read the time stamp of the first occurrence, the error code as a number and an occurrence counter (cycle). If the occurrence counter no longer moves, this error is no longer pending. However, it will be displayed as the first (triggering) error until all errors have been acknowledged.

This behaviour is intended to enable you to carry out detailed troubleshooting, as triggering errors often generate many other subsequent errors.

Timestamp	Error Code	Occurrence Counter	Error Variable Name
21.06.2019 08:44:47	34	19256	R_ID_OvervoltageProtection
21.06.2019 08:44:47	36	19256	R_ID_SupplyVoltage
21.06.2019 08:44:47	17	19256	R_ID_ESTOP_Other
21.06.2019 08:44:47	38	19256	R_ID_CircuitBreakerTrafo
21.06.2019 08:44:47	40	46899	R_ID_ECC_CommError
21.06.2019 08:44:47	57	17986	R_ID_PLC_HWError
21.06.2019 08:44:47	2	17986	R_ID_IMD_ErrorNotDuringCharge
21.06.2019 08:44:47	4	17986	R_ID_IMD_WarningNotDuringCharge
21.06.2019 08:45:33	28	50676	R_ID_PanelCommsLost

Fig 43: Charging station stop causes - all errors

21.06.2019 08:44:47	34	19256	R_ID_OvervoltageProtection
21.06.2019 08:44:47	36	19256	R_ID_SupplyVoltage

Fig 44: Charging station stop causes - first value error

7.12 Charger Service Menu

In this menu, you can obtain information about ongoing charging processes. By pressing the respective charging point button, you can access a diagnostic view.

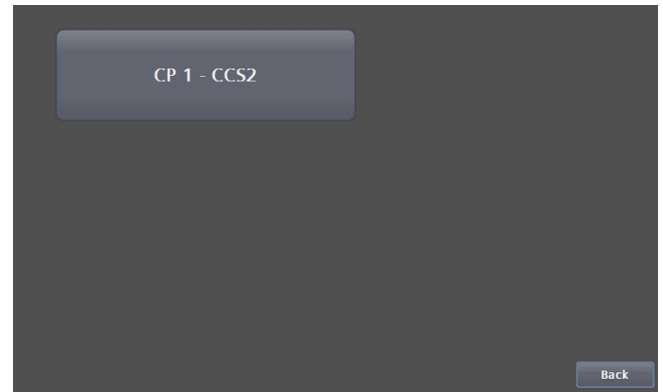


Fig 45: Selection of charging points for diagnosis

In the "Charging CCS/CHAdeMO" menu, the current parameters of the charging process are displayed.

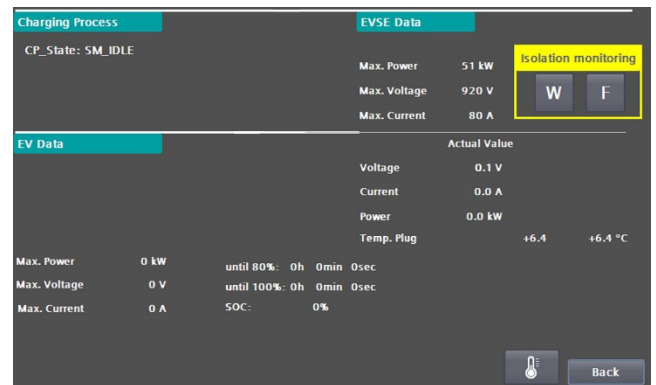


Fig 46: Charging CCS/CHAdeMO

7.13 Energy metering

The "Energy measurement" menu shows you the current power and the amount of energy transferred per charging point and in total since the charging station was commissioned.

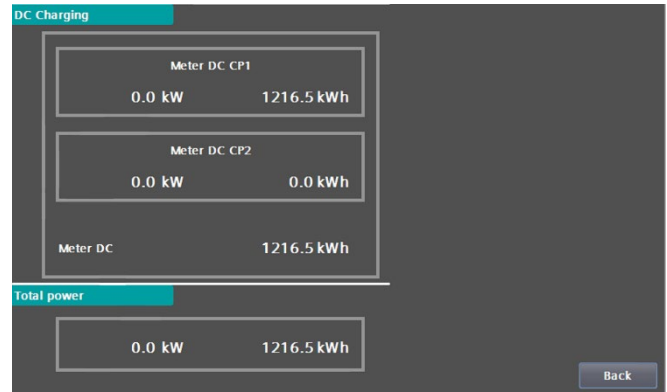


Fig 47: Energy measurement menu

7.14 Diagnosis

The service area Service area "Messages" shows system and hardware-related messages. Pending errors and warnings are listed in the upper area, old messages from a buffer in the lower area.

