KeContact

KC-P30 x-series
Charging Station
Configuration manual V 4.14

Translation of the original instructions

KEBA®
Automation by innovation.

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1 Introduction

This document refers to the following devices:

- P30 x-series with software version 1.14

The device variant can be determined by the product designation on the type plate. The software version can be read out via the web interface. For more information, see the "Operating instructions".

The pictured devices used in this manual are visual examples. The figures and explanations contained in this manual refer to a typical device design. The devices used by you may differ in their appearance.

1.1 Representation of safety instructions

At various points in this manual, you will see notes and precautionary warnings regarding possible hazards. The symbols used have the following meaning:

DANGER!

indicates an imminently hazardous situation, which will result in death or serious bodily injury if the corresponding precautions are not taken.

WARNING!

indicates a potentially hazardous situation, which can result in death or serious bodily injury if the corresponding precautions are not taken.

CAUTION!

means that if the corresponding safety measures are not taken, a potentially hazardous situation can occur that may result in slight bodily injury.

Caution

means that damage to property can occur if the corresponding safety measures are not taken.

ESD

This symbol reminds you of the possible consequences of touching electrostatically sensitive components.

Information

Identifies practical tips and useful information. No information that warns about potentially dangerous or harmful functions is contained.

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1.2 Purpose of the document

This document describes the configuration of the advanced features of P30 x-series after it has been installed. This includes, among other things, the description of the settings in the web interface.

This document is an extension to the supplied manuals of P30 x-series.

You must comply with all instructions and safety instructions in the supplied manuals!

1.3 Requirements

This document contains information for persons with the following requirements:

Target group	Required knowledge and abilities
Electrician	Person who, due to his or her special training, expertise and experience as well as knowledge of current standards, is able to assess the work performed and the possible hazards. Knowledge of: ● current valid safety information, ● the mode of operation of the charging station, ● the displays and operating elements of the charging station, ● basics of network technology, ● basics of IT, ● diagnostic options, ● systematic fault analysis and rectification, ● the setting options on the charging station.

1.4 Warranty

Only general maintenance work that is expressly permitted by KEBA may be performed. Any other tampering to the device will result in a loss of the warranty claim.

WARNING!

Risk of electric shock and fire hazard!

After the front part has been opened, product safety can no longer be guaranteed.

Only those covers that are described in the procedure instructions are allowed to be opened. If one of the covers is sealed by a lead seal, it is not permitted to be opened by unauthorized persons. If the lead seal is broken, the device loses its specific suitability for use and may no longer be put into operation due to the resulting incorrect identifier.

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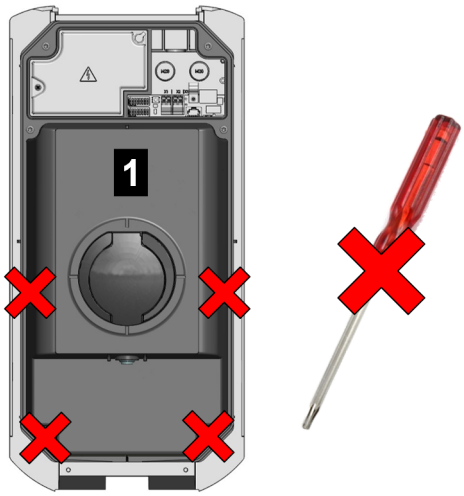

Fig. 1-1: Screws on the front part

The front part 1 must not be opened. Opening the front part (4 Torx screws) will break the manufacturer's seal and void the warranty claim. For a warranty claim, there is a duty of proof of the customer that the defect – which led to the defect of the device – already existed at the time of delivery. If the manufacturer's seal is broken, this proof can no longer be provided, resulting in expiration of the warranty claim.

A device with a broken manufacturer's seal or removed lead seal may no longer be put into operation. The necessary steps must be taken for having the charging station replaced or repaired by a specialist dealer or service partner.

1.5 Notes on this document

The manual is part of the product. It is to be retained over the entire life cycle of the product and should be forwarded to any subsequent owners or users of the product.

