

Charging and Energy Management

User Manual

Version 3.13



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1 Introduction

1.1 About This User Manual



Note: This product is a Charging Station Management System and is abbreviated as CSMS in the following chapters.

Conventions

The two tables below show the notation and icon conventions used throughout this manual.

Style	Utilization
bold	Fields/blocks, user/surface interface elements, window- and dialog names of the software, special emphasis of terms [OK] Push buttons in square brackets File Save Notation for menus and menu entries
<u>Hyperlink</u>	Hyperlinks and references

Symbol	Utilization
	This icon indicates notes and tips that facilitate your work.
	This icon warns of dangers that could lead to damage.
	This icon indicates more detailed information.
	This icon indicates examples.
	This icon indicates step-by-step instructions.
	This icon indicates multimedia files like e.g. video clips.
	This icon indicates an introduction to a specific topic.
	This icon indicates text areas containing basic knowledge.
	This icon indicates text areas containing expert knowledge.

1.1.1 Warranty

Restriction of warranty

We reserve the right to modify the contents of the documentation or the software without notice. We disclaim all liabilities for the completeness or correctness of the contents and for damages which may result from the use of this documentation.

1.1.2 Trademarks

Protected trademarks

All brand names in this documentation are either registered or non-registered trademarks of their respective owners.

1.2 Important Notes

1.2.1 Safety Instructions



Caution: In order to avoid personal injuries and damage to property, you must read and understand the following safety instructions and hazard warnings prior to installation and use of this product. Provide this documentation (manual) to every user of this product.

1.2.1.1 Proper Use and Intended Purpose



Caution: This product is a Charging Station Management System which is mainly used to monitor and control charging sessions of electrical vehicles.

This product may only be operated according to the instructions and descriptions of this manual.

This product is exclusively designed for use by skilled personnel as its operation may result in serious personal injuries and damage to property. Therefore, only those persons may operate this product who (i) have understood the possible effects of the actions which may be caused by this product; (ii) are specifically trained in the handling of this product, charging stations and the system intended to be influenced; and (iii) have sufficient experience in using this product safely.

1.2.1.2 Hazards



Caution: This product provides functionality to control the start and stop of charging sessions and their power consumption. Wrong configuration of this product can lead to an increased power consumption, which could result in an overload of the transformer station and/or higher electricity costs.

1.2.1.3 Disclaimer



Caution: Claims based on defects and liability claims against the provider of this product are excluded to the extent damages or errors caused by improper use of this product or use not according to its intended purpose. The same applies to damages or errors arising from insufficient training or lack of experience of personnel using this product.

It is not the responsibility of this product or the product provider to monitor safety critical parameters (e.g. over-current) of the transformer station, the charging infrastructure (e.g. cables), the charging stations and of the vehicle and its battery.

1.2.2 Prerequisites

In order to use the Charging Station Management System (CSMS) as intended, the following services/materials must be provided by the customer:

- > The CSMS provides functions to manage charging stations. The charging infrastructure (charging stations, electrical infrastructure and IT systems) is not part of the CSMS and must be provided by the customer. The charging station must support OCPP (see chapter 3) and must be able to connect to the CSMS by an appropriate IT infrastructure.
- > The charging stations must be configured by the customer to establish an OCPP communication with the CSMS. Since the configuration process depends on the used charging station model, additional support by the charging station manufacturer might be necessary.
- > For On-Premise customers: The CSMS is a software product. Server hardware which fulfills the minimum requirements stated in chapter 12.3 Setup must be provided and operated by the customer. The customer is responsible for a reliable environment, monitoring and data backups.
- > For Software-as-a-Service (SaaS) customers: The CSMS is offered as an internet service. The connection between the charging stations and the internet must be provided by the customer. The connection should be reliable to ensure a stable operation.

1.2.3 General Data Protection Regulation

Cookies

When visiting the CSMS user front end, information may be retrieved or stored, mostly in the form of cookies. This might include information about the user, his preferences or the device and is mostly used for improvements of the website. The information usually does not directly identify the user, but it can provide a more personalized web experience. Blocking some types of cookies may impact your user experience of the site and the services offered.



Note: Every user of the CSMS front end must be informed about the usage of cookies. The user accepts the usage of cookies by opening the CSMS front end.

1.2.4 Data Storage

The CSMS uses a database to store different kinds of data:

- > User Accounts
 - > Username and password of individual users (email address is used as username)
 - > Permissions of users
 - > Last login date and time
 - > License options of customer
- > Relevant data received via OCPP from the charging stations, for example:
 - > Status information of charging points, e.g. which connectors are in use
 - > Provisioning data, e.g. configuration parameters of charging stations
 - > Metering information, e.g. consumed energy
 - > Authorization requests from customers/vehicles
- > Data entered via the user front end, for example:
 - > Configuration of charging stations and vehicles
 - > Certificates
 - > Firmware files for charging stations
- > Data exchanged via APIs (REST, VDV261, VDV463, OCPI, ...), for example:
 - > Fleet management information, e.g. departure time of vehicles
 - > Preconditioning information
 - > Clearing information

Backup

The data is stored for different time periods depending on the data and corresponding use-case. Data backups are created by the operator of the CSMS infrastructure.

Users can use the provided reports to export the most important statistics. An export of the entire database is not provided.

On-Premise customers are responsible to create backups of the database for themselves.

1.2.5 Open-Source Licenses

Open-Source Licenses

The CSMS includes several open source software tools. This open source software is governed by the terms and conditions of the applicable open source license. You are bound to the terms and conditions of the applicable open source license in connection with your use and distribution of the open source software in this product.

A complete list of open source software modules and their respective licenses can be found in the user frontend via Settings|About and the button [Third Party Licenses].

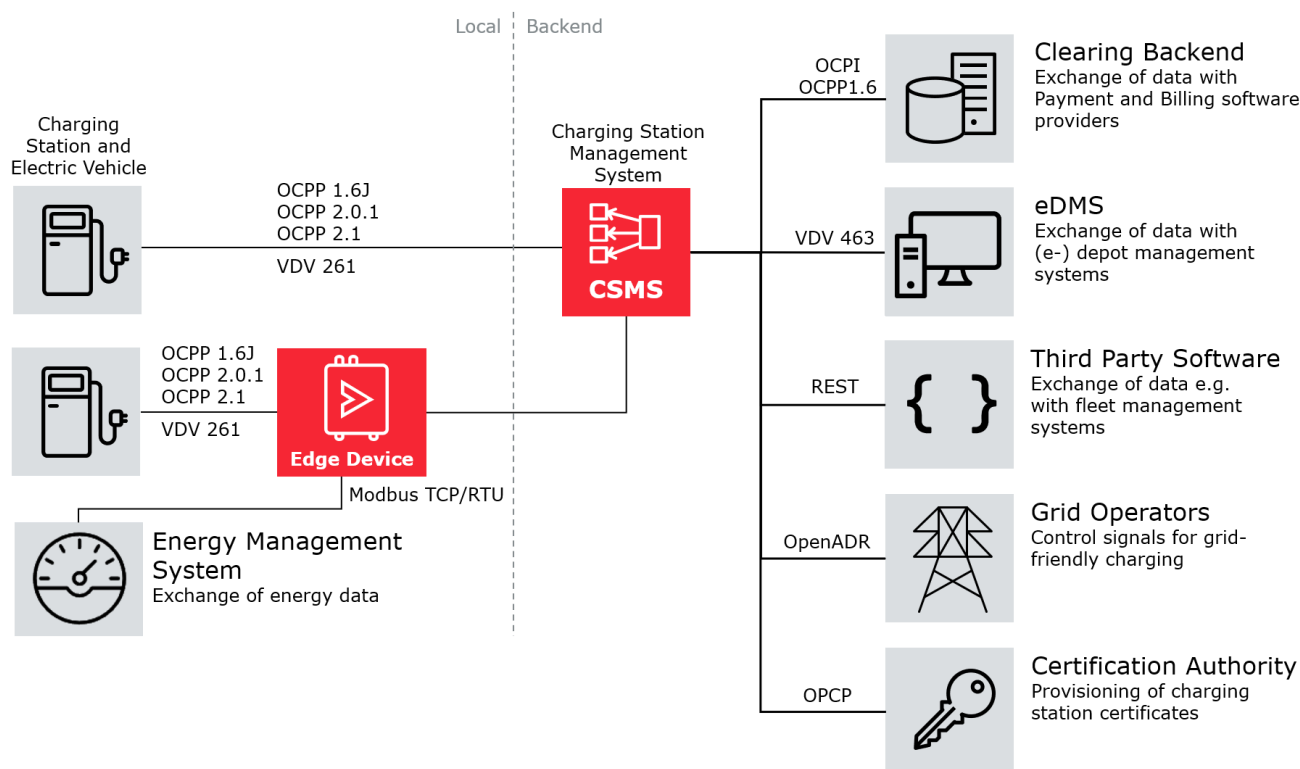
On request, a SBOM file can be provided.

Written offer for GPL/LGPL source code

Upon request, we will provide the applicable GPL source code files via a link for a nominal cost to cover provisioning as allowed under the GPL. This offer is valid for 3 years.

1.3 Overview

1.3.1 Architecture



Architecture with Edge-Device

The OCPP connection of the charging station can be made either directly with the backend or with an [edge-device](#). The following advantages result from a connection with an edge-device:

- > By integrating a smart meter or an energy management system, dynamic load management can be used. This means that the building connection can be utilized even more efficiently. This means that more power is available for the charging infrastructure without incurring a higher risk of overload.
- > Load management - static or dynamic - reacts promptly and reliably, without the connection quality to the CSMS playing a role.
- > Charging sessions can be authorized, started and stopped independently of the CSMS connection. If the CSMS connection is disrupted, e.g., due to a poor Internet connection, the charging infrastructure continues to be available with all functions.

1.3.1.1 External Interfaces

Protocol	Description	Security (SaaS)	Chapter
OCPP (Websocket)	Communication interface to charging station(s)	Websocket connection encryption is mandatory.	2.8.6
	URL (SaaS) ¹ : > wss://ws.vcharm.vector.com/ocpp/<tenant-id> > Port 443 > TLS/SSL must be activated in charging station		
HTTP	Access to webserver which provides the graphical user interface	TLS (HTTPS) encryption is mandatory.	2
	URL (SaaS) ¹ : https://vcharm.vector.com		
REST API	HTTP REST interface to connect with other external applications, e.g. Fleet Management Systems	TLS (HTTPS) encryption is mandatory.	8.2.4
	URL (SaaS) ¹ : <a href="https://api.vcharm.vector.com/csmsapi/<tenant-id>">https://api.vcharm.vector.com/csmsapi/<tenant-id>		
VAS	Value-Added-Service communication with vehicle	TLS (HTTPS) encryption is mandatory.	8
	URL (SaaS) ¹ : <a href="https://api.vcharm.vector.com/csmsapi/<tenant-id>/vehicle/vas/preconditioning/message">https://api.vcharm.vector.com/csmsapi/<tenant-id>/vehicle/vas/preconditioning/message		

The placeholder <tenant-id> is provided during the setup process.

1.3.1.2 TLS Encryption

Root Certificate

In principle, TLS encryption is required for every connection with CSMS. If the required root certificate is not installed on the end device (charging station, desktop computer, mobile end device), it will not be possible to establish a connection. The following certificate must be installed in the device's trust store: <https://letsencrypt.org/certs/isrgrootx1.pem>

For on-premise installations, the IT administrator is responsible for activating TLS and installing the correct certificates.

¹ For On-Premise customers, the URL differs and must be provided by the customer's IT department.

1.3.2 Features

Charging Station Administration and Control

Add, configure and monitor your charging stations via OCCP 1.6, 2.0.1 and 2.1. Change the availability, restart the charging stations and update their firmware.

Charging points can be configured, monitored and controlled via the user interface. Guided dialogs support the operator in his various tasks. In case of problems with a charging session, the operator is notified and supported in failure diagnosis. Communication with the charging station is via the manufacturer independent OCPP protocol.

Notifications

React fast with notifications on events and failures.

Notifications about events occurring in the charging infrastructure, that can disrupt the operation are classified by severity level and provided in the front end, via E-Mail and Push Notifications.

Vehicle Authorization

Manage and verify vehicle authorization requests.

Various methods are available for the authorization of charging sessions. The CSMS supports established technologies such as RFID chips, Plug&Charge and Autocharge.

Reporting

Evaluate the usage of your charging infrastructure with comprehensive reports.

Reports with statistics on completed charging operations can be created for various purposes. Predefined reports can be customized, exported and analyzed if desired.

Events

Analyze the behaviour of the charging station.

All information exchanged with the charging stations is listed. Both the original OCPP message and an event history showing all important information are displayed.

Browser User Interface

Keep track of your charging infrastructure via web browser.

Use the CSMS from a browser-based interface with a modern and intuitive user experience. It allows the user access to all functions. An HTTPS connection secures the access.

Role Management

Different rights can be granted to specific user groups.

It is possible to restrict the access to certain functionalities via user accounts and role permissions. Customized views depending on the user role are available.

Sub-Clients

Manage multiple customer instances that share an electrical connection.

Independent customers can be created in one instance, whose configuration and data are stored separately. Load management nevertheless takes all customer charging points into account and finds the optimum power distribution. Users only see content in the web interface that has been granted to them.

Change History	Keep track of configuration changes. Configuration changes are logged and can be tracked retrospectively.
Mobile App	Stay informed anywhere thanks to our mobile app and push notifications. iOS and Web App that contains the most important features for charge point operators.
Load Management	Manage the maximum load statically or dynamically and benefit from a variety of charging strategies. Load management is required at the latest when the total power of the charging stations exceeds the available installed power. However, costs can also be saved beforehand by avoiding peak loads at individual charging stations. Therefore, the available power is divided between all active charging stations depending on their power limits.
Clearing Interface	Log billing-relevant data from charging sessions in a lawful manner (CDR) and exchange it with payment systems via OCPP or OCPI. Meter readings are centrally recorded and processed. The data is made available for billing transactions. The meter readings can be protected against manipulation by a digital signature in order to meet the requirements of the new calibration law. The Charge Data Records (CDR) can be exported via several interfaces. For the integration with external payment and billing providers, the standardized OCPP and OCPI protocol is supported.
Certificates / Plug and Charge	Manage certificates for security features. Authorize vehicles without driver interaction based on digital certificates. Certificates can be installed and managed on charging stations. They are used for several security features, for example Plug and Charge. Certificates can optionally be automatically generated and provided by a certification authority.
Data Interface	Automate the data exchange e.g. for important planning data with other management systems. Existing fleet and depot management systems can be integrated via an automated data interface and used for optimized load management or pre-conditioning control. Fleet and depot management systems can use the CSMS data for their own purposes, e.g. for availability display. Further tools can also be integrated, such as a maintenance ticket system. For the integration of electric bus Depot Management Systems (eDMS) or Intermodal Transport Control Systems (ITCS), the VDV 463 interface is supported. This bi-directional communication allows the exchange of status information and planning data.

**Vehicle
Preconditioning****Monitor and control the vehicle preconditioning via VDV 261.**

The control of the preconditioning of electric buses was standardized by the Verband Deutscher Verkehrsunternehmen (VDV) as a Value-Added-Service. The CSMS supports the VDV 261 specification.

Charging Schedule**Optimized load management based on charging schedules.**

Charging schedules can be imported into the CSMS to ensure that vehicles are fully charged on time for departure. The data can either be received via the VDV463 interface or imported via an Excel file.

Single-Sign-On**Login via Single Sign-On (SSO)**

Users can use their company organization account to log in to the CSMS. This saves users having to enter a password and makes it easier for organization administrators to manage access to the CSMS.

Optionally, multi-factor authentication (MFA) can also be activated in the company's identity provider.

**Grid-friendly
Charging****Controllability by Grid Operators**

Controllability by grid operators can be implemented via the OpenADR interface and the interface for external power limits. This may be mandatory by the grid operators in the case of large charging park installations and is even rewarded financially in some cases.

Stationary Batteries**Control of Stationary Batteries**

To avoid peak loads and to save energy costs, stationary battery storage systems can be integrated and controlled. The CSMS creates a plan for charging and discharging the storage systems and optimizes it depending on the charging infrastructure.

**Telematics
Integration****Integration of Telematics Services**

Vehicle data can be retrieved via an interface with telematics service providers. This data is available even when the vehicle is currently in transit and not plugged into a charging station. Additionally, other data is available that is not included in other CSMS interfaces, such as OCPP.

2 Web Browser User Interface

2.1 General

General

The user interface is a browser-based application. The CSMS can be run with the following web browsers:

- > Google Chrome
- > Mozilla Firefox
- > Microsoft Edge

The current CSMS version has been tested with the following browser versions:

- > Google Chrome v152 64-bit
- > Mozilla Firefox v153 64-bit
- > Microsoft Edge v152 64-bit

Full functionality is guaranteed with these versions.

Navigate to <https://vcharm.vector.com> to open the user front end. For On-Premise installations, the responsible IT department must provide the URL of the server where the CSMS is running.

Language Selection

On of the following languages can be selected for the user interface:

- > English
- > German
- > French

Login

The login credentials are provided via email. The email contains a temporary password, which is valid for 60 days and must be changed after the first login. In case the user forgot the password, a new password can be requested with a click on "Forgot Password?".

After a successful login, the password can be changed in the settings section.

Password Entry for Single Sign-On

If the email address belongs to an organization that uses the Single Sign-On procedure, no password is entered in the CSMS. Instead, the user is redirected to a page of the organization to enter the password. After successfully entering the password (possibly with multi-factor authorization), the CSMS is opened.

Therefore, the initial invitation email does not contain a temporary password and the password cannot be changed via the CSMS.



Username*
department@company.com

Next

Privacy Policy Language



Username*
department@company.com

Password*

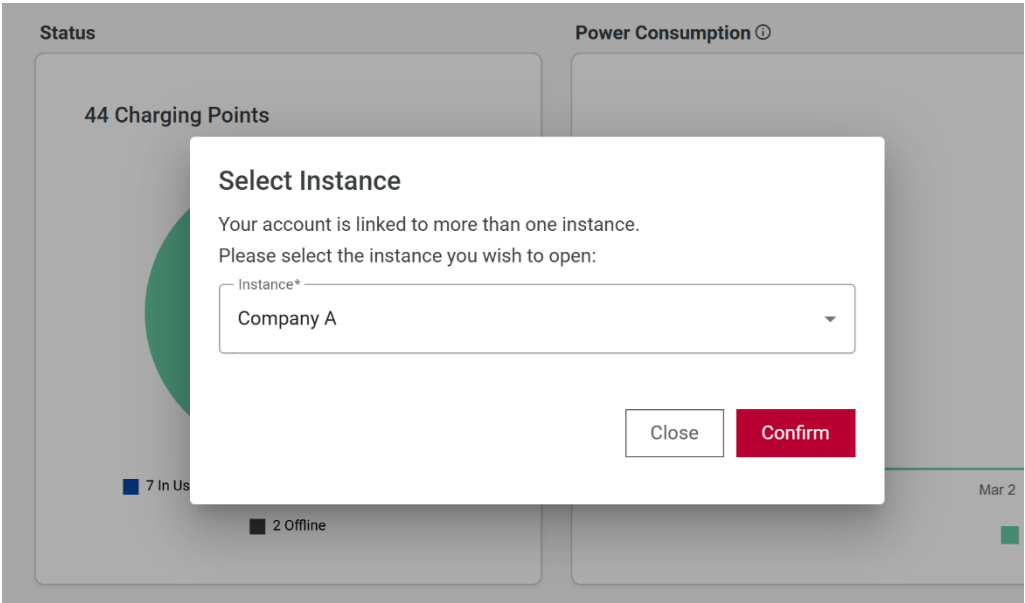
Forgot password?

Log in

Privacy Policy Language

Client Selection

In case the user account is linked to multiple clients, the desired client must be selected after login. If the user is already logged in, the client can be changed in the settings menu.



Navigation

Use the navigation bar to open one of the following views, which are explained in the following chapters.

Navigation with titles	Navigation without titles
<  Charging Infrastructure Charging Infrastructure Requests New Connections  Vehicles Vehicles Tokens Vehicle Models  Charging Schedule  Map  Events  Messages  Reports  Certificates Certificates Certificate Signing Requests  Settings 7 3	>  7  3       

The header provides access to additional functions:

- > Notifications
- > Support
- > Language selection
- > Client selection

If a specific client is selected, the initials of the client are displayed beside the settings icon.



Troubleshooting

If your browser does not show the front end but an error message regarding certificate issues, your browser does not know the certificate used by the CSMS server. Ask your IT department to install the corresponding Root Certificate. As a short-term solution the warning can be ignored, but then your connection is vulnerable for attacks.

2.2 Charging Infrastructure

Overview

The "Charging Infrastructure" view is used to configure, control and monitor all components of a charging infrastructure, especially charging stations.

Before any of the provided functions can be used, the infrastructure topology and charging stations must be configured.

2.2.1 Topology

Root Node

The topology is represented by a tree view and is used both for navigation and for configuring load management.

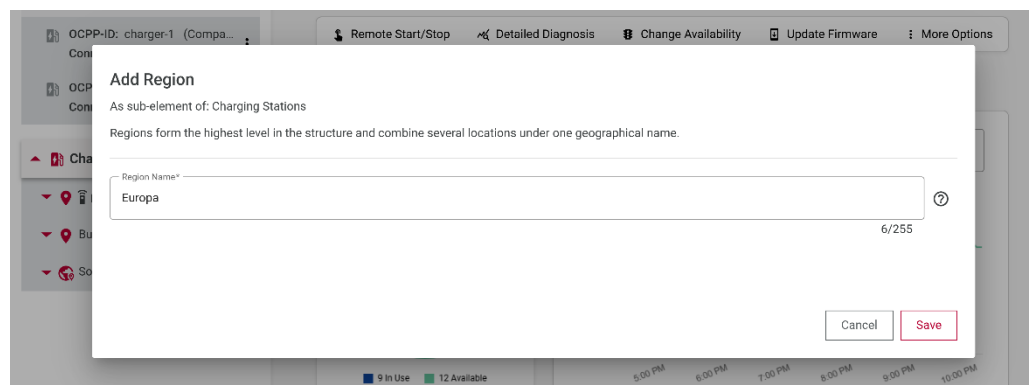
The top-level node of this structure is called "Charging Infrastructure" and is used to combine several independent locations/regions and therefore not relevant for the load management. It is not possible to configure load management limits of the top-level node.

The next level in the structure can either be of the Region or Location type.

Region

A region has no properties other than a name. It can be used to group several locations. Another region can also be created below a region if no location has been created yet. Further levels of the region type are not possible.

Regions are optional. Locations can also be created directly without any functional disadvantages.



Locations and Group Nodes

Locations can be created below the start group and below regions. Usually, this level represents the transformer station and defines the maximum available power granted by your electric utility.

Create Location

The location can be configured in the Charging Infrastructure view in the left side-panel. Use the  button to open the "Add Location" dialog.



General

Add Location

As sub-element of: Charging Stations

Locations form the middle or top level and represent locations with their own grid connection point and possible a load management configuration.

Location Name*

0/255

Loadmanagement
☒ Off
☐ Static
☐ Dynamic

Cancel Save

A location can contain groups or charging stations, but not both. Further nested groups could represent other limiting components of the charging infrastructure, e.g. fuse boxes. A group can be also used to divide charging stations into logical groups, e.g. customers and employees, although they all share the same electrical installation.

A group is configured similarly to a location using the menu in the sidebar. Click the [Add Group] button to open the configuration dialog. If the button is not available, charging stations have already been created at this level.



Note: Charging stations and group nodes cannot be mixed.



Search

Charging Infrastructure

Building Downtown

Battery Booster Pack Downtown

DC Station 1

DC Station 2

DC Station 3

DC Station 4

Building North

Southern Region

Building South

Underground Garage

Battery Booster Pack South

AC Station 1

AC Station 2

AC Station 3

AC Station 4

Charging Station Node with Charging Point and Connector

A charging station represents the device, which opens the OCPP connection to the CSMS. It can contain multiple charging points with separate Electric Vehicle Supply Equipment (EVSE) units, so a charging station could charge multiple vehicles at the same time. Each charging point can contain one or multiple connectors. A connector is the device, which is plugged into the electric vehicle.



Example: Triple-Chargers provide three connectors: one CCS, one CHAdeMO and one GB/T. All of them can be used at the same time, so three EVSEs with one connector each are necessary.

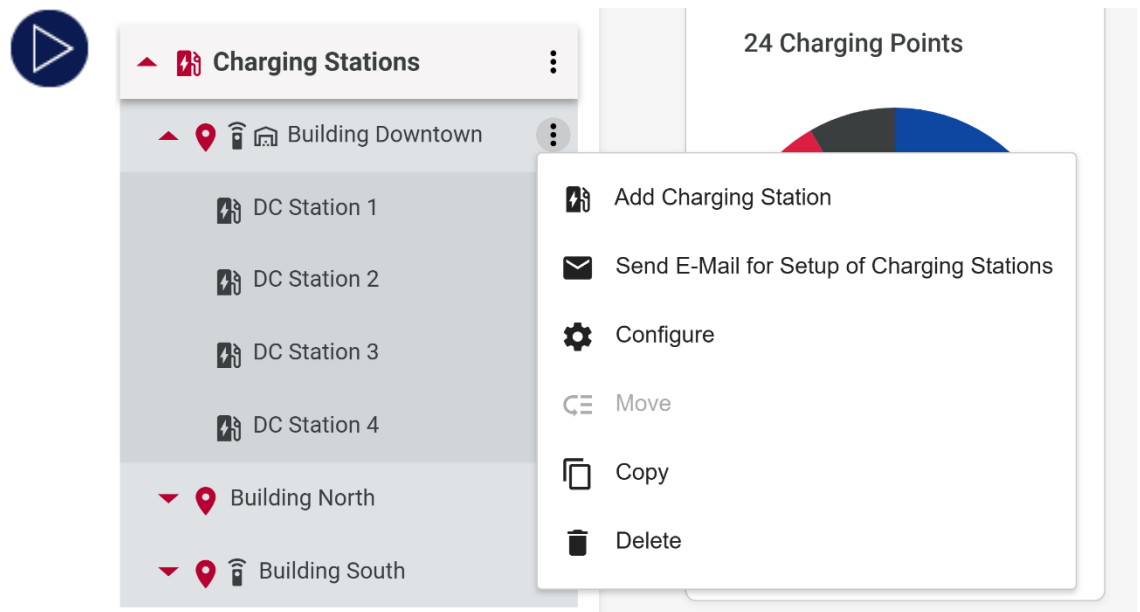
The number of charging points and connectors is defined by the charging station manufacturer. The CSMS can auto-detect the configuration and creates all required elements automatically. Nevertheless, all topology elements can be also configured manually in the CSMS.

It is recommended to use the automatic configuration process (see 2.2.3 Charging Station Configuration) to configure new charging stations.

Edit Topology

Elements except the top-level node can be edited by using the  button:

- > Add Charging Station: Add a new charging station below the selected group. This option is only available for groups.
- > Send E-Mail for Setup of Charging Station: Send an email to the installer with all the information required to set up the charging station.
- > Configure: Edit basic information of group or charging station node.
- > Move: Move a group or a charging station to a new location within the topology. All sub-elements are also moved.
- > Copy: Copy a group or a charging station. The dialog offers the option to copy also all sub-elements or just the selected element. All information except the OCPP ID are copied since this identifier is unique for each charging station.
- > Delete: Delete a group or a charging station. All sub-elements are also deleted.



Caution: None of these actions can be reverted!

2.2.2 Load-Management

Activate Load-Management

At the site level, load management can be enabled for all charging stations belonging to this group. When load management is enabled, you can select either static or dynamic load management.

With static load management, the maximum available power for the charging infrastructure is fixed. The available power is distributed among all active charging sessions so that the grid connection limit is not exceeded.

With dynamic load management, the available charging power is continuously adjusted to the building's current energy consumption. This is achieved using an edge device that monitors the building's consumption via an energy meter. This ensures that the available connection power is utilized optimally.

The decision on whether to use static or dynamic load management can be made separately at the location level and for each group level. However, the setting is only available at the group level if load management has been enabled for that location.



Caution: The infrastructure topology and the configuration parameters (e.g. maximum power) are used for calculations in the load management algorithms. Incorrect configuration has an immediate impact on the behavior of the load management and the charging session.

Overload of the charging infrastructure (e.g. transformer) must be monitored and prevented by corresponding safety components. The load management of the CSMS avoids power peaks but does not have direct control of the power consumption of charging stations and other loads (e.g. heating installation).



Note: Dynamic Load Management with a single metering point:

If the site has a low-voltage connection or a single medium-voltage transformer, dynamic load management is configured at the location level. Groups can be used to represent substations or to divide the charging stations into logical groups.

Dynamic load management with multiple metering points:

If multiple medium-voltage transformers are operated at a single grid connection and load management is to be controlled separately for each transformer, a group is created for each transformer under the location. Static load management is selected at the location level, and dynamic load management at the group level.

2.2.2.1 Static Load Management Configuration

Configuration of Static Load Management

If static load management is activated, the following parameters from the section General must be entered:

- > **Charging Strategy:** This determines the algorithm of the load management, i.e. how the available power is distributed to the charging stations. The individual strategies are described in more detail below.
- > **Number of Phases:** Number of separate phases used for the electrical wiring.
- > **Maximum Current in Ampere:** The total available current for each phase. This parameter depends on the installed transformation station or fuses. If the total current (per phase) from all charging stations in this group is higher than this value, the load management will limit the consumption to the given value. Depending on the fuse trip time, a reserve might be necessary to avoid an overload.
- > **Phase Voltage in Volt:** The voltage measured between any phase (e.g. L1) and neutral. In most parts of Europe it is 230V.

In the section Peak Shaving, the following parameters must be entered:

- > **Maximum Load in kW:** This parameter is not relevant for the overload protection but can be optionally used to limit the power in order to prevent exceeding the average power value contractually agreed with the grid operator (Peak Shaving).
- > **Power Supply Limit in kW (read-only):** This is the maximum deliverable power of the connection. This value is calculated by the parameters above (No. Phases * Max. Current * Phase Voltage).
- > The configuration of charging schedules is described in 2.2.2.3 Power Schedule Configurations

In the section Advanced Settings, the following parameters can be entered optionally:

- > **Fallback Charging Limit: Maximum charging power per charging point (DC Charging):** This value is stored in the charging station. It specifies the power limit of the charging point if the connection to the backend is interrupted.
- > **Fallback Charging Limit: Maximum charging current per charging point (AC Charging):** This value is stored in the charging station. It specifies the current limit of the charging point if the connection to the backend is interrupted.



Note:

When AC chargers are used, the maximum current must be at least 6A.
When DC chargers are used, the maximum power must be at least 3kW.



Caution: If the parameters "Number of phases" or "Phase Voltage" are changed in an existing configuration, the new values are also applied for all sub-nodes. This could lead to unintended limits, so all limits should be checked after this

change.



Caution: Load management basically regulates consumption by the vehicle. Power losses caused by cables or voltage converters in the charging infrastructure are not taken into account. If these losses are too high, appropriate buffers must be added in the load management configuration.

Sub-Groups

For sub-groups the same Number of Phases, Phase Voltage and Charging Strategy is used and therefore these properties cannot be changed. However, the Maximum Current and Maximum Load must be entered. This is relevant if the group represents a limiting component in the infrastructure or a virtual limit should be used for all charging stations of this group.



Add Group
As sub-element of: Charging Stations

General

Peak Shaving

Advanced Settings

Group Name*
Depot 5/500

Loadmanagement* ☐ Off ☒ Static ☐ Dynamic

Charging Strategy
Select Strategy*
Balanced

Charging Rotation ☒ Interval minutes

Power Supply
Number of phases* ☐ 1 ☒ 3

Maximum Current*
16 A

Phase Voltage*
230 V

Power Supply Limit*
11.04 kW

Cancel Save

2.2.2.2 Dynamic Load Management Configuration



Note: Measured values of the building consumption are required for dynamic load management. The integration of an edge-device is therefore required for this feature. The configuration is described in Chapter 4 Edge-Device.

Configuration of Dynamic Load Management

If static load management is activated, the following parameters must be entered in addition to the static load management:

- > **Maximum Load in kW:** The maximum total power (charging infrastructure, building, Machines, etc.) to be consumed. The dynamic load management controls the power consumption of your charging infrastructure so that the specified limit is not exceeded. In contrast to static load management, this value does not only refer to the charging infrastructure, but to the total consumption.
- > **Fallback Value – Maximum Power:** The power to be consumed by the charging infrastructure when the meter has not sent a reading to the CSMS for a certain time (e.g. network fault). The value must be selected so that, together with the consumption of other consumers, the connection limit is not exceeded.
- > **Time without measurement:** When no meter reading was received for the specified time, the fallback power value will be applied.

Meter Configuration

In addition, you must select the energy meter to be used for dynamic load management. In the "Energy Meter" section, first select the appropriate energy meter model. If the appropriate model is not listed, you must add it in the settings (see 2.10.6 Modbus Device Models).

If a Modbus/TCP device has been selected, the following settings must also be configured:

- > **Modbus TCP Server IP Address:** The network IP address of the meter through which the meter reading can be retrieved. The IP address must be accessible from the edge device.
- > **Modbus TCP Server IP Port:** The TCP port number for the Modbus connection. The default value is 502.

Regardless of the meter type, the following settings must be configured:

- > **Polling Interval:** The interval in seconds specifying how often a new reading should be retrieved from the meter. For example, a value of 1 means that the value is updated every second. A shorter interval allows load management to respond more quickly to changes in building consumption.
- > **Device ID:** A unique ID for the meter. The ID can either be set on the meter or found in the device manual.



General
Peak Shaving
Energy Tariffs (Beta)
PV Usage
Energy Meter
Advanced Settings

Add Location

As sub-element of: Charging Stations

Locations form the middle or top level and represent locations with their own grid connection point and possible a load management configuration.

Energy Meter Type*
Modbus Device

Energy Meter Configuration

i An edge device is required to connect a modbus device. The Modbus devices can be edited in the [settings](#).

Device Selection*
Janitza Umg 96

Modbus Type
Modbus TCP

Modbus TCP Server IP Address*
192.168.0.11

Modbus TCP Server Port*
502

Polling Frequency*
1 s

Unit Identifier*
1

Cancel Save

Preplanning for Dynamic Load Management

Certain load management configurations require preplanning, such as the Schedule-based charging strategy or the strategy option Cost Optimization.

To ensure that the preplanning is as accurate as possible, the restrictions by dynamic load management must also be taken into account.

For this purpose, an average value is determined based on historical values, which is used in the planning. The historical values from the last 3 weeks are used for the respective weekday and time and the average is calculated.

If insufficient data is available, half of the power limit is assumed as the building consumption. It is therefore possible that the optimization results in the first 3 weeks are not yet ideal.



Example: The forecast for Tuesday, 17:00 - 17:15 in calendar week 30 is the average value for Tuesday, 17:00 - 17:15 from weeks 29, 28 and 27.

2.2.2.3 Power Schedule Configurations

Overview

The "Maximum Power" parameter, which is set as the upper limit for the charging infrastructure in static load management and as the upper limit for total consumption in dynamic load management, can also be configured to be time-dependent. Up to 12 entries with individual power limits can be defined for each day of the week, which overwrite the "Maximum Power" parameter. If no entry is created for a certain period, the "Maximum Power" value applies again.

Schedule Configuration

The configuration of the individual days of the week is displayed in the "Peak Shaving" section. After a weekday has been unfolded, a new power value can be configured using the [Add entry] button. The period for this limit must not overlap with other entries.

Unnecessary entries can be deleted.

Copy Entries

If the configuration is identical/similar for several or all days of the week, the entries can be copied to other days of the week using the copy button:

- For other weekdays
- For all weekdays Monday - Friday
- For all weekdays




The following examples demonstrate how versatile time-based limits can be used.

Example 1: If a peak load is expected for a limited time due to the charging infrastructure and other large consumers (e.g. a canteen or machines), the charging power can be reduced during this time. Outside of this time, charging can take place at full power.

Example 2: Charging can be completely deactivated for certain periods of time by reducing the limit to 0kW. For example, charging points without authorization could be made available to visitors, which can only be used during office opening hours.

2.2.2.4 Charging Strategies

2.2.2.4.1 Charging Strategy Balanced

Charging Strategy Balanced

The "Balanced" charging strategy distributes the available power evenly across all charging sessions. This allows as many vehicles as possible to charge at the same time, but the individual charging session may take longer until the battery is fully charged due to the divided power.

Vehicles that are already fully charged are considered in the planning with 6A per phase (AC charging) or 3kW (DC charging). This allows the vehicle to continue to draw energy at a later time, e.g. for trickle charge or the auxiliary heating.

As the number of charging sessions increases, the available power is distributed until the minimum power or current is reached for all of them. After that, charging sessions must be paused so that the limit of the power supply is not exceeded.

Charging Rotation

If the Charging Rotation feature is activated, vehicles get up to 30min. charging time. The interval time of 30 minutes can be adjusted if required. After that, the power is assigned to other vehicles that have been paused so far. Vehicles that are already fully charged are also offered power. If the charging session does not start within 3 minutes, the power is reassigned to another vehicle.

2.2.2.4.2 Charging Strategy Schedule-based

Charging Strategy Schedule-based

In schedule-based distribution, the departure time and the Target-SoC of the vehicle are used for prioritizing the charging sessions. Therefore, this charging strategy can only be used meaningfully if this data is provided by a planning system (e.g., depot or fleet management system).

The different options to manage charging schedules are explained in 2.5 Charging Schedules.

Assignment of Planning Data

When a new charging session is started, a check is made within the available planning data to see whether there is a matching data record. An assignment takes place if the vehicle linked to the started charging session matches the vehicle in the planning data and the start time of the charging session matches the period in the planning data. In this case, the actual arrival time may be between 2 hours before the planned arrival time and the planned departure time.

The data record is also used if the bus charges at a different charging station / charging station group than described in the planning data.

The planned data (VDV463) may change during the charging session (target SoC, departure time, preconditioning values). The Load-Management then performs a recalculation and, if necessary, updates the charging profile for all affected charging stations.

If planning data is incomplete, substitute values are used for the missing values. The values are described under "Spontaneous Charging".

Spontaneous Charging

Charging sessions that are started without planning information are scheduled and prioritized according to the same procedure as charging sessions for which planning data has been received in advance. The following values are assumed for calculating the priority:

- > Energy demand: The energy demand is calculated from the current battery charge level (SoC) and a charging target of 100%. If the current battery charge level has not been received from the charging station, the configured battery capacity is used as the energy demand instead. If this information has not been configured, 300kWh is used as a default value.
- > Standing time: 8 hours

If planning data for vehicles is only created and received after charging has started, charging begins as a spontaneous charging session and is updated later with the planning data.

2.2.2.5 Strategy Options

Configuration of Load Management Behavior

Regardless of the charging strategy, there are configuration options that can be used to adjust the load management behaviour. These options are available in every charging strategy, but can have different effects depending on the charging strategy.

2.2.2.5.1 Cost-optimized Charging

Cost Optimization

With the option cost-optimization, the costs for charging can be reduced if the energy supplier's tariff includes variable prices, for example a day/night tariff.

Costs can be saved by prioritizing charging sessions at times when prices are low. It is usually possible to postpone charging sessions if vehicles are parked at the charging station for significantly longer than they are actually charged. This is often the case, for example with employee vehicles during working hours or with fleet vehicles during the night.

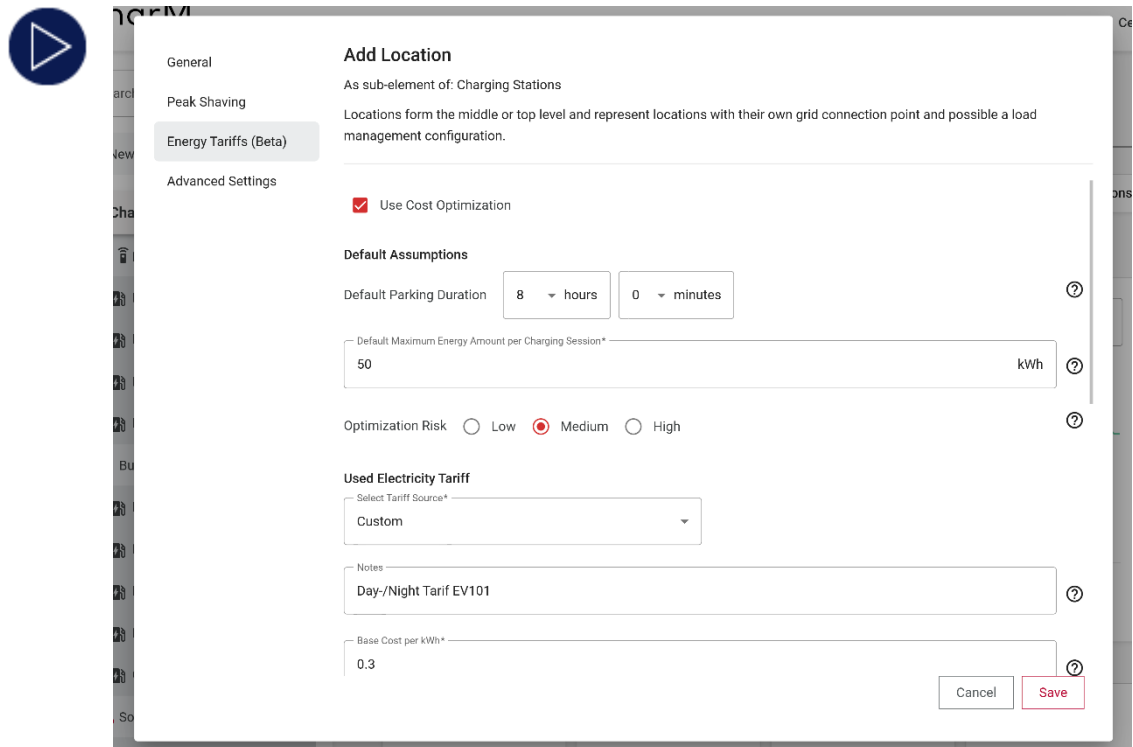
The load management creates a charging plan and starts/pauses charging sessions based on the price information so that the vehicles receive the necessary energy to fully charge before the vehicle leaves again.



Caution: The cost optimization is still in beta status, as not all planned functionalities have been implemented yet and can only be used with restrictions.

Basis Configuration The following parameters are necessary for calculating the charging plan:

- > **Parking Duration:** To ensure that the vehicle is reliably fully charged, it is necessary to know the minimum time the vehicle will be at the charging station. The departure time is calculated from the arrival time and the Parking Duration parameter.
- > **Maximum Amount of Energy per Charging Session:** The amount of energy required must be known so that the charging session is not paused for too long. A high amount of energy can lead to the charging session being started even at high prices. This ensures that the vehicle is fully charged before departure.
- > **Optimization Risk:** Defines the risk that is taken during optimization in order to shift charging to periods with low electricity costs. If a high risk is specified, as much of a charging session as possible is shifted to periods with low electricity costs, but this means that there is a possibility that a charging session that deviates from the assumed values (shorter parking duration or higher energy quantity) will not be fully charged.



Add Location
As sub-element of: Charging Stations

Locations form the middle or top level and represent locations with their own grid connection point and possible a load management configuration.

☒ Use Cost Optimization

Default Assumptions

Default Parking Duration: 8 hours 0 minutes

Default Maximum Energy Amount per Charging Session*: 50 kWh

Optimization Risk: ☐ Low ☒ Medium ☐ High

Used Electricity Tariff

Select Tariff Source*: Custom

Notes: Day-/Night Tarif EV101

Base Cost per kWh*: 0.3

Cancel Save

Energy Tariffs

If the cost optimization has been activated, price information must be configured. There are two sources for price information:

- > Weekly schedule with fixed prices
- > Dynamic day-ahead prices, automatically received from the spot market

Weekly Schedule for Price Information

For the weekly schedule, the currency is not relevant for load management, so any currency can be used.

Up to 12 entries with individual prices can be defined for each day of the week. If no entry is created for a specific period, the "Base price" value applies again.



Power Schedule Configuration

The configuration of the individual days of the week is displayed in the Energy Tariffs section. After a weekday has been unfolded, a new price can be configured using the [Add entry] button. The period for this price must not overlap with other entries.

Unnecessary entries can be deleted.

Copy Entries

If the configuration is identical/similar for several or all days of the week, the entries can be copied to other days of the week using the copy button:

- For other weekdays
- For all weekdays Monday - Friday
- For all weekdays

Dynamic Day-Ahead Prices

As an alternative to the weekly schedule, price information can also be received automatically from the exchange. The support is available to help you configure the relevant parameters.

Automated Learning of Optimization Parameters

The "Parking Duration" and "Maximum Amount of Energy per Charging Session" values are automatically determined individually for each vehicle over time. The last 10 successful charging sessions are used as a basis, whereby AC and DC charging sessions are considered separately. If not enough charging sessions have taken place, the default values (see above) are used.

Whether the individually learned values should be used or the default values instead can be set separately for each vehicle (parameter "Use learned values of the vehicle for the cost-optimized charging strategy" in the vehicle settings).

For vehicles with very fluctuating charging behavior (e.g. company pool vehicles), it is recommended to fall back on the default values and deactivate the function on the vehicle.