If a customer SD card is inserted, you can open a message archive on the SD card via the <Archive> button. This archive is also available after a restart or after a software update of the display. This is a circulation archive that is saved in csv format.

The message archive is primarily intended for support assistance by the manufacturer. Press the <Back> button to return to the basic menu.

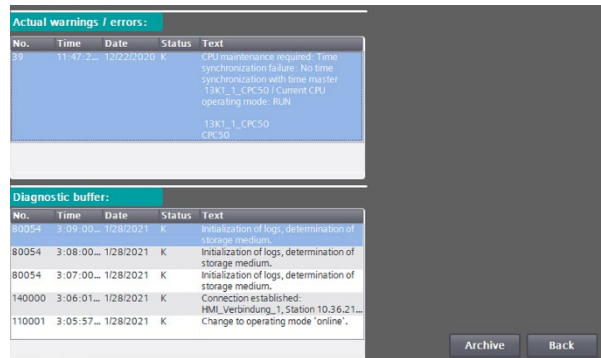


Fig 48: Display of the diagnostic data

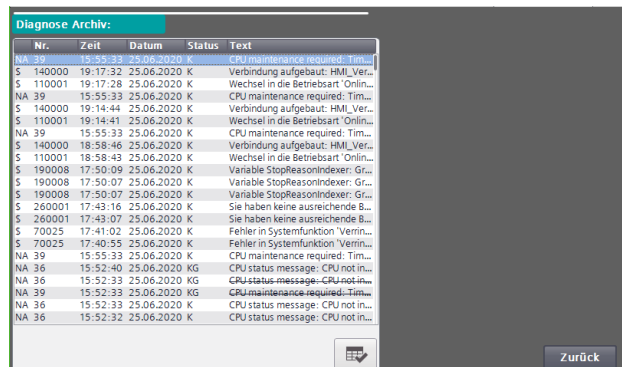


Fig 49: Display of the message archive data

8 Maintenance guide

8.1 Cleaning the Mobile DC-Charger

The Mobile DC-Charger must be kept in good condition. Clean the charging station three times a year as follows:

1. Remove dirt with a soft damp plastic fleece cloth.
2. Optionally, you can treat the front with a stainless steel cleaner for extra protection and shine.

**ATTENTION***Normal cleaning*

Keep the air inlets clean and ensure that they are free of snow and leaves or other materials.

**ATTENTION***Rust formation*

If the charging station is installed in an environment that is sensitive to corrosion, the formation of superficial rust at the welding points is possible. This rust is only visual, there is no risk of the control cabinet rusting through.

**CAUTION**

Do not use high-pressure water jets. Water can get into the control cabinet. If a high-pressure water jet has been used, make sure that the inside of the control cabinet is dry.

Do not use cleaning agents with abrasive ingredients.
Do not use abrasive tools.

8.2 Filter exchange

8.2.1 Inlet filter

Turn the Mobile Charger over on its back and place a solid, raised object between the Charger and the floor. Using a slotted screwdriver, open the cover of the inlet filter, which is located on the underside of the Mobile DC-Charger.

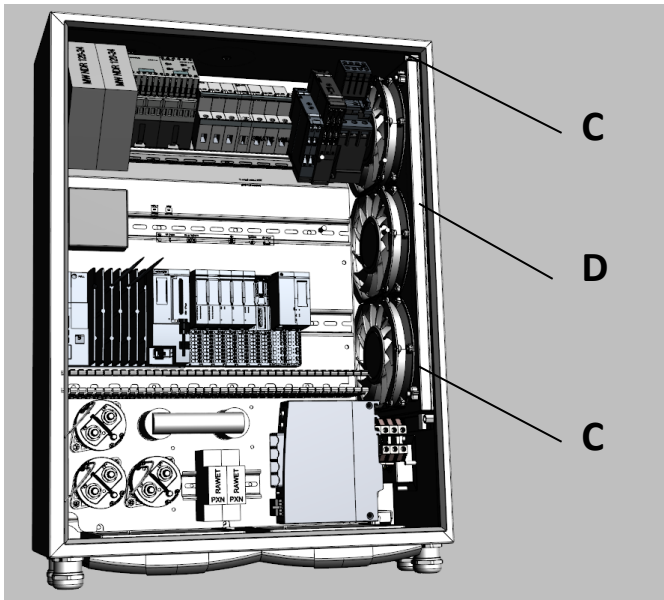


Fig 50: Exit filter

- A. Inlet filter
- B. Filter mat

8.2.2 Exit filter

Open the door of the Mobile Charger. After opening, the filter cassette is located in the outer right area (see illustration). Open it using the two quick-release screws. Then pull the cassette out of the lock, change the filter, reinsert it and close the quick-release screws again.