The instructions contained in this manual must be followed precisely. Failure to do so could result in the creation of potential sources of danger or the disabling of safety devices. Apart from the safety instructions given in this manual, the safety precautions and accident prevention measures appropriate to the situation in question must also be observed.

1.5.1 Contents of the document

- Configuration of the advanced features of P30 x-series

1.5.2 Not contained in this document

- Commissioning and deinstallation of the charging station
- Operating behavior of the charging station
- Operation of the charging station

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1.6 Further documentation

Manuals and additional information are available on our website:

www.keba.com/emobility-downloads

Designation	Target group
P30 operating instructions	• End customer • Electricians
P30 installation manual	• Electricians
UDP Programmer's Guide	• Programmer
FAQ	• End customer • Electricians • Service technicians

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2 System overview

The P30 x-series (depending on the variant) enables multiple charging stations to be connected with each other in the form of a master/client network. This makes charging with an intelligent load management possible. In addition, a connection to a higher-level OCPP backend can take place. The charging station is equipped with different network interfaces for these functions.

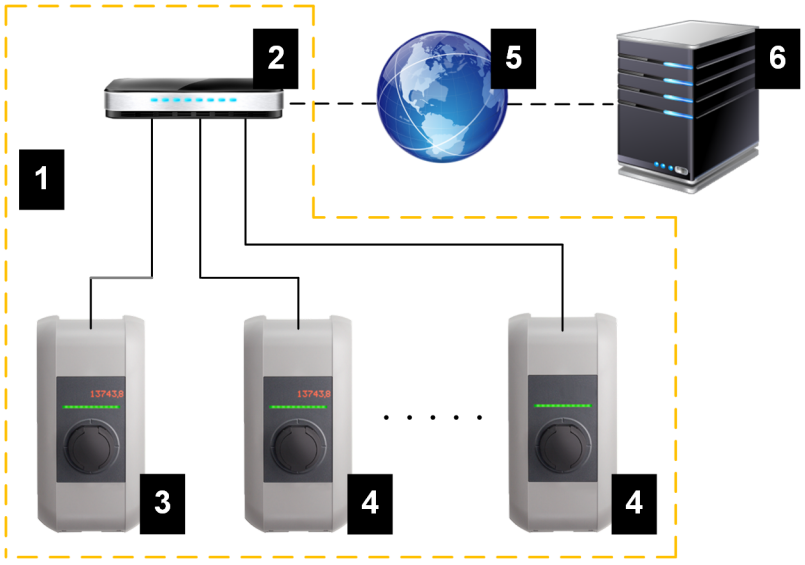

Fig. 2-2: Example network setup

1 ... Local charging network	2 ... Router/Switch
3 ... Master charging station (x-series)	4 ... Client charging station (c-series)
5 ... Higher-level network/Internet	6 ... OCPP backend

Only the P30 x-series (depending on the variant) can be operated as master charging stations, and only the c-series as client charging stations.

The following chapters describe which network interfaces the P30 x-series (master charging station) provides and how to set up a master/client network.

2.1 Network interfaces

The P30 x-series provides the following network interfaces (e.g. for connection to an OCPP backend, etc.):

- LAN
- WLAN (optional)
- WLAN access point (optional)
- Mobile communications (optional)