Current Learned Values

The currently learned values can be checked in the vehicle view.

Applied Values

The "Charging Session Details" report can be used to check which values were actually used for a charging session. After expanding the desired entry, the values are displayed under "Assumed Parking Duration Used by Load Management" and "Assumed Charged Energy Used by Load Management".



Assumed Parking Duration Used by Load Management	6h8min
Assumed Charged Energy Used by Load Management	23,08 kWh

2.2.2.5.2 Manual Priorisation

Summary

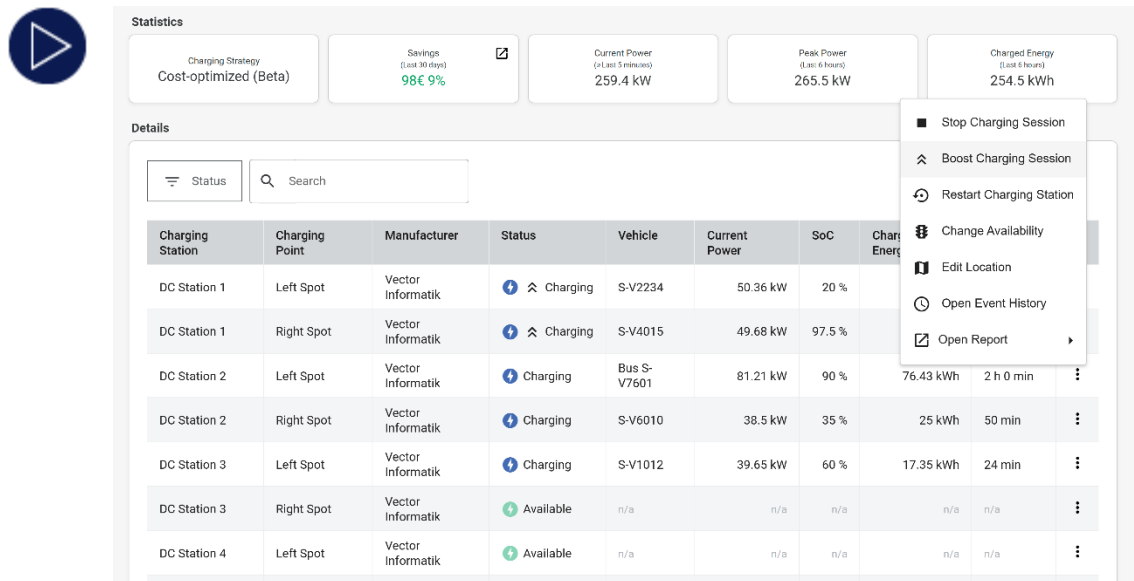
If the prioritization in the selected charging strategy is not correct in individual cases, the prioritization can be influenced manually. The following options are available:

- > Prioritization of charging points: The "Charging Priority" parameter in the charging point configuration (see 2.2.3.4 Charging Station Parameters) is used to prioritize all charging sessions that take place at this charging point.
- > Prioritization of vehicles: All charging sessions from this vehicle are prioritized via the "Charging Priority" parameter in the vehicle configuration (see 2.4.4 Vehicle Parameters).
- > You can view and change the current priority using the configuration dialog for a running charging process (see 2.5.3 Manual Administration of Charging Schedules).
- > An individual charging session can be prioritized via the [Boost Charging Session] option. The setting only applies to the current charging session. The option can be accessed from various menus.

"Boost Charging Session" options:

- > In the "Charging Infrastructure" view at group level, the option is located in the "Details" table in the action menu for each charging point.
- > In the "Charging Infrastructure" view at charging station level, the option can be found in the action menu of the respective charging point.

- > In the “Vehicles” view at vehicle level, the option can be found in the action menu.



Statistics

- Charging Strategy: Cost-optimized (Beta)
- Savings (Last 30 days): 98€ 9%
- Current Power (Last 5 minutes): 259.4 kW
- Peak Power (Last 6 hours): 265.5 kW
- Charged Energy (Last 6 hours): 254.5 kWh

Details

Search:

Charging Station	Charging Point	Manufacturer	Status	Vehicle	Current Power	SoC	Charged Energy	Time	Action
DC Station 1	Left Spot	Vector Informatik	Charging	S-V2234	50.36 kW	20 %			
DC Station 1	Right Spot	Vector Informatik	Charging	S-V4015	49.68 kW	97.5 %			
DC Station 2	Left Spot	Vector Informatik	Charging	Bus S-V7601	81.21 kW	90 %	76.43 kWh	2 h 0 min	
DC Station 2	Right Spot	Vector Informatik	Charging	S-V6010	38.5 kW	35 %	25 kWh	50 min	
DC Station 3	Left Spot	Vector Informatik	Charging	S-V1012	39.65 kW	60 %	17.35 kWh	24 min	
DC Station 3	Right Spot	Vector Informatik	Available	n/a	n/a	n/a	n/a	n/a	
DC Station 4	Left Spot	Vector Informatik	Available	n/a	n/a	n/a	n/a	n/a	

Context Menu Options:

- Stop Charging Session
- Boost Charging Session
- Restart Charging Station
- Change Availability
- Edit Location
- Open Event History
- Open Report

2.2.2.5.3 Power After Charging Is Finished

Power After Charging Is Finished

The power distribution after the end of charging can be influenced by a setting, as this situation often requires a compromise.

As soon as the vehicle signals that no power is currently required, no more power should be allocated to this vehicle and instead the power should be made available for other charging sessions.

However, this vehicle can then no longer independently call up energy that is required, for example, to recharge the battery or to heat/air-condition the vehicle.



Example: In a property with 30 AC charging stations and a grid connection of 125 kW, for example, 15 fully charged vehicles would block half of the grid connection if the minimum load is reserved for each vehicle.

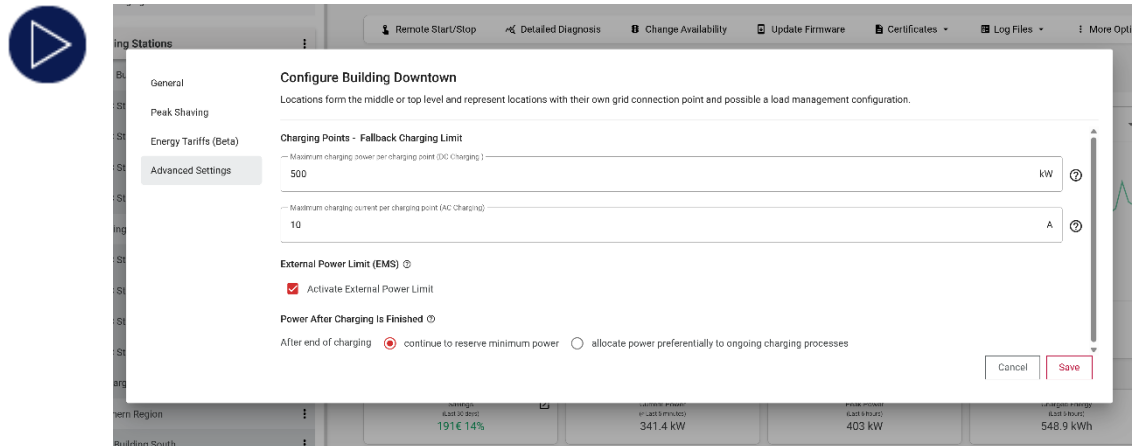
Parameters

Depending on the charging situation, it may make more sense to provide a vehicle with the minimum power or to use the power for other charging sessions. The “Power after Charging Is Finished” option can be used to control the behavior.

To do this, open the settings at location level via [Configure] and open the [Advanced Settings] section. The following options are available:

- > After end of charging continue to reserve minimum power: Power is reserved for the vehicle, even if the vehicle is not currently charging. The power for other ongoing charging sessions may therefore have to be reduced. However, the paused vehicle has the option of continuing the charging session or receive energy for the air conditioning/heating system at any time.

- > After end of charging allocate power preferentially to ongoing charging sessions: If there is no more unused power, the power is allocated to ongoing charging sessions. The paused vehicle is limited to 0 A / 0 kW and may no longer get any energy. If there is still unused power available, the minimum power is allocated to the vehicle again.



Reference: Other settings that have an influence on load management but are assigned to a vehicle are described in chapter 2.4.4 Vehicle Parameters.

2.2.2.6 PV Usage

Summary

Charging vehicles with energy from a photovoltaic system can offer economic and environmental benefits. Therefore, the CSMS includes a feature that allows vehicles to be charged exclusively with PV energy.

The CSMS allows users to set time periods during which power is allocated to vehicles only as long as the energy is being generated locally. Control is similar to that of dynamic load management, based on consumption measurements at the grid connection point. The control system regulates the consumption of the charging stations so that consumption is 0 kW. If consumption from the grid is measured, the power to the charging stations is gradually reduced until consumption returns to 0 kW. If energy is measured being fed back into the grid, the power to the charging stations is gradually increased, if possible.

In principle, this method can also be used for other local energy sources, such as wind power.

Since the power output and amount of energy generated by the photovoltaic system can be highly volatile and constantly fluctuate with weather conditions, this setting does not guarantee that the vehicles will be fully charged. If necessary, the charging period must be ended early enough to allow the vehicle to be fully charged using energy from the grid if needed.



Example: If vehicles are only needed on weekdays and are connected to the charging point from Friday evening through Monday morning, the time window for PV charging can be set from Friday at 6:00 p.m. to Sunday at 10:00 p.m. The vehicles are then charged with PV energy during the day on Saturday and Sunday. If heavy cloud cover prevents a full charge, the vehicle is fully charged using grid power from 10:00 p.m. on Sunday until early Monday morning.

Prerequisites

An edge device is required for dynamic control of consumption at the grid connection point. A power meter must be connected to the edge device.

In addition, the "Cost-Optimized Charging" option must not be enabled.

Activation of PV Usage

To enable this feature, you must turn on the [Enable PV Usage] toggle in the Location-level settings. If cost-optimized charging is already enabled, the toggle will be grayed out.

Maximum Output Power of PV Inverter

Next, you must enter the Maximum Output Power of PV inverter. This is not the peak power of the PV system (kW_{peak}), but rather the output power of the inverter (AC voltage).

During a period when charging is to be powered exclusively by PV energy, the maximum output power of the PV inverter serves as the power limit for the charging infrastructure; in other words, no more power than this value is allocated to the charging points. Outside the configured time periods, the limit is determined by the static/dynamic load management setting plus the maximum output power of the PV inverter. Thus, the charging stations can be charged at the full power of the grid connection plus the full power of the inverter.

If PV usage is disabled, the maximum output power of the PV inverter has no effect on load management.

Configuration of Time Periods

You can then define the time periods during which charging should be done exclusively with PV energy. The dialog displays the individual days of the week. After expanding a day of the week, you can configure a new time period by clicking the [Add Entry] button. Time periods must not overlap with other entries.

Unnecessary entries can be deleted.

Copy Entries

If the configuration is identical or similar for several or all days of the week, you can use the Copy button to apply the settings to other days of the week:

- For other days of the week
- For all days of the week, Monday through Friday
- For all days of the week



Configure Building Downtime
Locations form the middle or top level and represent locations with their own grid connection point and possible a load management configuration.

General

Peak Shaving

Energy Tariffs (Beta)

PV Usage

Advanced Settings

☒ Enable PV Usage

Maximum Output Power of PV Inverter ^{*} 220 kW

PV only schedule
Defines the time slots where charging sessions with priority **Normal** and **High** are only supplied with power from the PV system. Charging sessions with priority **Highest (Boost)** are always supplied with the maximum power.

Monday
0:00 - 10:00 Disabled | 10:00 - 16:00 Enabled | 16:00 - 24:00 Disabled

10:00 16:00

+ Add entry

Tuesday
0:00 - 10:00 Disabled | 10:00 - 16:00 Enabled | 16:00 - 24:00 Disabled

Wednesday
0:00 - 10:00 Disabled | 10:00 - 16:00 Enabled | 16:00 - 24:00 Disabled

Thursday
0:00 - 10:00 Disabled | 10:00 - 16:00 Enabled | 16:00 - 24:00 Disabled

Friday
0:00 - 10:00 Disabled | 10:00 - 16:00 Enabled | 16:00 - 24:00 Disabled

Cancel Save

2.2.2.7 External Power Limits

Summary

The CSMS can take several power limits into account simultaneously when calculating the charging profiles. The limits for static and dynamic load management have already been explained in the previous chapters.

Limits from external systems can also be taken into account. These systems can either set event-based limits, for example only during an overload situation. Alternatively, the systems can also set and update the limits on a recurring basis. This can be used for the integration of energy management systems (EMS) in order to react dynamically to the current load situation. This also makes it possible for the regulation for dynamic load management not to take place in the CSMS, but in an external system that can also control other consumers in addition to the charging infrastructure.

Interfaces

The following interfaces are provided for integration:

- > Modbus/TCP
- > REST

These interfaces are offered by an [edge-device](#). Details on the interface description can be found in the edge-device documentation.

Configuration

The interface must be activated in the CSMS so that the limits are taken into account in the calculation.

To do this, open the [Configure] menu in the top group. If an edge-device has been connected to this group, the "External Power Limit" functions can be activated and deactivated in the "Advanced Settings" section.



Display

The received limit can be checked both in the edge-device interface and in the CSMS interface (see 2.2.4 Status Overview).

2.2.2.8 Automatic Power Adjustment

Summary

Load management can set power limits for the charging infrastructure in order to limit power consumption. However, actual consumption is always controlled by the electric vehicles. While the vehicles are not allowed to consume more than the limit set by the CSMS, they can consume less. This unused power can be distributed to other charging sessions through automatic power adjustment.

Automatic Power Adjustment

The CSMS continuously monitors the vehicle power consumption. If the CSMS detects that consumption is lower than the amount allocated to the charging point, it assigns a new, lower limit.

Since the CSMS does not know the vehicle's current power demand and can only make conclusions based on measured values, it allocates slightly more power to the charging point than the vehicle is consuming (provided this does not cause any other limit to be exceeded). This allows the vehicle to increase its consumption again at any time.

Upon the first reduction, the charging point receives the currently consumed power plus 10% of that amount. If the vehicle utilizes the new limit, it can be assumed that the vehicle would charge at an even higher power level. Therefore, the limit is adjusted to a higher value if the next measurement indicates that the vehicle is utilizing the 10% additional power. The new limit corresponds to half the difference between the charging point's maximum power and the current consumption. If the next measurement indicates that this power is also being fully utilized, the maximum possible power is allocated.

Automatic power adjustment begins no sooner than 120 seconds after the start of the charging session, and the system waits for the first measurement value.

Consumption is measured regularly by the charging infrastructure and sent to the CSMS. Depending on the configured measurement interval, it may take

several minutes for the limit to be adjusted up or down. If this delay is too long, the measurement interval must be set to a shorter duration.



Example: A DC charging station can deliver a maximum of 150 kW of power to a vehicle. Once the charging process has started, the full 150 kW is assigned as the limit.

The vehicle initially uses only 50 kW, so after a short time the limit is reduced to 55 kW (50 kW + 10%).

Later, the vehicle wants to increase the power to 150 kW, but it cannot exceed the 55 kW limit. As soon as the CSMS receives a new power consumption reading, the limit is adjusted to approximately 100 kW.

If the vehicle also reaches this limit, the full 150 kW is reassigned after the next power consumption reading.

In the meantime, the unused power has been made available to other charging sessions.

2.2.3 Charging Station Configuration

Summary

A new charging station can be configured using two different methods:

- > Automatic configuration process: First, the charging station is configured and put into operation. The charging station establishes an OCPP connection to the CSMS and is displayed there as a new charging station. In order to use all functions, the charging station must still be configured in the CSMS. During configuration, only information that has not yet been transmitted by the charging station needs to be added.
- > Manual configuration process: First, the charging station is created in the CSMS with all the necessary information. After commissioning, the charging station can then connect to the CSMS at any time and immediately use the full range of functions.

Depending on the cooperation model with the electrician on site, one or the other method may be more efficient and simplify the installation and configuration process.



Note: The following information is typically required to configure the OCPP backend connection in the charging station:

- > OCPP backend address: The connection address in URL format (see 1.3.1.1 External Interfaces)
- > OCPP ID: A unique identifier for each charging station
- > Password: An individual password that protects the connection to the OCPP backend
- > TLS root certificate: The correct root certificate for TLS encryption, if not already installed by the charging station manufacturer (see 1.3.1.2 TLS Encryption)

2.2.3.1 Preparing the Charging Station Commissioning

Prepare Charging Station

To provide the installer with all the necessary information about configuring the OCPP connection, an email containing all the relevant information can be sent from the CSMS.

The dialog box can be opened via the [New Connections] view and the [Send Installation Instructions by E-Mail] button.

At least one email recipient must be entered in the dialog box. Optionally, additional recipients (direct or in copy) can be entered.

Then, any number of charging stations that are configured by the installer can be entered. The following information can be filled in:

- > OCPP ID: The charging station is identified by the OCPP ID. Therefore, the OCPP ID must be unique for each charging station.
- > Vendor / Model: Optionally, a vendor and model can be selected. If the fields are filled in, the email will contain a PDF guide with all the relevant steps for configuration. If the desired model is not available in the list, the fields can be left blank.
- > Comment: A comment with additional information for the installer, e.g., assignment to parking spaces, phase rotation, etc.

If many similar charging stations need to be created, a completed entry can be duplicated using the plus symbol and then customized. An entry can be deleted using the trash can symbol.

The email is sent by clicking on [Send].



Send E-Mail With Installation Instructions

Send an E-Mail with detailed instructions on how to setup a charging station to a coworker or contractor.

To

Cc

Charging stations to be added

OCPP ID* CP-1	Vendor Vector Informatik	Model Vector Model 1	Comment Parking Lot A
OCPP ID* CP-2	Vendor Vector Informatik	Model Vector Model 1	Comment Parking Lot B
OCPP ID*	Vendor	Model	Comment

For the OCPP IDs only numbers, letters and the chars `._%+@-` are allowed.

Cancel

Send

2.2.3.2 Automatic Configuration Process

Summary

Once the charging station has been configured and an OCPP connection to the backend has been established, information about the charging station model is automatically requested. This information simplifies the next configuration step and prevents inconsistent configuration.

Charging stations that have connected to the CSMS but have not yet been configured are listed under [New Connections].



[Send Installation Instructions per E-Mail](#)

Open Connections

How to connect a charging station

For charging stations to appear in the table below, they must be connected to the following OCPP URL:

wss://ws.vcharm.works/ocpp/

[Copy OCPP URL](#)

- Charging stations connected via OCPP are displayed here until you have completed their setup.
- Click on **Complete Setup** in the table to finish the configuration of the selected station.
- Only accept charging stations that you trust.
- To help you to configure your charging station, you can use our commissioning slides, which show how this works for different manufacturers: [Commissioning Slides](#)

OCPP ID	Last request	Vendor	Model	Serial Number	Firmware	Charging points	Status	
charger-1	2 hrs ago	Company Inc.	HPC	123456	1.0	2	✓ Ready for Setup	Complete Setup
charger-2	2 hrs ago	Company Inc.	HPC	123456	1.0	n/a	✓ Ready for Setup	Complete Setup
charger-3	an hour ago	Vector Informatik	Vector Model 1	n/a	n/a	2	✓ Ready for Setup	Complete Setup
charger-4	n/a	Company Inc.	HPC	n/a	n/a	2	✓ Ready for Setup	Complete Setup
charger-5	an hour ago	n/a	n/a	n/a	n/a	n/a	⚠ Missing Password	Detailed Diagnosis
charger-6	2 hrs ago	n/a	n/a	n/a	n/a	n/a	⚠ Missing Credentials	Detailed Diagnosis
occpId-1	9 mins ago	n/a	n/a	n/a	n/a	n/a	⚠ Username Conflict	Detailed Diagnosis

Open Connections

The table contains the following information:

- > **OCPP ID:** The ID with which the charging station identified itself. Since the OCPP ID must be unique for each charging station, the CSMS can use it to determine whether the charging station has already been configured or not.
- > **Last request:** The time at which the last OCPP message was received.
- > **Vendor / Model / Serial Number / Firmware:** Information about the charging station that was transmitted by the charging station.
- > **Charging points:** Number of charging points that were detected.
- > **Status:** If all the information required for configuration has been exchanged, the status is "Ready for Setup." Otherwise, the status indicates which information is missing.

If communication with the charging station is faulty or incomplete, further information can be displayed via [Detailed Diagnosis]. The scope of the detailed diagnosis is described in 2.2.5 Charging Point State Diagnosis.

Once all the necessary information has been received from the charging station, the configuration can be created via [Complete Setup]. A dialog box for completing the configuration opens.

First, the location or group from the topology where the charging station is to be added must be selected. All other fields that need to be filled in are described in 2.2.3.4 Charging Station Parameters.

2.2.3.3 Manual Configuration Process

Summary

If the charging station has not yet been put into operation but the CSMS configuration needs to be created, a charging station can be created in the topology at any time.

Use the  button for a location without a group or for a group to open the "Add Charging Station" dialog.

2.2.3.4 Charging Station Parameters

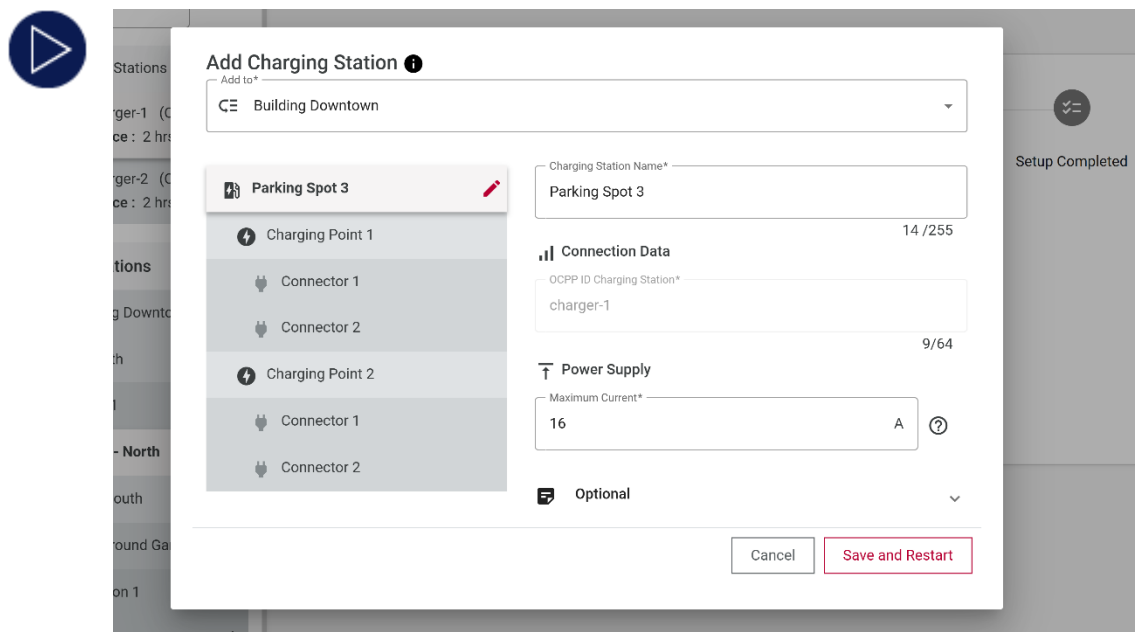
Summary

The following parameters are relevant to create a charging station. If parameters are mandatory but no valid value has yet been entered, saving is not possible. In addition, a red dot is displayed in the menu on the left-hand side for entries that are still incomplete.

Charging Station Components

The number of charging points and connectors has already been automatically detected and created during the automatic configuration process. If the automatic detection was incorrect, the number can be corrected by clicking on the pencil icon. Charging points and connectors can be added using the plus icon and removed using the trash can icon.

In the manual configuration process, one charging point and connector has already been created and must be expanded if necessary.



Connection Data

Each component (Charging Station, Charging Point and Connector) requires an OCPP ID:

- > OCPP ID Charging Station: This ID is used during the connection setup between a Charging Station and the CSMS. This ID must be unique across

all charging stations. Only numbers, letters and the chars `._%@+-` are allowed.

- > Charging Point OCPP ID: This ID identifies the charging point and must be unique across all charging points of this charging station. Usually, this ID is a consecutive number starting with 1.
- > Connector OCPP ID: This ID identifies the connector and must be unique across all connectors of this charging point. Usually, this ID is a consecutive number starting with 1.

If the automatic configuration process was used, the OCPP IDs for all components are already entered correctly.

Power Supply Configuration

If load management is activated for this specific group, additional parameters must be set.

For the Charging Station, the Maximum Current in Ampere must be set. This value depends on the charging station model, the wiring, and fuses. The total current of all charging points (per phase) will be limited to this value.

The power supply settings must also be entered for each Charging Point. The settings are different for AC and DC charging points:

AC:

- > Phase Rotation: To avoid an unbalanced load, it is recommended to rotate the phases for each charging station. Especially if vehicles only use one phase, the phase rotation ensures a distribution of the load over all phases. The load management considers this information in the calculation of the current load.
- > Maximum Current in Ampere: The maximum permissible current per phase.
- > Phase Voltage in Volt (read-only): This value is derived from the top-level group.
- > Power Supply Limit in kW (read-only): This value is calculated by the parameters above (No. Phases * Max. Current * Phase Voltage).

DC:

- > Maximum Current in Ampere: This value is calculated by the parameters below (Power Supply Limit / No. Phases / Phase Voltage).
- > Phase Voltage in Volt (read-only): This value is derived from the top-level group.
- > Power Supply Limit in kW (read-only): This is the maximum deliverable power of the connection.



Caution: The actual number of phases used depends on the vehicle and may vary with each charging session. The CSMS automatically detects the phases used, provided phase-specific currents or power are sent by the charging pole.

Therefore, the `MeterValuesSampledData` configuration parameter must contain either the `Current.Import` or `Power.Active.Import` value.

Recommended configuration:

```
Energy.Active.Import.Register, Current.Import
```

Configuration of parameters is described in chapter 2.2.10.

Charging Priority

The charging priority influences the power distribution in load management. Depending on the set charging strategy, the charging session is prioritized for power distribution if the value "High" or "Highest" is selected.



Note: The setting "Charge Point Type" and "Power Supply Limit" (only for DC) should also be entered if no load management is used. This information improves the display and search in the map views.

Optional Information

Additional information can be stored for documentation purposes:

- > Location (Optional): The location where this charging station is installed, e.g. the address.
- > Notes (Optional): Additional information.

Save and Restart

When the configuration is saved, the charging station is automatically triggered to restart and should automatically re-establish a connection after a few minutes.

If the automatic restart is not successful, the charging station must be restarted manually.

2.2.3.5 Authentication of the Charging Station

Security

If the charging station is connected via public internet, an authentication is required for security reasons. Therefore, Basic Authentication (Username and Password) is used during the connection setup. According to the OCPP specification, the username shall be identical to the OCPP ID. However, for more flexibility the CSMS offers the possibility to also choose another username. If this is desired, the option "OCPP ID as username" must be deactivated.

Alternative User Name

However, for more flexibility, the CSMS offers the option of choosing a different user name. If this is desired, the option "Custom username" must be activated.

Password

The password is set on the charging station.

In the automatic configuration process, the password is transferred to the CSMS when the connection is first established. Each time a connection is established in the future, the password sent is checked against the stored password.

The same procedure can be used in the manual configuration process if the option "Accept first password sent by the charging station" is activated when creating the charging station. Otherwise, a password must be entered directly during creation, which must match the password in the charging station configuration.

Change Password

If the password is to be changed at a later date, this must be done simultaneously on the charging station and the CSMS side. The saved password can be changed via the "Configure" dialog.

2.2.3.6 Modular DC-Charging Stations

Summary

To save costs, some manufacturers offer DC charging stations in which several charging points are supplied by a central power unit. The power unit is divided into individual modules that can be dynamically assigned to the charging points. Since the power unit is the most expensive component of a charging station, costs can be saved by not equipping every charging point with the maximum power, but instead assigning the power modules to the charging points where the power is currently needed.

Control of Modular DC-Charging Stations

When distributing power in load management, the CSMS offers the option of taking into account the special requirements of modular DC charging stations. Since a power module can only ever be assigned to one charging point, it makes sense to take the power limit of the module into account in load management distribution.

The number of available modules and the power of a module can be freely configured in the CSMS.



Example: The following example illustrates why modular DC charging stations must be given special consideration in load management.

A charging station with three charging points uses a central power unit consisting of three 60 kW modules.

Each charging point can therefore deliver a maximum of 60 kW, 120 kW, or 180 kW, depending on the assigned power modules.

If two charging points are occupied in parallel, only a limitation to 60 kW/120 kW or vice versa makes sense.

All other values, e.g., 100 kW (2 modules) and 80 kW (1 module), mean that the available power cannot be fully utilized. Since in the example the second charging point has only received a single 60kW module, the requested 80kW cannot be called up. The first charging point, on the other hand, does not fully utilize the power of the two power modules, as it has been limited to 100kW instead of 120kW.



Caution: The control of modular DC charging stations has not yet been standardized via OCPP. The CSMS offers a generic option for configuring and controlling modular DC charging stations. However, it must be checked in each individual case whether the function is compatible with the respective charging station.

Variants

Due to the lack of standardization, different variants are supported by the CSMS:

Configuration of Charging Stations with several Charging Points

Variant with one charging station and multiple charging points:

A charging station has multiple charging points that share power modules. The charging station is created in the CSMS as described in chapter 2.2.3 Charging Station Configuration.

Once at least two DC charging points have been created (automatically or manually), the information about the power modules can be added. To do this, activate the "This charging station uses shared power modules for DC charging" function in the charging station configuration dialog and enter the following data:

- > Number of power modules: Number of power modules available in total for the DC charging points.
- > Power of each module: Power in kilowatts provided by each module.



Configure Charging Station

As sub-element of
Matrix Charger 2

The connection URL for the Charging Station
wss://ws.staging.vcham.works/ocpp/s1d9u2cnr2/modular_dc_charger

Modular Charging Station	+
Charging Point 1	+
Connector 1	
Charging Point 2	+
Connector 1	

Charging Station Name*
Modular Charging Station 24 / 255

Connection Data
OCPP ID Charging Station*
modular_dc_charger 18 / 64

Custom Username
Username*
modular_dc_charger ?
Password (already set) ?

Power Supply
Maximum Current*
200 A ?

This charging station uses shared power modules for DC charging

Number of power modules*
3 ?

Power of each module*
60 kW ?

Optional

Configuration of several Charging Stations with only one Charging Point

Variant with multiple charging stations and one charging point each:

If each charging point uses its own OCPP connection, this charging point is referred to as a charging station in accordance with the OCPP standard and must therefore also be created as a separate charging station in the CSMS.

If multiple charging stations share a power unit, the charging stations must be created under a group (not a location). Only DC charging stations that are supplied by the same power unit may be included in this group.

The settings are not made at the charging station, but in the configuration dialog of the group. After the "This group uses shared power modules for DC charging" function has been activated, the following data must be entered:

- > Number of power modules: Number of power modules available in total for the DC charging points.
- > Power of each module: Power in kilowatts provided by each module.

After saving, the icon of the group changes and is framed.



General

Peak Shaving

Advanced Settings

Configure Modular Charging Station 1

Groups are areas within a location in which other groups or charging stations are located.

Group Name*

Modular Charging Station 1

26/255

?

Power Supply

Number of phases :*

3

Maximum Current*

1000

A

?

Phase Voltage*

230

V

?

Power Supply Limit*

690

kW

?

☒ This group uses shared power modules for DC charging

Number of power modules*

3

?

Power of each module*

60

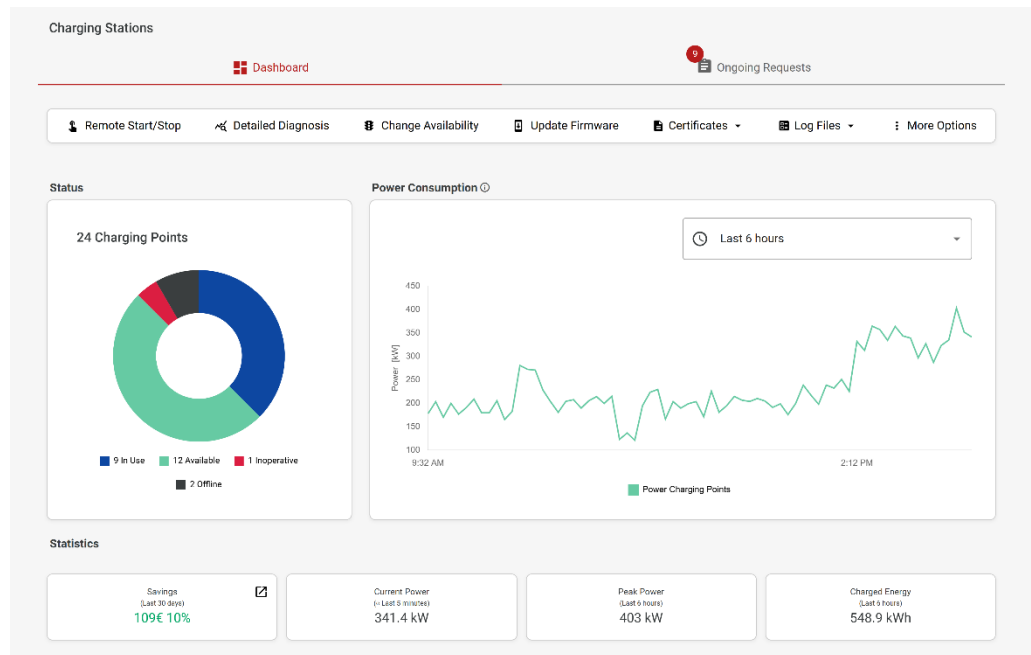
kW

?

Cancel

Save

2.2.4 Status Overview



Status Overview

The status overview shows all charging stations in one of the following categories:

- > In Use: A vehicle is connected to this charging point
- > Available: No vehicle is connected to this charging point, but ready to use
- > Inoperative: This charging point cannot be used at the moment
- > Offline: The charging station is not connected or startup process not completed successfully

The view is limited to those charging stations, which are configured within the current selected group and their sub-groups.

Power Consumption

A summary of usage, including various statistics, is displayed for each group, charging station, and charging point. The statistics contain data from the selected time interval. The time interval can be adjusted via the [Date Range] dialog. You can either use a preset option (e.g., last 7 days) or select any time period using the date/time selection. You can also select a time period with the mouse (hold down the mouse button to select the range).

The data is aggregated from all charging points that belong to this group / charging station.

Two different consumption curves can be displayed:

- > Power consumption of the charging points (green): Contains the consumption totaled for all selected charging points (depending on the selected group). The consumption is sent from the charging station to the CSMS at regular intervals. The frequency can be influenced via the configuration parameters (see 2.2.10 Configuration Parameters, section "Recommended Parameter Values"). The resolution in the statistics depends on the frequency. As the consumption values of several charging points are

not sent to the CSMS synchronized in time, this can lead to incorrect displays if consumption fluctuates.

- > Power consumption of the infrastructure (gray): If dynamic load management is used, the building consumption is also displayed in the graph. As the building consumption includes the consumption of the charging points, the building consumption is usually higher than the consumption of the charging points. However, this does not apply if there are local generators, such as photovoltaics.

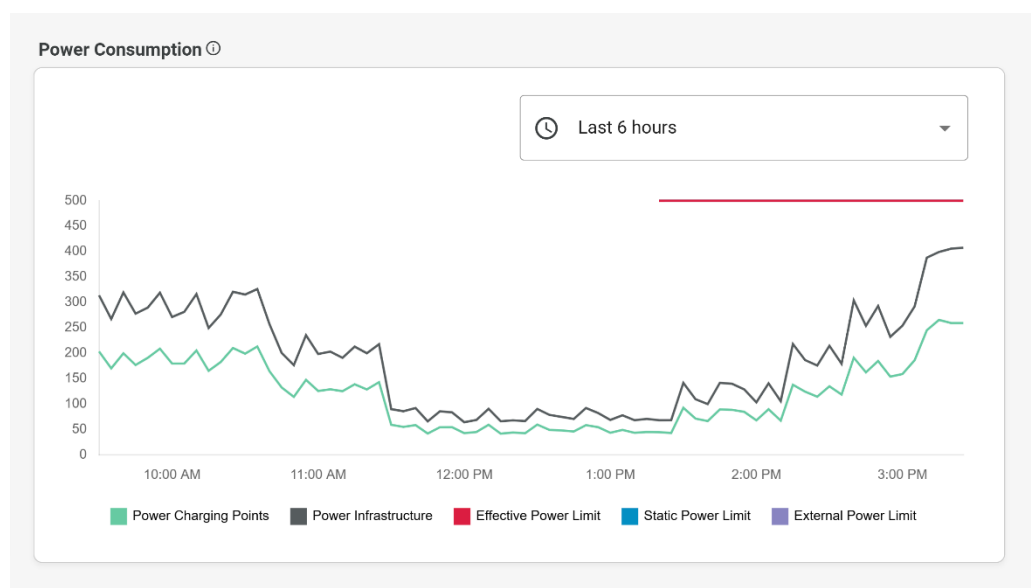
In addition to the consumption values, the load limits are also displayed when load management is activated:

- > Power limit (blue): The power limit that is configured in the CSMS. If time-variable power limits have been set (see 2.2.2.3 Power Schedule Configurations), the line in the diagram changes over time. If load management was subsequently activated, the line only starts from this point in time.
- > External power limit (purple): The limit set by an external system (see 2.2.2.7 External Power Limits).
- > Effective power limit (red): The minimum of the previous power limit that was actually applied in load management.

Lines that are not relevant can be hidden by clicking on them in the legend. The entry is then shown crossed out.

The graph shows averaged values at 5-minute intervals. The charging station can send readings at shorter or longer intervals. If the charging station sends readings at shorter intervals, the average of the 5-minute interval is used. If the charging station sends readings at longer intervals, the previous reading is used until the new value is received. In the latter case, upon receipt of a new measurement value, the display is retroactively adjusted to the updated value.

The Power Consumption report (see 2.8.3 Power Consumption) can be opened via the export icon in the upper right corner. The filter settings are carried over from the chart.



Temperatures

In addition to consumption, temperature measurements from the charging stations can also be displayed. To do this, change the view in the diagram using the [Temp] button.

The diagram is used in the same way as the consumption diagram. Different time intervals can be selected and individual curves can be shown or hidden using the legend.

The view is not available at the region, location, and group levels, as the diagram quickly becomes complex for a group of charging stations and temperature values cannot be summed up like consumption values. To display the temperature values, the desired charging station must therefore be selected.

If values have been received from several temperature sensors, the diagram contains one curve per temperature sensor. The label in the legend contains the name of the charging station/charging point and the location of the temperature sensor.

The charging station must be configured accordingly for the temperature values to be sent. The parameter can be edited via the CSMS (see 2.2.10 Configuration Parameters):

- > Parameter: MeterValuesSampledData
- > Additional value: Temperature

The value should be added and the existing values should not be replaced/removed. To add a new value to the parameter, first add a comma and then the value at the end.



Example:

Old Value:

Energy.Active.Import.Register,SoC,Power.Active.Import

New Value:

Energy.Active.Import.Register,SoC,Power.Active.Import,Temperature



Note: Not all charging stations have temperature sensors installed, and the positions of the temperature sensors may also vary between charging station models. Details on the temperature sensors can be found in the charging station manual.



Limitation: Temperature values from charging stations can currently only be received via OCPP1.6.



- Charging Sessions** All active charging sessions are displayed in two different views:
- > Details: Tabular view of the charging points
 - > Schedule: Display of past, current and planned charging sessions

Details

Charging points are displayed in a table in the Details section. You can customize which columns are displayed. These settings are saved separately for each user. Clicking the gear icon in the upper-right corner displays a list of all available columns. You can use the checkboxes to show or hide columns. The default configuration can be restored using the [Reset to Default] button.

The data displayed depends on the current status of the charging point. Some columns contain data only when the charging point is in use and a charging session is active. The entries in the action menu also depend on the current status of the charging point. Only actions that are applicable in the current state are displayed.

When a charging session is active, the priority of the charging session is also displayed in the "Status" column. A single arrow icon indicates "High" priority, while a double arrow icon indicates "Highest" priority. No symbol is displayed for "Normal" priority. The priority can be adjusted as described in 2.2.2.5.2 Manual Priorisation.

The number of entries displayed can be adjusted at the bottom of the table. If there are more entries than selected, you can navigate between pages using the arrow buttons.



Details

Status

Charging Station	Charging Point	Status	Vehicle	Authorization Method	Current Power	SoC	Charged Energy
C Station	Left Spot	Charging	S-V2234	n/a	50.36 kW	20 %	9.65 kWh
C Station	Right Spot	Charging	S-V4015	n/a	49.68 kW	97.5 %	48.92 kWh
C Station	Left Spot	Charging	Bus S-V7601	n/a	81.21 kW	90 %	73.28 kWh
C Station	Right Spot	Charging	S-V6010	n/a	38.5 kW	35 %	25 kWh
C Station	Left Spot	Charging	S-V1012	n/a	39.65 kW	60 %	17.35 kWh

Items per page: 5

Choose visible columns

- ☒ Charging Station
- ☒ Charging Point
- ☐ Manufacturer
- ☒ Status
- ☒ Vehicle
- ☒ Authorization Method
- ☐ Assigned Power by Load Management
- ☒ Current Power
- ☒ SoC
- ☒ Charged Energy
- ☒ Duration
- ☒ Predicted Total Charged Energy
- ☒ Predicted End Of Charge Time

Reset to defaults

Detection of Charging Pauses

If the vehicle is currently in a charging pause, this is indicated by a separate status. There are two possible reasons for a charging pause:

- > The vehicle does not require any further energy and switches to pause mode (paused by vehicle).
- > Load management enforces a charging pause because no power is currently available or the charging session is to take place at a different time (Paused by load management).

For DC charging sessions, the CSMS does not receive an explicit message when the vehicle enters a charging pause. Therefore, the CSMS assumes that the charging session is paused if the vehicle consumes less than 1 kW of power. As soon as the vehicle consumes more than 1.5 kW, the charging session is displayed as active again.

Schedule

In the section Schedule, all active charging sessions are displayed as blue bars. Each charging session is assigned to the corresponding charging point. A pop-up with detailed information is displayed after a click on the bar.

The bar contains the actual charging power (kW) for running charging sessions or the start time for sessions planned in the future.

If the departure time is available, the bar ends at the given time slot. Otherwise the bar fades out.

Requests

If a new operation is started, a corresponding entry is shown in the category "Requests". Each of the listed operations has been started in the CSMS. The current status is listed in the table.

The following operation requests will be shown:

- > Change Availability
- > Restart
- > Firmware Update
- > Certificate Installation

Use the  button to select further options:

- > Details: All information related to this operation
- > Delete: Some operations can be deleted. This is only possible if the operation is planned for the future and not already sent to the charging station.

2.2.5 Charging Point State Diagnosis

Summary

If a charging station / charging point is not connected correctly or is faulty, a status diagnosis is displayed in the dashboard. The diagnosis indicates which steps have been completed successfully and which step is the cause of the problem.

Connection Setup Diagnostics

The connection setup contains several individual steps, all of which must be successfully completed in succession. If the diagnostics detects an error, the corresponding step is highlighted and displayed with further information.

First, the following steps must be successfully completed in accordance with the OCPP standard:

- > Internet Connection: The charging station must establish a TLS-protected connection to the CSMS backend.
- > Authentication: The charging station must authenticate correctly with username and password. This step can be optional for on-premise installations.
- > Websocket Connection: The charging station must establish a valid websocket connection.
- > Startup: The charging station must register correctly with OCPP messages.



Dashboard

Requests

Restart
Remote Start/Stop
Change Availability
Update Firmware
Configure Parameters
More Options

Status Diagnosis

Internet Connection

Authentication

Websocket Connection

Startup

No connection with the charging station. Verify the OCPP and network configuration in the charging station settings.

To help you to configure your charging station, you can use our commissioning slides, which show how this works for different manufacturers:
[Commissioning Slides](#)

Following OCPP connection URL must be configured in the charging station

`wss://ws.staging.vcharm.works/ocpp/s1d9u2cnr2/One`

The network configuration of the charging station must allow a websocket connection to the Internet via port 443. Firewall / proxy settings may have to be checked for this.