C. Quick release screws

D. Filter cassette

Fig 51: Interior view

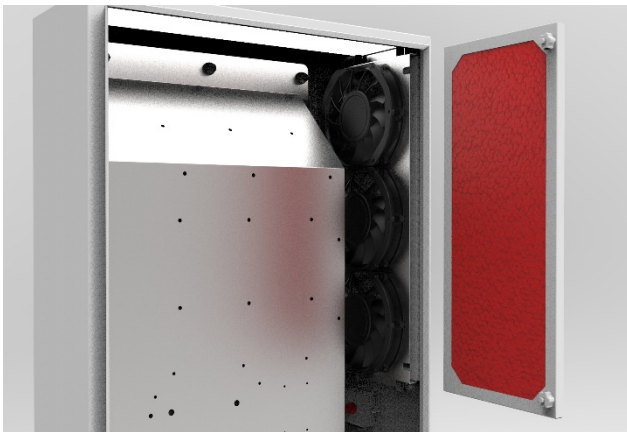


Fig 52: Interior view 1

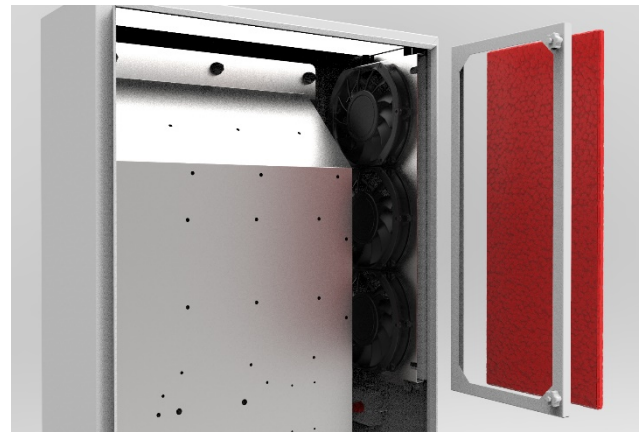


Fig 53: Interior view 2

8.3 Maintenance of the charging station

The following points must be checked regularly:

An inspection is recommended during the annual maintenance visit.

- Cables and plugs**

 - Check that there are no cracks or breaks in the plug or cable and that no inner wires of the cable are visible.
- Display screen**

 - Check if there is any damage or cracks.
- Filter mats**

 - Check the degree of contamination of the inlet and outlet filter mats, clean them, replace them if necessary.

8.4 Special maintenance:

In the following cases, the charging station must be checked by a Kostad service technician before further use:

- If this was struck by lightning.
- If it has been damaged by an accident or fire.
- If the charging station location was flooded.
- Do not switch on the charging station until it has been checked and approved.

8.5 Problem solving

The site operator or Kostad Support is the first point of contact for a customer. Kostad Support can solve simple problems for the customer remotely.

In special cases, the site operator, if they have knowledge of the charging station, may be asked by Kostad Support to report on the status of some internal components of the Mobile DC-Charger. Therefore, a brief description of the location and function of these components is given on the next pages.

8.6 Component view with control cabinet door open

The main components that can be seen when the control cabinet door is open are listed below:

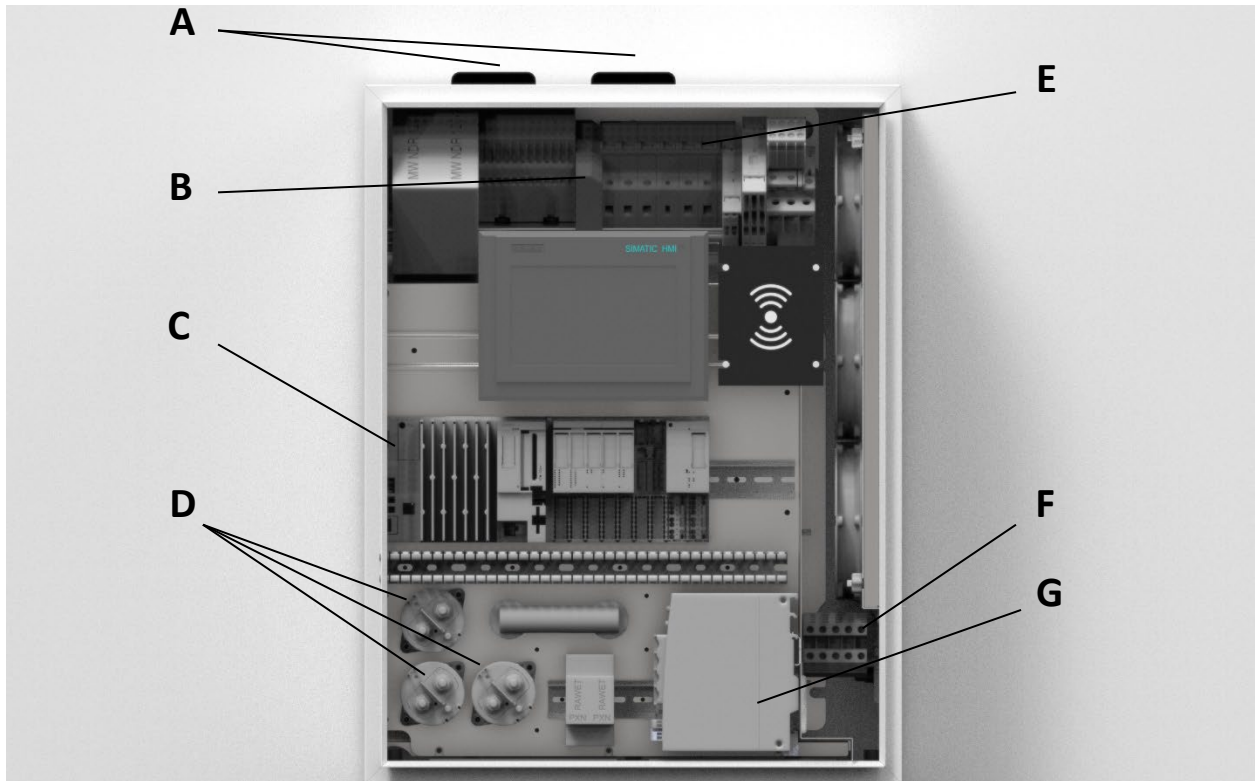


Fig 54: View of the front components

- A. LTE antennas
- B. Modem (Backend / CPO)
- C. Control unit
- D. DC contactor
- E. Ground fault circuit interrupter
- F. Mains connection
- G. Modem (remote maintenance)

9 Technical data

9.1.1 Electrical data

Entrance	
Supply voltage	3 phases, 400 V AC: PE, L1, L2, L3
Input voltage range	400 V AC +10%, -15%(50 Hz)
Maximum rated input current & power	33A, 22kVA
Power factor	0,99
Efficiency	96% at nominal output power max. 95.5%
DC output (C)	
Maximum output power	22 kW
Output voltage range	150 - 1000V DC (CCS 2)
Maximum output current	80 A DC (CCS 2)

General	
DC connection Standard	EN 61851-23 / DIN 70121 / IEC 62196 Mode 4 ISO 15118 in preparation
Cable length DC	4.0 metres +/- 10%
Plug type	CCS 2
RFID data	
RFID system	ISO/IEC 14443A/B ISO/IEC 18092
Network connection	GSM / GPRS / UMTS (3G modem) / LTE 4G / Ethernet 10/100Base

9.1.2 Mechanical data

Dimension (H x W x D)	650 mm x 500 mm x 230 mm
Weight	62 kg
Dimension incl. packaging (H X W x D)	650 mm x 1200 mm x 800 mm
Weight incl. packaging	65 kg
Mechanical impact protection	IK10 / Display IK 8

9.1.3 Environmental data

Protection class	IP54
Temperature range operation	-30°C to + 50°C
Temperature range - Storage	-40 °C to +70 °C
Humidity	5% - 95% RH - (without condensation)
Operating noise level	55 dBA at 25°C
Height	2000 m max.

9.1.4 Certifications

General	CE certification
Security	IEC 61851-1, IEC 61439-2
EMC	EN 61000-6-2, EN 61000-6-3

10 Contact information

Please contact Kostad or your service partner directly for a problem analysis and its solution.

10.1 Manufacturer



Kostad Steuerungsbau GmbH
Parkallee 20
A-2483 Ebreichsdorf
Austria

office@kostad.at

10.2 Support

Mail: support@kostad.at
Web: support.kostad.at