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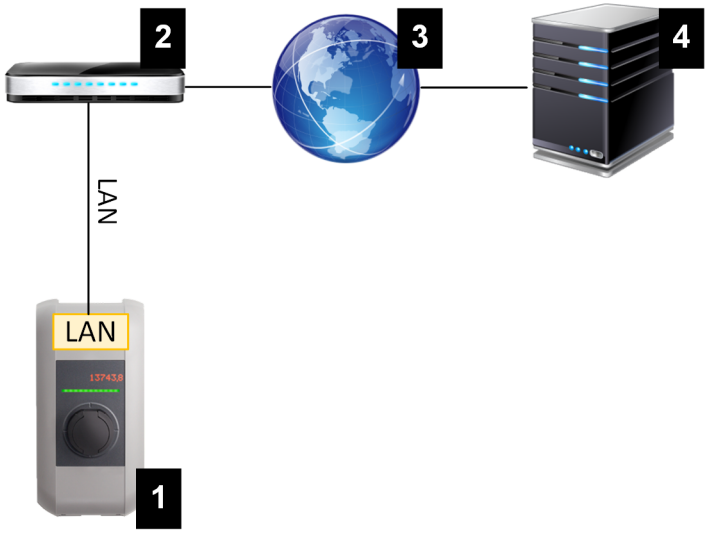
Client charging stations from the c-seriescan only be connected to the master (P30 x-series) over LAN.

2.1.1 LAN

P30 x-series can be connected to a router via the integrated LAN interface. The router establishes a connection to an OCPP backend via internet.



1 ... P30 x-series	2 ... Router
3 ... Internet	4 ... OCPP backend

Connection: Ethernet1 connection (LSA+®)

Via the LAN interface, P30 x-series can also be connected to other charging stations, allowing to implement a charging network.

Information

The Ethernet1 connector X4 (LSA+®) and the Ethernet2 connector X3 (RJ45) are connected in parallel on the PCB and cannot be used at the same time. The unused connection must be disconnected if necessary (e.g. during servicing).

The Ethernet1 connection X4 is designed as a terminal block in LSA+® technology. It is recommended to implement hard-wired communication (e.g. for SmartHome or a charging network) at the LSA+® connection.

2.1.2 WLAN (optional)

P30 x-series can be connected to a router via the integrated WLAN interface. If the router is connected to the Internet, a connection to an OCPP backend can be made.

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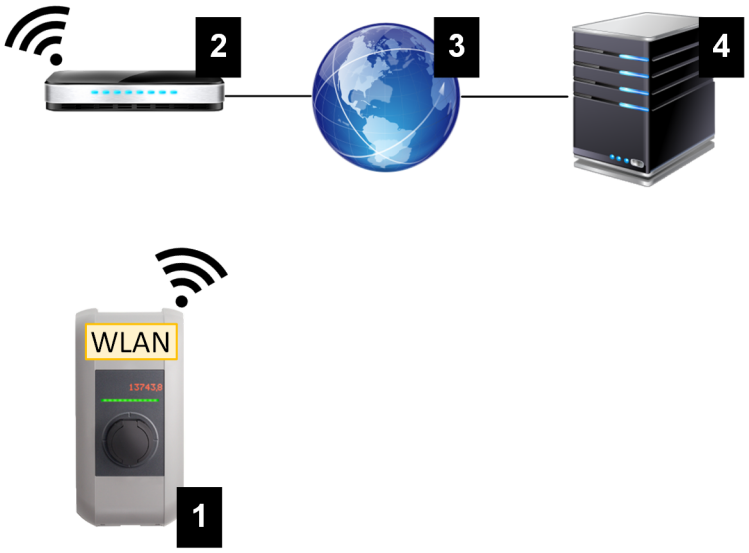

1 ... P30 x-series	2 ... Router
3 ... Internet	4 ... OCPP backend

The technical data of the WLAN module can be found in the "Installation Manual".

Information

Only a charging station that is operated as a single charging station can be connected to the router via WLAN. A charging station that is part of a charging network (master/client network) must always be connected to the router via LAN.

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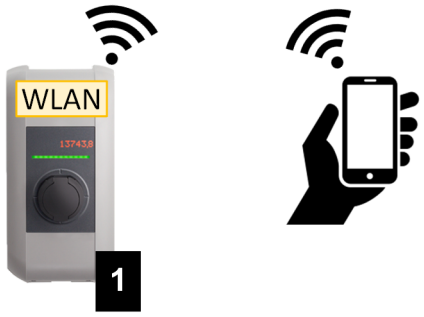
2.1.3 WLAN Access Point (Hotspot) (optional)

P30 x-series can be connected to a mobile device via the integrated WLAN access point. With the mobile device, the web interface can be easily accessed and the configuration of the charging station can be performed.