Since communication is encrypted via TLS, the charging station's system time must be correct. If the root certificate of the certification authority is not yet installed on the charging station, the following file can be used:

[CRT Format: https://comodoca.my.salesforce.com/sfc/p/#1N000002Ljih/a/3l000000VZ4M/ie5Sho19m8SLjTZKH_VL8efOD1qyGF19h5Ju1ddt](https://comodoca.my.salesforce.com/sfc/p/#1N000002Ljih/a/3l000000VZ4M/ie5Sho19m8SLjTZKH_VL8efOD1qyGF19h5Ju1ddt)

2.2.6 Change Availability

Summary

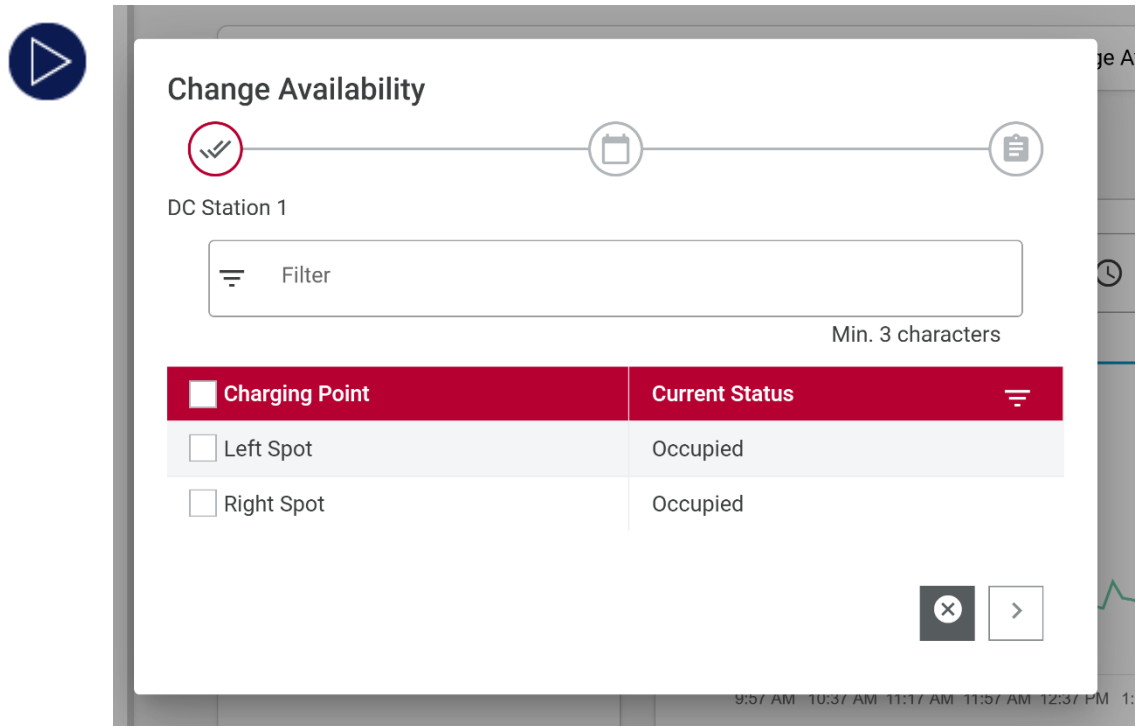
The availability of each charging point can be controlled. The following states are possible:

- > Available: The charging point can be used as long as no error is detected by the charging station itself.
- > Unavailable: The charging point is deactivated and cannot be used by any electric vehicle.

To change the availability, the [Change Availability] dialog must be opened.

Select Charging Point

In the first step, all charging points must be selected which shall be updated with a new state.



Change Availability

DC Station 1

Filter Min. 3 characters

Charging Point	Current Status
☐ Left Spot	Occupied
☐ Right Spot	Occupied

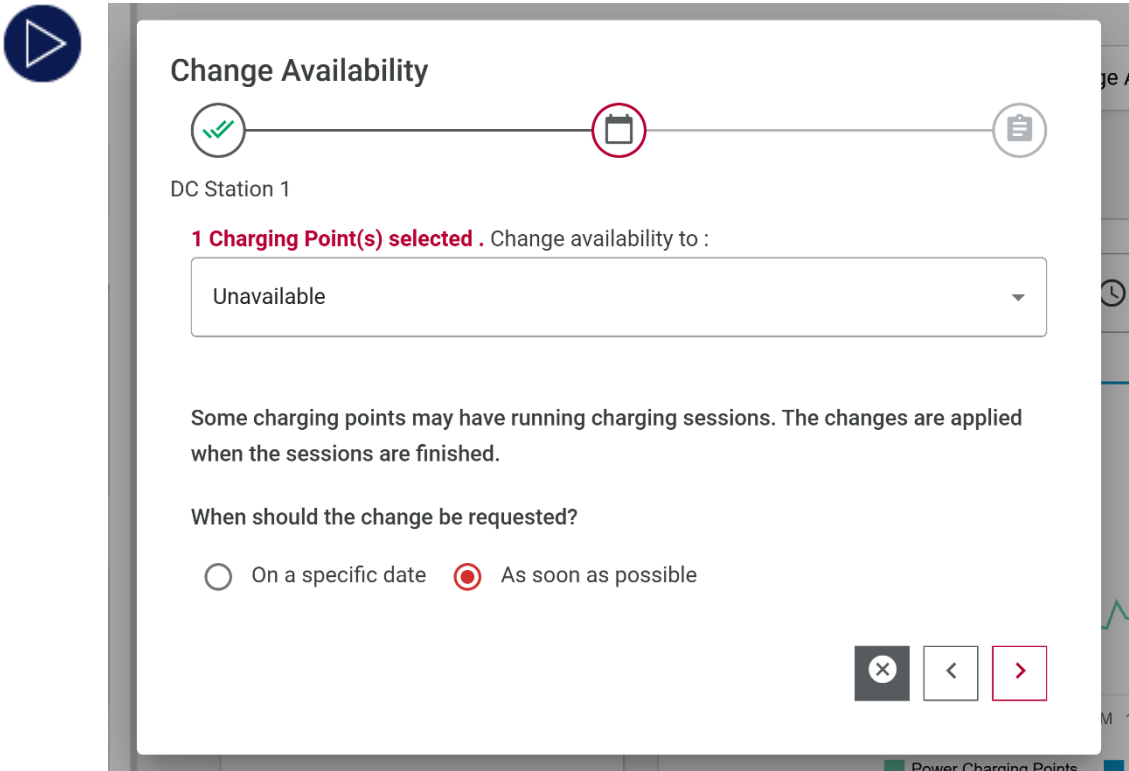
Cancel (X) Next (>)

The filter can be used to search for certain charging point names. Furthermore, the list can be filtered by the current status of the charging point by clicking on the  symbol next to "Current Status".

Select new options In the next step, the new state can be selected (Unavailable or Available).

If the new state shall be applied immediately, the check box "As soon as possible" must be activated. Otherwise, a date and time can be selected when the state change shall be sent.

For each charging point, only the last availability change will be stored and delivered to the charging station.

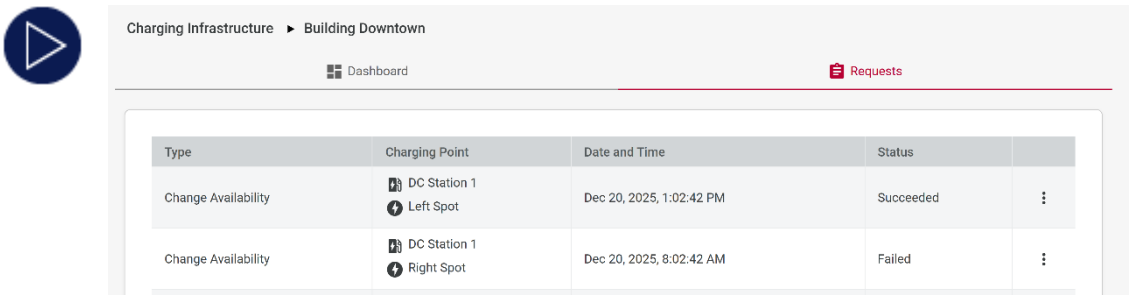


Confirmation

The last step of the dialog summarizes all information. The request will be scheduled by finishing the dialog.

Request Status

After submission, the current status of the request can be tracked under "Requests."



An ongoing request can be deleted by clicking on the  button, if the request has not been sent to the charging station yet.

2.2.7 Restart

Summary

A charging station can be restarted. This is usually necessary when the charging station does not behave as expected or an error prevents the charging of vehicles.

Select Charging Station

To restart a charging station, the [Restart] dialog must be opened. This command is only available for a charging station node, not for a group of charging stations.

Confirmation

The restart request can be postponed until a running charging session is completed. If the charging station shall be restarted although a charging session is active, the check box "Stop running charging sessions" must be activated.

The request will be scheduled by closing the dialog.



Restart request

A restart request is about to be sent to DC Station 1

The charging station may have running charging sessions. Shall they be stopped remotely or shall the restart be postponed until the charging sessions are finished?

☐ Stop running charging sessions



Request

After submission, the current status of the request can be tracked under "Requests."



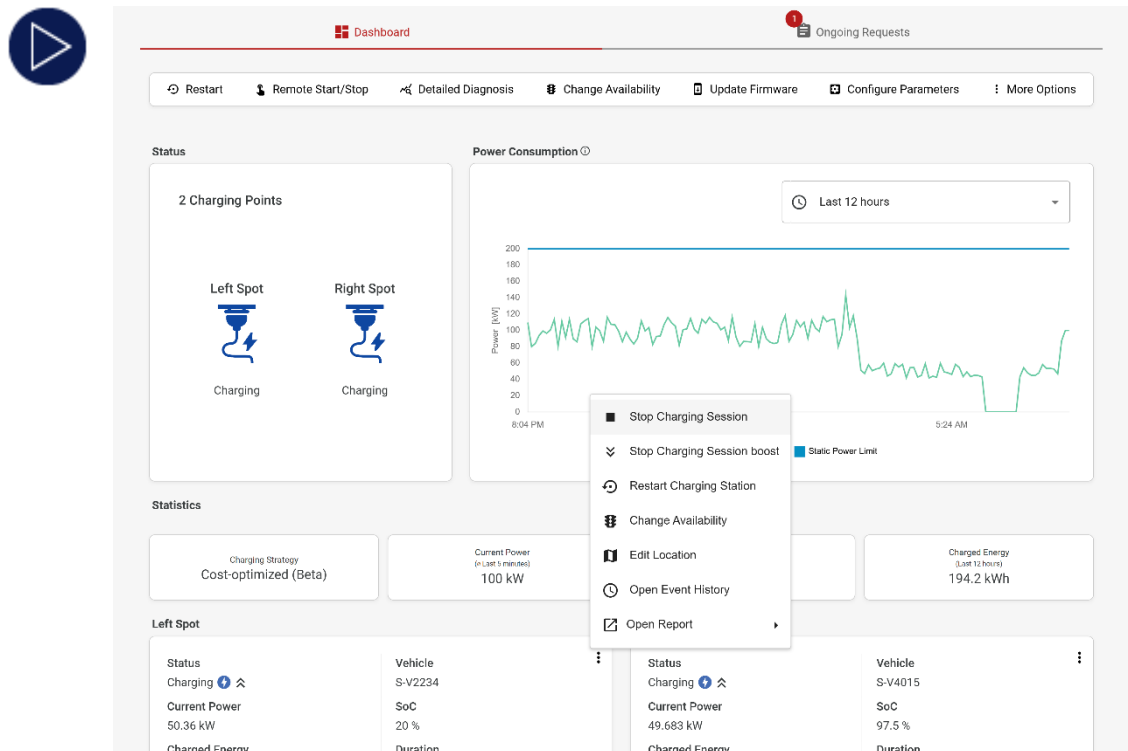
Caution: A reset will abort all running charging sessions. It is not guaranteed that a charging session will be resumed after the reset. It might be necessary to re-plug the cable.

2.2.8 Remote Start/Stop

Summary

New charging sessions can be authorized, and ongoing charging sessions can be stopped.

The function can be accessed either from the action menu via the [Remote Start/Stop] entry or in the Details view in the action menu via the [Authorize Charging Session] or [Stop Charging Session] entries.



Start Charging Session

If a new charging session is to be authorized, the desired charging point must first be found.

- > Variant 1: Search for the charging point in the Remote Start/Stop dialog. The list is based on the current group that was previously selected. If the list is very long, the text search can be used for filtering. Once the desired charging point has been found, the desired vehicle can be selected via the Start button.
- > Variant 2: Search for the charging point in the details table. The list is based on the current group that was previously selected. If the list is very long, the text search can be used for filtering. Once the desired charging point has been found, the desired vehicle can be selected via the [Authorize Charging Session] action menu.

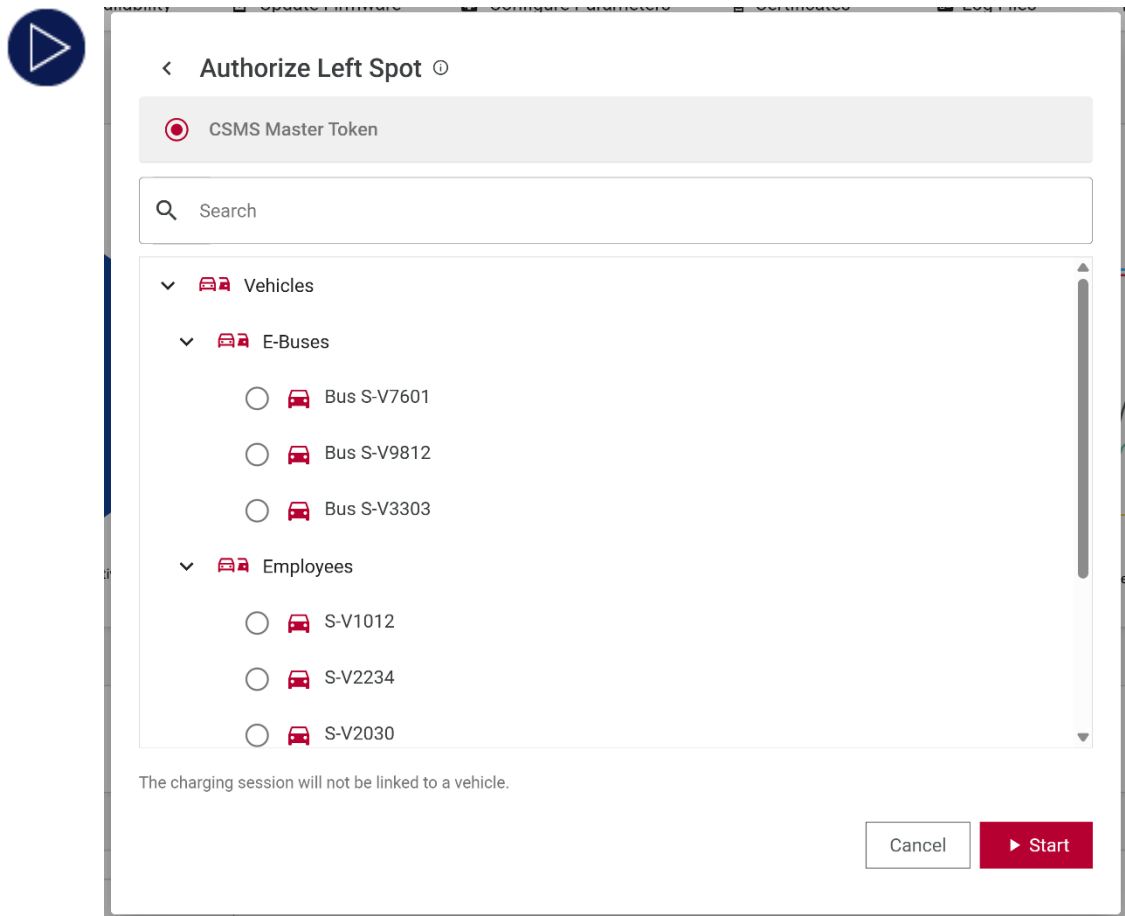
Vehicle Selection

Before starting the authorization process, a vehicle must be selected. The token for the selected vehicle is used during authorization, which links the charging session to that vehicle. The selection list displays only vehicles that are authorized to charge at the selected charging point and for which a valid token has been configured. If multiple tokens have been configured, one of them is selected automatically. When the charging process is subsequently started, this

token is used in the background for authorization, and the charging session is linked to it.

The selection dialog is sorted by vehicle groups and can be filtered using the search field. If the charging session is not to be linked to a specific vehicle, a default token (CSMS Master Token) can be used instead.

The user can then plug in the charging cable, and the charging session will begin. Only then does the charging point status change. If the user does not plug in the cable for an extended period, re-authorization may be required (depending on the charging station).



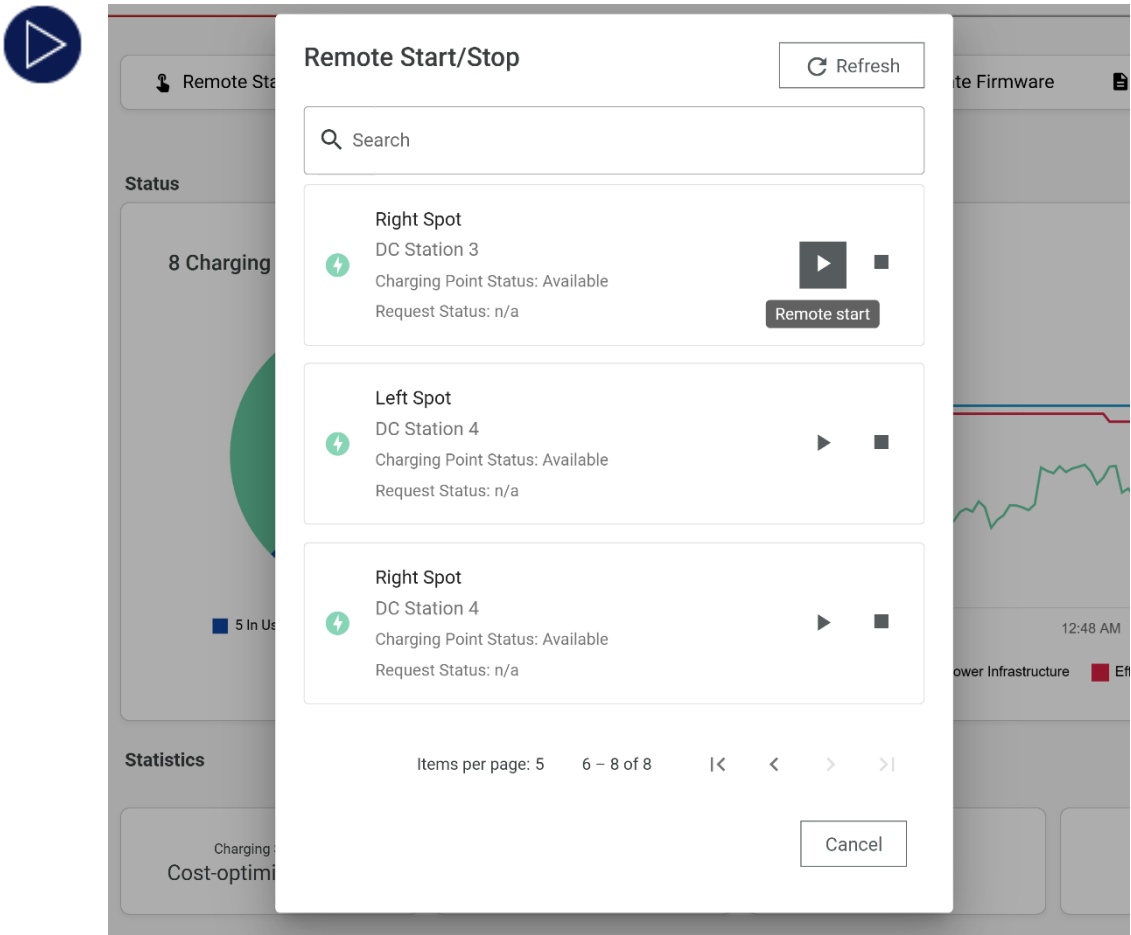
Stop Charging Session

If an ongoing charging session is to be stopped, the desired charging point must first be found.

- > Variant 1: Search for the charging point in the Remote Start/Stop dialog. The list is based on the current group that was previously selected. If the list is very long, the text search can be used for filtering. Once the desired charging point has been found, the charging session can be stopped using the Stop button.
- > Variant 2: Search for the charging point in the details view. The list is based on the current group that was previously selected. If the list is very long, the text search can be used for filtering. Once the desired charging point has

been found, the charging session can be stopped via the [Stop Charging Session] action menu.

The charging session is then displayed as completed. The charging point is only available again after the user has unplugged the cable.



2.2.9 Firmware Update

Summary

New charging station firmware versions can be installed remotely. The firmware must be provided by the charging station manufacturer.



Caution: The charging station manufacturer and the charge point operator must ensure that only compatible and released firmware versions are used for updates. Incompatible software can lead to an outage of the charging station and/or to damage of the hardware.



Caution: The charging station is not available during firmware updates. An update will abort all running charging sessions. It is not guaranteed that a charging session will be resumed after the update. It might be necessary to re-plug the cable.

Select Firmware

To start a firmware update, the [Firmware Update] dialog from the action menu must be opened. First, the new firmware must be selected. The dialog shows all available firmware versions, which have been uploaded before and are compatible with the selected charging station. Alternatively, an URL can be used, which points to a HTTP or FTP server providing the new firmware file.



Firmware Update

☒ Use file
 ☐ Use URL

Upload new firmware

2020-05-Firmware.bin

Upload

Available firmware files:

Vector Firmware
2.0

Selected: Vector Firmware

Firmware Upload

If no compatible firmware is available, new firmware files can be uploaded. After selecting the correct file from the hard drive, additional information can be entered after clicking the [Upload] button. It is mandatory to enter a name. If

additional properties are specified, e.g. the model, this information is used to check the compatibility and filter the list.

Available firmware files can be edited, downloaded and deleted by using the corresponding buttons in the dialog.



Editing Firmware info

Name *

Vector Firmware

Vendor

Vector

Suitable for model

vSECC

Version

2.0

Suitable for versions (comma separated)

1.9, 2.0

Description

New Features:

Firmware URL

If no firmware file is available, the firmware can be also provided as HTTP or FTP URL. This URL can be either provided directly by the charging station manufacturer or hosted locally.



Note: The charging station must have access to this URL, i.e. if the URL refers to a public internet address, the charging station must be also connected to the internet.

Security

Optionally, the charging station manufacturer can secure the firmware with a digital signature. The signature can be used to detect manipulations of the firmware.

If the charging station manufacturer requires this security mechanism, a certificate file and the signature file must be provided together with the link to the new firmware version.

Select Charging Station

Firmware updates can be installed on one or several charging stations.

If the dialog is started from a charging station node, this charging station is automatically selected for the update. If the dialog is started from a group node, the desired charging stations can be selected from a list.



Update Firmware

Filter

☐ Charging Station	Model	Vendor	Current Version
☐ DC Station 1 from Depot City-Center	vSECC	Vector Informatik	1.0.0
☐ DC Station 2 from Depot City-Center	vSECC	Vector Informatik	1.0.0
☐ DC Station 3 from Depot City-Center	vSECC	Vector Informatik	1.0.0
☐ DC Station 4 from Depot City-Center	vSECC	Vector Informatik	1.0.0

The filter can be used to search for certain charging station names. Furthermore, the list can be filtered by the current firmware version of the charging station by clicking on the symbol next to "Current Version".

Scheduled Update

Updates can be scheduled for a future date, e.g. at a time when no charging sessions are expected. If the firmware update shall be started immediately, the check box "As soon as possible" must be activated.

Furthermore, the firmware update can be postponed until a running charging session is completed. If the update shall be started although a charging session is active, the check box "Force to end running transactions" must be activated.

Confirmation

The last step of the dialog summarizes all information. The update will be scheduled by closing the dialog.

Request Status

After submission, the current status of the request can be tracked under "Requests."

An ongoing request can be deleted by clicking on the button.

Review new firmware version

After the firmware has been installed successfully, the new version can be reviewed in the details section of each charging station.

2.2.10 Configuration Parameters

Summary

Charging stations can offer several parameter and sensor values, which can be accessed via the CSMS. The number of parameters depends on the charging station model. The CSMS provides a generic view to show and change these values.



Caution: The parameters can have direct impact on the behavior of the charging station and the charging session. Please read the charging station documentation carefully regarding the meaning of the parameters, before changing any values.

Invalid parameter values can lead to an outage of the charging station and/or to damage of the hardware.

Value Overview

The configuration parameters can be accessed in a separate view, which can be opened via the button [Configure Parameters] of a selected charging station. This view is not available on group node level.

Parameter Structure

The parameters are represented as a tree view. The structure and the parameters are defined by the charging station manufacturer; therefore, this list can vary for each charging station model / manufacturer.

Each parameter can have the following characteristics, although some of them are optional:

- > Unit: The representation unit of the value, e.g. C°, RPM, ...
- > Values:
 - > Current: The last value reported by the charging station
 - > Set-Point: The desired target value
 - > Minimum: The current value shall not be lower than this minimum
 - > Maximum: The current value shall not be greater than this maximum
 - > Persistence: If the parameter is persistent, the value is stored in the charging station permanently and is still available after a restart. If the parameter is not persistent, the value is lost after a restart.



* ClockCtrl ⓘ
 * EVSE ⓘ
 * Fan ⓘ
 ↳ Left (Unknown Charging Point)
 ↳ Speed

Attribute : defaultInstance ⓘ In the charging station

Desired new value

Current 923 RPM	→	⊘
Set-Point 1000 RPM	→	Set-Point RPM Default value : 1000
It is a NOT persistent parameter Minimum 0 RPM	→	Minimum RPM Default value : 300
Persistent parameter Maximum 1200 RPM	→	Maximum RPM Default value : 1200
Persistent parameter		

↳ Right (Unknown Charging Point)

* OCPPCommCtrl ⓘ

* SmartChargingCtrl ⓘ

Refresh

The displayed values can be refreshed in two different ways:

The  button updates the displayed values with the latest values available in the CSMS. If the CSMS and the charging station are out of sync, the values could be not up-to-date.

The  button discards all stored values and requests the current values from the charging station.

Modify Parameters

The left part of the view shows the current values. Each value can be modified on the right hand side of the view. Modified values are marked with a grey background.

Selection of Charging Stations

After all desired values are modified, the modifications must be stored by pressing the  button.

In the last step, it is possible to select the charging stations to which the changes made are to be sent. If the same change is to be made at several charging stations, these can be selected in the dialog.



Caution: All charging stations are displayed in the selection dialog, regardless of whether the changed parameters are supported by the respective charging station model. In addition, there are different ways of writing parameters between charging station models, which must also be handled separately.

It is therefore recommended that the desired changes are made separately for each model type and sent to all charging stations of the same model type.

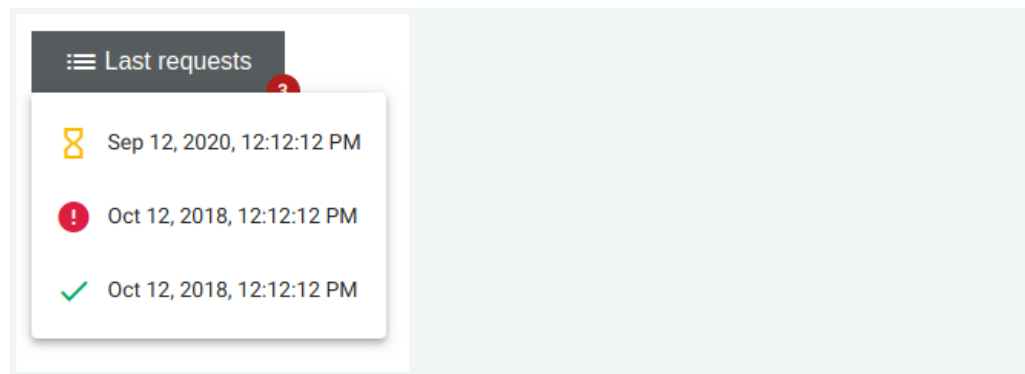
Read / Write Only

Some parameters can be read-only, e.g. sensor values. These parameters cannot be modified. The input field for the new value is marked with .

Some parameter can be write-only, e.g. user credentials. These parameters can be updated, but the current value is not displayed. The current value is marked with .

Previous Changes

Parameter changes from the past are stored and can be reviewed in the "Last requests" list. The entries show the current state of the request and the parameters which have been changed.

**Recommended Parameter Values**

There are a number of parameters that influence the behavior of the charging station and the OCPP communication with the CSMS. It is the task of the charge point operator to decide which of the parameters need to be changed and which values are appropriate.

The following parameters are recommended to be checked and changed if necessary:

- > MeterValueSampleInterval: Maximum 900 (15min), minimum 300 (5min)
- > AllowOfflineTxForUnknownId: Can increase availability if the Internet connection is unreliable and no edge-device is used
- > MeterValuesSampledData see 2.2.2

MeterValue-Sample-Interval

If the value for MeterValueSampleInterval should be chosen smaller than 300, not all values will be stored by the CSMS. The CSMS stores values only if they contain relevant changes and the number does not exceed certain limits.

2.2.11 Log Files**Summary**

For failure diagnostic it is possible to download log files from charging stations. The content and format of the log file depends on the charging station model. The CSMS stores received log files and provides an overview of already stored files with a download option.

Request Log File

Before a log file can be downloaded, the file must be requested from the charging station. The [Request Logs] dialog can be started from the action menu [More Options] and the sub-menu [Log Files].

Select Charging Station

If the dialog is started from a charging station node, this charging station is automatically selected for the request. If the dialog is started from a group node, the desired charging stations can be selected from a list.

Log File Content

The content of the log file can be limited with two options:

- > All logged events: All logged events are uploaded (Security events included)
- > Security events: Only security relevant events are uploaded

Furthermore, the time range of the log entries can be limited. If no time range is given, all available log entries are uploaded.



Note: The charging station manufacturer decides which events are security relevant, thus the granularity of log files could differ between different charging station models.



Caution: The size of the log files could differ depending on the settings mentioned above, the charging station model and the number of charging sessions. The time required for the upload of log files varies depending on the size. If the charging station is connected via UMTS or similar, this could cause additional costs.



Request Log Files from Charging Stations

✓

⌂

📄

1 Charging Station(s) selected

Which events shall be included in the log file ?

☒ All logged events
 ☐ Security events

Select the time range of the log files. If omitted all log entries are considered.

From

📅

03/05/2020, 12:50

×

To

📅

11/05/2020, 12:50

×

✕

<

>

Confirmation

The last step of the dialog summarizes all information. The logs will be requested by closing the dialog.

Show Log Files

Afterwards log files can be downloaded. The "Show Logs" dialog can be started from the action menu [More Options] and the sub-menu [Log Files].

Overview

The dialog shows all available log files. Each log file has one of the following status:

- > Ready for download: The file is already uploaded and stored in the CSMS. This entry can be downloaded and deleted, if not required anymore.
- > Pending: The upload is ongoing. This entry cannot be downloaded nor deleted.
- > Failed: The upload was not successful. The entry cannot be downloaded but deleted.



Charging Station	Status	Time range	Type
☐ DC Station 1	Ready for download	From Monday, 27 April 2020, 19:15:23 To Wednesday, 24 February 2021, 20:06:36	All logged events
☐ DC Station 2	Ready for download	From Monday, 27 April 2020, 19:15:23 To Wednesday, 24 February 2021, 20:06:36	Security events
☐ DC Station 1	Pending ⓘ	From Monday, 27 April 2020, 19:15:23 To Wednesday, 24 February 2021, 20:06:36	All logged events
☐ DC Station 2	Pending ⓘ	From Monday, 27 April 2020, 19:15:23 To Wednesday, 24 February 2021, 20:06:36	Security events
☐ DC Station 1	Failed ⓘ	From Monday, 27 April 2020, 19:15:23	All logged events

Items per page: 5 1 - 5 of 8 < >

0 Log file(s) selected

2.2.12 Stationary Battery

Summary

Stationary batteries can support charging infrastructures in the following situations:

- > Expansion of the grid connection can be avoided with additional power from a battery during peak loads. Since no expansion of the grid connection is necessary, investment costs can be saved.
- > Peak loads on the grid connection can be reduced by a battery with additional power. Lower peak loads also result in lower grid fees.
- > With dynamic energy tariffs, energy costs can be reduced by charging the battery from the grid when energy prices are low, thereby avoiding energy consumption from the grid when energy prices are high.
- > Batteries can be combined with a PV system to increase the self-consumption of self-generated energy.

To take full advantage of these benefits, integration with the charging infrastructure is necessary. The CSMS therefore controls the battery to charge and discharge it at the right moment.

Supported Battery Models

So far, there is no standard interface for controlling stationary batteries. Modbus/TCP is generally used as the protocol, which is supported by the CSMS when using an edge device.

The Modbus/TCP registers vary from battery model to model, which means that each model requires individual integration into the CSMS. The following models are currently supported:

- > ADS-TEC ChargePost
- > Tesvolt

2.2.12.1 Configuration

Prerequisites

Before a battery is installed and configured, the load management for the charging stations should already be fully configured. Depending on the selected charging strategy, the battery is used differently in the charging schedule. With the "Balanced" charging strategy, the battery storage system is discharged as soon as the grid connection capacity is no longer sufficient for all ongoing charging sessions. With the "Schedule-based" strategy, the battery storage is used in such a way that the vehicle is fully charged in time for the departure time. Additionally, charging sessions with the "Highest" priority always receive energy from the battery storage, if necessary.

Configuration

A battery can be added in the "Charging Infrastructure" view. Similar to a charging station, batteries are added via the topology menu. The battery can be created at the location and group level. If multiple batteries are used at the same location, they must not be created at different levels in the topology.

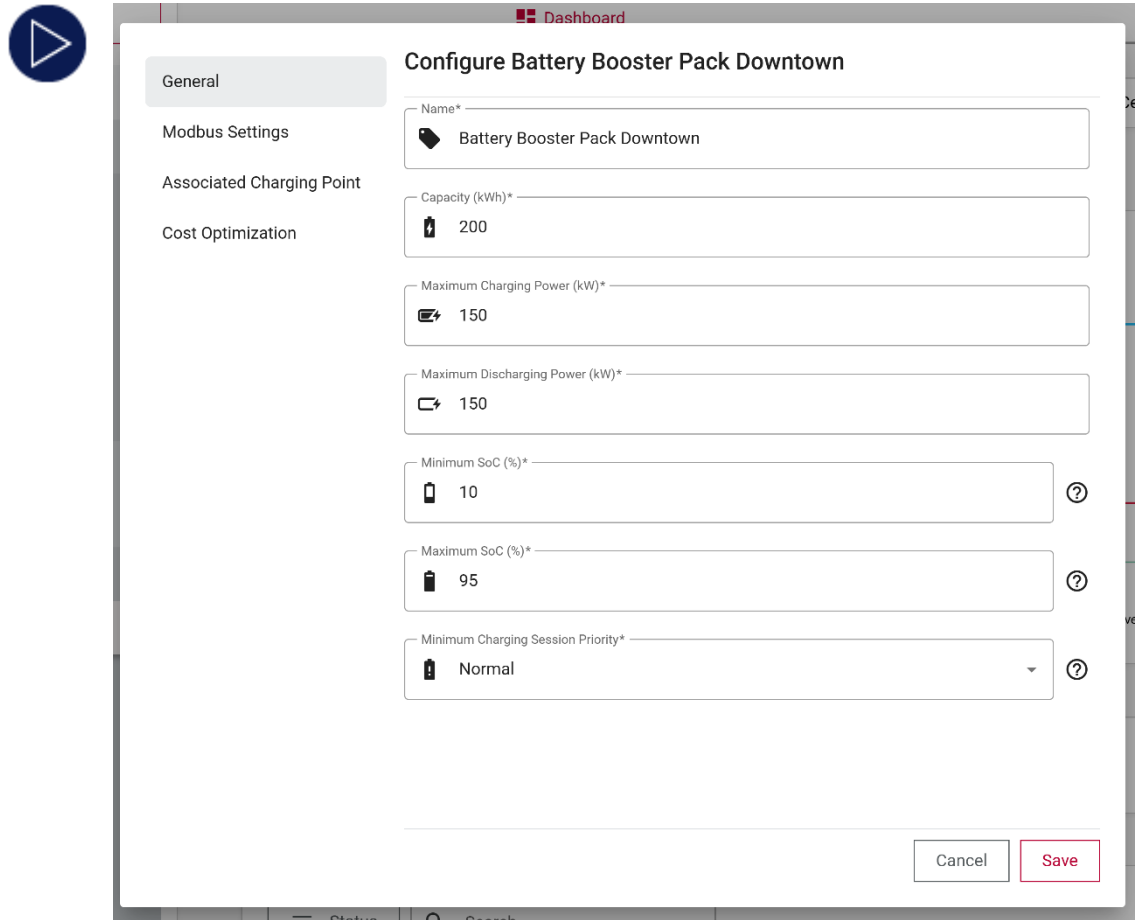
The power limits at the location and at the groups must also include the power for charging the battery and be adjusted if necessary.

Configuration Parameters

The configuration dialog box is opened via the [Add battery] menu.

General settings:

- > Name: A meaningful name for display in the CSMS
- > Capacity: The storage capacity of the battery in kWh
- > Maximum charging power: The maximum power in kW at which the battery can be charged
- > Maximum discharge power: The maximum power in kW at which the battery can be discharged.
- > Minimum SoC: The state of charge (SoC) in percent that should not be fallen below. Load management does not discharge the battery below this value or charges the battery with the highest priority if the value is fallen below.
- > Maximum SoC: The load management system charges the battery until this value is reached. If the battery can only be charged up to a certain SoC, this value should be entered as the maximum.
- > Minimum Charging Session Priority: If the battery is to be reserved for charging sessions with higher priority, this can be configured using this parameter. The charging session must then have at least this priority for the battery to be scheduled as a backup. The priority of the charging session can be adjusted in various ways (see 2.2.2.5.2 Manual Priorisation).



Dashboard

Configure Battery Booster Pack Downtown

General

Modbus Settings

Associated Charging Point

Cost Optimization

Name*
Battery Booster Pack Downtown

Capacity (kWh)*
200

Maximum Charging Power (kW)*
150

Maximum Discharging Power (kW)*
150

Minimum SoC (%)*
10

Maximum SoC (%)*
95

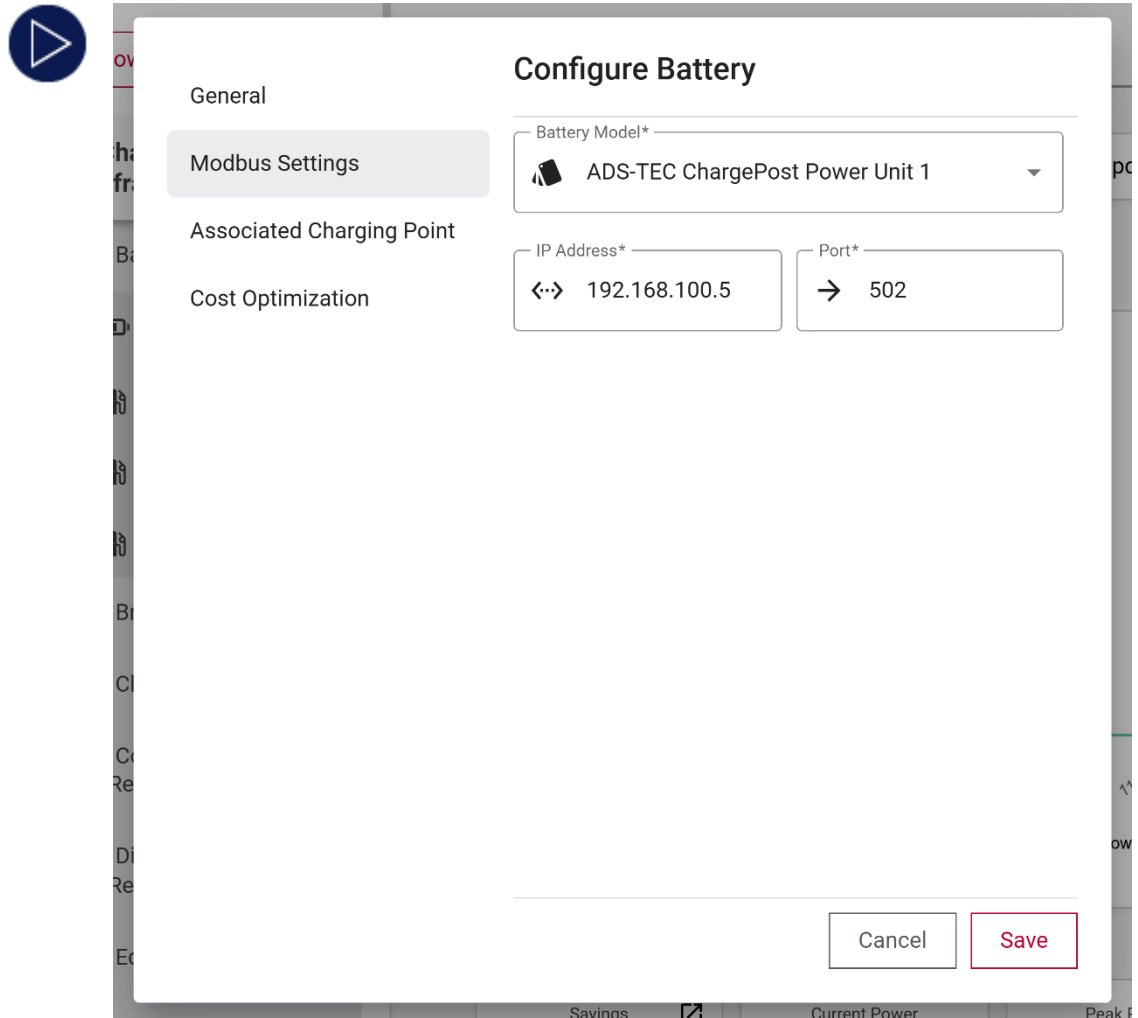
Minimum Charging Session Priority*
Normal

Cancel Save

Modbus Settings

The following settings are required for the Modbus connection:

- > **Battery model:** Since each battery model uses different Modbus/TCP registers, the correct model must be selected. New models will be added upon request.
- > **IP address:** IP address of the Modbus/TCP interface on the battery. The battery and the Edge-Device must be on the same network for communication to be established. The IP address can be adjusted in the battery settings.
- > **Port:** TCP port for establishing a Modbus connection with the battery. This information must be taken from the battery manual and can be probably adjusted in the battery settings.



Configure Battery

General

Modbus Settings

Associated Charging Point

Cost Optimization

Battery Model*
 ADS-TEC ChargePost Power Unit 1

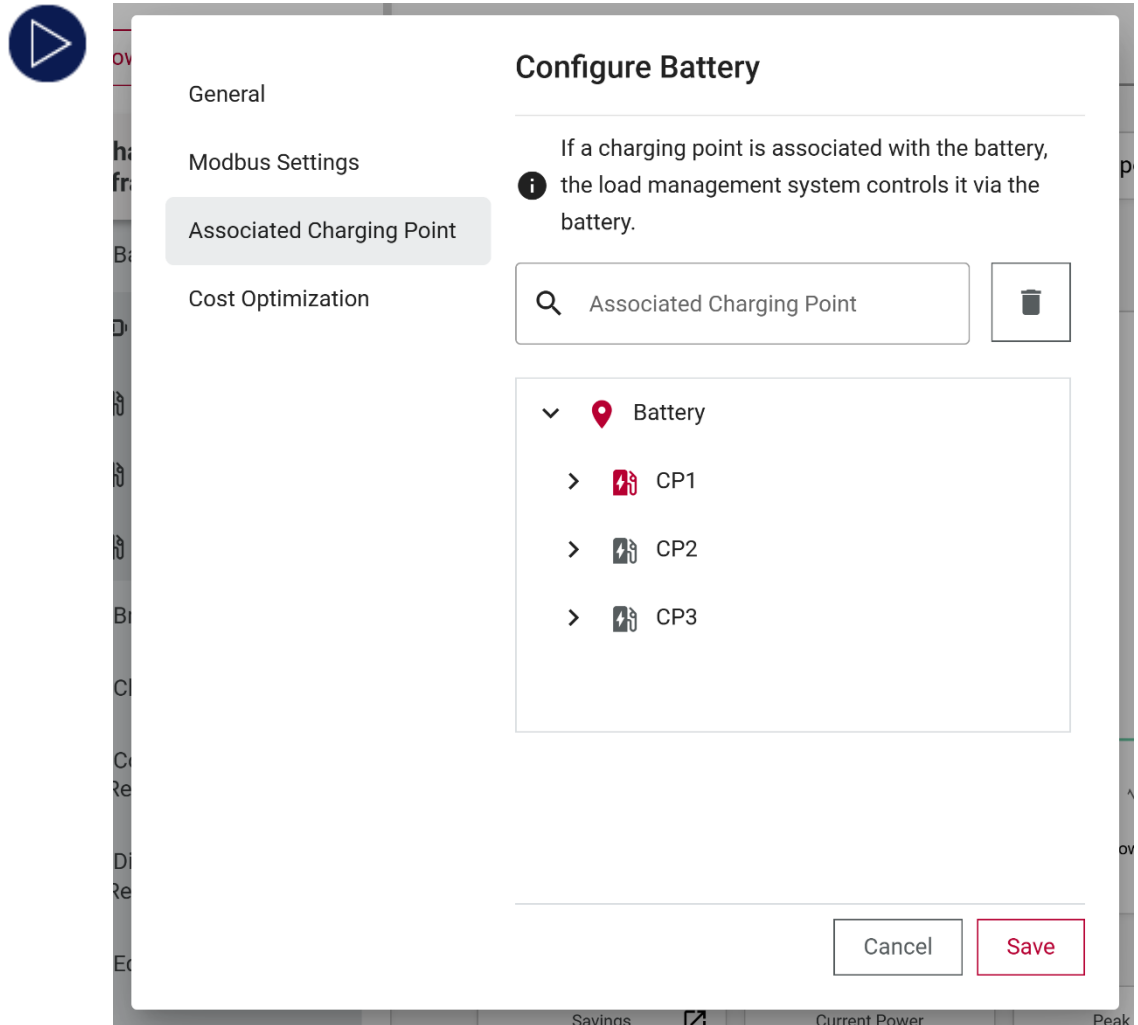
IP Address*
 <--> 192.168.100.5

Port*
 --> 502

Cancel Save

Assigned Charging Point

Certain battery models are an integrated system with a charging point. For these batteries, it is necessary to link the charging point in the configuration. The charging point must already be created and can then be selected under [Associated Charging Point]. The selection can be deselected using the trash can icon.



Cost-optimized battery charging

If cost optimization in load management is activated for the location, the stationary battery is also charged in the most cost-optimized way possible.

Two additional parameters must be set for this.

Load management creates an updated charging plan for each relevant event change. If the stationary battery is not needed to charge a vehicle, the CSMS checks whether the battery should be charged during this time. If the state of charge (SoC) is lower than the value set in "Start Cost Optimized Charging above SoC," charging will begin immediately up to this value.

The remaining charge up to the value set in "Maximum SoC" is then planned. The energy costs for the next few hours are taken into account for this. The period for consideration is set in "Optimization window". Within this time, enough energy is planned until the battery is charged to the desired SoC. Care is taken to ensure that the energy is charged at the lowest possible cost.

If a vehicle charging session or other relevant event occurs in the meantime, planning is repeated using the same procedure and the optimization window is restarted.

Configuration Changes

A battery that has already been created can be modified later via the [Configure] menu item, moved in the topology via [Move], and removed from the configuration via [Delete].

2.2.12.2 Status Overview

Status

After the battery has been connected, a status overview with various status information is displayed. The following information is displayed in the details window:

- > Status: The connection status with the battery. If no communication can be established for more than 180 seconds, the status changes.
- > SoC: State of charge of the battery in percent.
- > Current Charging Power: The battery is currently being charged with this power in kW.
- > Current Discharging Power: The battery is currently being discharged with this power in kW.

- > **Max. Charging Power:** The maximum power at which the battery can be charged. This value can be set in the configuration and is complemented by data from the Modbus interface.
- > **Max. Discharging Power:** The maximum power at which the battery can be discharged. This value can be set in the configuration and is complemented by data from the Modbus interface.
- > **Temperature:** Temperature of the battery. The position of the temperature sensor depends on the battery model.

The diagram shows the charging and discharging power as well as the state of charge (SoC). The diagram contains separate scales for power (left) and SoC (right). Clicking on the thermometer icon displays the temperature of the battery.



2.3 Map

Summary

Charging points can be displayed in a map view. Depending on the zoom level, the charging points are displayed individually or grouped together.

If charging points are grouped, the symbol shows in the middle the number of charging points. In addition, the colored border shows the percentage distribution of the charging point status. The color codes correspond to the color codes from the "Charging Infrastructure" view.

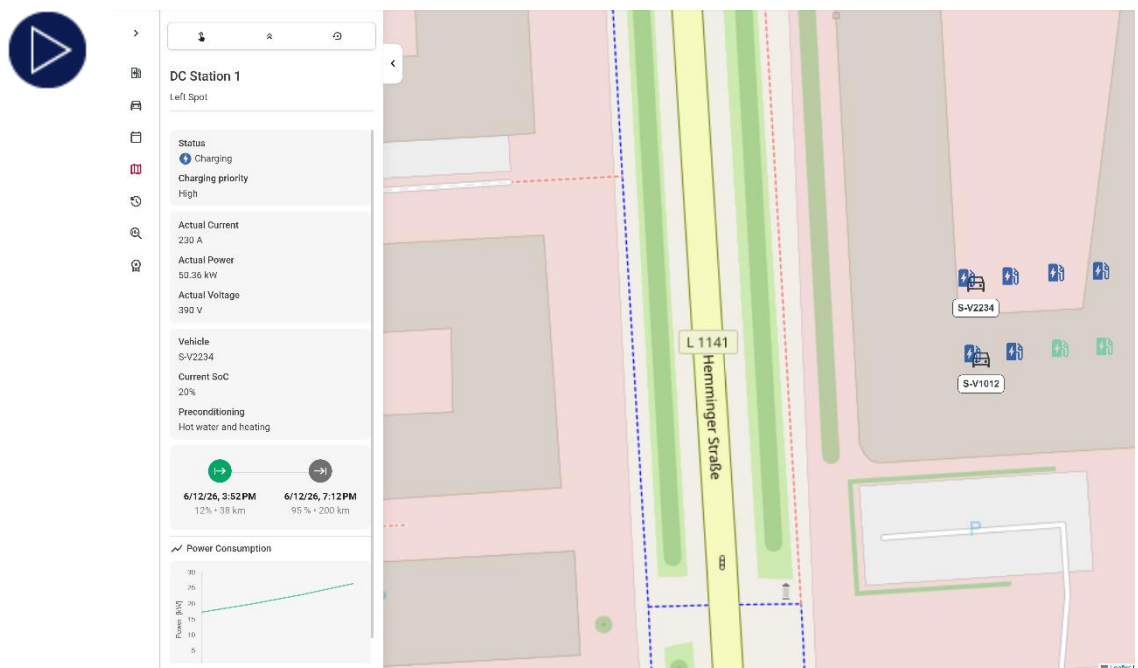
A more detailed view shows the charging point. The icon is also coloured according to its status. If a vehicle is connected to the charging point, the vehicle name is displayed next to the charging point.

Clicking on the charging point icon displays additional details in a sidebar.

At the top of the sidebar is an action menu for the following actions:

- > Remote start/stop of the charging session
- > Boost the charging session
- > Restart the charging station

Below that, information about the charging point and charging session is displayed, depending on the current status of the selected charging point.



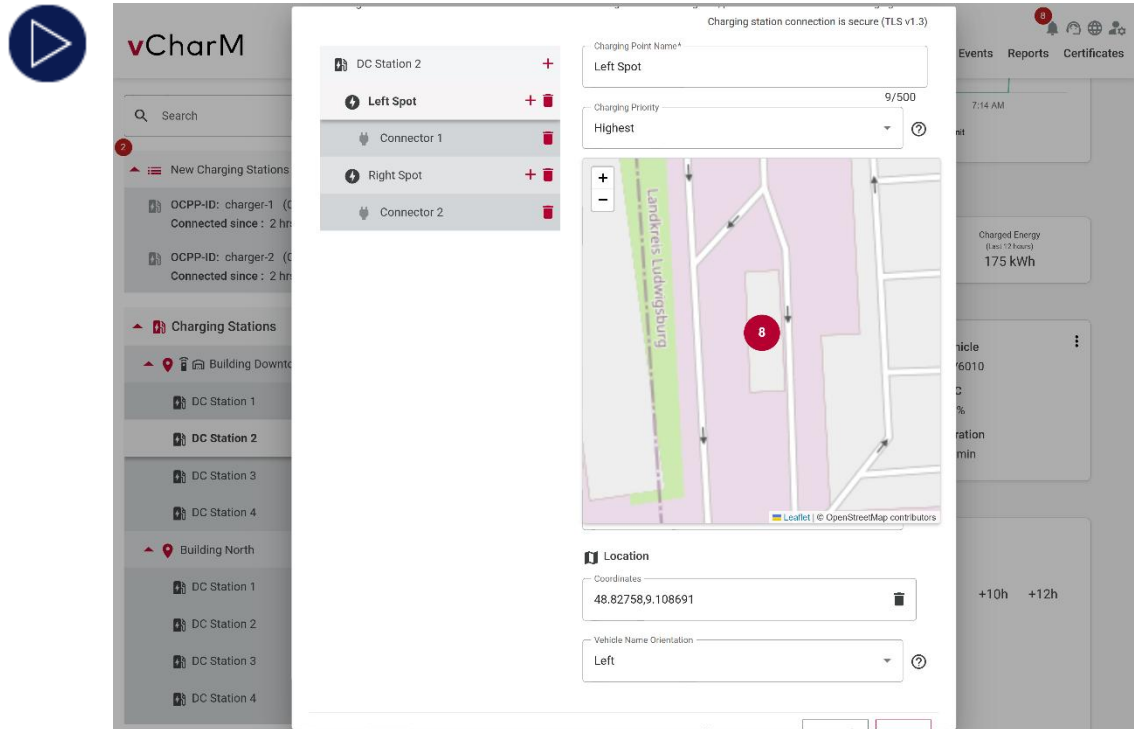
2.3.1 Location Coordinates

Configuration of Location Coordinates

Before charging points are displayed in the map view, the location must be configured. In the "Charging Infrastructure" view, the coordinates can be entered in the editing dialog for charging points.

Click in the "Coordinates" field to open a map view. There you can use the cursor to select the location of the charging point. Other charging points are also displayed, but cannot be edited.

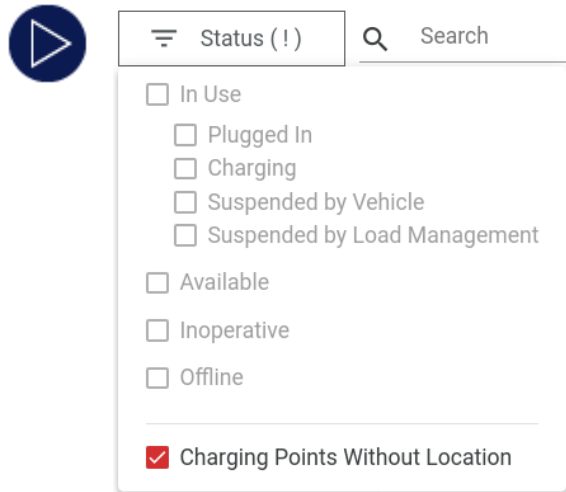
You can also specify whether the name of a connected vehicle is displayed on the left, right, above or below the charging point in the map view.



Charging Points without Location

To ensure that all charging points already have a location configuration if there are a large number of charging points, you can filter for this in the details table. Only charging points without a location configuration are displayed.

The configuration dialog can be opened directly via the action menu in the table.



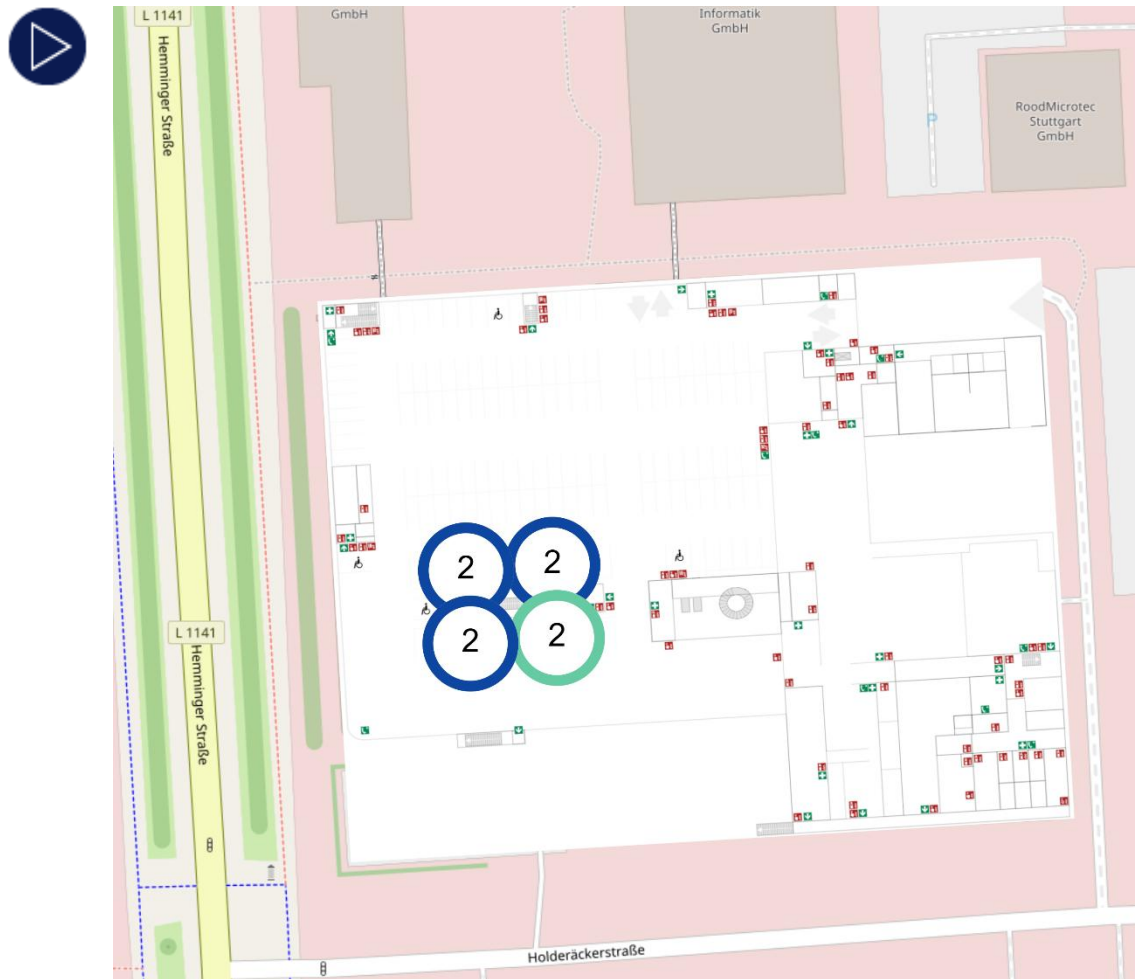
2.3.2 Site-specific Images

Summary

In some locations, the map data is not sufficient to accurately display the location of charging stations. Especially on private property, the map data is incomplete and lacks reference points needed to pinpoint the charging stations.

Therefore, it is possible to overlay custom images, such as schematic drawings. These images can include private driveways, buildings, underground parking garages, entrances, and exits, etc. Especially in commercial vehicle depots, the map function can be used in combination with these custom images to monitor vehicle positioning.

The images can be overlaid at a desired position with the appropriate scaling and rotation so that they fit precisely into the map data.



Note: The support will assist you with integrating the images into the map data. To do this, you must submit the image files via a support request. You will also need to provide a description of where the graphic should be displayed.

2.4 Vehicles

Summary

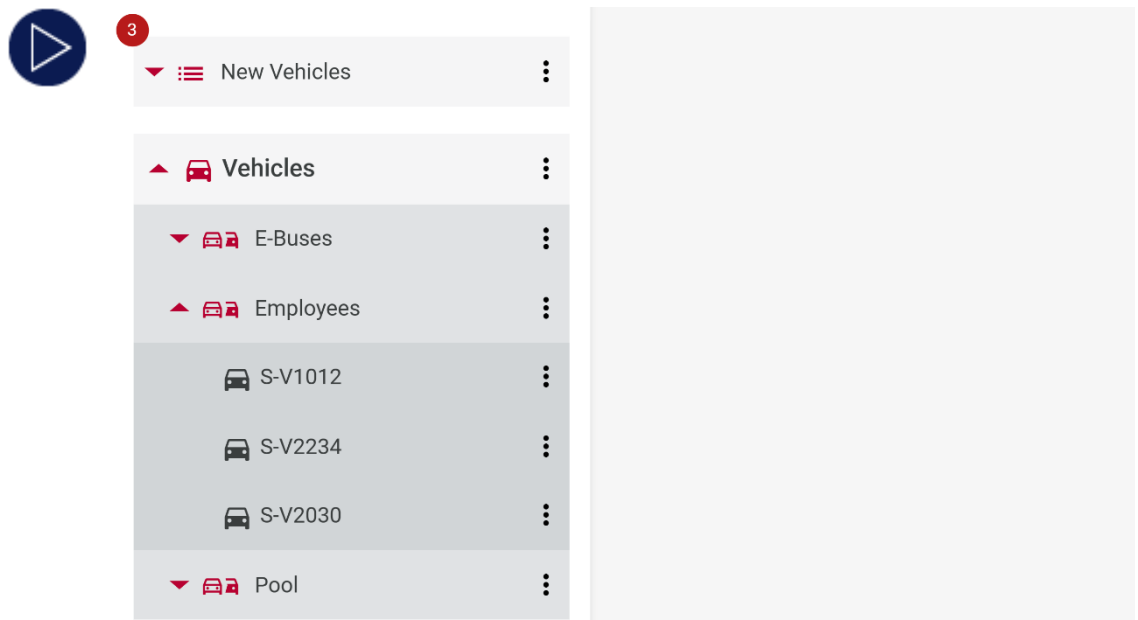
The Vehicles view shows the current state of the electric vehicles. If a vehicle is connected to a charging station, information related to this charging session are displayed.

Additional services are provided if Value-Added-Services are used. Refer to 8. Value-Added-Services for further information.

2.4.1 Groups

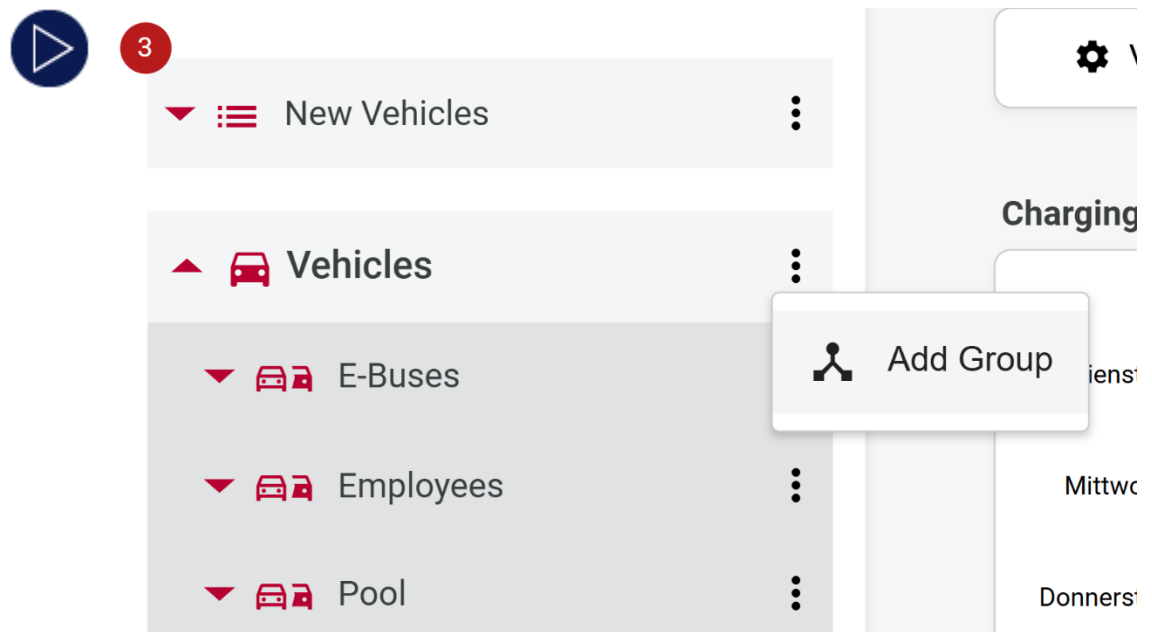
Navigation

Vehicles can be organized in groups. The groups are displayed in the navigation bar on the left, with the assigned vehicles below. Each vehicle is assigned to exactly one group. The "Standard" group is already created at the start.



Manage Groups

Additional groups can be added via the menu at "Vehicle" level. The name of existing groups can be changed via the [Configure] menu. If no vehicles are assigned to a group, a group can be deleted again.



Vehicle Status

If a group is selected in the navigation, a graphical and a tabular overview is displayed. The graphical overview shows the vehicles in the group in four categories:

- > Vehicles that are not connected to a charging station (black)
- > Vehicles that are connected to the charging station but not charging (green):
 - > The vehicle has been fully charged and has finished charging. AC and DC charging sessions can behave differently in this respect, as AC charging sessions are usually not ended but paused.
 - > The charging session was ended due to an error on the vehicle or charging station side
- > Vehicles that are currently charging (blue)
- > Vehicles for which the charging session has been paused by the vehicle or load management (yellow)

The tabular overview shows all vehicles with the following properties:

- > Vendor (if vehicle model is selected)
- > Vehicle Model
- > Status
- > Charging station*
- > Charging point*
- > Actual power*
- > SoC* (only in combination with ISO15118 or DINSPEC-70121)
- > Capacity (optional configuration data)
- > Duration*
- > Predicted Total Charged Energy*
- > Predicted End Of Charge Time*

The columns in the table can be shown or hidden individually for each user. The column configuration can be changed using the gear icon in the upper-right corner. Columns can be shown or hidden using the checkbox. The default configuration can be restored by clicking the [Reset to Default] button.

A series of actions can be started for each vehicle:

- > Stop charging session*
- > Display event history
- > Show reports

The entries marked with an asterisk (*) are only relevant if the vehicle is currently connected to a charging point.

The table can be filtered and sorted. The free text search searches in the columns Vehicle, Vendor, Model, Charging Station and Charging Point. Clicking on the column heading sorts in ascending order according to this column, clicking again sorts in descending order.

At the end of the table, you can set how many search hits should be displayed. If more vehicles are found, the arrow symbols can be used to scroll through the result list.

2.4.1.1 Access restriction for groups

Summary

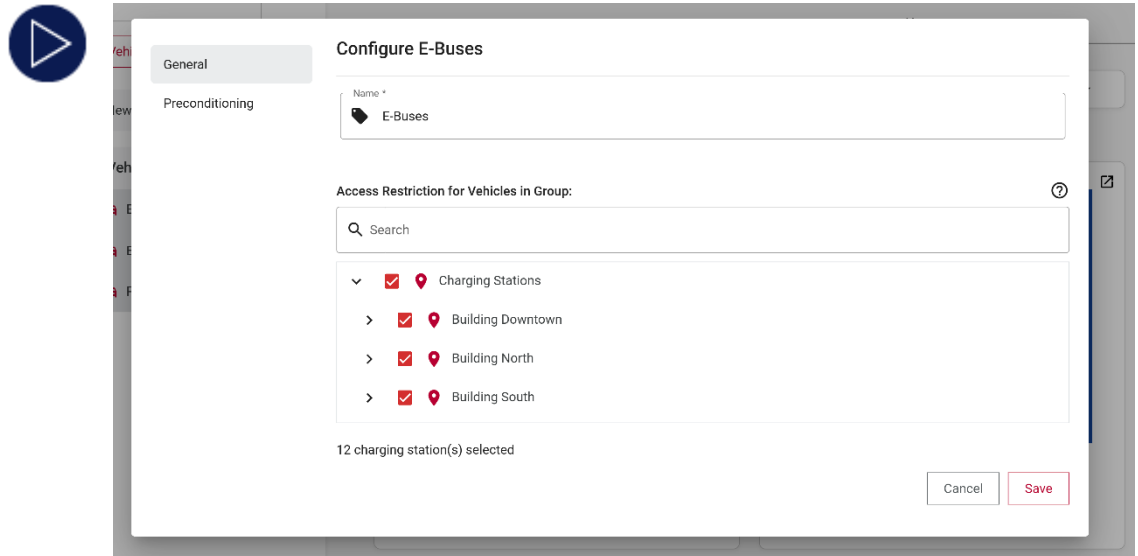
If it is not desired for individual vehicles to be allowed to start charging sessions at all charging stations, access can be restricted.

The access restriction is configured at vehicle group level. This means that the vehicles must be grouped together beforehand.

Configuration

When creating and editing a vehicle group, charging station groups and individual charging stations can be selected which may be used by the vehicles.

All charging stations that have not been selected are blocked for charging sessions. This means that authorization attempts at these charging stations will be rejected.



Note: If a charging station group has been selected, the configuration will be updated automatically in future. Charging stations that are subsequently created in the charging station group are also accessible for the vehicle group.



Caution: Charging stations can be configured so that authorization requests are temporarily stored for a certain period of time. If the access for a vehicle is blocked at a certain charging station, it is possible for the vehicle to continue charging there until the cache in the charging station has been cleared (automatically or manually).



Note: If sub-clients have been configured (see chapter 2.10.2 Sub Clients), only charging station groups that belong to the same sub-client as the vehicle group are displayed in the selection dialog.

2.4.2 Vehicle Models

Summary

A vehicle model contains settings that are the same for all vehicles in a model series. Settings such as minimum and maximum power are identical for vehicles of the same model and therefore need to be set only once.

Vehicle models are optional and are intended to simplify the management of vehicle fleets. However, if the vehicles are very different from one another, it is not necessary to configure vehicle models.



Model	Vendor	Comment	Battery Capacity	Minimum Current per Phase (AC Charging)	Maximum Current per Phase (AC Charging)	Minimum Power (DC Charging)	Maximum Power (DC Charging)	Energy Consumption	Avoid Charging Breaks	
Model 3	Volvo	n/a	290 kWh	7 A	9 A	4 kW	270 kW	1.6 kWh/km	No	⋮
Model 4	MAN	n/a	290 kWh	8 A	n/a	5 kW	260 kW	1.4 kWh/km	Yes	⋮

Configuration

Vehicle models are configured in the Vehicles | Vehicle Models menu. The overview displays all models that have already been created, along with their configured parameters. The list of displayed parameters can be configured using the gear icon in the upper-right corner. Models can be edited and deleted using the action menu.

New Vehicle Model

New models can be created using the [Add Vehicle Model] button. The following parameters are configured in the General section:

- > Model
- > Vendor
- > Comment

Charging Characteristics

The following parameters can also be configured directly on the vehicle if no vehicle model has been selected. These parameters are described in section 2.4.4 Vehicle Parameters:

- > Battery Capacity
- > Minimum Current per Phase (AC charging)
- > Maximum Current per Phase (AC charging)
- > Minimum Power (DC charging)
- > Maximum Power (DC charging)
- > Energy Consumption
- > Avoid Charging Breaks

Batterie Balancing

When this option is enabled, the vehicle is periodically charged to the Balancing SoC rather than the target SoC, allowing the battery to balance itself. If battery balancing is performed only when the battery is fully charged, low target SoC values can result in balancing not being performed for extended periods of time. Contrary to the charging schedule, it may then be necessary to charge the vehicle to a higher target SoC.

When battery balancing is enabled for a model, the configured Balancing SoC is used instead of the target SoC. The Balancing SoC is used only if it is higher than the target SoC. The Balancing SoC is used depending on the balancing frequency and is ignored during all other charging processes.



Add Vehicle Model

General

Charging Characteristics

☒ Enable Battery Balancing Support ?

Battery Balancing

DC Charging Curve

Balancing SoC* 100 %

Balancing Frequency* 10 sessions

Cancel Save

DC Charging Curve

During DC charging, the vehicle may not be able to charge at full power in certain cases to protect the battery from damage or premature aging. Especially when the state of charge is between 80% and 100%, the charging power decreases noticeably.

The charging curve takes these effects into account and helps predict the vehicle's remaining charging time more accurately and better estimate when the desired charge level will be reached. It is also used at the start of the charging process to distribute the available charging power efficiently.

The charging curve consists of one data point for every 5% state of charge (SoC). The maximum power can be set either using the slider or the input field below it.



Note: The DC charging curve does not limit the charging power during the charging session. If you want to limit the charging power, you must do so using the "Maximum Power (DC Charging)" setting.



Note: Cost-optimized charging does not take the charging curve into account



Add Vehicle Model

General

Charging Characteristics

Battery Balancing

DC Charging Curve

The charging curve helps to more accurately predict the vehicle's remaining charging time and better estimate when the desired charging target will be reached. In addition, it is used at the beginning of the charging process to distribute the available charging power efficiently. However, it does not limit the charging power. The charging curve is not taken into account during cost-optimized charging.

SoC 0% 5% 10% 15% 20% 25% 30% 35% 40% 45% 50% 55% 60% 65% 70% 75% 80% 85% 90%

kw 250

Cancel Save

2.4.3 Vehicles

Create Vehicle

A new vehicle can be created at the desired group action menu. The dialog requires at least a Vehicle Name which is used to show the vehicle in different views.



Vehicles

E-Buses

Bus S-V7601

Bus S-V9812

Bus S-V3303

Employees

Pool

Status

3 Vehicles

Add Vehicle

Configure

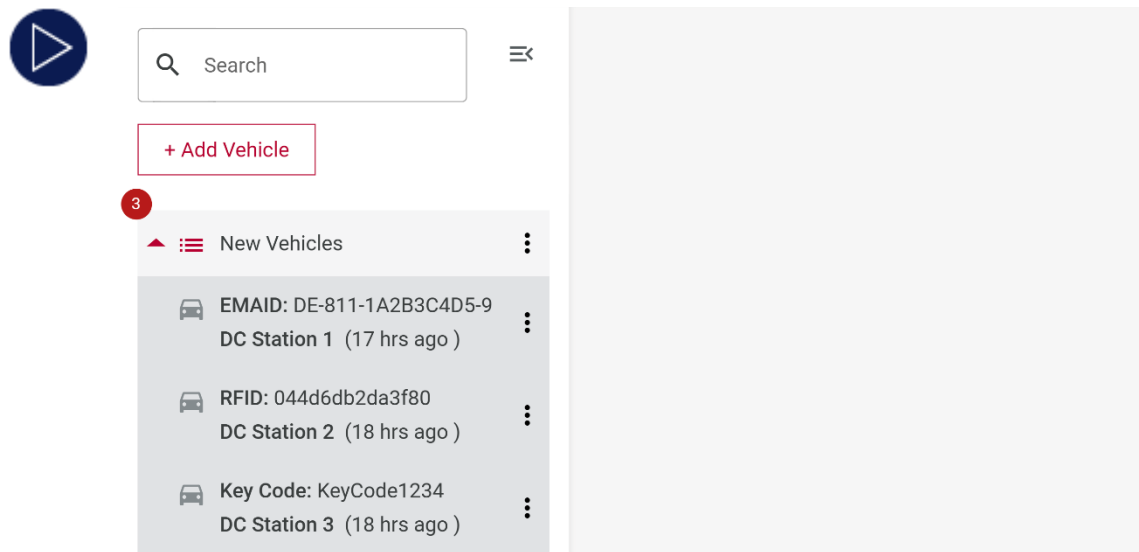
Delete

Auto-Pairing

The alternative and easier procedure to create vehicles is to use the auto-pairing feature instead of the manual creation. If a vehicle is connected to the charging station before it is configured in the CSMS, the vehicle is shown in a separate list. The following two connections are considered:

- > Identification via OCPP
- > Identification via Value-Added-Service, see Preconditioning (VDV 261)

After choosing the desired vehicle from the list, a dialog appears which already contains all known information. The vehicle is created by closing the dialog.



Authorization Tokens

To identify a vehicle at a charging station, one or several authorization tokens can be associated with a vehicle. Authorization tokens can be configured in the second step of the dialog. This process is described in chapter 2.4.4.

Modify Vehicle

Vehicles can be edited by using the  button. The [Configure] command opens a dialog to change the information listed above.

The "Delete" command removes the vehicle from the configuration. This is only possible when the vehicle is not connected to a charging system.

2.4.4 Vehicle Parameters

General:

Vehicles Parameters

The name is used to display the vehicle in different views.

Vehicle Model

Optional selection of the vehicle model (see 2.4.2 Vehicle Models). Once a model has been selected, the corresponding settings can no longer be configured directly on the vehicle.

Assigned Group

The properties of groups are described in chapter 2.4.1 Groups.

Notes

A free text input for general comments.



Vehicles

Configure Vehicle S-V4015

General

Load Management

Preconditioning

Token

Vehicle Name*

Vehicle Model ?

Assigned Group* ?

Assigned Driver ?

Notes

Cancel Save

Load Management:

Battery Capacity

The battery capacity is used for the conversion between State-of-Charge (SoC) and the required amount of energy. This value is only required when load management is enabled with the "Schedule-based" charging strategy.

Minimum and Maximum Power Values

When load management is enabled, the minimum and maximum power values are taken into account when calculating the charging profiles.

The minimum and maximum current are used for AC charging. The minimum and maximum power are used for DC charging.

The charging power is not below the minimum current/minimum power, unless charging is to be paused completely, for example because insufficient power is available or cost-optimized charging requires it. This parameter is useful for preventing charging interruptions in vehicles that cannot charge at low power levels.

The maximum current/maximum power limits the charging power in addition to the limits set in the charging infrastructure. This value is optional and can be used to optimize power distribution.

Energy Consumption

The average amount of energy consumed by the vehicle per kilometer. This value is only required if load management is activated with the "Schedule-based" charging strategy.

Charging Priority

The charging priority influences the power distribution in load management. Depending on the charging strategy, the vehicle is given priority in power allocation if the value "High" or "Highest" is selected.

Learned Values

If this option is selected, the load management uses the learned values for the parking duration and the charged energy to determine the vehicle's demand. Otherwise, the default values defined for the strategy are used.

Avoid Charging Breaks

The charging profiles calculated by the charging strategy can contain time intervals where the vehicle does not receive any power (charging breaks). The reason could be there is not enough power available to charge all vehicles at the same time or that it is not desired to charge at the moment, e.g. due to high energy prices.

When the setting is enabled, the vehicle receives at least the minimum power until charging has finished if there is enough power available. This might be necessary if the vehicle does not support charging breaks, e.g. is not able to start to charge again automatically after a charging break.

Enabling the setting may degrade the result of the charging strategy.

Keep minimum power after charging has finished

When the setting is enabled, the vehicle receives the minimum power after charging has finished. This might be necessary for example if the vehicle continues with trickle charging.

If the option is deactivated, the configuration "Power After Charging is Finished" determines the charging behavior (see 2.2.2.5.3 Power After Charging Is Finished).

Enabling the setting may degrade the result of the charging strategy.



Vehicles

Add Vehicle

General

Load Management

Preconditioning

Token

Battery Capacity kWh

Minimum Current per Phase (AC Charging)* A 6

Maximum Current per Phase (AC Charging) A

Minimum Power (DC Charging)* kW 3

Maximum Power (DC Charging) kW

Energy Consumption kWh/km

Charging priority* Normal

Load Management Behavior

☒ Use historical data in Load Management

☐ Avoid Charging Breaks

☐ Keep minimum power after charging has finished

Cancel Save



Note: It may take up to 15 minutes for changes to the settings to take effect in load management.

Preconditioning:

Vehicle Identification Number (VIN)

The Vehicle Identification Number (VIN) is a unique code used to identify vehicles. Its format is defined in ISO 3779.

The VIN is used as an identification key in VDV463 and VDV261. This is necessary when the vehicle is controlled by a depot management system (see also Chapter 5) and/or when the vehicle's preconditioning is to be controlled (see also Chapter 8.2).

VDV261 Parameters

If the vehicle supports a Value-Added-Service (VAS) connection for preconditioning control according to VDV261 (see also chapter 8.2), the following information is also required:

Password: The password which is used for the authentication check.



Configure Vehicle S-V4015

General

Load Management

Preconditioning

Token

Vehicle Identification Number (VIN)*
5GZCZ43D13S812704

Used as username for the connection 17/17

☒ Enable Value-Added-Service for preconditioning (VDV261) ?

☒ Require Authentication for Value-Added-Services

Password (already set) ?

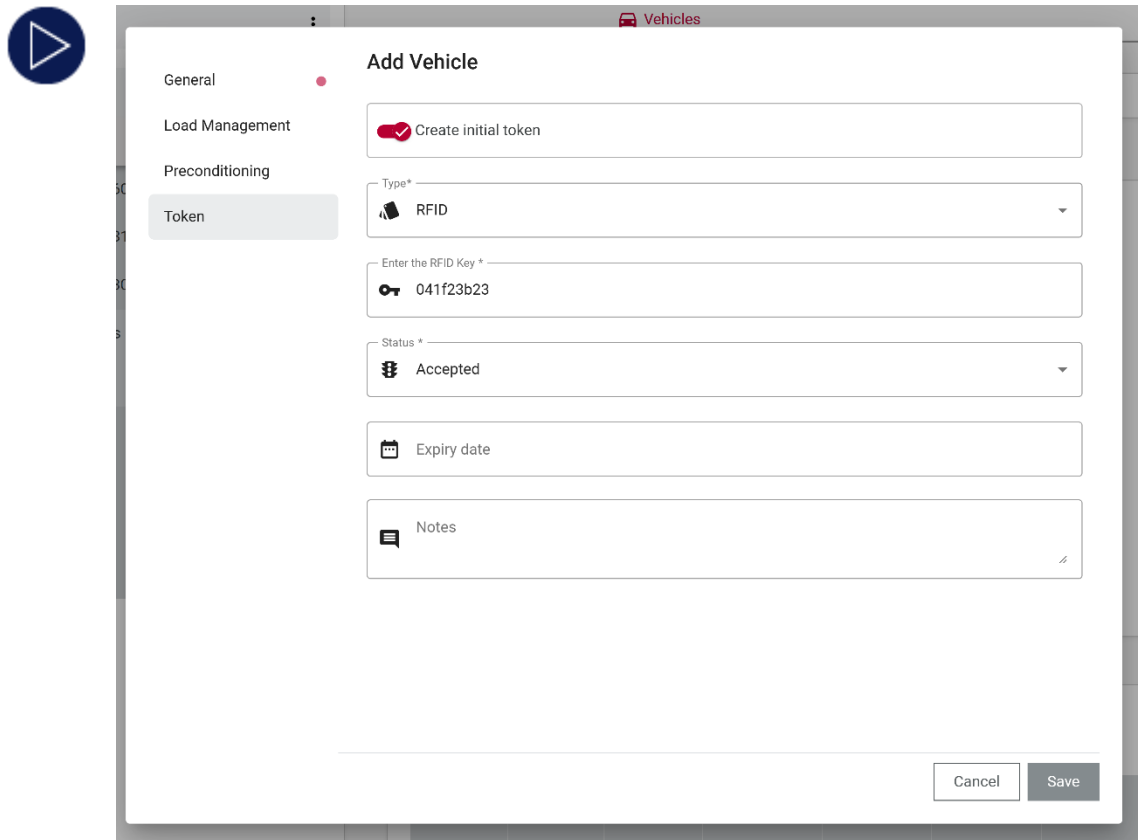
Cancel Save

Token:

Token

When creating a vehicle, you can optionally link a token to it. If this is not necessary, you can skip this step by clicking the [Create Initial Token] button. When editing a vehicle, linked tokens are displayed in this view.

Details about the token are described in 2.4.5 Vehicle Details. Tokens for vehicles that have already been created can also be edited this way.



2.4.5 Vehicle Details

Vehicle Details

If the vehicle has been selected in the navigation, vehicle-specific information is displayed.

Status

The Status tile displays various data about the vehicle and the charging session. The information may come from different sources:

- > Received from the charging station via the OCPP protocol
- > Received from the charging station via the VDV261 connection
- > Received from a third-party system that provides data via a telematics connection

The following data is displayed, if available:

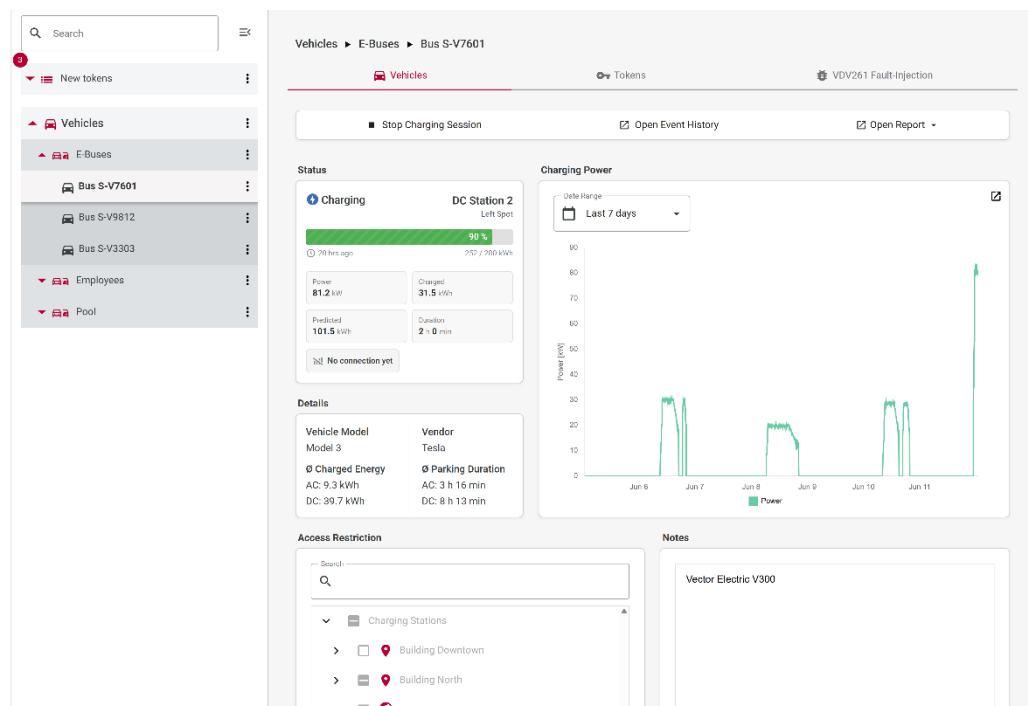
- > Status: The current charging status is displayed in the first line, for example, "Charging," "Plugged in," or "Suspended by Load Management" (Source: OCPP)
- > State of Charge: The current state of charge (SoC) is visualized as a charging bar. Information about the state of charge can be transmitted either via the charging station when the vehicle is plugged in or via a

telematics connection, if one has been configured. The data source and the time of the last data point are displayed when the mouse is hovered over the bar. In addition to the graphical display, the current percentage value is shown.

- > Below the bar, the time of the last data point is displayed, along with the absolute values for the state of charge (current / fully charged).
- > Current charging power (Source: OCPP)
- > Amount of energy charged (Source: OCPP)
- > Duration of the charging session so far (Source: OCPP)
- > Forecast values for the end of charging (Source: internal)
- > Telematics connection status (Source: Telematics)
- > Battery temperature (Source: Telematics)
- > Mileage (Source: Telematics / VDV261)

Charging Power

The Charging Power chart displays the charging power of the selected vehicle over time. The charging curve is independent of individual charging sessions, so the displayed curve may consist of several consecutive charging sessions. The time interval can be adjusted via the [Date Range] dialog. You can either use a preset option (e.g., last 7 days) or select any time period using the date/time selector. You can also highlight a time period with the mouse (hold down the mouse button to select the range).



The following information is also displayed in the form of tiles:

- > Vehicle model (if selected)
- > Vendor (if vehicle model is selected)
- > Battery Capacity: The battery capacity configured in the master data.
- > Average charged energy from the last 10 successful charging sessions. The values for AC and DC charging are displayed separately and can be changed by clicking on the tile.

- > Average parking time during the last 10 successful charging sessions. The values for AC and DC charging are displayed separately and can be changed by clicking on the tile*.

* If no 10 charging sessions have yet taken place, the value "n/a" is displayed. If the learning function for this vehicle is deactivated in the settings, the value "n/a" is displayed and the tile is grayed out.

2.4.6 Authorization Tokens

Summary

Public or Semi-Public installed charging stations shall only be used by authorized vehicles. Several authorization methods are available, such as:

- > RFID tag
- > Key code
- > Vehicle-based authorization via Autocharge or Plug&Charge

If this feature is activated on the charging station and the CSMS, the charging session can only be started, if the authorization was successful.

Token

Tokens are used to authorize a charging session. Different types of tokens are supported, each representing a certain authorization method. Depending on the type, each token represents a certain authorization device or information. Following types of tokens are supported:

- > RFID ISO14443: The driver uses an RFID tag in ISO14443 or ISO15693 format for authorization. The charging station must provide an RFID reader.
- > Key Code: The driver uses a key code for authorization. The charging station must provide a key pad.
- > EVCC ID: The vehicle authorizes itself automatically with its own ID (Autocharge).
- > EMAID: The vehicle authorizes itself automatically with a contract certificate (Plug&Charge).
- > Custom ID: A custom format is used for the authorization token.

For each vehicle / user, a separate token should be created in the CSMS.

A token has the following attributes:

- > Token ID: Unique identifier which depends on the selected type, e.g. RFID chip identifier or the EVCC ID (vehicle MAC address).
- > Status:
 - > Accepted: The token is authorized to start charging sessions.
 - > Blocked: The token is not authorized to start charging sessions.
 - > Expired: The expiry date of the token is in the past. The token is not authorized to start charging sessions.
- > Expiry Date: Date until the token is authorized
- > Notes: Additional information about this token

Create, Modify and Delete Tokens

When creating a vehicle, a token can be linked to it right away. For vehicles that have already been created, tokens can be managed via the "Tokens" view. The list can be filtered using vehicle filter.

In this view, new tokens can be created and linked to vehicles. Additionally, existing tokens can be edited and deleted. The assignment of a token to a vehicle and the token ID cannot be changed afterwards. In this case, the token must first be deleted and then added as a new token.

At least one token should be added to each vehicle, as it is also used to identify a vehicle at a charging station.



Add Authorization Token

Vehicle*
Bus S-V7601

Type*
EVCC ID

Enter the EVCC ID (MAC Address) *
0 / 12 characters

Status *
Accepted

Expiry date

Notes

Cancel Save

2.4.7 Preconditioning

Summary

To optimize the battery range, it is recommended to heat or cool the battery and the passenger compartment immediately before departure from the charging station (preconditioning) in order to draw the required energy from the charging infrastructure.