1 ... P30 x-series	

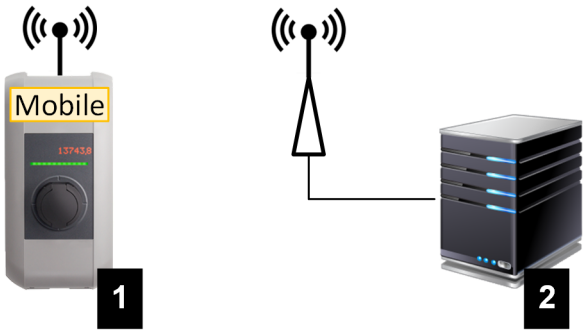
The access data and the IP address of the WLAN access point are listed on the configuration label. The configuration label is in a pouch which is enclosed with the mounting material.

The following steps are necessary to perform the configuration via a mobile device:

1) Connect a mobile device to the WLAN access point.
2) Access the IP address of the WLAN access point in a web browser on the mobile device.
3) Perform configuration via the web interface, see 4 Web interface.

2.1.4 Mobile communications (optional)

Certain device variants have a mobile network module. P30 x-series with mobile network can connect to an OCPP backend over the cellular network. The mobile communications provider may charge additional fees (depending on the tariff) for running data transmissions.



1 ... P30 x-series	2 ... OCPP backend

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For the connection to an external OCPP backend over the mobile network, a suitable SIM card must be installed during commissioning. In addition, the mobile network must be activated as the connection to the OCPP backend and the access data of the mobile service provider must be set in the configuration (web interface).

Information

The username and password for the mobile network connection must not be empty and must consist of more than on character!

Commissioning the mobile network module is described in the "Installation manual". The technical data for the mobile network interface and SIM card can also be found in the "Installation manual".

2.2 Design of a local charging network (master/client)

A local charging network includes one P30 x-series as master (depending on variant) and up to 15 c-series (P20 and/or P30) as clients.

Depending on the number of client charging stations, the design of a local charging network is implemented differently:

- **1 client charging station**: Direct connection

  The client charging station is connected directly to the master charging station.

- **Multiple client charging stations**: Connection via router or switch

  The client charging stations are connected to the master charging station via a router or switch.

To enable communication between master and client charging stations, the charging stations must be configured in the web interface, see 3 Configuration.

2.2.1 Displays and signals

The display on the front of the charging station provides information about which communication connection is established.

Display	Description
 blue | blue | blue | blue	Communication is possible throughout the network. The master charging station and the OCPP backend are reachable.
 blue | blue | blue | -	Communication between master and client charging stations is possible. The OCPP backend is not reachable or missing.
 - | blue | blue | -	Communication between master and client charging stations is not possible. The OCPP backend is not reachable.

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2.2.2 Direct connection of master and client

A single client charging station can be connected directly to the master charging station via LAN.

Fig. 2-3: Direct connection of master and client

1 ... x-series (master)	2 ... c-series (client)

In this case, the master charging station must be configured as a DHCP server. The IP address is then assigned to the client charging station by the master charging station.

2.2.3 Connection via router or switch

If there are multiple client charging stations, these must be connected to the master via a router or switch. The connection of the charging station to the router/switch is made via LAN.