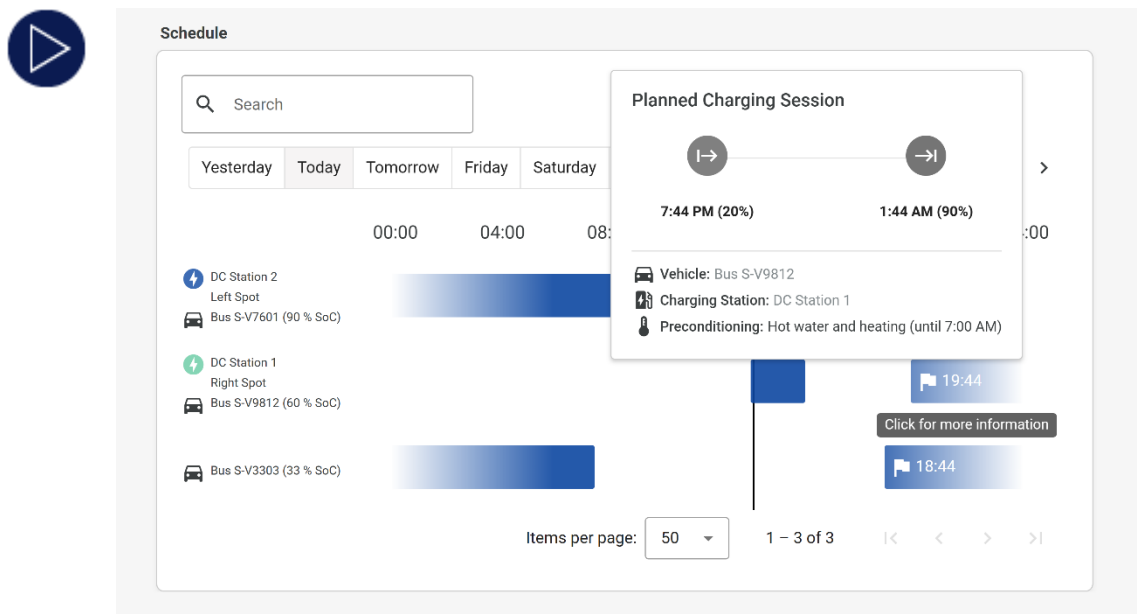
The CSMS can take into account the time and energy required for preconditioning in the planning. The required data can be received either via a VDV463 charging plan (see 5 Fleet- and Depot Management) or via an Excel file (see 2.5 Charging Schedules).

If no planning data is available, substitute values can optionally be configured and used instead.

Planning Data

Whether and which planning data is available can be seen in the "Charging Infrastructure" and "Vehicles" view in the "Schedule" section.

Each blue bar corresponds to a charging session. Charging sessions that takes place in the future (to the right of the "Now" axis) have been received as planning data. Clicking on the bar displays additional information, including the parameters for preconditioning.



Control of Preconditioning

The planning data contains information on whether and what type of preconditioning is required. The departure time also determines when preconditioning is started.

The VDV261 interface is required for the vehicle to receive and use this information (see 8.2 Preconditioning (VDV 261)). This is used for electric buses and commercial vehicles.

No standardized interface is yet available for passenger cars.

Vehicle Information By using the VDV261 interface, the vehicle also has the option of sending information to the CSMS. This information is used to optimize planning in load management. This means that the required time and amount of energy is planned for each vehicle.

All information received from the vehicle is displayed in the "Preconditioning Details" section.



Preconditioning Details	
Vehicle ID (VIN) 9GZCZ43D13S812708	Odometer 20455 km
Required time for HV battery preconditioning 10 min	Required energy for HV battery charging 143 kWh
Required energy for vehicle preconditioning 10 kWh	Required time for vehicle preconditioning 25 min
Charging state Charging	Battery state Battery ok
Hydrogen leak detector state Ok	

Configuration Default Values

In the event that the planning data is incomplete or no planning data is used at all, substitute values can be configured. The values can be set per vehicle group and apply to all vehicles assigned to this group.

The values can be set on the vehicle group via [Configure] in the "Preconditioning" section.

CSMS Parameters

The "Values to Be Sent to the Vehicle" section is used to set the values that are sent to the vehicle via the VDV261 interface as soon as the vehicle has established communication.

The following parameters can be set:

- > Desired: Is preconditioning desired ("Yes" or "No"). Corresponds to the variable "prec_dsrd" from the VDV261 specification. If "Not defined" is selected, "Signal Not Available" is sent instead.

- > Preconditioning Level:

- o No HVAC preconditioning
- o No hot water, cooling or ventilation
- o Hot water and heating
- o Only hot water and ventilation

Corresponds to the variable "prec_hvac" from the VDV261 specification. If "Not defined" is selected, "Signal Not Available" is sent instead.

- > Standing time in minutes: Corresponds to the "driveoff" parameter in the VDV261 standard. If the departure time for a charging session is not known, it is calculated from the arrival time of the vehicle and the standing time set here.

- > Ambient Temperature in degrees Celsius: Corresponds to the "ambienttemp" parameter in the VDV261 standard.
- > Target SoC in percent: Corresponds to the "target-soc" parameter in the VDV261 standard. Only used for VDV261-V2 communication.
- > Target distance in km: Corresponds to the "target-distance" parameter in the VDV261 standard. Only used for VDV261-V2 communication.



Configure E-Buses

General

Preconditioning

Values to Be Sent to the Vehicle
The following preconditioning requirements are sent to a vehicle in this group in case no specific planning data is available for the charging session.

- Desired: ?
- Preconditioning Level: ?
- Standing Time: minutes ?
- Ambient Temperature: °C ?
- Target SoC: % ?
- Target Distance: km ?

Values to Be Received From the Vehicle
The following values are assumed by the load management if the vehicle provides no specific energy demand for preconditioning.

- ☒ Reserve energy for preconditioning ?

Cancel Save

Vehicle Parameters In the section "Values to be Received from the Vehicle", the values are set that are used as substitute values if no data is received from the CSMS via the VDV261 interface. The following parameters can be set:

- > Energy in kWh: Corresponds to the "prec_eamount" parameter in the VDV261 standard. Defines the energy demand for preconditioning the vehicle.
- > Duration in minutes: Corresponds to the "prec_reqtime" parameter in the VDV261 standard. Defines the time required for preconditioning the vehicle.
- >



General

Preconditioning

Configure E-Buses

Hot water and heating

?

Standing Time

420

minutes

?

Ambient Temperature

20

°C

?

Target SoC

80

%

?

Target Distance

100

km

?

Values to Be Received From the Vehicle

The following values are assumed by the load management if the vehicle provides no specific energy demand for preconditioning.

☒ Reserve energy for preconditioning

?

Energy*

5

kWh

?

Duration*

20

minutes

?

Cancel

Save

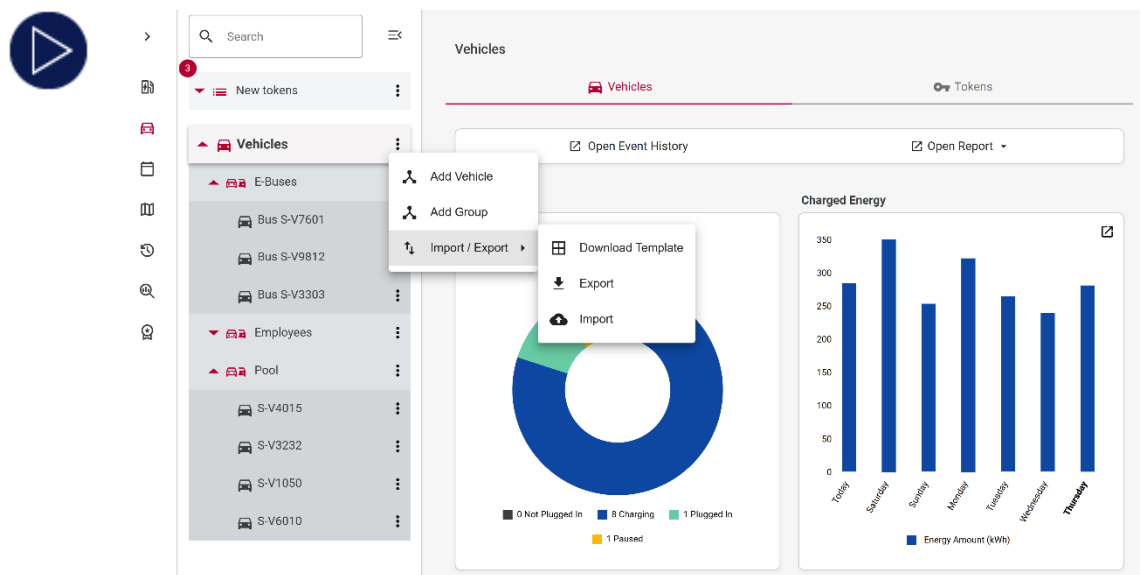
2.4.8 Import and Export of Vehicle Data

Summary

If you need to make many vehicle changes at once, the Import/Export feature can simplify the process. This feature can be used to create new vehicles and to update data for existing vehicles.

Both the import and export functions use Excel files. If the data comes from another source, the Excel file must be created in the appropriate format so that the CSMS can import it.

The Import/Export function is accessible via the Actions menu at the "Vehicle" level.



Format Template

The import function requires the data to be in a specified format. If no vehicles have been created in the CSMS yet, you can download a template. This template already contains the necessary columns and formatting, which will help ensure the data is entered correctly.

Each row in the Excel file corresponds to one vehicle. Columns that can be left blank are marked with "optional" in the column header.

If multiple tokens are to be assigned to a single vehicle, use multiple rows. The first row contains all data for the vehicle and the first token. In the second row, leave all columns containing vehicle data blank. Enter additional data for the second token only in the "Token" section. Repeat this step for any additional tokens.



Group	Name	Avoid Charging Breaks (optional)	Keep Minimum power after charging has finished (optional)	Token ID	Type	Status
Standard	Vehicle A	Yes	Yes	04f666da170190	RFID	ACCEPTED
				040bc3a2d2681	RFID	ACCEPTED
Standard	Vehicle B	No	Yes	04b7e6a2d3649	RFID	ACCEPTED

The template can be downloaded in the Vehicle view via the action menu at the "Vehicle" level by selecting "Import/Export" | "Download Template."

Import

When the Import function is selected, you must first select the Excel file containing the vehicle data. The file is then analyzed and checked for errors. Depending on the number of entries, this process may take some time.

If the file contains no errors, all entries are imported immediately. A pop-up window with the message "The vehicle data has been imported" appears once the process is complete.

If the file analysis detects errors or warnings, a dialog box with detailed information appears. A warning is a notification to the user to ensure that data is not accidentally overwritten. For example, a warning appears if a vehicle or token is to be imported that already exists. The user can continue the process by clicking the [Import Anyway] button or cancel it by clicking [Close].

Errors, on the other hand, are messages that block the import. The user must first correct the errors in the Excel file and then restart the import process. The following types of error messages may occur:

- > The file used is not a valid Excel file
- > The format of the Excel file is invalid, e.g., because a worksheet or column is missing
- > A required column is empty
- > The format of a value is invalid, or a value is being used that is not available in the drop-down list.
- > The specified vehicle group does not exist
- > There are already multiple vehicles with the same name in the system, and the entry cannot be uniquely identified
- > There are multiple vehicles with the same name in the file
- > There are multiple tokens with the same ID in the file
- > The minimum AC current is below the permitted minimum of 6 A
- > The minimum DC power is below the permitted minimum of 1 kW
- > The minimum AC current must not exceed the maximum AC current
- > The minimum DC power must not exceed the maximum DC power

Export

Vehicles already created in the CSMS can also be exported as an Excel file. This export feature can be used to make multiple changes at once and then reimport the file. In addition, the export can also be used for processing in third-party applications.

The export can be initiated in the Vehicle view via the action menu at the "Vehicle" level by selecting "Import/Export" | "Export."

2.5 Charging Schedules

Summary

Charging plans are important in combination with load management. The "Schedule-based" charging strategy (see 2.2.2.4.2 Charging Strategy Schedule-based) requires that schedule data is available. This data is used to prioritize charging sessions and finally to allocate power. The following options are available for managing charging schedules:

- > If a BMS or ITCS system is available, charging schedule data can be received automatically via the VDV463 interface (see 5 Fleet- and Depot Management).
- > Weekly charging schedules can be imported via an Excel file.
- > Manual charging schedules can be created and edited in the Charging Schedule view.

Navigation

The charging schedules that have already been created are displayed in the Charging Schedule view. The view shows a single day (0:00 – 24:00). The desired day can be selected using the calendar selection. Alternatively, the next or previous day can be displayed using the arrow buttons.

A separate row is displayed for each vehicle. The list of vehicles can be restricted using the [Vehicles] button. After clicking on [Vehicles], individual vehicles and vehicle groups can be displayed.

If many vehicles have been selected, only as many entries as specified under "Items per page" are displayed. Additional entries can be displayed using the arrow buttons.

Display of Charging Sessions

Charging sessions are represented by bars. In addition to those planned for the future, spontaneous charging sessions that are currently taking place or have taken place in the past are also displayed.

The following information can be taken from the graph:

Planned and completed charging sessions:

- > A blue bar symbolizes a charging session that took place during this period.
- > A hatched bar symbolizes a charging session that has been planned but not yet completed. Typically, this charging session is in the future. A planned charging session can also be in the past if the planned vehicle did not start charging during this time.
- > A gray charging session has been planned but is not taken into account by load management. This occurs when several charging plans overlap, e.g., when a weekly plan and VDV463 are used simultaneously.

Planning types:

Symbol	Type	Chapter with further information
	Charging session from weekly schedule	2.5.1 Charging Schedule Import via VDV463
	Exception in weekly schedule	2.5.1 Charging Schedule Import via VDV463

	Manual scheduled charging session	2.5.3 Manual Administration of Charging Schedules
	Planned via VDV463	5.2 VDV463
	Adhoc Charging Session (unplanned)	-

Planning conflicts:

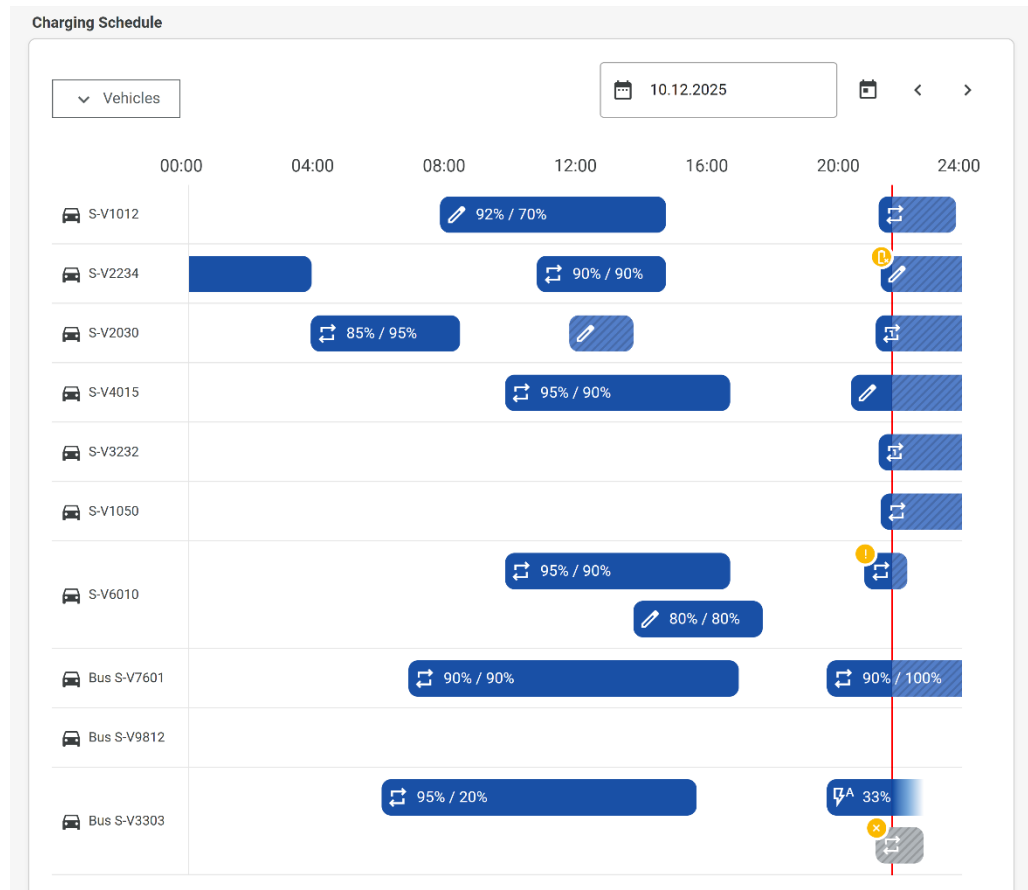
Symbol	Conflict
	Charging target will not be reached: The estimated state of charge (SoC) at the planned departure time is below the required state of charge. The vehicle will therefore have a shorter range. Load management was unable to find a plan that avoids this conflict. The reason for this is that more charging sessions were planned than can be supplied with the available grid power.
	Location deviation: Charging takes place at a different charging point, charging station, or charging station group than planned. This does not restrict the charging of the vehicle if the actual charging point provides sufficient power. The impact on operational processes must be assessed by the dispatcher.
	Charging session overlapped: The planned charging session overlaps with another planned charging session for the same vehicle and is therefore not taken into account.
	The charging session started much later than expected. This means there is less time available for charging.
	Several of the conflicts described above were identified.

Charge status:

If the information is available, the current charge status (SoC) and the target status are displayed in the bar, for example 90% / 100%.

Start time:

For future planned charging sessions (hatched), the start time of the charging session is displayed in the bar.



Detail Information

Clicking on a charging session displays detailed information. Different information is displayed depending on the status:

- > **Arrival time:** For a scheduled charging session, the expected start time of the charging session is displayed. For an active or completed charging session, it is the actual start time.
- > **Departure time:** For an active or planned charging session, the planned end time of the charging session is displayed. For a completed charging session, the actual end time is displayed.
- > **Charge level on arrival:** For a planned charging session, the expected charge level (SoC) of the vehicle is displayed. For an active or completed charging session, the actual charge level is displayed.
- > **Target state of charge on departure:** For an active or planned charging session, the required state of charge at the end of the charging session is displayed. For a completed charging session, it is the actual state of charge on departure.
- > **Authorization method:** The method used by the vehicle to authorize charging.
- > **Charging station:** The charging station where charging is taking place.
- > **Status:** The current status of the charging session.
- > **Actual power:** The current power in kW at which the vehicle is being charged. The value last received from the charging station is displayed. The more frequently the charging station sends the value, the more up-to-date the display is.

- > Current SoC: The current state of charge of the battery. The value last received from the charging station is displayed. The more frequently the charging station sends the value, the more up-to-date the display is.
- > Preconditioning: The desired type of preconditioning

If errors or conflicts are detected for a charging session, a message is displayed in the dialog box.

2.5.1 Charging Schedule Import via VDV463



Reference: The configuration of the VDV463 interface is described in chapter 5.2 VDV463.

2.5.2 Charging Schedule Import via Excel File

Charging Schedules Weekly schedules can be imported via an Excel file. The Excel file can be created and maintained manually or filled automatically from other data sources. If created manually, a corresponding template can be exported in the CSMS, which already contains the necessary columns and also suggests valid values for individual columns.

Each row in the Excel file represents a charging session. Created charging sessions are repeatedly scheduled until the charging plan is updated or deleted.



Example: If the charging schedule for a vehicle contains an entry with charging start Monday, 8:00 a.m., then a charging session is scheduled for this vehicle every week on Mondays, 8:00 a.m..

Charging Schedule Parameters

The following information is relevant:

- > **Vehicle Name:** Name of the vehicle that is to be scheduled for charging. The name must match the vehicle name as created in the CSMS.
The Excel template already contains a list of the configured vehicles. If a vehicle was subsequently added in the CSMS, the template must be exported again.
- > **Charging Station Group:** The group of charging stations at which the vehicle is charged. In order to calculate an accurate prediction for the end of charging, the maximum power of the charging stations within this group should be similar. The decision as to which charging station from this group will actually be used for charging can be made at short notice.
The Excel template already contains a list of the configured groups. If a group is subsequently added in the CSMS, the template must be exported again.
- > **Start of Charging (Day of Week):** The day of the week on which this charging session will start. As the charging session is scheduled every week, no explicit date is required.

- > Start of Charging (Time): The time at which the vehicle is expected to be plugged into the charging station. If there is a power bottleneck at the beginning, the charging session can start with a charging pause and is automatically resumed at a later time.
- > Remaining Range at Start of Charging (optional): The remaining range in km that the vehicle is expected to have at the start of the charging session. Based on this information and the configured energy consumption of the vehicle (see 2.4.4 Vehicle Parameters), the range at the end of charging can be determined. If no value is specified, 0 km is assumed.
- > End of Charging (Day of Week): The day of the week on which the vehicle should depart. The period between the start and end can be used for charging.
- > End of Charging (Time): The time at which the vehicle should depart.
- > Required Range at End of Charging: Based on this information, the remaining range at the start of charging and the configured energy consumption of the vehicle (see 2.4.4 Vehicle Parameters), the amount of energy that needs to be charged during the charging session is calculated. This value should be specified with a safety buffer so that the range is also sufficient for unplanned detour.
- > Rotation Number (after charging) (optional): The number of the round trip that the vehicle is to make after the charging session. The rotation number is used to simplify the assignment of charging sessions, but has no effect on the planning of charging sessions.
- > Length of Rotation (optional): The length of the round trip that the vehicle should make after the charging session. The entry is optional and has no effect on the planning of charging sessions.
- > Charge as fast as possible (optional): If this option is activated, the vehicle is charged as quickly as possible, regardless of the time remaining until the end of charging. This option is deactivated by default.

The "Metadata" table sheet contains settings for language and time zone, which must be adjusted if necessary.

Export Charging Schedule Template

In the "Manage weekly schedule" action menu, an Excel file can be downloaded via "Download Template", which already contains all the required columns. It is recommended that you use this file to create a new charging schedule.

Import Charging Schedules

In the same action menu, a charging schedule can be imported via [Upload New Schedule]. If a charging schedule is already active, it will be overwritten after a warning message. After a successful import, the planned charging sessions can be seen in the "Schedule" view.

If the Excel file contains an invalid format or implausible values, a warning or error message is displayed. If an error occurs, the import is aborted, and no changes are made to the current configuration.

The following checks lead to an error and the import is canceled:

- > The Excel file does not contain all the necessary worksheets or columns.
- > The metadata is not available, or the version entered is not supported.
- > A planning entry was created without filling in all mandatory fields.

- > The specified vehicle was not found in the CSMS.
- > There are several planning entries for a vehicle that overlap in time.
- > The specified charging station group was not found in the CSMS.
- > There are more simultaneous planning entries for a charging station group than charging points in the group.
- > The energy consumption was not filled in for the vehicle entered.

The following checks lead to a warning. The user decides whether to complete or cancel the import:

- > The amount of energy required to fulfill a planning entry is greater than the specified battery capacity.
- > There are several vehicles in the CSMS with the same name. The charging plan is assigned to one of them.
- > There are several charging station groups in the CSMS with the same name. The charging plan is assigned to one of them.



Import failed

The uploaded charging schedule 2024-06-21_Weekly Charging Schedule.xlsx could not be imported.

Errors (6)

Row 2, Column B: Charging Station Group is missing. ?

Row 2, Column C: Start of Charging (Day of Week) is missing. ?

Row 2, Column D: Start of Charging (Time) is missing. ?

Row 2, Column F: End of Charging (Day of Week) is missing. ?

Row 2, Column G: End of Charging (Time) is missing. ?

Row 2, Column H: Required Range at End of Charging is missing. ?

Close

Delete Charging Schedule

The current charging schedule can be deleted via [Delete] in the [Manage weekly schedule] action menu. The "Schedule-based" charging strategy can then no longer perform any optimizations. If this charging strategy is configured, either a new valid charging schedule should be imported or the load management should be switched to a different charging strategy.

2.5.3 Manual Administration of Charging Schedules

Summary

The user interface allows you to create charging schedules manually or to customize weekly schedules imported from an Excel file.



Note: Charging sessions imported via VDV463 can only be modified in the pre-system. Editing or deleting them in the CSMS is not possible in order to ensure data consistency with the pre-system.

Edit Weekly Schedules

Charging sessions that have been imported as a weekly schedule via an Excel file can be edited and deleted afterwards. The change only applies to the selected charging session. All other charging sessions that originated from this weekly schedule remain unchanged.

To edit or delete a charging session, first open the window with the detailed information by clicking on the blue or hatched bar. In the window, you can edit the entry using the pencil icon and delete it using the trash can icon.

When importing a new charging schedule, changes or deletions to individual weekly schedule elements are retained, provided that the arrival time of the series has not been changed. If there is no series for the same vehicle with the same arrival time in the new version of the charging schedule, all exceptions from the old series are also deleted.

Create new Charging Sessions

Individual charging sessions can be created directly via the user interface. To do this, either use the [Add charging session] button or click on the location in the graphic where the charging session should begin.



Note: Currently, weekly schedules cannot be created manually. Instead, weekly schedules can be imported via an Excel file.

Create / Edit Charging Sessions

The dialog for creating and editing charging sessions includes the following information:

- > From: Date and time when the charging session should start. Typically, this is the arrival time of the vehicle.
- > To: Date and time when the charging session should end. Typically, this is the departure time of the vehicle.
- > Vehicle: The vehicle being charged.
- > Battery capacity: Information from the vehicle profile about the size of the battery. The value can be adjusted in the Vehicles view.
- > Energy consumption: Information from the vehicle profile about the average consumption of the vehicle. The value can be adjusted in the Vehicles view.
- > Group: The group of charging stations where the vehicle is being charged. To allow for more flexibility in parking space assignment, a group is selected rather than an individual charging point. In order to calculate an accurate prediction for the end of charging, the maximum power of the charging stations within this group should be similar. The decision as to which

charging station in this group will actually be used for charging can be made at short notice.

- > **Charging priority:** If the calculation of the charging priority does not yield the desired result, the priority can be increased manually. The current priority is displayed provided that the required fields for the charging point and vehicle have been filled in. If the priority is to be determined based on the priority of the vehicle and the charging point, the option "Use calculated priority" must be selected. The priority is automatically adjusted if the priority of the vehicle or charging point changes. If desired, the priority can also be set to a fixed value (Normal, High, Highest).
- > **Remaining SoC at start of charging:** The state of charge (SoC) of the battery when the vehicle is plugged in. The information can be given either as a percentage of the battery capacity or in kilometers for the remaining range. The conversion between percent and kilometers is based on energy consumption.
- > **Required SoC at end of charging:** The desired state of charge (SoC) of the battery when the vehicle departs. This information can be given either as a percentage of battery capacity or in kilometers for the remaining range. The conversion between percent and kilometers is based on energy consumption.
- > **Preconditioning:** Switch on the vehicle's preconditioning (VDV261 required)
- > **Preconditioning level:** Type of vehicle preconditioning (VDV261 required)



Edit series entry

Changes apply to this charging session only. The underlying series remains unchanged.

General

From*

18.12.2025, 16:56

To*

19.12.2025, 05:56

Vehicle*

Bus S-V7601

Battery Capacity (kWh)

280

Energy Consumption (kWh/km)

0.16

Group*

Building North

Charging priority

Normal

Arrival & Departure ⓘ

Remaining SoC at start of charging (%)*

20

Remaining range at start of charging (km)*

350

%

km

Required SoC at end of charging (%)*

90

Required range at end of charging (km)*

1575

%

km

Preconditioning

Preconditioning desired

Not defined

Preconditioning level

Not defined

Cancel

Save

2.6 Events

Summary

The event history abstracts the communication from the CSMS to connected systems (charging stations, pre-system, etc.) in understandable language, stores and displays it. The events can be filtered and sorted according to various criteria in order to narrow down the analysis of errors.

Details of the event entries can be displayed by expanding the respective entry.

Most of the events are based on OCPP messages that are exchanged with the charging station. The events summarize the relevant information from the messages in order to display it more clearly and comprehensibly. The original messages can also be viewed as described in chapter 2.7 OCPP Messages.



Event History Download as ▾

Severity level ▾ Categories ▾ Charging Stations ▾ Vehicles ▾ Events ▾
 Date Range

Severity level	Date and time	Charging Station	Vehicle	Event	
Info	Mar 27, 2024, 12:32:54 PM	DC Station 4 Charging Point: Right Spot Group: Building Downtown	n/a	Charging session started	▾ ⋮
Info	Mar 27, 2024, 1:32:54 PM	DC Station 4 Charging Point: Right Spot Group: Building Downtown	n/a	Charging session finished	▾ ⋮
Error	Mar 27, 2024, 2:32:54 PM	DC Station 3 Charging Point: Left Spot Group: Building North	n/a	Charging Station Faulted [HighTemperature] Temperature inside the Charge Point is too high	▾ ⋮
Info	Mar 27, 2024, 3:32:54 PM	DC Station 2 Charging Point: Right Spot Group: Building Downtown	n/a	Requested a state change to unavailable	▾ ⋮
Warning	Mar 27, 2024, 3:32:54 PM	DC Station 1 Charging Point: Left Spot Group: Building North	n/a	Temporary unavailable	▾ ⋮

2.6.1 Overview

Summary

An overview of the available events is described in 2.10.4 Events & Notifications. In the settings, you can adjust the severity level of events and create custom events and notification rules.

2.6.2 Filters and Sorting

Filters and Sorting

The event list can be filtered according to the following criteria:

- > Severity:
 - > Info: Events for which no action is required.
 - > Warning: Events that can restrict the charging session or the CSMS functionalities as long as the event is present.
 - > Error: Events for which manual intervention is recommended to resolve the problem.
- > Categories: Type of event
- > Charging Station: Charging Stations / Charging Station Groups that triggered the event
- > Vehicles: Vehicles / Vehicle Groups that triggered the event
- > Events: Full text search in the detailed information of the events
- > Date Range: Time period in which the event occurred

The charging station, the charging station group, the vehicle and the vehicle group can also be filtered directly in the event table using the filter icon. The symbol appears when an entry is selected with the mouse.

The action menu can be used to filter by charging session. All events that have occurred in the context of the same charging session are then displayed.

If one or more filters have been set, all filters can be reset using the "Clear filter" icon.

Clicking on a table column sorts the results in ascending order according to this column. Another click sorts in descending order.

Result List

At the end of the table, you can set how many search hits should be displayed. If more events are found, you can use the arrow symbols to scroll through the result list.

2.6.3 Export

Excel and CSV Export

The filtered event list can also be downloaded as a CSV or Excel file. Once the desired filters have been set, the "Download as" button can be used to start either the CSV or Excel export. The events are always exported in ascending order by date.

The export may take some time depending on the number of events. The export contains a maximum of 5000 lines.

2.7 OCPP Messages

2.7.1 Overview

Summary

All OCPP messages that are exchanged with the charging station can be viewed under "Events" | "OCPP messages".

As a large number of messages are sometimes processed in a short time, the view offers filter options to limit the messages displayed.

The data can be exported in CSV and Excel format for further external processing.

Only data from the last 30 days is saved and displayed.



OCPP Messages History						Send Custom Message	Download as	
Local Date and Time	Charging Station	Protocol	Type	Message from Charging Station	Message from vcharM	Date Range (last 24 hours)		
Dec 16, 2024 1:56:13.197 PM	DC Station 1	OCPP 2.0.1	ClearChargingProfile	Response after +881 ms { "status": "Accepted" }	Request id: 6c2a036d-f7b5-70ba-4a3b-afac04343421 { "chargingProfilePurpose": "TxDefaultProfile" }			
Dec 16, 2024 12:53:49.892 PM	DC Station 1	OCPP 2.0.1	NotifyEvent	Request id: 045002ba-8758-c8c3-d547-c78c38241a09 { "eventData": { "actualValue": "NoError", "component": { "name": "Char..."	Response after +803 ms 0			
Dec 16, 2024 12:25:13.627 AM	DC Station 1	OCPP 2.0.1	StatusNotification	Request id: 2168333c-2360-5064-18a4-e02769b2118c { "connectorId": 1, "connectorStatus": "Unavailable", "evseId": 1, "timeste...	Response after +319 ms 0			
Dec 15, 2024 7:53:39.172 PM	DC Station 1	OCPP 2.0.1	BootNotification	Request id: 770a4c70-4840-1a06-cde1-6cda89c7238b { "chargingStation": { "firmwareVersion": "development", "mode": "2024...	Response after +565 ms { "currentTime": "Mon Dec 16 2024 05:19:31 GMT+0000 (Coordinated ...			
Dec 15, 2024 5:26:30.829 PM	DC Station 1	OCPP 2.0.1	StartTransaction	Request id: 89c3d77f-7b1a-ed6a-f21a-74d503289c71 { "connectorId": 1, "idTag": "6ec9084a-d98c-eda3-b546-2d8f8882c98", "...	Response after +29 ms { "connectorId": 1, "idTag": "6ec9084a-d98c-eda3-b546-2d8f8882c98", "...			

Messages

The OCPP messages are displayed in a table. Each line contains a message pair consisting of request and response. If no response has (yet) been sent or received, this field is empty.

The following information is displayed:

- > **Date and Time:** time at which the message was received or sent in the CSMS. If the charging station was offline for a certain period of time, it is possible that the message was generated earlier but not received in the CSMS until later. The timestamp in the message may therefore differ.
- > **Charging Station:** Name of the charging station with which this message was exchanged
- > **Protocol:** OCPP version that was negotiated when the charging station established the connection
- > **Type:** OCPP message type
- > **Message to CSMS:** Content of the message received by the CSMS (request or response). If it is a response, the time required to answer the request is also displayed. If the field is empty, no response has yet been received.
- > **Message from CSMS:** Content of the message that was sent to the charging station (request or response). If it is a response, the time required to answer the request is also displayed. If the field is empty, no response has yet been sent.

As some of the message content can be large, only the first few characters are displayed. The full content can be displayed by clicking on the arrow.

Messages that have been received in the meantime can be displayed via the "Reload" symbol.

2.7.2 Filters and Sorting

Filters and Sorting The messages are sorted by date and time. By clicking on the column header, the messages can be sorted either in ascending or descending order.

Due to the large amount of data, filtering will usually be necessary. The following filters are available:

- > Charging Stations: If individual charging stations are selected, only messages from these connections are displayed.
- > Type: Selection of one or more OCPP message types
- > Protocol: Selection of the OCPP version
- > Payload: Full text search within the request and response
- > Time Period: Selection of the time period for the search.

2.7.3 Export

Excel and CSV Export The filtered event list can also be downloaded as a CSV or Excel file. Once the desired filters have been set, either the CSV or Excel export can be started via the "Download as" button.

The export may take some time depending on the number of events. The export contains a maximum of 10,000 lines.

2.7.4 Send Custom Messages

Summary In special cases, it is necessary to send specific OCPP messages to a charging station. These may be OCPP use cases that the CSMS does not support or supported use cases for which individual parameters must be set individually.



Caution: The function requires detailed knowledge of the OCPP standard. The message content is sent to the charging station without being checked. Syntax errors can lead to the message being rejected by the charging station. Semantic errors can lead to unwanted behavior on the charging station.

Charging Station Selection First, the charging station that is to receive the message must be selected in the "Select Communication Partner" section.

Message Definition The message type and message content can then be specified. Both should conform to the OCPP standard so that the charging station can process them. Nevertheless, it is also possible to send content that is not defined in the standard.



Send Custom OCPP Message

Select Communication Partner

Parking Lot 1

Define Message

Templates :

☐ OCPP 1.6
 ☒ OCPP 2.0.1
 ☐ OCPP 2.1

ReserveNow

CancelReservation

ClearChargingProfile

SetDisplayMessage

Message Type *

ReserveNow

JSON Payload

```

{
  "id": 12345,
  "expiryDateTime": "2024-10-28T16:00:00Z",
  "evseId": 1,
  "idToken": {
    "idToken": "041A2B3C4D5E6F",
    "type": "ISO14443"
  },
  "groupIdToken": {
    "idToken": "DEF67890",
    "type": "Central"
  }
}

```

Send

Close

Message Transmission

The message can be sent by clicking on "Send". The dialog remains open if the message still needs to be sent to other charging stations or the message is to be sent repeatedly in a similar form.

The response can be observed as described in 2.7 OCPP Messages under OCPP messages.



Note: The OCPP version does not have to be selected in the dialog, as the version has already been defined when the connection is established and cannot be changed for individual messages. The message type and content must match the OCPP version used.

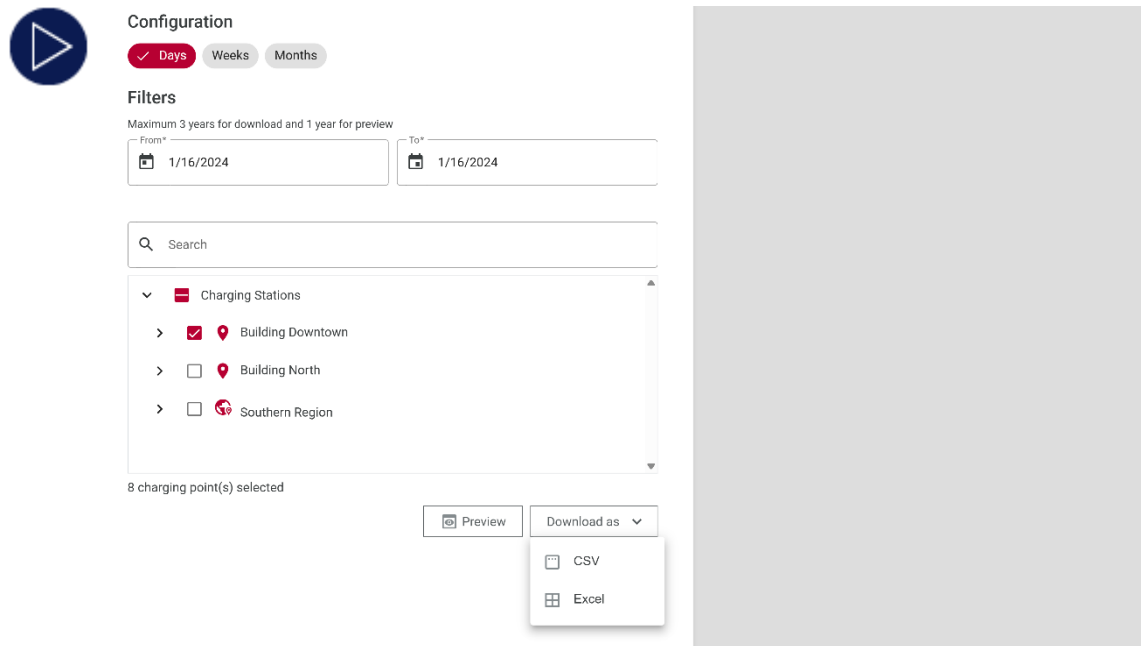
2.8 Reports

Summary

Several reports are provided with different content and visualization. The overview shows the available reports and a short description.

Filter

The content of each report can be customized by selecting a date range and the charging stations, which shall be considered in the report.



The report can be previewed directly in the browser to quickly determine the desired filter settings. However, the preview result may be limited in number. The maximum preview period is 1 year, unless otherwise specified. In addition, the number of results may be limited.

Alternatively, the report can be downloaded directly. In this case, the maximum period is 3 years, unless otherwise specified.

Export

All data elements of a report can be exported in Excel and CSV format. The data can be downloaded with the [Download as] button.

Depending on the number of results, generating the export may take some time. The status can be viewed in the export overview. Once the report is complete, it can be downloaded from the export overview. The list only contains reports that the user has generated.



Efficiency

An overview of the charged energy of all charging sessions compared to the consumed energy at the mains supply (measurement point). An energy meter should be installed in order to get all metrics.

Cost Savings

A tabular overview of the cost savings through cost-optimized charging.

Generated Reports

This table contains all reports which have been generated in the last 30 days.

! The generated files from the reports Availability and Charging Sessions Statistics are not listed here. They are downloaded directly.

Report Type	Request time	Creation time	Filter Timerange	Format	File size	Status	
Cost Savings	9/8/25, 9:33 AM	Report is still waiting in the queue to be generated...	From: 8/8/25, 2:00 AM To: 9/8/25, 1:59 AM	Excel		Queued	↓
Charging Session Details	9/8/25, 9:33 AM	Report is still being generated...	From: 8/8/25, 2:00 AM To: 9/8/25, 1:59 AM	Excel		Being generated	↓
Energy Consumption - Charging Points	8/31/25, 9:34 AM	3 min.	From: 8/23/25, 2:00 AM To: 8/31/25, 1:59 AM	Excel	4.2 KB	Completed	↓
Energy Consumption - Vehicles	8/30/25, 2:43 PM	2 min.	From: 8/22/25, 2:00 AM To: 8/30/25, 1:59 AM	Excel	423.3 KB	Completed	↓
Charging Session Details	8/28/25, 1:51 PM	10 min.	From: 8/21/25, 2:00 AM To: 8/28/25, 1:59 AM	Excel	4.2 KB	Completed	↓
Cleaning	8/28/25, 1:12 PM	1 min.	From: 8/20/25, 2:00 AM To: 8/28/25, 1:59 AM	Excel	4.2 KB	Completed	↓
Cost Savings	8/27/25, 11:07 AM	1 min.	From: 8/19/25, 2:00 AM To: 8/27/25, 1:59 AM	Excel	2.4 MB	Completed	↓

Link

Alternatively the report can be accessed later by saving the link to the report with the [Copy Link] button. The link can be also passed on to other users.

2.8.1 Energy Consumption - Charging Points

Content

A summary of the energy consumed per charging point. The listing can be created in the following granularity:

- > Days: Charged energy summed up per day
- > Weeks: Charged energy per calendar week
- > Months: Charged energy per calendar month

Two values are always displayed per day/week/month (depending on the selection). The first value "Charged energy" is the energy sum of the charging sessions on this day/week/month. The second value is the last received value sent by the charging station.



Caution: There are charging stations that reset the energy counter for each charging session. Therefore, the value is not continuous. However, this does not result in any restriction for the energy calculation.



Caution: Due to the large amount of data, in the preview a maximum of only 50 entries is displayed. If the desired entries are not included in the result, the period of the report can be limited. Afterwards, the report must be generated again.

Alternatively, all entries can be exported as Excel or CSV file.



Energy Consumption - Charging Points

Montag, 24. März 2025 - Montag, 24. März 2025

Copy link

Download as

	CW 12														
	18.03.25		19.03.25		20.03.25		21.03.25		22.03.25		23.03.25		24.03.25		Sum
Charging Point	Charged Energy (kWh)	Meter value (kWh)	Charged Energy (kWh)	Meter value (kWh)	Charged Energy (kWh)	Meter value (kWh)	Charged Energy (kWh)	Meter value (kWh)	Charged Energy (kWh)	Meter value (kWh)	Charged Energy (kWh)	Meter value (kWh)	Charged Energy (kWh)	Meter value (kWh)	Charged Energy (kWh)
DC Station 1 Left Spot	50,565	44,624	43,721	43,721	101,085	83,278	56,989	47,203	43,265	27,365	106,488	63,002	90,485	68,178	492,599
DC Station 1 Right Spot	83,871	83,871	54,413	54,413	49,663	49,663	83,278	83,278	65,010	65,010	37,151	37,151	119,846	60,927	493,232
DC Station 2 Left Spot	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	150,046	73,613	150,046
DC Station 2 Right Spot	42,337	42,337	60,927	60,927	83,871	83,871	54,413	54,413	49,663	49,663	83,278	83,278	25,000	25,000	399,489
DC Station 3 Left Spot	59,699	47,067	74,621	71,239	51,031	51,031	67,687	49,663	82,104	65,254	54,193	48,160	85,614	37,151	474,949
DC Station 3 Right Spot	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
DC Station 4 Left Spot	43,121	43,121	0,000	0,000	42,337	42,337	50,047	50,047	33,824	33,824	0,000	0,000	0,000	0,000	169,329
DC Station 4 Right Spot	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
DC Station 1 Left Spot	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	70,000	70,000	70,000
DC Station 1 Right Spot	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000

2.8.2 Energy Consumption – Vehicles

Content

- A summary of the energy consumed per vehicle. The listing can be created in the following granularity:
- > Days: Charged energy summed up per day
 - > Weeks: Charged energy per calendar week
 - > Months: Charged energy per calendar month



Caution: Due to the large amount of data, in the preview a maximum of only 50 entries are displayed. If the desired entries are not included in the result, the period of the report can be limited. Afterwards, the report must be generated again.

Alternatively, all entries can be exported as Excel or CSV file.



Energy Consumption - Vehicles
Monday, March 24, 2025 - Monday, March 24, 2025

Copy Link Download as

Vehicle	CW 12							Sum
	3/17/25	3/18/25	3/19/25	3/20/25	3/21/25	3/22/25	3/23/25	
	Charged Energy (kWh)	Charged Energy (kWh)	Charged Energy (kWh)	Charged Energy (kWh)	Charged Energy (kWh)	Charged Energy (kWh)	Charged Energy (kWh)	Charged Energy (kWh)
S-V1012	42.337	60.927	83.871	54.413	49.663	83.278	40.042	414.531
S-V2234	18.973	52.864	24.742	0.000	0.000	37.050	13.771	147.349
S-V2030	5.398	12.134	16.846	9.988	10.398	0.001	18.863	73.628
S-V4015	70.394	0.000	42.337	0.000	83.871	0.000	74.955	271.557
S-V3232	30.550	38.215	34.185	43.421	16.192	13.177	1.563	177.302
S-V1050	0.000	0.000	0.000	0.000	0.000	0.000	1.500	1.500
S-V6010	0.000	0.000	0.000	0.000	0.000	0.000	84.977	84.977
Bus S-V7601	54.413	49.663	85.423	62.865	37.151	79.802	92.721	462.038
Bus S-V9812	83.871	54.413	49.663	83.278	65.010	37.151	0.000	373.386
Bus S-V3303	60.927	83.871	54.413	49.663	83.278	65.010	37.151	434.313
Sum	366.864	352.087	391.480	303.628	345.562	315.469	365.492	2,440.582

2.8.3 Power Consumption

Content

The report contains a detailed breakdown of power consumption and energy used, as well as the various thresholds that were active at that time.

The values in the report are aggregated across all selected objects. Objects can include charging stations and stationary batteries.

The report contains a separate entry for every 5 minutes. A received measurement value is assigned to the respective entry. Thus, depending on the measurement frequency, an entry may consist of several measurement values, or only one, or even none at all. If a charging station sends measurement values more frequently than every 5 minutes, the average is calculated. If a charging station sends measurement values less frequently than every 5 minutes, average values for power and energy are also calculated. The energy is distributed proportionally across all entries.

Limitations

Depending on the selection of charging points, the following restrictions apply:

- > Total power (kW) and total energy consumption (kWh):
Available only if a single location with meter data is selected. Not available for multiple properties.
- > Power/energy of charging points (kW/kWh):
Available if at least one charging point is included in the selected properties.
- > Power/Energy of Batteries (kW/kWh):
Available if at least one battery is included in the selected properties.
- > Power Limits (Static Power Limit, External Power Limit, Reduced Power Limit, Effective Power Limit):
Available only if exactly one property has been selected. Not available for multiple properties.



Leistungsaufnahme					
Von	2026-01-29 00:00:00				
Bis	2026-02-05 11:09:07				
Ausgewählte Objekte	Ingersheimer Straße 24				
Zeitstempel	Wochentag	Gesamtleistung (kW)	Gesamtenergieverbrauch (kWh)	Leistung Ladepunkte (kW)	Energie Ladepunkte (kWh)
2026-01-29 04:55:00	THURSDAY	118,462 kW	9,871 kWh	10,21 kW	0,853 kWh
2026-01-29 05:00:00	THURSDAY	138,054 kW	11,504 kWh	24,12 kW	1,707 kWh
2026-01-29 05:05:00	THURSDAY	144,729 kW	12,06 kWh	29,447 kW	2,46 kWh
2026-01-29 05:10:00	THURSDAY	146,537 kW	12,211 kWh	29,17 kW	2,412 kWh
2026-01-29 05:15:00	THURSDAY	143,469 kW	11,955 kWh	29,178 kW	2,438 kWh
2026-01-29 05:20:00	THURSDAY	145,755 kW	12,146 kWh	29,171 kW	2,431 kWh
2026-01-29 05:25:00	THURSDAY	148,928 kW	12,41 kWh	29,162 kW	2,431 kWh
2026-01-29 05:30:00	THURSDAY	151,559 kW	12,629 kWh	29,164 kW	2,43 kWh
2026-01-29 05:35:00	THURSDAY	153,01 kW	12,75 kWh	35,4 kW	2,976 kWh
2026-01-29 05:40:00	THURSDAY	159,993 kW	13,332 kWh	34,166 kW	2,847 kWh
2026-01-29 05:45:00	THURSDAY	166,49 kW	13,874 kWh	33,813 kW	2,844 kWh
2026-01-29 05:50:00	THURSDAY	191,492 kW	15,957 kWh	42,681 kW	2,779 kWh
2026-01-29 05:55:00	THURSDAY	199,811 kW	16,65 kWh	42,851 kW	3,503 kWh
2026-01-29 06:00:00	THURSDAY	188,299 kW	15,691 kWh	41,726 kW	3,584 kWh
2026-01-29 06:05:00	THURSDAY	169,986 kW	14,165 kWh	56,144 kW	3,336 kWh
2026-01-29 06:10:00	THURSDAY	200,767 kW	16,73 kWh	55,611 kW	4,598 kWh
2026-01-29 06:15:00	THURSDAY	209,867 kW	17,488 kWh	63,013 kW	5,245 kWh
2026-01-29 06:20:00	THURSDAY	204,905 kW	17,075 kWh	73,822 kW	6,089 kWh
2026-01-29 06:25:00	THURSDAY	196,205 kW	16,35 kWh	73,872 kW	6,163 kWh
2026-01-29 06:30:00	THURSDAY	200,744 kW	16,728 kWh	73,503 kW	6,157 kWh
2026-01-29 06:35:00	THURSDAY	216,863 kW	18,071 kWh	72,857 kW	6,685 kWh
2026-01-29 06:40:00	THURSDAY	216,343 kW	18,028 kWh	83,623 kW	6,026 kWh
2026-01-29 06:45:00	THURSDAY	219,06 kW	18,255 kWh	76,968 kW	6,771 kWh
2026-01-29 06:50:00	THURSDAY	216,966 kW	18,08 kWh	77,483 kW	6,179 kWh
2026-01-29 06:55:00	THURSDAY	218,398 kW	18,199 kWh	81,251 kW	6,379 kWh
2026-01-29 07:00:00	THURSDAY	217,93 kW	18,16 kWh	74,167 kW	7,029 kWh
2026-01-29 07:05:00	THURSDAY	217,816 kW	18,151 kWh	57,907 kW	5,306 kWh
2026-01-29 07:10:00	THURSDAY	220,712 kW	18,392 kWh	58,956 kW	4,803 kWh
2026-01-29 07:15:00	THURSDAY	217,398 kW	18,116 kWh	56,921 kW	4,899 kWh
2026-01-29 07:20:00	THURSDAY	216,595 kW	18,049 kWh	51,524 kW	4,56 kWh
2026-01-29 07:25:00	THURSDAY	220,238 kW	18,353 kWh	49,653 kW	4,206 kWh
2026-01-29 07:30:00	THURSDAY	216,189 kW	18,015 kWh	59,13 kW	4,849 kWh
2026-01-29 07:35:00	THURSDAY	214,989 kW	17,915 kWh	60,448 kW	5,011 kWh
2026-01-29 07:40:00	THURSDAY	215,247 kW	17,937 kWh	55,355 kW	4,949 kWh

2.8.4 Charging Session Statistics

Content

A table with all the summarized information about charging sessions on a selected time range and location.

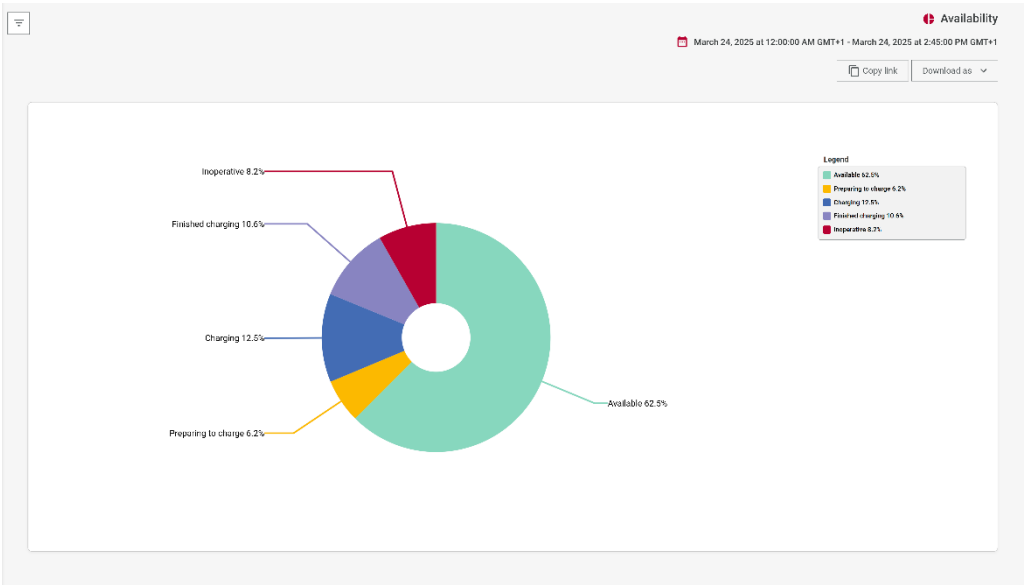


Charging Sessions Statistics	
March 4, 2025 at 12:00:00 AM GMT+1 - March 4, 2025 at 8:00:00 AM GMT+1	
Copy link Download as	
▶ Number of started charging sessions	36
🔍 Number of failed charging sessions	2
🕒 Longest charging session	15h40min
🕒 Shortest charging session	0h0min
🕒 Avg. duration of a charging session	7h27min
⌵ Max. power consumption of a single charging session	83,871 kW
⌴ Min. power consumption	0 kW
→ Avg. power consumption	53,340,68 kW
⚡ Requested energy	3,136,784.7 kWh
⚡ Charged energy	2,987,414 kWh
Operational Status Statistic	
🟢 Available	62.5 %
🟡 Preparing to charge	6.2 %
🟦 Charging	12.5 %
🟦 Finished charging	10.6 %
🔴 Inoperative	8.2 %

2.8.5 Availability

Content

A summary of the operation states of selected charging points within the selected date range.



2.8.6 Charging Session Details

Content

A list with all charging sessions and their details. For each charging session, a separate entry is displayed. In the overview, the date and the status of the charging session is displayed. The entry can be expanded, so all details of the session are visible.



Caution: Due to the large amount of data, in the preview a maximum of only 50 entries are displayed. If the desired entries are not included in the result, the period of the report can be limited. Afterwards, the report must be generated again.

Alternatively, all entries can be exported as Excel or CSV file.



Charging Sessions Details

4. März 2025 um 00:00:00 GMT+1 - 24. März 2025 um 08:00:00 GMT+1

Copy link Download as

Search

Oldest first Newest first

DC Station 1 Charging Session fd1e9d3-77ad-47c5-9ede-df0c0b1981a	24.03.2025, 14:43:45	Still Running
DC Station 1 Charging Session c2cc18f1-4c2d-40d3-adcb-3bc92da550a7	24.03.2025, 10:03:45	24.03.2025, 13:03:45
DC Station 1 Charging Session f03bfff0-537a-4f83-b477-77ad58ce5324	23.03.2025, 15:03:45	23.03.2025, 21:03:45
DC Station 1 Charging Session c8aaaf7-9c84-4b3a-9cad-a94054acab04	24.03.2025, 09:03:45	24.03.2025, 10:19:45
DC Station 1 Charging Session b21eaa7a-eb6a-44c2-bd74-1983365c6566	22.03.2025, 22:37:45	23.03.2025, 09:57:45
DC Station 1 Charging Session 10df7453-8c19-4759-a906-9a965fa9b4f8	21.03.2025, 22:02:45	22.03.2025, 08:34:45

Minimum Dataset in NOW Format

This report can also be exported in CSV and Excel formats. Two versions are available for each format:

- > In the standard version, the export includes a large number of columns containing different information
- > The NOW version follows the template required by the National Organization for Mobility Transformation (NOW). This report contains a minimum dataset required for publicly funded projects.

2.8.7 Clearing

Content

A list with all charging sessions and their clearing relevant data. For each charging session, a separate entry is displayed. In the overview, the date, the vehicle, the charging point and the charged energy of the charging session is displayed. The entry can be expanded, so all details of the session are visible.

Each entry has one of the following states:

- > Valid: The charging session is completed and all relevant data is valid and stored
- > Invalid: The charging session is completed, but the validation of the data failed. The validation is based on signature checks.
- > Incomplete: Relevant data is missing, e.g. due to communication interrupt



Caution: Due to the large amount of data, in the preview a maximum of only 50 entries are displayed. If the desired entries are not included in the result, the period of the report can be limited. Afterwards, the report must be generated again.

Alternatively, all entries can be exported as Excel or CSV file.



The screenshot displays the 'Clearing' report interface. At the top right, it says 'Clearing' with a red icon. Below it, a date range is shown: 'March 4, 2025 at 12:00:00 AM GMT+1 - March 24, 2025 at 8:00:00 AM GMT+1'. There are buttons for 'Copy link', 'Download as', and a checked 'Download all' option. A search bar is present on the left. The main content area shows a list of charging sessions, each with a station icon, station name, vehicle details, charged energy, token type, and location. The sessions are sorted by date, with the newest first.

Station	Vehicle	Charged energy	Token type	Location	Start Date	End Date
DC Station 1 - Left Spot	Vehicle: S V2234	Charged energy: 12.65 kWh	Token type: RFID	Location: n/a	Mar 24, 2025, 10:06:06 AM	Mar 24, 2025, 12:51:06 PM
DC Station 1 - Left Spot	Vehicle: S V2234	Charged energy: 37.15 kWh	Token type: RFID	Location: n/a	Mar 23, 2025, 3:06:06 PM	Mar 23, 2025, 8:51:06 PM
DC Station 1 - Left Spot	Vehicle: Bus S-V/501	Charged energy: 73.51 kWh	Token type: LVCC ID	Location: n/a	Mar 24, 2025, 12:06:06 AM	Mar 24, 2025, 10:06:06 AM
DC Station 1 - Left Spot	Vehicle: Bus S-V/501	Charged energy: 79.8 kWh	Token type: LVCC ID	Location: n/a	Mar 23, 2025, 10:35:06 PM	Mar 23, 2025, 9:35:06 AM

2.8.8 Efficiency

Content An overview of the charged energy of all charging sessions compared to the consumed energy at the mains supply (measurement point). An energy meter should be installed in order to get all metrics.

Data Sources The energy amount consumed by the charging stations is calculated based on the meter values received via OCPP from each charging station.

The reference value for the comparison and the calculation of the efficiency is received via a REST API. This API must be called by the smart meter device (or a gateway device), which measures the total consumption of the charging infrastructure.



Note: If no smart meter device is available or the API is not integrated, the report will not show the expected results.



2.8.9 Cost Savings

Content The report calculates the savings achieved by the charging option "cost-optimization". For the calculation, the actual charging session is compared with a simulated charging session that would be expected with the "Balanced" charging strategy without cost-optimization.

The basis for the calculation is the energy consumption per time unit (15 min or 60 min) and the associated costs.

The report can be generated at different time granularities (day, individual date). If the report is to be created for a longer time range, the resolution of the data is 15 minutes. If a month is selected, either 15min (max. 7 days) or 60min (max. 1 year) can be selected as the resolution.

Due to the large amount of data, no preview can be displayed for a month and the granularity 15min. Only the export to CSV / Excel is possible.

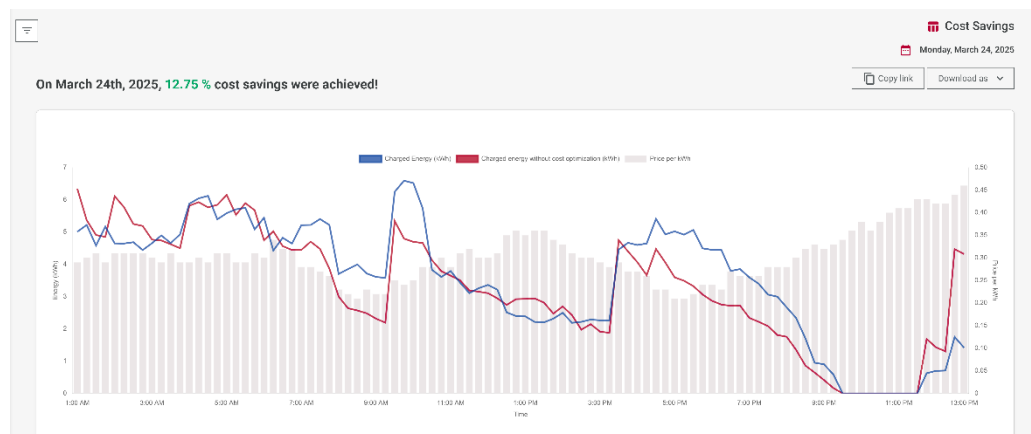
The report can only be created for charging station groups for which the cost-optimization is currently activated. If this applies to several groups, a group must be selected in the filter settings.

Overview Graphic

If "Day" has been selected as the time period, the course of the day is displayed as a graph. The graph contains the following information:

- > Blue curve: The energy actually charged per time unit (with cost-optimization)
- > Red curve: The simulated energy per time unit (charging strategy "Balanced" without cost-optimization)
- > Gray bars: Costs per time unit

The graph allows a quick plausibility check that, taking into account the energy demand and standing time, charging took place primarily during periods when the energy costs were low.



Details

All values are also listed in a table. If the table contains a large number of rows, only the first 5 entries and the total values are displayed. Click on "Show all xx entries" to display all entries.

The table contains the following columns:

- > Date: Start of the period
- > Price per kWh (day) / Daily average price per kWh (month): The configured price for this time period. The currency unit must be known to the user and is not stored in the system.
- > Charged Energy (kWh): The energy actually charged in this time period.
- > Costs: The product of the price per kWh and the charged energy in this time period.
- > Charged energy without cost optimization (kWh): The simulated energy that would have transferred if no cost-optimization had been used.
- > Costs without optimization: The product of the price per kWh and the simulated energy in this time period.
- > Cost difference: The difference between "Costs" and "Costs without optimization".



Cost Savings

Friday, March 1, 2024 - Sunday, March 31, 2024

In March 2024, **9.76 %** cost savings were achieved!

Charged energy shows the actual energy flow of the cost-optimized charging processes. The values refer to 15 minute intervals.
Charged energy (without cost optimization) is based on a simulation of the charging processes under the assumption that the balanced charging strategy was selected.

Date	Daily average price per kWh	Charged Energy (kWh)	Costs	Charged energy without cost optimization (kWh)	Cost without optimization	Cost difference
2025-02-22	0.290	151.121	41.695	194.995	68.248	2.335
2025-02-23	0.300	157.817	47.345	199.504	59.826	0.848
2025-02-24	0.310	135.952	42.145	140.202	49.071	0.693
2025-02-25	0.290	150.057	43.516	132.612	46.414	0.290
2025-02-26	0.310	170.921	52.985	210.696	73.743	2.076
Show all 30 entries						
Total	0.294	3,192.310	960.283	3,040.397	1,064.139	103.856 (9.76%)



Note: The report only takes into account the energy costs that were provided via the configuration. Additional costs (taxes, fees, ...) that are charged during billing are not taken into account.

2.9 Certificates

Summary

Certificates are used for different purposes. Following certificate types can be managed in the CSMS:

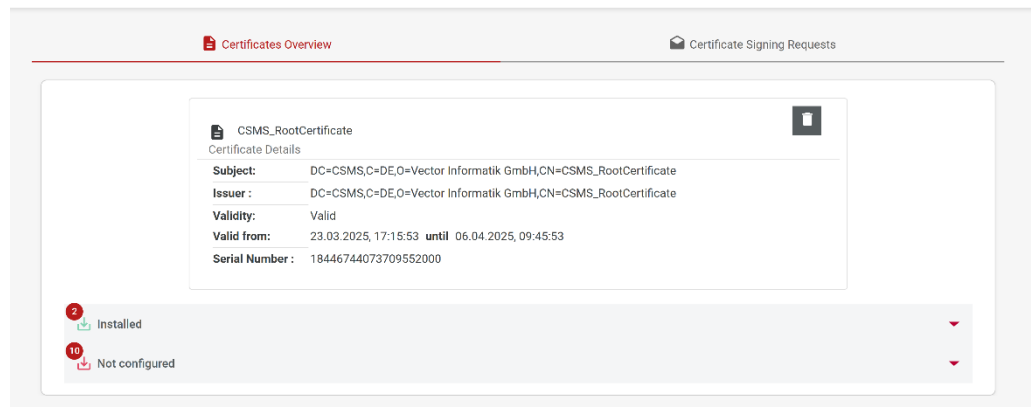
- > **V2G Certificates:** Certificates which are introduced by the ISO15118
 - > **EVSE Leaf Certificates:**
The certificates are installed in the charging station and used as server certificate during the TLS handshake between vehicle and charging station. The corresponding root certificate (V2G root) must be installed in the vehicle.
 - > **V2G and Mobility Operator (MO) Root Certificates:**
The certificates are used to verify the validity of other certificates, e.g. the contract certificate which is used for Plug&Charge.
- > **CSMS Certificates:** Certificates used to encrypt the back end communication
 - > **CSMS Root Certificates:**
The certificates are used during the TLS handshake between Charging Station and the CSMS.
 - > **CSMS Client Certificates:**
The certificates are used by the Charging Station to authenticate at the CSMS.
 - > **OCPP server certificates:**
The certificates are used by an edge-device to provide a TLS-protected OCPP connection.
 - > **VDV261 server certificates:**
The certificates are used by an edge-device to provide a TLS-protected VDV261 connection.

The CSMS provides functions to manage these certificates, but the certificates must be created by a Certificate Authority (CA) outside of the CSMS.

Detail View

All uploaded certificates are displayed in the navigation menu on the left-hand side. The menu represents the structure of the Public-Key-Infrastructure (PKI). Several PKIs can be installed and managed at the same time.

The details of each certificate can be viewed by clicking on the specific certificate. The details view provides basic information of the certificate and a list with all charging stations using this certificate.

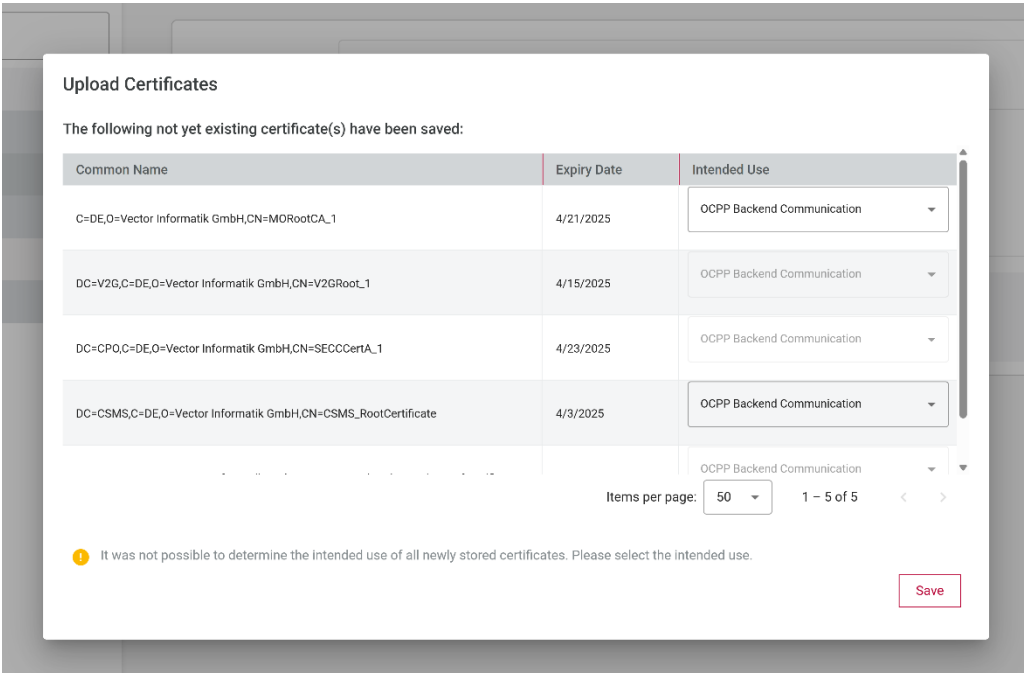


2.9.1 Manual Installation

Upload of new Root Certificates

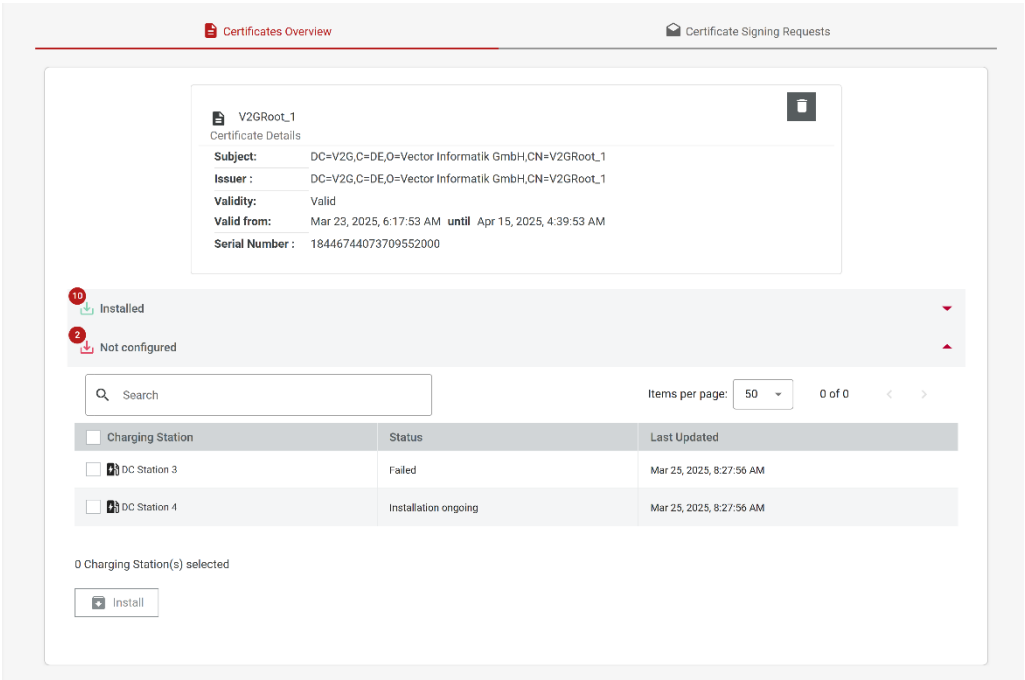
Use the [Upload] button to upload new certificates. One or several certificates can be selected in the dialog. The upload is confirmed by a second dialog.

If the type of a certificate could not be determined automatically, the type must be selected manually.



Installation of Root Certificates

If a root certificate is not installed on a specific charging station, the charging station is listed in the “Not configured” list. Select one or several charging stations and click on [Install] to start the installation process. After the installation was successful, the charging station is listed in the “Installed” list.



Installation of Sub-CA Certificates

Sub-CA certificates are installed automatically by the CSMS, when the corresponding leaf certificate is installed.

Installation of Leaf Certificates

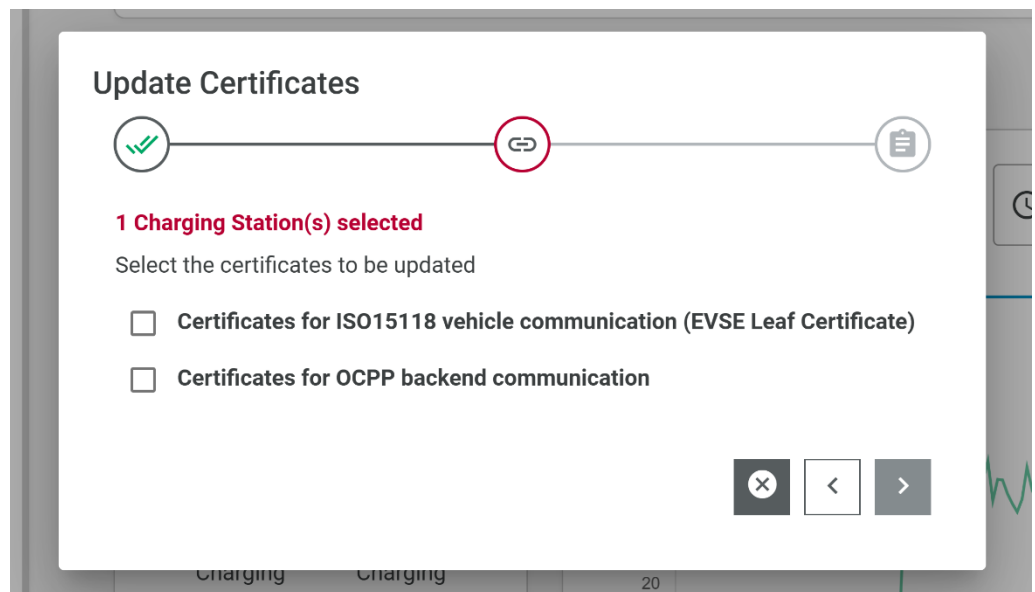
The installation process of leaf certificates is different to ensure optimal security. The charging station has to generate a certificate signing request (CSR). The CSR process can be started by using the [Update Certificates]

dialog. The dialog can be opened in the Charging Infrastructure view in the action menu More Options|Certificates

In the first step of the dialog, the charging stations can be selected which shall update the certificates.

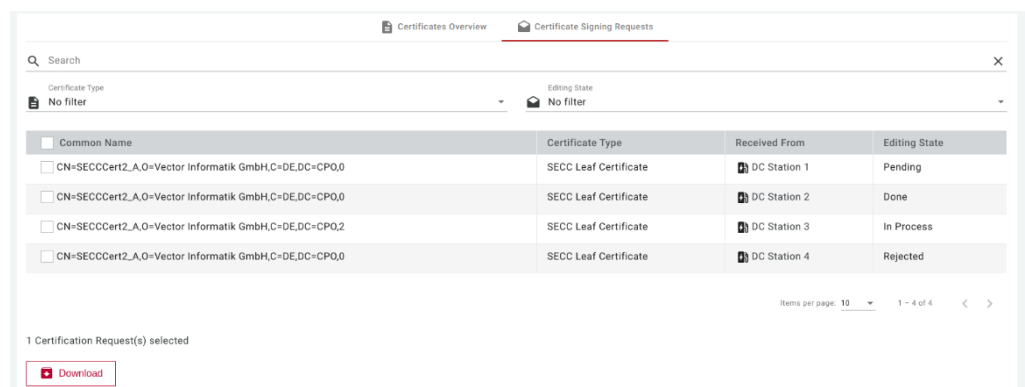
In the second step, the type of certificate can be chosen:

- > Certificates for ISO15118 vehicle communication (EVSE Leaf Certificate)
- > Certificates for OCPP back end communication



Certificate Signing Requests

Certificate signing requests can be processed automatically, if the PKI is connected to the CSMS. Alternatively, CSRs can be processed offline. Select the desired CSRs in the list and download the files. After the Certificate Authority (CA) created the certificates based on the CSR, the certificates can be uploaded in the CSMS. The installation process of the new certificates is started automatically after the upload finished.



Deletion and Deinstallation

Certificates can be uninstalled and deleted. If a certificate is uninstalled, the certificate is removed from the charging station but still available in the CSMS.

If a certificate is deleted, the certificate is removed from the charging station and from the CSMS.

To uninstall a certificate, select all desired charging stations in the "Installed" list in the details view and click the [Uninstall] button. Use the  button to delete a certificate.

The certificates are only removed in the CSMS, if they are removed from all charging stations successfully.



Caution: If a certificate is deleted, all sub-certificates are deleted too. Example: If a root certificate is deleted, all Sub-CA certificates and all leaf-certificates are deleted, which are derived from this root.

2.9.2 Automatic Installation

Summary

To simplify installation and make the process more secure, certificates can also be installed automatically. To do this, CSR requests are automatically forwarded from the charging station to a certification authority. The certification authority generates the certificate, which is then installed on the charging station by the CSMS.

The CSMS currently supports the following certification authority:

- > Hubject GmbH

Configuration

Due to the increased need for coordination, the connection to the certification authority will be set up by support.

2.10 Settings

2.10.1 Users

Summary

Users who should have access to the CSMS can be added, edited and removed under Settings - Users.

These functions are only available to users with Administrator role.

User Roles

To avoid unintended changes in the configuration, users can have limited access to specific functions. Every user must be assigned to one of the following roles:

Viewer:

- > Intended for passive monitoring
- > Read-only rights

Operator:

- > Extends Viewer role
- > Intended for daily operation of charging infrastructure
- > Basic configuration of charging infrastructure, e.g. vehicle and token administration

Configurator:

- > Extends Operator role
- > Intended for technical expert
- > Right to configure all parameters in charging infrastructure, including critical

Administrator:

- > Extends Configurator role
- > Intended for system administrator with no usage restrictions
- > Configuration of user accounts and role assignment (in development)

The assigned user role is displayed in the user profile / settings view.



Profile

Account:

Username: user@company.de

Roles: administrator

Change password

➔ Sign out

Access Rights

	Viewer	Operator	Configurator	Admin
Charging Stations				
Display configured charging stations	✓	✓	✓	✓
Manage charging stations and groups			✓	✓
Activate and configure load-management			✓	✓
Display current operation data (e.g. charging point status)	✓	✓	✓	✓
Change availability of charging points		✓	✓	✓
Change charging station parameters			✓	✓
Update charging station firmware			✓	✓
Restart charging station		✓	✓	✓
Request and download log files of charging station		✓	✓	✓
Remote Start / Stop		✓	✓	✓

Map				
Display Map	✓	✓	✓	✓
Vehicles				
Display configured vehicles	✓	✓	✓	✓
Manage vehicles		✓	✓	✓
Control preconditioning		✓	✓	✓
Events				
Display Events	✓	✓	✓	✓
Reports				
Display Reports	✓	✓	✓	✓
Certificates				
Manage charging station certificates			✓	✓
Settings				
Display and manage users				✓
Display and manage sub-clients				✓
Display and configure notification receivers				✓
Display edge devices	✓	✓	✓	✓
Manage edge devices			✓	✓
Manage pre systems				✓
Display Billing Configuration	✓	✓	✓	✓
Appearance				✓

Add User

In the Settings - Users view, a new user can be granted access to the CSMS via the "Add user" button. This function is only available to users with Administrator role.

The following information must be entered:

- > Email address: The email address is used by the user to log in. Also, emails are automatically sent to this address when there are changes to the user account settings.
- > Role: The role determines what actions the user is allowed to perform in the CSMS.
- > Notes: Optionally, notes can be saved for this user.
- > Sub clients: A sub-client to be assigned to the user. The setting is only relevant if the "Viewer" or "Operator" role has been selected. If a sub-client has been selected, the user only has access to charging stations and vehicles that have also been assigned to the sub-client. If no sub-client is selected, the user has access to all data.

The user initially receives a temporary password. When logging in for the first time, the user must update the temporary password with their own password. If the user already has access for another CSMS client, he will not receive a new password, but will only be informed about the change via email.



Add user

E-mail*

✉

name@company.com

16/255

?

⊕ Roles *

☒ Viewer

☒ Operator

☐ Configurator

☐ Administrator

?

?

?

?

It may take up to one hour for the role change to be applied. If a sign out is done, the changes are applied immediately.

Notes

🗨

Responsible for Location City-Center

36/255

Sub Clients

👤

No sub client

▼

⚠

The user is not assigned to a sub client. This allows the user to view ALL data.

Cancel

Save

Manage Users

Already created users can be managed under Settings – Users by users with Administrator role. In addition to the information entered, the time of the last login is also displayed.

If the icon of a user is displayed in gray instead of black, this user has never logged in to the CSMS.

Users can be edited via the  button or deleted via the  button. In both cases, the user will be informed by email.



Caution: It may take up to one hour for the changes to be applied. If a sign out is done, the changes are applied immediately.

2.10.2 Sub Clients

Summary

Independent customers can be created in one instance, whose configuration and data are stored separately.

Load management nevertheless takes all customer charging stations into account and thus finds the optimum power distribution. Users only see content in the web interface that has been approved for them.

Use-Case

The function is particularly suitable if several independent parties want to use charging infrastructure in a property. In a commercial property, this could be different companies that have rented office space and want to use charging infrastructure at a shared grid connection. As these are independent organizations, a strict separation of data is required. The situation is similar in apartment buildings.

The function can also be used to integrate different locations that are organizationally independent into one instance, but to separate access to the data.



Note: The function can also be used to integrate different locations that are organizationally independent into one instance, but to separate access to the data. The following restrictions must be observed:

- > The purchased scope of functions applies to all sub-clients / charging points. This may be undesirable if the locations require different use cases.
- > The access rights for sub-clients are restricted (see next section), in particular the configuration of the charging stations.
- > Not every functionality can be configured independently for sub-clients, for example the interface for fleet and depot management systems and the billing interface.

Access Rights

As the load management configuration affects all sub-clients, only users who have access to all sub-clients are allowed to change load management settings.

Users with the roles "Administrator" and "Configurator" always see data from all sub-clients and have the necessary rights to make settings in load management and at the charging stations.

Users with the "Operator" or "Viewer" rights only see the data from the sub-client to which they have been assigned. As described in section 2.10.1 Users, these users may not make any settings in load management in order to prevent undesirable effects on other sub-clients.

Create Sub Client

Before sub-clients are set up, charging station groups (see 2.2.1 Topology) and vehicle groups (see 2.4.1 Groups) should already be created. Subsequent changes are nevertheless possible.

The charging station groups, which contain the charging stations of a sub-client, may be subordinated to a common root node. This is usually also necessary if the sub-clients share a house connection/transformer. However, the charging station group of a sub-client should not be a sub-group of another sub-client. If this is the case, the first sub-client also sees the data of the second sub-client.

Any number of charging station and vehicle groups can be assigned to a sub-client.

In the Settings – Sub Clients view, a new sub-client can be created using the "Add sub client" button. This function is only available to users with the Administrator role.

The sub-client requires the following settings:

- > Name: Name that is used for the display in the settings.
- > List of charging station groups: Selection of one or more groups that are assigned to the sub-client. Users from this sub-client only have access to the data of these charging stations.
- > List of vehicle groups: Selection of one or more groups that are assigned to the sub-client. Users from this sub-client only have access to the data of these vehicles.

Finally, the users must be assigned to the sub-client (see 2.10.1 Users).



Sub Client Name*

Sub Client 1

Search charging station group

Charging Stations

☒

 Building Downtown

☒

 Building North

☐

 Building South

Search vehicle group

Vehicles

☐

 E-Buses

☒

 Employees

☐

 Pool

The past usage data of assigned charging station groups and vehicle groups are visible to sub clients

The charging station group **Building North** is already being used by another sub client

Cancel

Save



Warning: Users generally have access to all data that corresponds to the current configuration. If changes are made to the configuration, users also have access to data prior to the changeover, for example if a charging station is moved from one group to another.



Caution: The following functions have limitations regarding the use of the sub-client feature:

- > OCPI messages are always displayed in the message view. This view may also contain data (such as authorization tokens) that is used in other sub-clients.
- > Charging schedules via Excel files cannot be managed on a sub-client specific basis
- > Site-specific images are visible to all sub-clients

2.10.3 Licenses

Summary

In the overview page under "Settings" | "Licenses", all client instances to which the user has access are listed first. If the user has access to several client instances, you can switch to the respective client instance via the list.

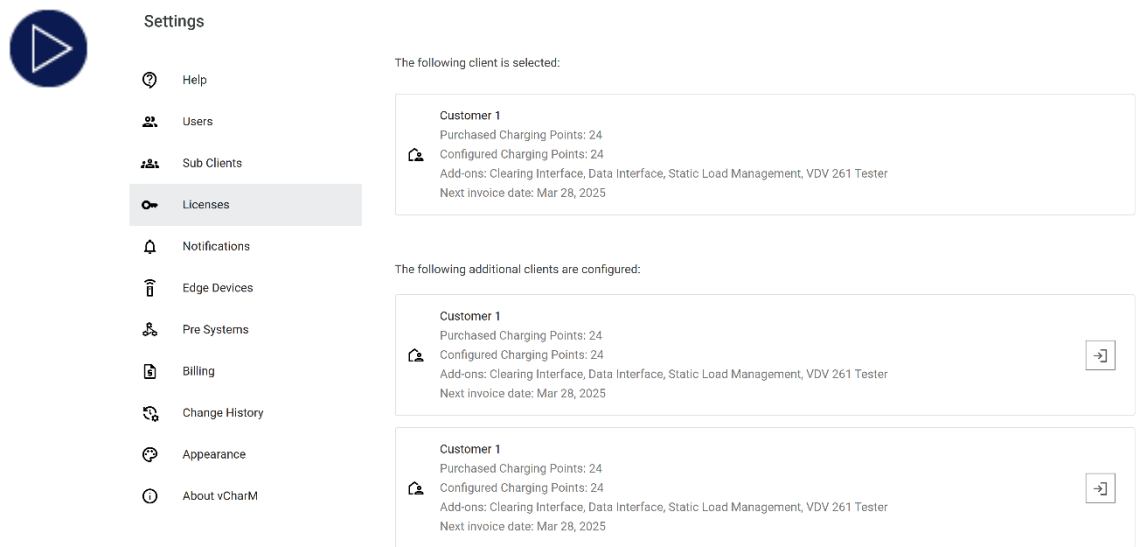
License Information

The following commercial information is displayed for each client instance:

- > Purchased Charging Points: The maximum number of charging points that may be configured in the CSMS. This number was agreed when the order was placed and is the basis for invoicing.
- > Configured Charging Points: The actual number of charging points configured in the CSMS. Changes made in the "Charging Infrastructure" view can affect this number.
- > Add-ons: Functions that must be ordered separately. Only functions that are listed here can actually be used.



Note: If it is a time-limited test version, the above data is not relevant.



2.10.4 Events & Notifications

Summary

The settings for events and notifications allow for fine-grained control over which users should be notified in which situations. This ensures that users receive the information they need based on their roles, without having to review every single notification.

There are predefined events, and users can also create custom events. Notifications can be configured for these events.

Event List

Event	Default Severity	Notification via Mobile App
Category: Operational Status		
Requested a state change to available	Info	
Requested a state change to unavailable	Warning	
Charging Station Faulted	Minor Error	✓
Charging station was reserved	Info	
State changed to available	Info	
State changed to occupied	Info	
Temporary unavailable	Warning	✓
Category: Charging Session		
Authorization failed	Warning	
Authorization successful	Info	

Charging session failed	Minor Error	✓
Charging session finished	Info	
Charging session started	Info	
Charging target not reached	Warning	
Unknown response to clear the fallback charging limit	Info	
Unknown response to clear the charging profile	Info	
Implausible Energy Data detected	Warning	
Implausible timestamp	Warning	
Remote authorization accepted for selected charging point	Info	
Remote authorization failed for selected charging point	Warning	
Remote authorization rejected for selected charging point	Info	
Remote authorization requested for selected charging point	Info	
Remote authorization request for selected charging point triggered by billing system	Info	
Remote stop accepted for selected charging point	Info	
Remote stop failed for selected charging point	Warning	
Remote stop rejected for selected charging point	Info	
Remote stop requested for selected charging point	Info	
Remote stop for selected charging point requested by billing system	Info	
Setting the fallback charging limit was rejected	Warning	
Setting the charging profile was rejected	Warning	
Stop Transaction Message discarded	Warning	

Category: Maintenance

Problem with the certificate installation	Minor Error	✓
Certificate was installed	Info	
Certificate was uninstalled	Info	
Problem with the certificate uninstallation	Minor Error	✓
Problem with the certificate request	Minor Error	✓

Certificate Signing Request received	Info	
Device model was modified	Info	
Problem during Firmware update	Minor Error	✓
Firmware was installed	Info	
Firmware update request sent	Warning	
A restart was requested	Info	
Category: Charging Station Event		
Error message from Charging Station received	Minor Error	
Info message from Charging Station received	Info	
Warning message from Charging Station received	Warning	
Category: Billing		
Transmission of charge detail record failed. Will be retried automatically.	Warning	
Charge detail record was successfully transmitted to eMSP	Info	
Could not send a clearing message to the eMSP	Warning	
Category: Preconditioning		
Vehicle connected	Info	
Vehicle disconnected	Info	
Category: Connections		
Connection was re-established	Info	
Charging Station disconnected	Warning	✓
Edge Device disconnected	Warning	✓
Charging station was offline for a long time	Warning	
Presystem communication timeout	Warning	

Configure Events

Before configuring notifications, you should first review the event settings and adjust them as needed.

For each available event, you can set the corresponding severity level. The following severity levels are available:

- > Info
- > Warning
- > Minor Error

- > Major Error
- > Critical Error

The selected severity level can be used to create custom notification rules. Additionally, entries in the Event View are displayed and filtered based on the selected severity level.

In the settings, system events are divided into different categories for a better overview. To customize system events, the respective categories must first be expanded. When a severity level is changed, the change is automatically saved.

The list of system events can be filtered by severity level.



Custom Events

In addition to the system events provided in the CSMS, you can also add custom events. A new event can be created using the [Add Custom Event] button.

The following settings are available in the dialog:

- > Name: A descriptive name to help distinguish between events later
- > Severity

In the Conditions section, you can configure when the event should be triggered and how long it remains active.

The condition consists of a number and a metric. The number can be specified as an absolute value (items) or a relative value (percentage). You can also set whether the event is triggered when the threshold is exceeded or not met.

The following metrics are available:

- > Number of available charging stations
- > Number of faulted charging points
- > Number of available edge-devices
- > Number of accepted charging profiles

Optionally, you can limit which charging stations are monitored for this event. From the selection dialog, you can choose a single charging station or a group of charging stations. If a group is selected, the selection automatically updates when charging stations are added to or removed from that group.

If short-term events are to be ignored, the conditions can be debounced before the event becomes active. The debounce time can be entered in minutes.

The created events will be displayed in the table under Settings. The icon in the first column indicates whether the conditions for this event have been met at the moment.

If a notification shall be received for this event, email notification rule must be created in the next step.



Charging Session

Add Custom Event

Configure a custom event that triggers when the specified condition is met.

General

Name*

Severity Level*

Condition

What condition triggers the event?

Where should the condition occur?

☒ All Charging Stations
 ☐ Specific Charging Stations

When will the event be triggered?

☐ Immediately
 ☒ The condition has been met for min.

Note that in order to receive email notifications for your event, you have to set up a notification rule matching the event or severity level.

E-Mail Notification Rules

E-Mail notification rules determine when users receive email notifications about specific events. Each notification rule has a name to make it easier to identify. Multiple email addresses can be added to the recipient list.

Depending on the users preference, the email can be sent immediately after the event occurs or as a daily/weekly summary. For the daily summary, also a time can be selected; for the weekly summary, both the time and the day of the week can be selected.

Individual events or all events can be selected of a specific severity level. The grouping of events by severity level can be customized as described under "Configure Events."



Note: If email notifications are restricted to charging stations, all custom events will be excluded.



Edit notification rule

General

Name*

Notify Support on Warnings

Recipients*

oecs@vector.com

employee123.surname@vector.com

The notification should happen...

☒ Immediately
☐ Daily
☐ Weekly

Notification Options

Define when to receive email notifications for certain events. You can specify particular events or all events of a severity level. You can further restrict the notification to charging stations, so that you are notified for events occurring at certain charging stations. Note that restricting the notification to any charging stations excludes all custom defined events.

It is not possible to restrict custom events to charging stations.

Event and Severity

Q

▼

☒ Info

▼

☐ Warning

▼

☐ Minor error

▼

☐ Major error

☐ Select All Types

Cancel

Save

2.10.5 Edge Devices



The configuration of edge-devices is described in chapter 4 Edge-Device.

2.10.6 Modbus Device Models



Note: Starting with version 3.13, settings for Modbus devices are configured via the web interface. In previous versions, these settings were configured via the Edge device. These settings can still be used, but they can no longer be changed. If you wish to make a change, the device must be integrated as described in this chapter.

Summary

The settings page for Modbus device models allows you to integrate any Modbus devices. The Modbus standard defines only the manner in which data is exchanged between devices. The data content—such as format and meaning—is not standardized and is implemented differently by each device manufacturer.

The CSMS already includes a list of commonly used models with the appropriate settings. If one of these devices is used, no further settings need to be configured other than the addressing.

If the installed device is not included in the list, a new model can be added. The communication settings, such as the register address and length, can be defined entirely individually.

Model List

The list displays all configured models. Predefined models cannot be edited or deleted. Only the predefined parameters can be viewed by clicking the eye-icon.

User-defined entries are also displayed and can be edited by clicking the pencil-icon and deleted by clicking the trashcan-icon.



Settings

- Help
- Sub Clients
- Licenses
- Events & Notifications
- Edge Devices
- Modbus Device Models**
- Pro Systems
- Billing
- Telematics Systems
- PKI
- OpenADR

The following Modbus models are configured:

[+ Add Modbus Model](#)

Battery Predefined			
	Modbus Type	Modbus TCP	
	Communication Objects	Power	
Janitza UMG96			
	Modbus Type	Modbus TCP	
	Communication Objects	Power, Current L1, Current L2, Current L3	
User Defined Battery			
	Modbus Type	Modbus TCP	
	Communication Objects	Power	
User Defined Meter			
	Modbus Type	Modbus RTU	
	Communication Objects	Power	

Create New Model

A new model is created using the [Add Modbus Model] button. The following parameters must be set in the dialog:

- > Model Name: Descriptive name for the display
- > Modbus Type: The communication protocol used, Modbus TCP or RTU. This depends on the device's available interfaces and the selected cabling.
- > Endian Type: The order in which the data is transmitted. This information must be obtained from the device manual.
- > Data Objects: The necessary parameters must be set for each data object to be read. At a minimum, the parameters for the power value must be defined. For future functions, it is recommended to also specify the current per phase.

The following parameters must be specified for each communication object:

- > Register address: This information must be taken from the device manual.
- > Number of registers: The number of registers that must be read for this communication object. This information must be taken from the device manual. If the manual specifies the size in bits or bytes (e.g., 32 bits or 4 bytes), then the value must be divided by 16 for bits and by 2 for bytes (e.g., the number of registers is 2 for 32 bits or 4 bytes).
- > Register Type: The Modbus operation used to access the data (Holding or Input). This information must be obtained from the device manual.
- > Data Type: The type that specifies how the data must be interpreted. This information must be obtained from the device manual.
- > Multiplication Factor: If necessary, the read value can be multiplied by a factor. If the value is 1, the measured value remains unchanged.



Add Energy Meter

Configuration for a Modbus Device which provides measured power and current values.

Device Name*

Smart Meter

Modbus Type*

Modbus TCP

Endian Type*

Big Endian

Communication Objects

Types*

Power

Type: Power

Register Address*

3080

Register Quantity*

2

Register Type*

Holding

Data Type*

Integer

Unit Factor*

1

Cancel

Save

2.10.7 Pre Systems



The configuration of pre systems is described in chapter 5 Fleet- and Depot Management.

2.10.8 Billing



The configuration of billing systems is described in chapter 6 Billing.

2.10.9 Change History

Summary

All configuration changes made in the CSMS are logged. The log can be exported and viewed so that changes can be tracked later and unintentional changes can be detected.

Content

Changes to the following data are logged. The creation and deletion of sub-elements is also included:

- > Charging station groups
- > Load management configuration
- > Charging stations, charging points and connectors
- > Vehicle groups
- > Vehicles
- > Authorization tokens
- > Actions at charging stations, e.g. restart
- > Import of charging schedules
- > Settings
 - > Users and roles
 - > Sub-clients
 - > Notifications
 - > Edge devices
 - > Pre-systems
- > Successful Login-Attempts

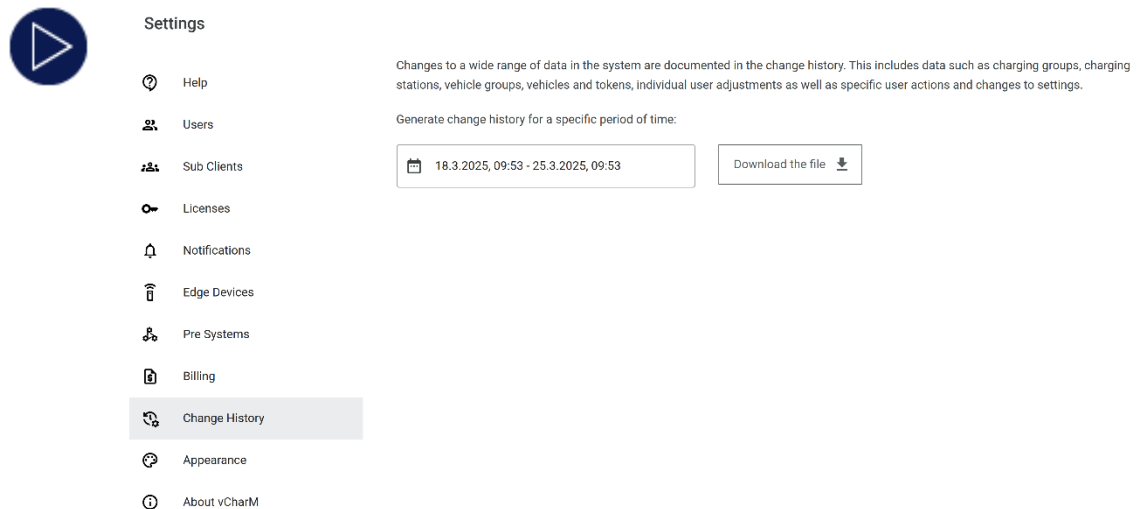
Export

The log can be downloaded as an Excel file. The period of the entries must be selected beforehand.

A maximum of 1000 entries are exported. If there are more entries in the specified period, the period must be selected smaller in order to see the desired results.

The Excel file contains the following columns:

- > Timestamp: Time and date of the change
- > Item Type: The type of object that was changed, created or deleted
- > Item Name: The name of the object at that time. If the name of the object is subsequently changed, previous entries are not updated. There is a separate entry for the name change.
- > Action Type: The type of change
- > Username: The name of the user who triggered this change
- > Item ID: A unique identifier for the object that does not change over the life cycle.

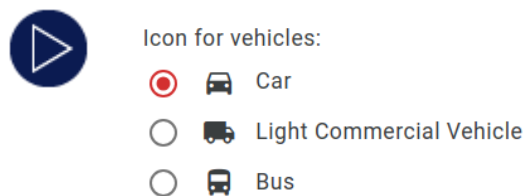


2.10.10 Appearance

Summary

The CSMS offers functions for a wide range of applications, which is also reflected in the different vehicle types. A corresponding vehicle symbol can be selected to adapt the web interface to your own application.

The selection is saved permanently and applies to all users.



2.10.11 Single-Sign-On

Summary

Users can use their company organization account to log in to the CSMS. This saves users having to enter a password and makes it easier for organization administrators to manage access to the CSMS.

Optionally, multi-factor authentication (MFA) can also be activated in the company's identity provider.

Authentication Endpoint

The authentication endpoint is available at:

<https://auth.charging-management.com/oauth2/idpresponse>

Configuration

The initial setup in the CSMS is started in coordination with the support. Following information is required:

Value	Description
Identifier	An E-Mail domain to identify your company users e.g. <i>company.com</i>
ClientId	A client identifier provided by the OpenID Connect identity provider
ClientSecret	A client secret provided by the OpenID Connect identity provider
IssuerUrl	URL of the provider which allows the API server to discover public signing keys e.g. for Microsoft EntraId <a href="https://login.microsoftonline.com/<directory-tenant-id>/v2.0">https://login.microsoftonline.com/<directory-tenant-id>/v2.0
Scopes	email, openid, profile
AttributeRequestMethod	POST or GET
Authorization Endpoint	The endpoint a user is redirected to at sign-in e.g. for Microsoft EntraId <a href="https://login.microsoftonline.com/<directory-tenant-id>/oauth2/v2.0/authorize">https://login.microsoftonline.com/<directory-tenant-id>/oauth2/v2.0/authorize
Token Endpoint	The endpoint used to exchange the code received in a user's request for an ID token e.g. Microsoft EntraId <a href="https://login.microsoftonline.com/<directory-tenant-id>/oauth2/v2.0/token">https://login.microsoftonline.com/<directory-tenant-id>/oauth2/v2.0/token
UserInfo Endpoint	The endpoint used to retrieve information about the authenticated user e.g. Microsoft EntraId <a href="https://login.microsoftonline.com/<directory-tenant-id>/oidc/userinfo">https://login.microsoftonline.com/<directory-tenant-id>/oidc/userinfo
JwksUri Endpoint	The endpoint used to decode and verify tokens issued by the identity provider e.g. Microsoft EntraId <a href="https://login.microsoftonline.com/<directory-tenant-id>/discovery/v2.0/keys">https://login.microsoftonline.com/<directory-tenant-id>/discovery/v2.0/keys

3 Mobile App

3.1 Overview

Overview

In addition to the web browser user interface, a mobile app for smartphones is provided for charge point operators. This allows a flexible monitoring of the charging infrastructure outside the office.

The features of the mobile app are limited to monitoring, for configuration tasks the web browser user interface is still required.

Platforms

Supported platforms:

- > [Apple iOS](#)
- > [Google Android](#)

3.2 Charging Stations

Charging Point Status

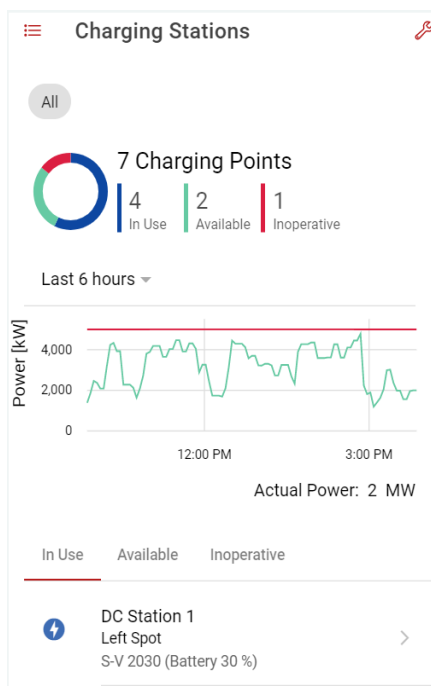
The Charging Infrastructure view provides statistics and information about the status of all charging stations.

The first graphic shows how many charging points are

- > in use (charging in progress)
- > available (no vehicle connected)
- > inoperative (charging station is faulted or not connected)

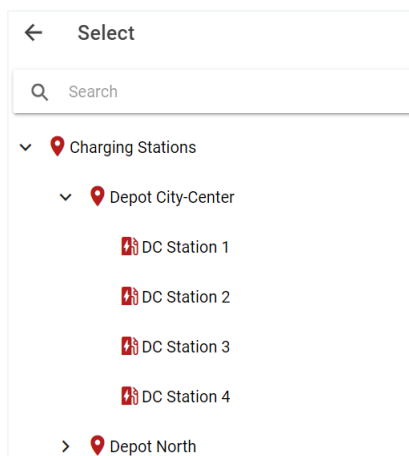
The second graphic shows the power consumption of all charging stations in the selected group. The time frame can be adjusted.

At the bottom of the view, a list of charging points is provided. The list is divided into the different states (in use, available, inoperative).



Navigation

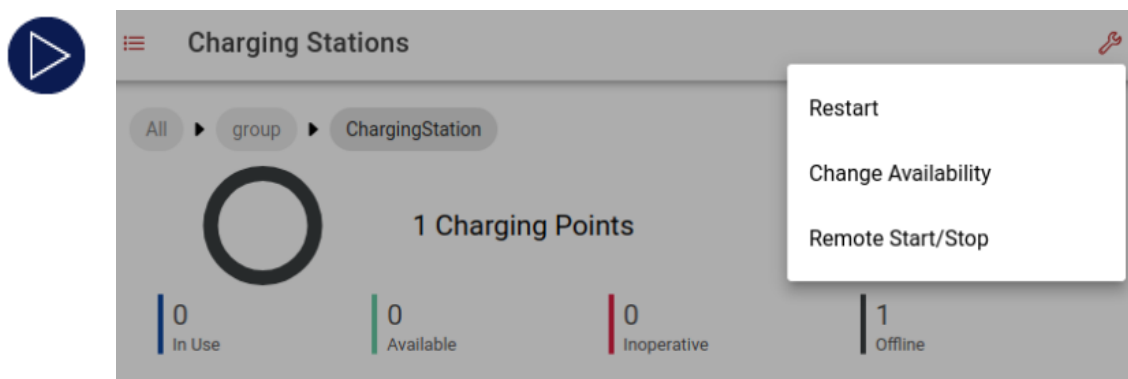
The charging stations can be filtered by selecting specific groups. Open the navigation by clicking on the ☰ symbol. Select any group, sub-group or charging station to filter the view.



Charging Station Control

The mobile app supports the following functions to control charging stations. Use the 🔧 symbol to open the options menu:

- > Restart charging station (available only on charging station level)
- > Change availability of charging points (available on group and charging station level)
- > Authorize/Start and stop charging session remotely (available at group and charging station level)

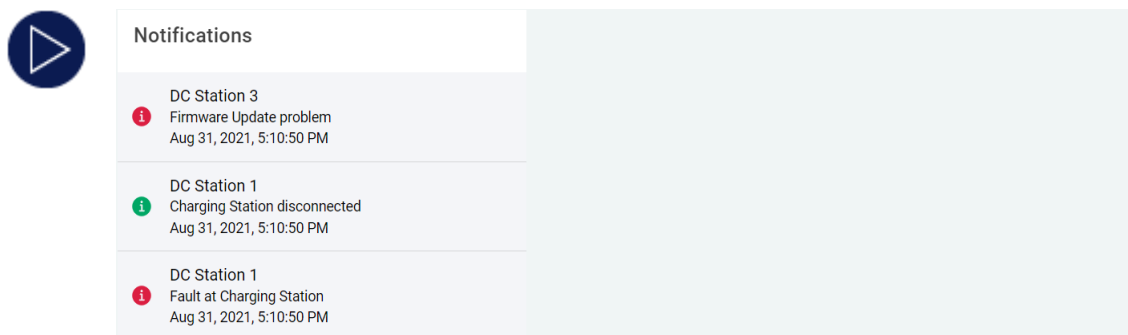


3.3 Notifications

Overview

Important events are displayed in the Notifications view. The entries are separated into new events and already seen events. Furthermore, events have different severity level, depending on the event reason.

If the notifications option in the Settings view is activated, new events are directly pushed to the home screen of the smartphone.



4 Edge-Device



Reference: Information about the product can be found on the product page and in the user manual:

- > [Product Information](#)
- > [Product Documentation](#)

Overview

With the help of an edge-device, on the one hand the use of dynamic load management is possible, on the other hand the operation of the charging infrastructure becomes more robust, since disturbances of the Internet connection do not lead to any restriction during charging.

Further documentation on the installation and initial configuration of an edge-device is available from Support.

After installation, access to the device is no longer required, as all further configuration settings are made via the familiar CSMS interface. The relevant settings are explained below.

Connection to edge-device

As soon as the edge-device connects to the Internet, the configuration data is retrieved. To protect the data from unauthorized access, each edge-device must be enabled separately.

The edge-device configuration is performed under "Settings" in the "Edge devices" section. Via "Add edge device", a new device can be authorized to retrieve data.



Add edge device

Device ID*

edge-north

?

Only hexadecimal characters (0-9, a-f, A-F) are allowed 10/255

Password *

.....

Ocpp Security

No Security

▼

Assigned Charging Station Group

Building North

▼

Name

edge-device-north

17/255

Notes

Installed in IT cabinet in room U.1a

36/255

Cancel

Save

Following settings are available:

- > Device-ID: The Device-ID is used to identify the edge-device and is printed on the device housing. Furthermore, the Device-ID can be read via the configuration interface.
- > Password: The edge-device logs in with this password. For security reasons, a strong password should be selected. The same password must also be entered in the configuration interface of the edge-device. The device can only connect if the Device-ID and password has been entered correctly.
- > OCPP Security: Details are described in chapter 4.1 OCPP Security
- > Assigned Charging Station Group: Each edge-device is assigned to a group from the charging station configuration. This determines which charging stations are under the management of this edge-device. Assignment is done at the top level, subgroups cannot be assigned.
- > Name: A name can optionally be entered for display.
- > Notes: Annotations can optionally be entered for documentation purposes.



vCharM Configuration



Connection

Connection State

Connected

Tenant-ID

Tenant-ID

Authorization

vCharM.edge-ID

00000000a1b2c3d4

Password

.....

After saving, the device is displayed in the overview list and can be edited from there. The device configuration can also be deleted, but the load management must be deactivated beforehand so that no unintentional overload can occur.



Settings

Help

Users

Sub Clients

Licenses

Notifications

Edge Devices

Pre Systems

Billing

Change History

Appearance

About vCharM

You can find information about the use of vCharM.edge in the user manual.

User Manual

A description of how to set up vCharM.edge can be found in our quick start guide.

Quick Start Guide

The following edge devices are configured:



Building Downtown Edge Device
Assigned group: Building Downtown
Edge Device to control the Depot located at the city center



Building South Edge Device
Assigned group: Building South
Edge Device to control the Underground Garage parking located at the south

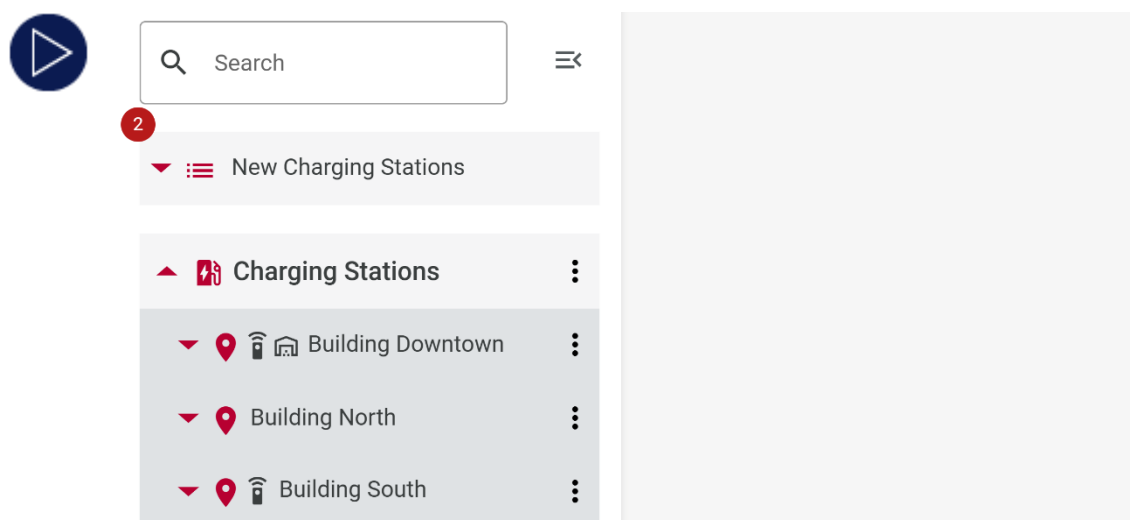


local-controller-device-id-3
Not assigned to any group



+ Add edge device

If the device has been successfully configured and assigned to a group, this is also indicated in the charging station view by an icon in front of the name.



Charging Station Configuration

Once the configuration has been completed, it may take a few minutes for the next connection attempt to be made and the data retrieved. The charging stations can then be configured (see 2.2.2).



Note: The backend URL for the charging stations differs if the connection is to be made via an edge-device. The exact address depends on the local network installation. For more information, refer to the product manual.

4.1 OCPP Security

Summary

Charging stations that connect without an edge-device must support OCPP Security Profile 2. This means that the connection must be secured via TLS and Basic Authentication.

However, if the charging station is connected via the edge-device, Security Profile 2 can be activated or deactivated.



Caution: A secure connection must be guaranteed in all cases. If Security Profile 2 is deactivated, other technical and organizational measures must be taken to ensure that communication with the charging infrastructure is secure.

Security Profile Activation

As certain requirements must be met to activate Security Profile 2, the setting is deactivated by default. The setting can only be changed once all requirements have been met.

CSMS Certificate

To protect the OCPP connection via TLS, a suitable OCPP server certificate must be installed on the edge-device.

As this certificate must be adapted to the conditions of the local IT installation, the edge-device does not have its own certificate. The certificate must be generated and installed by the customer.



Reference: The corresponding CSMS root certificate must be installed on the charging station, either via OCPP or via a manufacturer-specific method. Installation via OCPP is described in chapter 2.9 Certificates.

Installation of CSMS Server Certificate

The CSMS server certificate must be generated via a Certificate Signing Request (CSR). The CSR can be requested and downloaded via the following steps:

1. After the edge-device has been created, the CSR can be requested via [Update CSMS Certificate] in the options. The device should be actively connected at this point.
2. The list of all certificate requests can then be called up via [Check Certificate Status]. Alternatively, the view can also be opened via Certificates | Certificate Requests.





Building Downtown Edge Device
Assigned group: Building Downtown
Security Profile 2 Status: Activation succeeded (last update a day ago)
Edge Device to control the Depot located at the city center



Building South Edge Device
Assigned group: Building South
Security Profile 2 Status: Deactivation succeeded (last update a day ago)
Edge Device to control the Underground Garage parking located at the south





Update CSMS Certificate
Update VDV261 Certificate
Check Certificate Status

3. If the list contains several entries, the appropriate entry can be searched for using the "Received from" and "Received on" columns.
4. The entry must be selected for further processing and saved using the [Download] button.



Certificates Overview
Certificate Signing Requests

Common Name	Certificate Type	Received from	Received on	Editing State
C=OC-ST-Badstr-Waartenweg, O=Vector Informatik GmbH, OU=Charging Edge, CN=192.168.255.1	OCSP Server Certificate	Building Downtown Edge Device	Jun 11, 2025 2:46:30 PM	Done

1 Certificate Request(s) selected
Download

5. A certificate can then be generated based on the CSR. The necessary steps are known to the PKI operator and are not explained further here.

- The certificate file must be uploaded to the CSMS. The CSMS automatically recognizes which certificate request the certificate must be assigned to and starts installing the certificate on the edge-device.



Upload Certificates

The following not yet existing certificate(s) have been saved:

Common Name	Expiry Date	Intended Use
C=DE,O=Acme Corporation,CN=Depot1	3/17/2026	OCPP Backend Communication

Items per page: 50 1 - 1 of 1

It was not possible to determine the intended use of all newly stored certificates. Please select the intended use.

Save



Reference: Requirements for the content and format of certificates are described in chapter 7 Charging Station Communication and the OCPP specification.

- The installation status can be checked via the Certificates view. To do this, the appropriate PKI must be selected in the menu on the left-hand side and the [OCPP Server Certificates] entry opened.
- To see the status, the desired certificate must be selected from the list.
- In the detail view, the correct edge-device should be listed under the "Installed" tab. "Installed" should be the value in the "Status" column.



Certificates Overview

Certificate Signing Requests

ocppServerLeaf_1

Subject: C=DE,O=Vector Informatik GmbH,CN=ocppServerLeaf_1
 Issuer: C=DE,O=Vector Informatik GmbH,CN=OcppServerRoot_1
 Validity: Valid
 Valid from: Jun 11, 2025, 2:42:19 PM until Jul 10, 2025, 12:29:19 PM
 Serial Number: 18446744073709552000

Installed

Search

Items per page: 50 1 - 1 of 1

Device	Status	Last Updated
☐ Building Downtown Edge Device	Installed	Jun 12, 2025, 11:53:31 PM

0 Charging Station(s) selected

Uninstall

Not configured

- Finally, the OCPP Security Profile 2 can now be activated as described in chapter 4 Edge-Device.



Caution: As soon as the OCPP Security setting is changed, all active OCPP connections are interrupted. The charging station must then re-establish the connection according to the OCPP Security setting. This usually requires an adjustment of the settings in the charging stations. Details on the configuration of the charging pole can be found in the charging station manual.

5 Fleet- and Depot Management

5.1 Overview

Overview

The CSMS integrates with fleet and depot management systems. The automatic exchange of data between the two systems brings a number of benefits:

- > The CSMS receives information about planned tours. This includes, for example, arrival/departure times and energy demands. If schedule-based optimization is selected in load management, this information is used to ensure that vehicles are charged at the right time and receive enough energy to make planned tours.
- > The CSMS detects power bottlenecks in the schedule and informs the fleet manager. As a result, planning can be adjusted at an early stage and delays are avoided.
- > The fleet or depot management system receives up-to-date data on the availability of charging stations, status information on charging sessions and error information.

Interfaces

The following interfaces can be used for integration:

- > VDV463 V1.0
- > CSMS REST API

5.2 VDV463

5.2.1 Configuration

Supported Messages

Following messages are supported:

- > BootNotification Request / Response
- > ProvideChargingInformation Request / Response (partially)
- > ProvideChargingRequest Request / Response (partially)

Configuration

The use of the VDV463 interface requires a configuration in the CSMS and in the pre system (depot management system or ITCS). The configurations must be coordinated with each other so that the data is exchanged correctly. For example, identifiers (IDs) must be consistent.

VDV463 V1 defines a URI format for the Pre System ID and Depot ID. To increase compatibility, the CSMS also allows other formats. During configuration, a format must be selected that is also supported by the Pre System.

Create Pre System

The CSMS supports the connection to a maximum of one pre system. The connection data must be entered in the configuration. Under "Settings", "Pre Systems", a new pre system configuration can be created via "Add pre system":

- > Pre System ID: The pre system connects to the CSMS with this identifier. The identifier must be configured identically in the pre system.
- > Password: With this password the pre system authenticates itself at the CSMS. The password must be configured identically in the pre system.
- > Name: Optional parameter that is used for the display in the CSMS.
- > Notes: Optional parameter for relevant information.

Also displayed is the server address that must be used in the pre system to establish the connection.

After saving, the new pre system is displayed in the configuration. There, the pre system can also be edited and deleted afterwards.



The following

Edit VDV463 Pre System - Depot

Connection URL for Pre Systems

 wss://ws.vcharm.works/vdv463/

Pre system ID* 9/255

 uri://BMS

Username* ?

 BMS

Password (already set) ?



Name 23/255

 Depot-Management-System

Notes 0/255

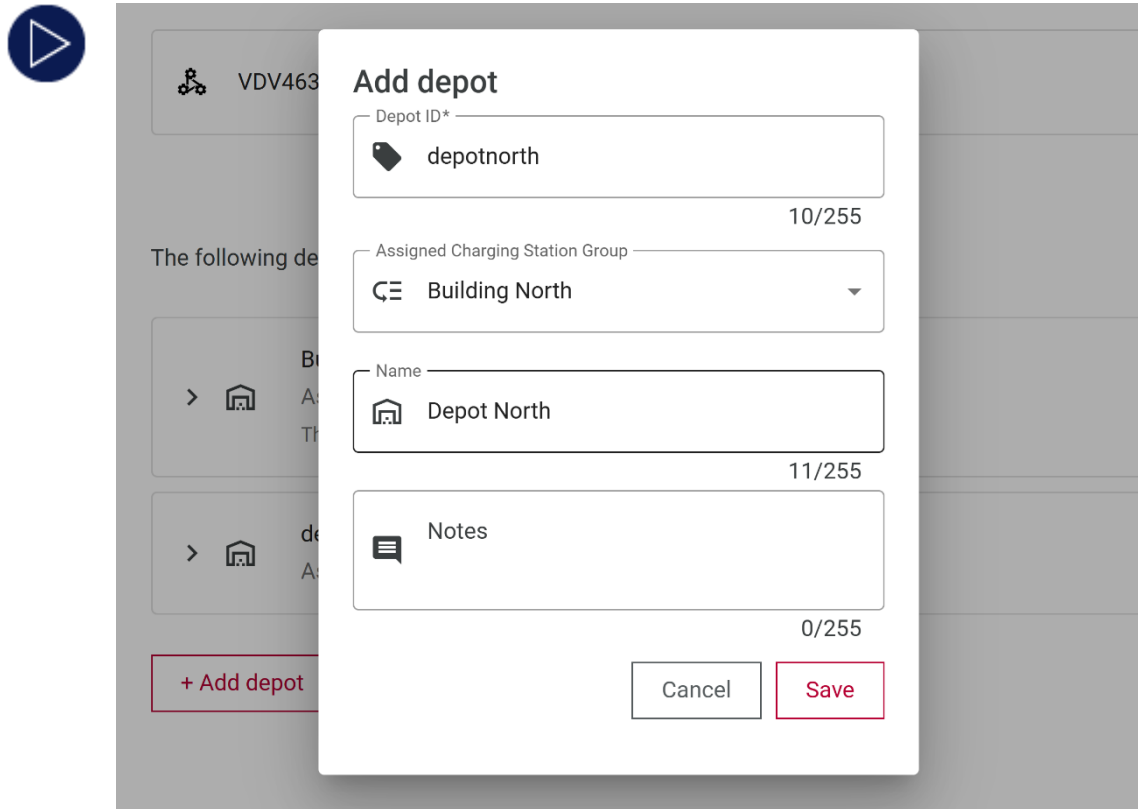
 Notes

Create Depot

Once a pre system has been created, one or more depots can be created. The depots are automatically assigned to the pre system.

A new depot can be created via "Add depot". The following parameters can be entered:

- > Depot ID: Via this ID, the pre system recognizes which depot it is.
- > Assigned Charging Station Group: All charging stations within this group are assigned to the depot.
- > Name: Optional parameter, which is used for the display in the CSMS.
- > Notes: Optional parameter for relevant information.



Add depot

Depot ID* 10/255

Assigned Charging Station Group ▼

Name 11/255

Notes 0/255

Cancel Save

Charging Station- and Charging Point Identifier

A unique identifier (ID) is generated for each charging station and charging point. These IDs are used for data exchange with the pre system. The IDs must be transferred manually to the pre system configuration. It is mandatory that the following IDs are configured identically in the CSMS and the pre system.

- > Pre System ID
- > Depot ID(s)
- > Charging Station and Charging Point ID(s)

If the configuration differs, communication will not work at all or will be limited.

The IDs can be copied to the clipboard individually or as a complete table.



The following depots are configured:

>

Building South BMS
Assigned group: Underground Garage
The BMS controlling the buses

<

depot://center-bms
Assigned group: Building Downtown

Copy entire table to clipboard

Charging Station Name	Charging Station ID	Charging Point Name	Charging Point ID
DC Station 1	uri://4ff71d	Left Spot	uri://06c7e6
		Right Spot	uri://16c7e6
DC Station 2	uri://5ff71d	Left Spot	uri://f39af4
		Right Spot	uri://049af4
DC Station 3	uri://6ff71d	Left Spot	uri://e16d03
		Right Spot	uri://f16d03
DC Station 4	uri://7ff71d	Left Spot	uri://df2021
		Right Spot	uri://ef2021

+ Add depot

Connection Status

To track the connection activity, the timestamp of the last received message is displayed for the pre system. This helps to identify connection problems.

Vehicle Battery-Capacity und VIN

If a vehicle is used in the pre system planning, the following information must be filled in the vehicle profile:

- > **Battery capacity:** The maximum amount of energy that the vehicle battery can charge. Since the VDV463 only transmits the energy demand in relative terms (State of Charge), the total capacity must be stored in the CSMS as a reference.
- > **Vehicle Identification Number (VIN):** The vehicles are referenced in the VDV463 via the VIN number.

Both parameters can be entered when creating the vehicle or added later. Although the parameters are optional in the vehicle profile, they are required when using the VDV463.



Add Vehicle

Vehicle Name* S-V 2033

Assigned Group* E-Buses

Assigned Driver

Battery Capacity (kWh) 220

Energy Consumption (kWh/km) 1.5

Charging Priority Normal

Notes

Vehicle Identification Number (VIN)*
 VIN1M8GDM9AKP0427
Used as username for the connection 17/17

☒ Enable Value-Added-Service for preconditioning (VDV261)

☒ Require Authentication for Value-Added-Services

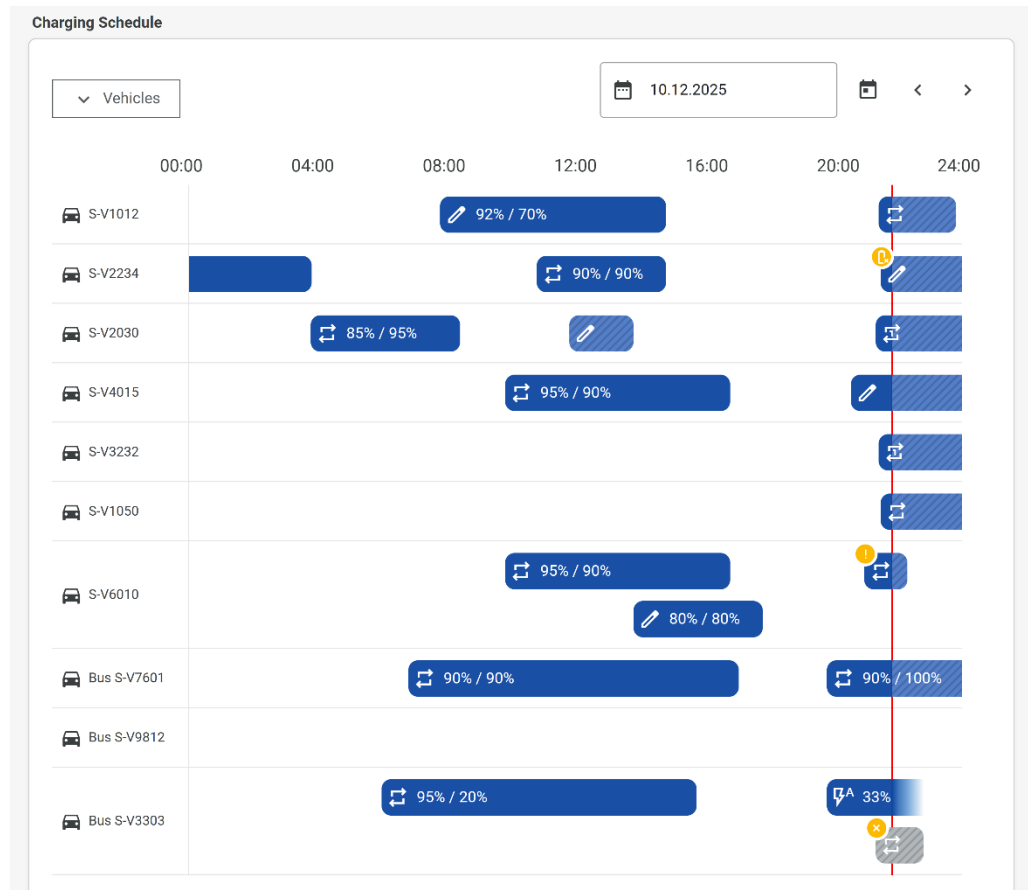
Password* ...

☒ Use historical data in Load Management

>

As soon as the connection with the pre system has been established, the CSMS sends all available data to the pre system.

As soon as the pre system sends planning data, these are displayed in the Charging Schedules view and in the Charging Infrastructure overview. Ongoing or planned charging sessions are displayed as a blue bar. With a click on it, details of the planning are displayed.



If the CSMS shall take the planning data into account in load management, the load management strategy must be set to "Schedule-based". The setting can be made on the group that has been linked to the respective depot.



Configure Building Downtown

Group Name*
Building Downtown 17/500

Loadmanagement* ☐ Off ☒ Static ☐ Dynamic

Charging Strategy
Select Strategy*
Schedule-based

Power Supply
Number of phases* ☐ 1 ☒ 3
Maximum Current* 2174 A
Phase Voltage* 230 V
Power Supply Limit* 1500.06 kW

Cancel Save

5.2.2 Protocol Implementation

Limitations of Provide-Charging-Information

The following parameters of the ProvideChargingInformation message cannot be sent. For some of the parameters there is currently no data source, so that an implementation is not possible.

- > chargingPointInfo: outsideTemperature
- > chargingPointInfo: connectorTemperature
- > tractionBatteryInfo: stateOfHealth
- > tractionBatteryInfo: temperature
- > vehicleStatusInfo: All parameters
- > vehicleFaultInfo: All parameters
- > electricData: reactivePower



Note: Further restrictions apply if a charging strategy has been selected in load management that does not allow advance planning. With advance planning, as is the case with the "Schedule-based" charging strategy, for example, the end of charging and target SoC are calculated.

For charging strategies without advance planning, such as "Balanced", status data is sent via VDV463, but no prediction of the end of charging is made.

Limitations of Provide-Charging-Request

The following parameters of the ProvideChargingRequest message are not evaluated on receipt:

- > ChargingRequest: priority
- > chargingRequestData: maxTargetSoc
- > chargingRequestData: adHocCharging
- > manualPreconditioning: All parameters

VDV463 without Load-Management

If the VDV463 is fully set up, but load management is deactivated or "Schedule-based" has not been selected as the strategy, the following information is not sent to the BMS in addition to the restrictions mentioned above:

- > Total power of ChargingPoint
- > ChargingProcessInfo

Prediction

During a charging session, the CSMS sends the data structure chargingPredictionDataMinSoC with the values requestedMinSoC and predictedTime via VDV463. There are two cases:

1. requestedMinSoC is expected to be reached in time before departure:
 - a. requestedMinSoC is then the requested requestedMinSoc
 - b. predictedTime is then the time at which this SoC will be reached (before the planned departure time)
2. requestedMinSoC is not expected to be reached in time before departure:
 - a. requestedMinSoC is then the SoC that is expected to be reached at the departure time (less than the requestedMinSoC)

- b. predictedTime is then the requested departure time

Without planning data, the time until 100% SoC is reached is predicted. If no battery capacity has been specified for the vehicle, no prediction is made.

6.1.1 Authorization Sequence

Authorization Sequence

Authorization requests received from the charging station via OCPP are processed in a defined sequence.

First, the authorization request is checked in the CSMS against the tokens in the vehicle configuration. If there is a match, the authorization request is responded to with this result. If the token is still valid, the charging session is authorized; if the token has been blocked or is no longer valid, the charging session is rejected.

If the token is not recognized in the CSMS, the billing systems are queried one after another. As soon as a request is answered positively by a billing system, the charging session is authorized and no further billing systems are queried.

If none of the billing systems recognize the token, the authorization request is rejected and the charging session is not rejected.

The order in which the billing systems are queried can be changed in the settings. The first and subsequent billing systems can be selected using the arrow keys.

6.2 Reports

Reports

The "Clearing" report shows whether a charging session has been billed via the billing system and whether this was successful. A green billing symbol is displayed in the top right-hand corner if the charging session was successful, and a red symbol if it was unsuccessful.

The overview displays the billing system and the billing date.

If the entry is expanded, further details are visible:

- > Billing status
- > eMSP charging session ID
- > Billing System storage location



> DC Station 1 - Left Spot Vehicle: Bus S-V7601 Charged energy: 83.28 kWh Authorization Method: n/a Token type: EVCC ID Billing System: Hubject (OCPP) Billed at: Mar 25, 2026, 10:01:23 PM	Mar 21, 2026, 7:59:23 AM — Mar 21, 2026, 6:29:23 PM Green billing symbol
> DC Station 1 - Left Spot Vehicle: Bus S-V7601 Charged energy: 49.66 kWh Authorization Method: n/a Token type: EVCC ID	Mar 20, 2026, 6:28:23 AM — Mar 20, 2026, 4:58:23 PM Green billing symbol

6.3 Clearing Interfaces

6.3.1 Open Charge Point Interface (OCPI)

OCPI Version OCPI versions 2.2-d2 and 2.2.1 are supported.

OCPI Modules Following OCPI modules are support:

- > Versions:
 - > Implemented methods: GET
 - > Used methods implemented by eMSP: GET
- > Credentials:
 - > Implemented Methods: GET, POST, PUT, DELETE
 - > Used methods implemented by eMSP: GET, POST, PUT, DELETE
- > Token:
 - > Implemented methods: none
 - > Used methods implemented by eMSP: POST (Sender)
 - > Realtime Authorization is supported, but the Token Exchange is not possible
- > CDRs:
 - > Implemented methods: GET (Sender)
 - > Used methods implemented by eMSP: POST (Receiver)
- > Locations (Sender)
 - > Implemented methods: GET (Sender)
 - > Used methods implemented by eMSP: PUT, PATCH (Receiver)
- > Sessions:
 - > Implemented methods: none
 - > Used methods implemented by eMSP: GET, PUT, PATCH (Receiver)
- > Commands:
 - > Implemented methods: POST (Receiver)
 - > Used methods implemented by eMSP: POST (Sender)
 - > Commands: START_SESSION, STOP_SESSION

Configuration The OCPI configuration is set up under Settings | Billing. You can add a new billing system via the [Set up] menu and the [New OCPI System] button. If an OCPI connection is already configured, the button is disabled.

The following settings are available:

- > Billing system name: An optional display name for the billing system.
- > Country code CPO: The ISO 3166 Alpha-2 country code of the country in which you operate.
- > Party ID CPO: The party_id in OCPI is used to uniquely identify and distinguish parties such as CPOs and EMSPs from one another. For example, a CPO in Germany with the party_id ABC in OCPI is uniquely identified by the combination of country_code = DE and party_id = ABC. Before assigning a new party_id and country code, make sure that this

combination is not already in use in your EMSP system. If you are unsure, contact your EMSP for clarification.

- > Only charging sessions authorized via OCPI should be transferred:
 - > If this option is enabled and the charging session has been authorized via the OCPI token module or the OCPI command module, a CDR is generated via OCPI. If the charging session has been authorized via another method, e.g., via the CSMS internal vehicle list, then no CDR is generated.
 - > If this option is disabled, a CDR is generated via OCPI for all charging sessions, regardless of the authorization method.
- > Credentials Exchange: To start the exchange of access tokens, one platform must be selected as the sender of the initial setup token. Select "Sender initial setup token" if the CSMS should initiate the credentials exchange. If you are unsure whether your EMSP (E-Mobility Service Provider) supports this, please contact your EMSP.
- > Initial Setup Token: Enter the initial setup token here. You can create the token yourself and provide it to your EMSP (e-mobility service provider). Alternatively, you can obtain the token from your EMSP and enter it here.
- > OCPI version endpoint EMSP: The address at which the OCPI version endpoint of the EMSP can be reached. The address must be provided by the EMSP.



Caution: For "OCPI version endpoint EMSP", an address is recommended which starts with "https". Addresses with "http" provide not enough security.



Note: The initial setup token cannot be copied from the configuration later and must be copied before the dialog is closed. The token must be exchanged with the EMSP via a sufficiently protected channel.



Note: The connection to the OCPI Version Endpoint EMSP is protected by a firewall. As a result, the initial connection and the connection established after each change take approximately 10 minutes until the firewall settings are applied.



Create OCPI configuration

Name Billing system 11/255
EMSP System ?

Country code CPO* 11/255
DE ?

Party ID CPO* 2/2
VIS ?

☒ Only charging sessions authorized via OCPI should be transmitted

Credentials Exchange* 3/3
☒ CPO - Receiver initial setup token ☐ CPO - Sender initial setup token ?

Initial Setup Token* 36/64
52e743ec-1a42-48c4-8144-18a8549acbe5 ?

OCPI Version Endpoint CSMS* 36/64
https://api.staging.vcharm.works/csmsapi/s1d9u2cnr2/ocpi/versions ?

☒ I have copied and saved the initial setup token. For security reasons, it cannot be viewed again later.

Cancel Save

6.3.2 Open Charge Point Protocol (OCPP)

OCPP Version

OCPP1.6J is used for the connection between the CSMS and the billing system

The connection between the charging station and the CSMS is independent of this. The information from chapter 7 applies.

OCPP Messages

Messages received from third-party backends:

- > TriggerMessageRequest: Following MessageTrigger are supported:
BOOT_NOTIFICATION, DIAGNOSTICS_STATUS_NOTIFICATION,
FIRMWARE_STATUS_NOTIFICATION, HEARTBEAT, METER_VALUES,
STATUS_NOTIFICATION
- > RemoteStartTransactionRequest
- > RemoteStopTransactionRequest
- > ReserveNow

- > ResetRequest
- > UpdateFirmwareRequest

Messages transmitted by the CSMS to third-party backends:

- > AuthorizeRequest
 - If Plug&Charge according to ISO15118 is used, the AuthorizeRequest is sent as described in the OCA Whitepaper „Using ISO 15118 Plug & Charge with OCPP 1.6“. This means, that the CSMS uses a DataTransferRequest message instead of a AuthorizeRequest.
- > FirmwareStatusNotificationRequest
- > HeartbeatRequest
- > MeterValuesRequest
- > StatusNotificationRequest
- > StartTransactionRequest
- > StopTransactionRequest

Transaction Data The transaction data is only forwarded to the third-party backend, if the charging session was authorized by the third-party backend. If the charging session has been authorized via another method, e.g., via the CSMS internal vehicle list, then no transaction data is forwarded.

Configuration The OCPP configuration for billing systems is created by the support.

7 Charging Station Communication

7.1 Overview

OCPP

The following OCPP versions are supported:

- > OCPP 1.6 with JSON syntax. SOAP is not supported.
- > OCPP 2.0.1 (IEC 63584)
- > OCPP 2.1

The connection parameters are listed in 1.3.1.1.

Charging Station Prerequisites

A charging station acting as an OCPP communication partner must meet at least the following requirements:

- > OCPP 1.6J, 2.0.1, or 2.1
- > Smart charging functionalities
- > Installation of root certificates for OCPP and EVSE leaf certificates for ISO 15118

7.2 Security

SaaS Operations

OCPP connections that are established directly to the CSMS (without an edge-device and no on-premise installation) must meet the following requirements:

OCPP Security Profil:

- > OCPP Security Profil 2: TLS with Basic Authentication

Cipher Suite:

- > TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256
- > TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384
- > TLS_RSA_WITH_AES_128_GCM_SHA256 (not recommended)
- > TLS_RSA_WITH_AES_256_GCM_SHA384 (not recommended)

TLS Version:

- > TLS 1.0 (not recommended)
- > TLS 1.1 (not recommended)
- > TLS 1.2
- > TLS 1.3



Caution: The following cipher suites are not recommended, although they are specified in the OCPP specifications (OCPP2.0.1 - A00.FR.416 and A00.FR.318). These cipher suites are not state of the art as they do not include perfect forward security and should therefore not be used:

- > TLS_RSA_WITH_AES_128_GCM_SHA256
- > TLS_RSA_WITH_AES_256_GCM_SHA384



Caution: TLS 1.0 and TLS 1.1 are only offered because specific charging station models do not yet support TLS 1.2. If possible, at least TLS 1.2 should always be used to ensure state-of-the-art protection.

7.3 OCPP 1.6J

Supported Feature Profiles

The following Feature Profiles of OCPP 1.6 are supported:

- > Core
- > Firmware Management
- > Smart Charging
- > Remote Trigger

Whitepapers

The following whitepapers are implemented:

- > Improved security for OCPP 1.6-J edition 2 FINAL, 2020-03-31
- > Using ISO 15118 Plug & Charge with OCPP 1.6, v1.0, 2020-09-16

7.4 OCPP 2.0.1 / IEC 63584

Standardisation

OCPP 2.0.1 has now been formalized as an international standard under the specification IEC63584.

Supported Use Cases

A. Security

- > A01 - Update Charging Station Password for HTTP Basic Authentication
- > A02 - Update Charging Station Certificate by request of CSMS
- > A03 - Update Charging Station Certificate initiated by the Charging Station
- > A04 - Security Event Notification

B. Provisioning

Booting a Charging Station

- > B01 - Cold Boot Charging Station
- > B03 - Cold Boot Charging Station - Rejected
- > B04 - Offline Behavior Idle Charging Station

Configuring a Charging Station

- > B05 - Set Variables
- > B07 - Get Base Report

Resetting a Charging Station

- > B11 - Reset - Without Ongoing Transaction
- > B12 - Reset - With Ongoing Transaction

C. Authorization

Authorization options

- > C01 - EV Driver Authorization using RFID
- > C02 - Authorization using a start button
- > C03 - Authorization using credit/debit card
- > C04 - Authorization using pin-code
- > C05 - Authorization for CSMS initiated transactions
- > C06 - Authorization using local id type

Plug and Charge Authorization

- > C07 - Authorization using Contract Certificates
- > C08 - Authorization at EVSE using ISO 15118 External Identification Means (EIM)

GroupId

- > C09 - Authorization by GroupId

Authorization Cache

- > C10 - Store Authorization Data in the Authorization Cache
- > C11 - Clear Authorization Data in Authorization Cache
- > C12 - Start Transaction - Cached Id

E. Transactions

OCPP transaction mechanism

- > E01 - Start Transaction Options
- > E02 - Start Transaction - Cable Plugin First
- > E03 - Start Transaction - IdToken First
- > E04 - Transaction started while Charging Station is offline
- > E05 - Start Transaction - Id not Accepted
- > E06 - Stop Transaction options
- > E07 - Transaction locally stopped by IdToken
- > E08 - Transaction stopped while Charging Station is offline
- > E09 - When cable disconnected on EV-side: Stop Transaction
- > E10 - When cable disconnected on EV-side: Suspend Transaction
- > E11 - Connection Loss During Transaction
- > E12 - Inform CSMS of an Offline Occurred Transaction
- > E13 - Transaction related message not accepted by CSMS

Interrupting and stopping ISO / IEC 15118 charging

- > E15 - End of charging process

F. RemoteControl

- > F01 - Remote Start Transaction - Cable Plugin First
- > F02 - Remote Start Transaction - Remote Start First
- > F03 - Remote Stop Transaction
- > F04 - Remote Stop ISO 15118 Charging from CSMS
- > F06 - Trigger Message

G. Availability

- > G01 - Status Notification
- > G02 - Heartbeat
- > G03 - Change Availability EVSE
- > G05 - Lock Failure

J. MeterValues

- > J01 - Sending Meter Values not related to a transaction
- > J02 - Sending transaction related Meter Values

ISO / IEC 15118 MeterValue signing

- > J03 - Charging Loop with metering information exchange

K. SmartCharging

General Smart Charging

- > K01 - SetChargingProfile
- > K02 - Central Smart Charging

- > K06 - Offline Behavior Smart Charging During Transaction
- > K07 - Offline Behavior Smart Charging at Start of Transaction
- > K10 - Clear Charging Profile
- > K15 - Charging with load leveling based on High Level Communication
- > K16 - Optimized charging with scheduling to the CSMS
- > K17 - Renegotiating a Charging Schedule

L. FirmwareManagement

- > L01 - Secure Firmware Update
- > L02 - Non-Secure Firmware Update

M. ISO 15118 CertificateManagement

- > M04 - Delete a specific certificate from a Charging Station
- > M05 - Install CA certificate in a Charging Station

N. Diagnostics

- > N01 - Retrieve Log Information
- > N02 - Get Monitoring report
- > N07 - Alert Event
- > N08 - Periodic Event

P. DataTransfer

- > P02 - Data Transfer to the CSMS

7.5 OCPP2.1

Supported Use Cases

A. Security

- > A01 - Update Charging Station Password for HTTP Basic Authentication
- > A02 - Update Charging Station Certificate by request of CSMS
- > A03 - Update Charging Station Certificate initiated by the Charging Station
- > A04 - Security Event Notification

B. Provisioning

Booting a Charging Station

- > B01 - Cold Boot Charging Station
- > B02 - Cold Boot Charging Station - Pending
- > B03 - Cold Boot Charging Station - Rejected
- > B04 - Offline Behavior Idle Charging Station

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- > B05 - Set Variables
- > B07 - Get Base Report

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- > C06 - Authorization using local id type

Plug and Charge Authorization

- > C07 - Authorization using Contract Certificates
- > C08 - Authorization at EVSE using ISO 15118 External Identification Means (EIM)

GroupId

- > C09 - Authorization by GroupId

Authorization Cache

- > C10 - Store Authorization Data in the Authorization Cache
- > C11 - Clear Authorization Data in Authorization Cache
- > C12 - Start Transaction - Cached Id

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OCPP transaction mechanism

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- > E05 - Start Transaction - Id not Accepted
- > E06 - Stop Transaction options
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- > E08 - Transaction stopped while Charging Station is offline
- > E09 - When cable disconnected on EV-side: Stop Transaction
- > E10 - When cable disconnected on EV-side: Suspend Transaction
- > E11 - Connection Loss During Transaction
- > E12 - Inform CSMS of an Offline Occurred Transaction
- > E13 - Transaction related message not accepted by CSMS

Interrupting and stopping ISO / IEC 15118 charging

- > E15 - End of charging process

F. RemoteControl

- > F01 - Remote Start Transaction - Cable Plugin First
- > F02 - Remote Start Transaction - Remote Start First
- > F03 - Remote Stop Transaction
- > F04 - Remote Stop ISO 15118 Charging from CSMS
- > F06 - Trigger Message

G. Availability

- > G01 - Status Notification
- > G02 - Heartbeat
- > G03 - Change Availability EVSE
- > G05 - Lock Failure

J. MeterValues

- > J01 - Sending Meter Values not related to a transaction
- > J02 - Sending transaction related Meter Values

ISO / IEC 15118 MeterValue signing

- > J03 - Charging Loop with metering information exchange

K. SmartCharging

General Smart Charging

- > K01 - SetChargingProfile
- > K02 - Central Smart Charging
- > K06 - Offline Behavior Smart Charging During Transaction
- > K07 - Offline Behavior Smart Charging at Start of Transaction
- > K10 - Clear Charging Profile

- > K15 - ISO 15118-2 Charging with load leveling
- > K16 - Renegotiation initiated by CSMS
- > K17 - Renegotiation initiated by EV

L. FirmwareManagement

- > L01 - Secure Firmware Update
- > L02 - Non-Secure Firmware Update

M. ISO 15118 CertificateManagement

- > M04 - Delete a specific certificate from a Charging Station
- > M05 - Install CA certificate in a Charging Station

N. Diagnostics

- > N01 - Retrieve Log Information
- > N02 - Get Monitoring report
- > N07 - Alert Event
- > N08 - Periodic Event

P. DataTransfer

- > P02 - Data Transfer to the CSMS

8 Value-Added-Services

8.1 Overview

ISO 15118 Value-Added-Service

The term Value-Added-Service (VAS) is defined by ISO 15118 and describes additional communication channels between the electric vehicle and the charging infrastructure. The communication partner can be the charging station or any back end system connected to the charging station.

The ISO 15118 standard does not define the communication protocol and the message format. Therefore, Value-Added-Services cannot be implemented as a generic service but must be defined during the development of the EV and the back end. Only if both communication partners agree on the same VAS protocol specification, the service can be used.

Services

The CSMS is able to support several Value-Added-Services and has implemented the following:

- > Preconditioning according VDV 261

8.2 Preconditioning (VDV 261)



Note: For this functionality, an [edge-device](#) is recommended. A usage without edge-device must be coordinated with the support.

Summary

The Value-Added-Service described in the specification VDV 261 describes a protocol to exchange data related to the preconditioning of electric busses. The standard is released by The Association of German Transport Companies (VDV).

Versions

The CSMS supports version V1.0 (01/2020) and V2.0 (05/2023). Furthermore, for V1.0 additional parameters (see Vehicle Data and Back end Data) are optionally supported.

Protocol Overview

The vehicle establishes the communication via HTTPs to the CSMS. This means the vehicle is the HTTP client and the CSMS the HTTP server. The charging station is only responsible for offering the internet service and routing the VAS data packets to the CSMS server.

The communication is secured by TLS. This requires installing the certificate of the root certificate authority (CA) in the vehicle. The verification of the server certificate is also used as authentication method of the server.

Authorization

The client uses HTTP BasicAuth as authentication method. Therefore, a username and a password must be stored in the vehicle. VDV 261 defines the Vehicle Identification Number (VIN) as username.

The "Credentials" dialog can be used to enter the password for a specific vehicle. The vehicle connection is only accepted, if the credentials are correct and the check box "Authorized" is activated.



Configure Vehicle S-V4015

General

Load Management

Preconditioning

Token

Vehicle Identification Number (VIN)*
5GZCZ43D13S812704

Used as username for the connection 17/17

☒ Enable Value-Added-Service for preconditioning (VDV261) ?

☒ Require Authentication for Value-Added-Services

Password (already set) ?

Cancel Save

Vehicle Data

The vehicle provides the following data to the back end:

Parameter	V1.0	V1.0 – optional Extension	V2.0
Vehicle Identification Number (VIN)	X		X
Electric Vehicle Communication Controller (EVCC) ID	X		X
Odometer value	X		X
Required time for HV-Battery preconditioning	X		X
Required energy for HV-Battery charging	X		X
Required time for vehicle preconditioning	X		X
Required energy for vehicle preconditioning	X		X
Vehicle charging status	X		X
Battery state		X	X
Hydrogen leak detector state		X	X

Back end Data

The back end provides the following data to the vehicle:

Parameter	V1.0	V1.0 – optional Extension	V2.0
Scheduled drive-off time	X		X
Preconditioning desired	X		X
HVAC Preconditioning desired	X		X
Ambient temperature outside the garage	X		X
Target SoC		X	X
Target distance		X	X

All parameters can be configured in the vehicle view. The parameters can be changed at any time and will be exchanged the next time the vehicle connects to the back end.



Reference: The display and configuration of the VDV261 parameters is described in chapter 2.4.7 Preconditioning.

8.2.1 Vehicle-Communication via IPv6

IPv6 Proxy

VDV261 specifies IPv6 as the protocol for transmission. Experience from VDV261 project implementations has shown that continuous IPv6 communication from the vehicle to the backend is difficult to implement.

For this reason, an edge-device is used as a communication proxy. Only the network connection between the charging station and the edge-device must support IPv6. The established IPv4 protocol is used for the further connection to the customer network / Internet, so that no complex network changes are required. In addition, the edge-device offers further network services for easier commissioning.

The configuration of the vehicle and the edge-device is explained in the [edge-device user manual](#).

8.2.2 Certificate Installation

Installation of VDV261 Server Certificate

The VDV261 server certificate must be generated via a Certificate Signing Request (CSR). The CSR can be requested and downloaded via the following steps:

1. After the edge-device has been created, the CSR can be requested via [Update VDV261 Certificate] in the options. The device should be actively connected at this point.

- The list of all certificate requests can then be called up via [Check Certificate Status]. Alternatively, the view can also be opened via Certificates | Certificate Requests.



Building Downtown Edge Device
Assigned group: Building Downtown
Security Profile 2 Status: Activation succeeded (last update a day ago)
Edge Device to control the Depot located at the city center

Building South Edge Device
Assigned group: Building South
Security Profile 2 Status: Deactivation succeeded (last update a day ago)
Edge Device to control the Underground Garage parking located at the south

Update CSMS Certificate

Update VDV261 Certificate

Check Certificate Status

- If the list contains several entries, the appropriate entry can be searched for using the "Received from" and "Received on" columns.
- The entry must be selected for further processing and saved using the [Download] button.



Certificates Overview

Certificate Signing Requests

Certificate Type

No filter

Editing State

No filter

☐ Common Name	Certificate Type	Received From	Received on	Editing State
☒ C=DE,ST=Baden-Wuerttemberg,O=Vector Informatik GmbH,OU=vCharM.edge,CN=vcharm.edge	VDV261 Server Certificate	100000002369d475	Sep 5, 2025, 3:07:43 PM	Pending

Items per page: 10

1 - 10 of 10

1 Certification Request(s) selected

Download

- A certificate can then be generated based on the CSR. The necessary steps are known to the PKI operator and are not explained further here.
- The certificate file must be uploaded to the CSMS. The CSMS automatically recognizes which certificate request the certificate must be assigned to and starts installing the certificate on the edge-device.



Upload Certificates

The following not yet existing certificate(s) have been saved:

Common Name	Expiry Date	Intended Use
CN=vcharm.edge,OU=vCharM.edge,O=Vector Informatik GmbH,ST=Baden-Wuerttemberg,C=DE	9/5/2026	VDV261 Local Controller ... ▼

Items per page: 50 1 – 1 of 1 < >

! It was not possible to determine the intended use of all newly stored certificates. Please select the intended use.

Save



Reference: Requirements for the content and format of certificates are described in the VDV261 specification.

- The installation status can be checked via the Certificates view. To do this, the appropriate PKI must be selected in the menu on the left-hand side and the [Leaf- Certificates] entry opened.
- To see the status, the desired certificate must be selected from the list.
- In the detail view, the correct edge-device should be listed under the "Installed" tab. "Installed" should be the value in the "Status" column.



Certificates Overview Certificate Signing Requests

ocppServerLeaf_1

Subject: C=DE,O=Vector Informatik GmbH,CN=ocppServerLeaf_1

Issuer: C=DE,O=Vector Informatik GmbH,CN=OcppServerRoot_1

Validity: Valid

Valid from: Jun 11, 2025, 2:42:19 PM **until** Jul 10, 2025, 12:29:19 PM

Serial Number: 18446744073709552000

Installed

Search

Items per page: 50 1 – 1 of 1 < >

Device	Status	Last Updated
☐ Building Downtown Edge Device	Installed	Jun 12, 2025, 11:53:31 PM

0 Charging Station(s) selected

Uninstall

Not configured

10. Finally, the VDV261 communication can be activated via the edge-device user interface.

8.2.3 Fault-Injection

Summary

For development and testing purpose, the VDV 261 communication can be influenced. This can be used to verify the correct communication behavior of the vehicle. The functions are displayed only if the user has the necessary permissions and preconditioning is enabled for the selected vehicle.

Modes

By clicking on [Configure], following options are available:

- > Disabled: All requests are answered according to the VDV 261 specification.
- > Raw values: The values for each parameter can be specified directly, without range or consistency checks. Each response contains these parameters; in other words, the backend does not send only changed values, as it does in "Disabled" mode. Additionally, the HTTP response code can be changed optionally. If a specific HTTP response code is assigned, the response message is empty.
- > Suppress response: Requests are received, but no response is sent to the vehicle. This can be used to provoke timeouts.



VDV261 Fault-Injection

Injection Mode

☒ Disabled
 ☐ Raw values
 ☐ Suppress response

<> Custom HTTP response code

Variables

☒ Absolute value
 ☐ Date-time

driveoff

prec_dsrd

prec_hvac

ambienttemp

target_soc

target_dist

Cancel Save

Communication Trace

Messages exchanged with the vehicle can be observed in the Trace Window. All request and response messages are listed together with the content of the messages. The following messages are marked with a special warning icon:

- > Response suppressed
- > Request with wrong authentication data



VDV261 Fault-Injection

07.09.2026, 15:37:03: #4 Response
 07.09.2026, 15:37:02: #4 Request
 Suppressed response
 07.09.2026, 15:36:51: #3 Request
 07.09.2026, 15:36:42: #2 Response

```
{
  "seq": 4,
  "vin": null
}
```

- Clear Trace** The [Clear message log] button can be used to delete all messages from the Trace Window. The messages are also deleted in the database and cannot be reloaded.
- Export Trace** The [Export log as CSV] button can be used to create a CSV export of all messages which are listed in the Trace Window.

8.2.4 Requirements for Charging Stations

- Requirements** Charging stations must meet the following requirements for trouble-free commissioning:
- > The charging station must support ISO 15118-2 communication (CCS2 connector) and TLS communication for VDV261.
 - > Furthermore, it must support the ISO 15118 "Value-Added Service" functionality for VDV261 (Internet Access (ID 03) as a free service on port 443 (Param. Set 04))
 - > IPv6 address assignment for vehicles via SLAAC/NDP and DHCPv6
 - > Forwarding of DNS requests from the vehicle
 - > Ethernet-based communication with the OCPP/VAS backend
 - > Recommendation: Tracing of powerline communication for troubleshooting during commissioning

9 Grid Operator Interface

Summary

In order to improve or ensure grid stability in the future, it may be necessary for the grid operator or energy supplier to control the charging infrastructure. This controllability allows consumption to be temporarily reduced and the grid stabilized in exceptional load situations.

Controllability can be implemented via the following interfaces:

- > OpenADR
- > External power limits

Load-Management

As soon as a request to reduce power is received from the grid operator, a new limit is added to load management. The site or group must therefore already have a valid load management configuration.

Load management continues to operate in the desired configuration. The new limit resulting from the grid operator's request does not replace limits that are already active, for example from static or dynamic load management. If the grid operator limit is lower than all other limits, consumption is restricted accordingly. If one of the other limits is already lower, there is no change for the time being.

9.1 OpenADR

Protocol Version

The CSMS supports OpenADR version 3.0 with the "Demand/Response" (DR) program.

Due to increased coordination requirements, the initial configuration of the OpenADR interface is carried out by Support.

Settings

- Help
- Sub Clients
- Licenses
- Notifications
- Edge Devices
- Pre Systems
- Billing
- Subject PKI
- OpenADR**
- Change History
- Appearance
- About vCharM

The following systems are configured:

To configure a utility company (Virtual Top Node) contact our support team.

Utility Company (Virtual Top Node)	
Protocol	OpenADR
Platform URL	https://energy.provider/openadr
Name	Energy Provider
Connection Status	Connected
Last Successful Request	09/01/2025, 06:02:47 PM

The following locations/groups are configured:

Building Downtown Curtailment Maximum Power: 20 kW	
Underground Garage Curtailment Maximum Power: 30 kW	

[+ Add New Location/Group](#)

Configuration

Once the OpenADR interface has been activated, various charging infrastructure locations or groups can be linked to the interface. To do this, create an entry under Settings | OpenADR using the [Add New Location/Group] button.

The entry requires the following settings:

- > **SDP ID:** SDP ID is the identification of the service delivery point; it is provided by the network operator to determine which charging stations are to be throttled.
- > **Assigned Charging Station Group:** Location or group to which the new limit is to apply. Distribution within the location/group is carried out according to the selected load management configuration.
- > **Name (optional):** Display name.
- > **Curtailment Maximum Power:** The maximum power that the SDP (Service Delivery Point - Virtual End Node) may consume during throttling. The CSMS ensures that energy consumption remains below this limit. If the network operator specifies a relative value, this must be manually converted to an absolute value and entered here.



Edit Building Downtown

SDP ID*

open-adr-sdp-id-1

17/255

Assigned Charging Station Group

Building Downtown (500 kW)

Name

Building Downtown

17/255

Curtailment Maximum Power*

20

kW

Cancel

Save

Underground Garage

Curtailment Maximum Power: 30 kW

Display

If a limit has been received from the grid operator, it is displayed under charging stations in the power consumption diagram under "Curtailment Power Limit."

9.1.1 Program Details

Definitions

The OpenADR specification serves as the basis for the program definition. Definitions of terms can be found in the specification and are not repeated in this manual.

Message Sequence

Once the configuration has been completed, the CSMS (VEN) creates a subscription at the grid operator (VTN). The CSMS is then ready to receive a curtail event.

If the grid operator detects a high load on the grid, a curtail event is created. This is sent to the CSMS, whereupon the associated charging station group is throttled. The CSMS then creates a report that is sent asynchronously to the VTN.

Before a new curtail event can be sent to the CSMS, a restore event must first be sent.

Authentication

VEN and VTN uses the OAuth 2.0 flow for authentication.

Subscriptions

The subscription request contains the following parameters:

- > id: Created by the CSMS and contains the client ID followed by a dash and a unique ID.
- > createdDateTime: Timestamp when the CSMS created the subscription.
- > modificationDateTime: Timestamp when the CSMS modified the subscription.
- > objectType: Always "SUBSCRIPTION".
- > clientName: The customer ID of the customer.
- > programID: The ID of the curtailment program.
- > objectOperations: EVENT object with POST operation.
- > Targets: Always null.

Events

The event request contains the following parameters:

- > id: The event ID to be used for correlation.
- > createdDateTime: Timestamp when the event was created.
- > modificationDateTime: Timestamp when the event was modified.
- > objectType: Always "EVENT".
- > programID: Same ID as in Subscription.
- > eventName: A name for debugging and logging purposes.
- > targets: Specifies the Service Delivery Points (SPD) affected by the event:
 - o type: Always "SDP_ID".
 - o values: An array of SDP IDs (only one ID is expected).
- > intervalPeriod: Specifies when the request should be executed:
 - o start: Always "0000-00-00" (means immediate start).
 - o duration: a duration in ISO 8601 format, which specifies how long the requested event should last. "P9999Y" is a special case that specifies that the interval of the event will continue until further notice.
- > reportDescriptors:
 - o payloadType – always "SIMPLE".
- > payloadDescriptors
 - o payloadType – always "SIMPLE".
- > intervals: There is only one interval, which lasts until a restore event is sent.
 - o Id: always 0.
 - o Payloads
 - type: always "SIMPLE".
 - values: "Curtail" or "Restore".

Reports

The report request contains the following parameters:

- > id: Created by the CSMS and contains the client ID followed by a dash and a unique ID.

- > createdDateTime: Timestamp at which the CSMS executed the corresponding request.
- > modificationDateTime: Timestamp at which the CSMS modified the report.
- > objectType: Always "REPORT".
- > programID: Same ID as in the associated event.
- > eventID: The ID of the associated event.
- > clientName: The customer ID of the customer.
- > reportName: A name for debugging and logging purposes.
- > payloadDescriptors
 - payloadType – always "SIMPLE".
- > resources:
 - resourceName – Name of the resource ("SDP" + SDP ID)
 - intervalPeriod
 - start: Time when the request was executed (or not executed).
 - duration: Duration of execution
 - o intervals
 - id – always 0.
 - payloads
 - type – always "SIMPLE".
 - values – "Executed" or "Not Executed".



Note: The curtail event does not contain any specific information about the limit. The actual limit is configured in the CSMS.

9.2 External Power Limit



Reference: The external power limit function can also be used to implement controllability. Details are described in section 2.2.2.7 External Power Limits.

10 Telematics Interface

Summary

A telematics component in the vehicle makes it possible to transmit vehicle data to telematics service providers via a wireless connection. Data transmission is independent of charging processes and continues even while the vehicle is in motion. Furthermore, the data is not limited to charging-related information—such as the state of charge—but also includes other useful information, such as the vehicle's geographic location.

The CSMS enables the integration of interfaces to telematics services. Since there is no standardized interface format, the various interfaces must be integrated individually upon request.

The following providers are currently integrated:

> MAN RIO [Datapackage S](#)



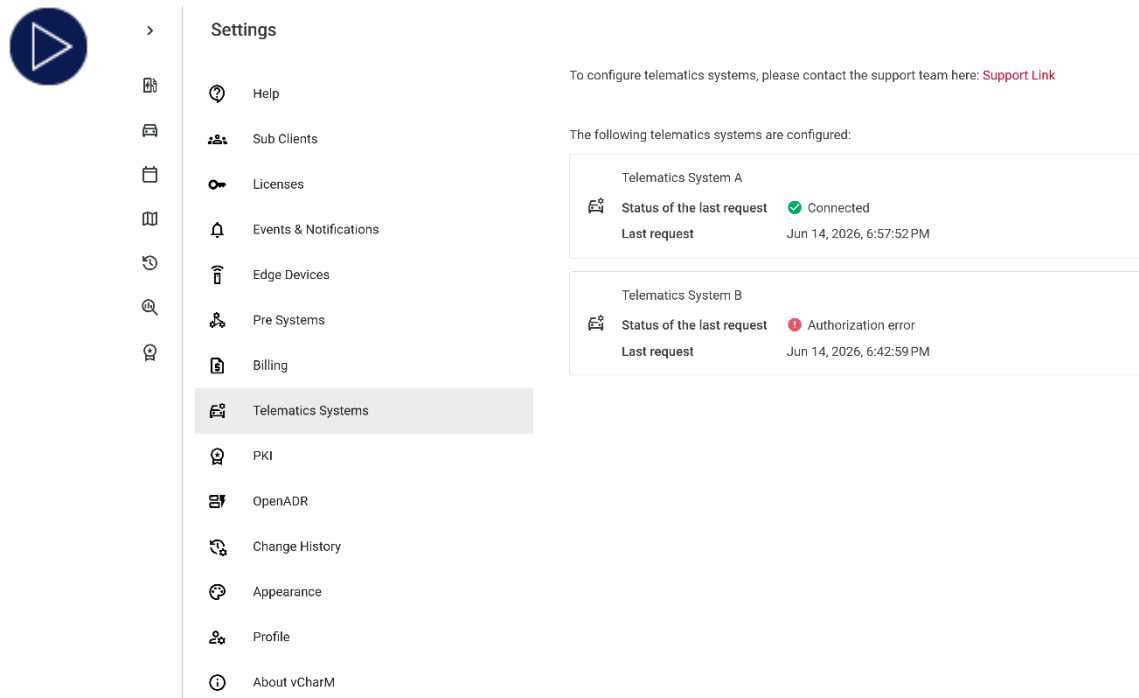
Note: Additional hardware is required in the vehicle to use telematics services. In addition, there are typically ongoing costs associated with a subscription. The fleet operator is responsible for installing the hardware and covering the additional costs.

Connection Setup

The CSMS support is responsible for setting up the connection to the telematics service provider. Upon request, the support will request the necessary access credentials from the telematics service provider and configure all settings. Once setup is successfully complete, the CSMS automatically retrieves data from the telematics service provider every minute.

The current connection status between the CSMS and the telematics service provider can be checked in the settings under "Telematics Systems." All configured systems are displayed there, along with the status and time of the last request.

To ensure that the data in the CSMS can be assigned to the correct vehicle, the VIN number must be set correctly during vehicle configuration in the CSMS.



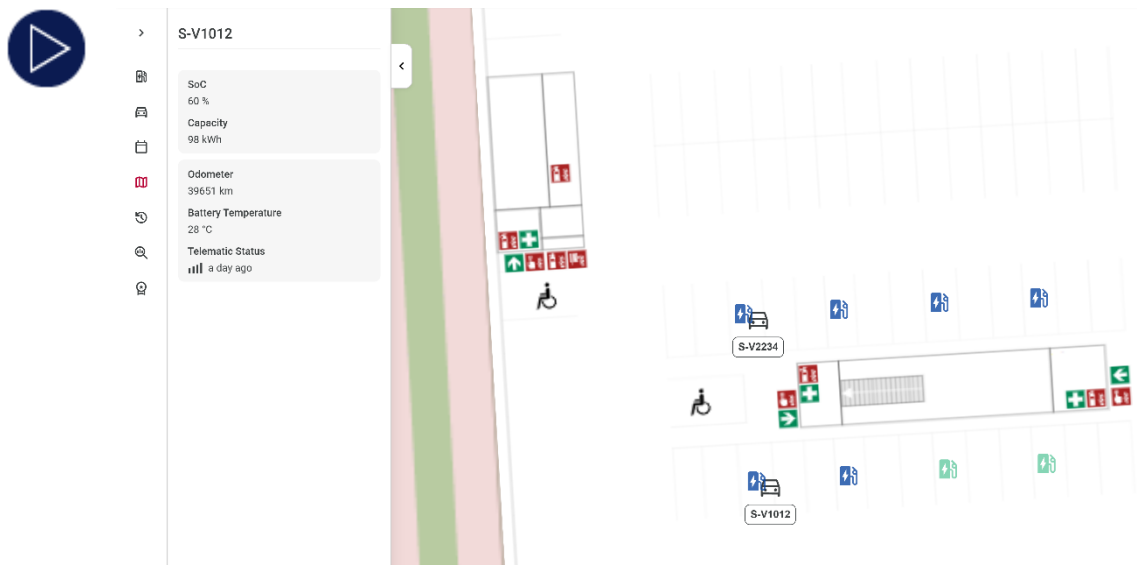
Vehicle Data

The following information is retrieved from the telematics service provider:

- > Battery state of charge (SoC)
- > Battery temperature
- > Battery state of health (SoH)
- > Mileage
- > Geolocation

The data is displayed in the vehicle view as described in Chapter 2.4.5 Vehicle Details.

The geolocation is displayed in the map view. When a vehicle is selected on the map, the telematics data is displayed in a sidebar.



11 REST API

11.1 Overview

Summary

All features provided by the CSMS back end can be controlled via a RESTful API. This API is offered as an HTTP interface and is also used by the browser front end.

The API can be used by any third party software to use information provided by the CSMS and to control the back end features.



Example:

- > An external display shows the current state of the charging stations and running charging sessions. EV drivers and depot operators can use the display to monitor the charging sessions.
- > Information related to the load management can be exchanged automatically, e.g. the departure time of vehicles organized by a fleet management software. This information improves the load management algorithms.

OpenAPI

The REST API is specified in the OpenAPI syntax. The OpenAPI Specification, originally known as the Swagger Specification, is a specification for machine-readable interface files for describing RESTful APIs. Several source-code generators are available for a large set of programming languages, which allows to integrate the API into a client application with low effort.

The specification includes all available operations, their request and response formats, datatypes and the required authorization roles.

The OpenAPI is available as HTML documentation and as a YAML file. The files can be requested via the support.

11.2 Examples

Get EVSE Status

Request URL:

http://xxx/csmsapi/chargingStation/evse/status?evselds=depotcenter_cs_1_evse_1

Request Method: GET

Request Payload: *empty*

Response Code: 200

Response Payload:

```
[
  {
    "evseId": "depotcenter_cs_1_evse_1",
    "currentStatus": "Available",
    "connectorStatus": [
      {
        "connectorId": "depotcenter_cs_1_evse_1_con_1",
        "status": "Available"
      }
    ]
  }
]
```

Change Departure-Time

Request URL:

<http://xxx/csmsapi/vehicle/1ZVBP8CH7A5121324/vas/preconditioning/parameters/>

Request Method: POST

Request Payload:

```
{
  "driveoff": "2019-12-20T06:50:23.000Z",
  "precDsrd": 1,
  "precHvac": 1
}
```

Response Code: 200

Response Payload: *empty*

12 On-Premise

12.1 Functionality

Limitations

The following functions are not available with an on-premise installation:

- > Mobile app (see chapter 3)
- > Edge devices (see chapter 4 Edge-Device)
 - The Runtime Service is part of the delivery and can be installed independently of the Control Service. This means that the key benefits of the distributed architecture can also be used without an edge-device.
- > User and role management is only available in combination with the Single-Sign-On feature. Users and roles are configured through the customer's identity provider. The same applies to the subtenant feature.

12.2 Operations

Availability

To ensure high availability, the operator of the on-premise infrastructure is responsible for taking appropriate measures to avoid failures and keep recovery times as short as possible, for example by designing redundant network and storage components or by virtualizing the server infrastructure.

A business continuity plan must be drawn up to define targets for data backup and recovery.



Caution: Protection against unauthorized access to the application and data must be designed in accordance with the cyber security concept of the on-premise infrastructure. The operator is responsible for planning, implementing and verifying the cyber security measures.

12.3 Setup

Minimum Requirements

To deploy the CSMS on your computer, the following conditions must apply:

- > 64-bit Linux kernel with Version 3.10 or higher
- > Docker (at least version 18.06)
- > Docker-compose(at least version 1.24.0)
- > At least 4 GB of RAM
- > At least 2 CPU cores with 2.0 GHz

Setup Prerequisites

To start the CSMS, the following conditions must apply.

- > Port 80 is free

> Port 443 is free



Note: Port 80 is used for the http communication.
Port 443 is used for the https communication.

12.4 Installation & Maintenance

Documentation

Detailed instructions for the installation, configuration and maintenance of an on-premise installation are included in the software delivery.

13 Troubleshooting

Summary

Im folgenden Kapitel werden häufige Fehler beschrieben. Über das Fehlerbild kann die Ursache eingeschränkt werden. Mittels Fehleranalyse kann die Ursache festgestellt und behoben werden.

13.1 Error Patterns

13.1.1 Charging sessions cannot be started

Symptoms

The following signs indicate that the charging session has not started:

- > The indicators in the vehicle and/or at the charging station indicate that the charging session has not started. These may be LEDs on the charging inlet on the vehicle or a display in the vehicle/at the charging station. The vehicle's mobile app can also be used to check.
- > There is no acoustic feedback from the vehicle and/or charging station. The driver cannot hear the typical clicking sound when the contactors in the vehicle and charging station are closed.
- > The display in the CSMS does not show any charging session, i.e., the charging point status is not "Charging".

Possible Causes

The following causes may be the reason for the malfunction:

- > Authorization failed. Further analysis:
 - > Chapter 13.2.3 Authorization Result
- > The OCPP connection was not established or is unstable. Further analysis:
 - > Chapter 13.2.1 OCPP Connection Setup
 - > Chapter 13.2.2 OCPP Connection Stability
- > The charging limit has been set to 0 amps/kilowatts. Further analysis:
 - > Chapter 13.2.4 Load-Management Power Limits

13.1.2 Charging session not at expected power

Symptoms

- > The charging power is lower than expected:
 - > The charging power displayed in the vehicle / charging station / CSMS is lower than expected.
 - > The predicted charging time is unexpectedly long.
 - > The state of charge (SoC) is changing very slowly.
- > In principle, however, the charging session has started successfully. In the CSMS, the charging point is displayed with the status "Charging" or "Paused by vehicle" / "Paused by load management."

- Possible Causes**
- > The following causes may be the reason for the malfunction:
 - > The CSMS has set a low limit, which prevents the charging station and the vehicle from charging at a higher power level. Further analysis:
 - > Chapter 13.2.4 Load-Management Power Limits
 - > The vehicle is charging at a lower power level than possible, for example because the battery temperature does not allow higher charging currents. Compare the permitted charging power with the actual power. Further analysis:
 - > Chapter 13.2.4 Load-Management Power Limits
 - > The charging station is in a critical state (e.g., due to high temperatures) and does not allow higher charging power. Further analysis:
 - > Chapter 12.2.5 Charging station events

13.2 Fault analysis

13.2.1 OCPP Connection Setup

The following methods can be used to check whether the OCPP connection has been successfully established:

Connection Diagnosis

1. In the Charging Infrastructure view, select the affected charging station from the menu on the left.
2. If a Status Diagnosis section appears, follow the instructions to establish a successful connection.
3. If the Status Diagnosis section does not appear, check the status of the charging points.

Charging Station Events

1. Check the Events view to see which events the charging station last reported.
2. Use the filters to narrow down the messages.
 - > Select a suitable time period.
 - > Select only a single charging station that is affected by the problem.
 - > Narrow down the results either by severity (warning/error) or by category (connections).
 - > Check the messages to see if there is a problem with the connection.



Event History

Download as

Severity level Categories Charging Stations Vehicles Events Date Range

Severity level	Date	Charging Station	Vehicle	Event
1	Oct 1	Station 1 Charging Point Right Spot Group: Building Downtown	S-V4015 Group: Pool	Charging session started
1	Oct 1	Station 1 Charging Point Left Spot Group: Building Downtown	S-V2234 Group: Crabs	Charging session finished
1	Oct 1	Station 2 Charging Point Left Spot Group: Building Downtown	S-V2010 Group: Crabs	Certificate Signing Request received
1	Oct 1	Station 3 Charging Point Left Spot Group: Building Downtown	N/A	Device model was modified
1	Oct 23, 2025, 1:03:39 PM	AC Station 4 Charging Point Left Spot Group: Underground Garage	N/A	Device model was modified
1	Oct 23, 2025, 12:22:36 PM	DC Station 1 Charging Point Left Spot Group: Building Downtown	S-V2234 Group: Crabs	Charging session started

Charging Station Logs

If the charging station has its own user interface, check there for error messages/error codes and download log files for a more in-depth analysis.

Actions

If the connection cannot be established, the following measures may help:

- > Check your internet connectivity, especially if you are using wireless networks.
- > Check the charging station configuration and compare it with the information in the [commissioning slides](#).
- > Check that the correct CSMS root certificate is installed on the charging station (see 1.3.1.2 TLS Encryption).

13.2.2 OCPP Connection Stability

Use the following steps to check the stability of the OCPP connection:

OCPP Messages

1. Check in the Events | Messages view whether the charging station is sending OCPP messages reliably.
2. Use the filters to narrow down the messages.
 - > Select a suitable time period.
 - > Select only a single charging station that is affected by the problem.
3. Check whether the response times are less than 1 second (e.g., response after +230 ms). Responses should only take longer in exceptional cases.
4. Check that the charging station sends a message at least every 100 seconds. In most cases, this is either the Heartbeat message or, during a charging session, the MeterValues (OCPP1.6) / TransactionEvent (OCPP2.x) message.
5. A charging station should not send more than one message per 10 seconds to avoid overload.
6. No messages with error responses should be visible. These can be filtered via Messages | "Show error messages only."

7. The BootNotification message should only be visible if an expected restart has taken place. If this message appears unexpectedly, this indicates a hardware or software problem in the charging station, e.g., undervoltage.

Actions

If the connection is unstable, the following measures may help:

- > Check your internet connectivity, especially if you are using wireless networks.
- > Restart the charging station.
- > Check the charging station configuration and compare it with the information in the [commissioning slides](#).

13.2.3 Authorization Result

Check the following steps if charging is not possible at the charging station:

Authorization Result

1. Check the Events view
2. Use the filters to narrow down the messages.
 - > Select a suitable time period
 - > Select the severity level Warning and the category Charging Session
3. Check whether there are any entries with the text "Authorization failed":
 - > The status "unknown" means that the token could not be found in the CSMS. Create a new token to enable charging (see 2.4.6 Authorization Tokens).
 - > The status "NotAtThisLocation" means that this token is not allowed to charge at this charging station. Change the access restriction if necessary (see 2.4.1.1 Access restriction for groups).
 - > The status "blocked" means that this token has been blocked in the CSMS. Check the status and validity period of the token (see 2.4.6 Authorization Tokens).

13.2.4 Load-Management Power Limits

Check the following steps if you want to check the power limits for a charging session:

Load-Management Configuration

- > The CSMS can only limit power if load management is enabled for the charging station in question. Check at the location level whether load management has been enabled and whether the load management settings have been selected correctly.
- > Check at the location level, for all subgroups, at the charging station and charging point level, whether the power limits have been selected correctly.

SetChargingProfile Messages

Compare the selected power limits and actual consumption with the limit parameter in the OCPP message SetChargingProfile:

1. Check the SetChargingProfile messages in the Events | Messages view
2. Use the filters to narrow down the messages.
 - > Select a suitable time period.
 - > Select only a single charging station that is affected by the problem.
 - > Select the following message types: SetChargingProfile, StartTransaction (OCPP1.6), StopTransaction (OCPP1.6), TransactionEvent (OCPP2.x)
 - > Find the start of the charging session. For OCPP1.6, this is the StartTransaction message. For OCPP2.x, this is a TransactionEvent message with EventType "Started." The time and the vehicle token will help you with your search.
 - > Check the SetChargingProfile messages that were sent after the start (pay attention to sorting). The chargingProfilePurpose is "TxProfile." The limit parameter contains the limit either in watts (chargingRateUnit 'W') or in amperes (chargingRateUnit "A").
 - > As long as no SetChargingProfile message has been sent for this charging session, the last message of type "TxDefaultProfile" applies.
 - > Make sure that the status in the response is "Accepted."
 - > If the charging station has multiple charging points, the ConnectorId must be taken into account.

13.2.5 Charging Station Events

Check the following steps if the charging station is not behaving as expected and the cause is unclear:

Events

1. Check the Events view to see which events the charging station last reported.
2. Use the filters to narrow down the messages.
 - > Select a suitable time period.
 - > Select only a single charging station that is affected by the problem.
 - > Narrow down the results either by severity (warning/error) or by category (connections)
 - > Check the messages to see if there is a problem. After expanding the message, manufacturer-specific information is displayed. Clarify the meaning using the charging station manual or manufacturer support.

14 Glossary

Autocharge Procedure to authenticate and to authorize a vehicle automatically at a charging station. The EVCC ID of the vehicle is used as identifier. The Combined Charging System (CCS) standard is required, since the EVCC ID is exchanged via V2G communication (DIN 70121 or ISO 15118).

The recommended integration with OCPP is described in the Whitepaper "WhitePaper Identification of ElectricVehicles in ChargingStationManagementSystem via OCPP" published by Vector.

Imprint

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