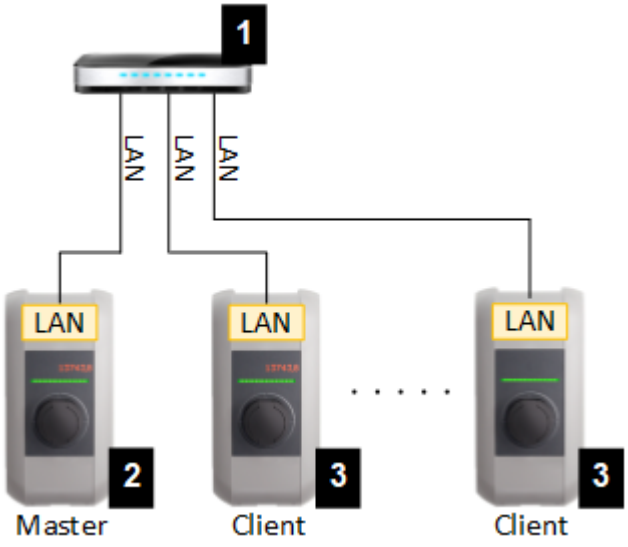

Fig. 2-4: Connection via router or switch

1 ... Router/Switch	2 ... P30 x-series (master)
3 ... P30 c-series (client)	

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Using a router

For a network connection using a router, the router automatically provides the functionality of a DHCP server in most cases.

Information

If the IP addresses are assigned externally (for example, by routers with activated DHCP server), the IP addresses must not be in the following range: 192.168.25.xxx

Using a switch

For a network connection using a switch, the master must be configured as a DHCP server. The IP addresses are then assigned by the master.

2.2.4 Ports for communication in the charging network

For the correct communication in the charging network, the ports below must be enabled network-internally.

Information

If necessary, contact your network administrator to enable the ports.

Port	Protocol	Definition	Description
49153	TCP	Within the network	Socket of the charging station
15118	TCP	Within the network	Link connection between the charging stations (SDP)
15118	UDP	Within the network	Link connection between the charging stations (SDP)
68	TCP	Within the network	Transfer of the software update (Bootps)
68	UDP	Within the network	Transfer of the software update (Bootps)
67	TCP	Within the network	Transfer of the software update (Bootps)
67	UDP	Within the network	Transfer of the software update (Bootps)

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3 Configuration

This chapter describes the necessary configuration for the correct operation of the charging stations. The following steps are necessary for this:

- Set the DIP switch on the charging station
- Configuration (via the web interface or via USB stick)

Depending on the network configuration, activation of the DHCP server on the master charging station may be necessary.

3.1 Connection panel

In the connection panel of the charging station are important interfaces and controls for the configuration of the charging station. To access, the housing cover and the connection panel cover must be removed. The description of removing the covers and the connection panel can be found in the "Installation Manual".

3.2 DIP switch settings

This DIP switch setting must be made for each master and client charging station to enable charging station communication.

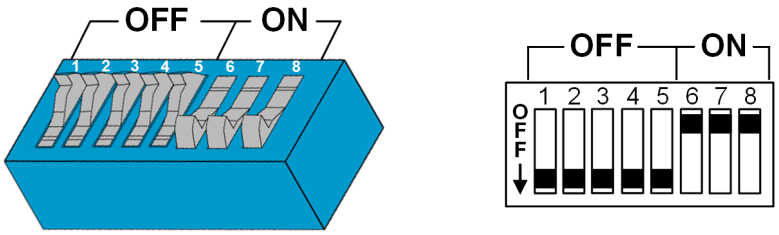
Caution

Possible damage to the DIP switches!

The DIP switches are rocker switches and not slider switches. The DIP switches must be pressed and must never be slid.

ON/OFF position of the rocker switches

The illustration shows the position of the rocker switches for the setting ON and OFF



The DIP switches are located under the connection panel cover. The following figure shows only the affected DIP switches, others are not shown. The following setting must be made on the DIP switch DSW2:

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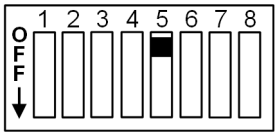
Activation of communication - DSW2.5

Function	Figure
Activation of communication This DIP switch setting must be made for each master and client charging station to enable charging station communication.	

Information

Changes to the DIP switch settings only become effective after a restart of the charging station!

To restart, press the "Service button" until the first beep (approx. 1 second) or switch off the charging station for a short time via the line circuit breaker.

3.3 Enabling the DHCP server

To simplify the setup of a charging network, the master can be configured as a DHCP server. This function is required for the network configuration when the master and a client are connected directly or when a network connection is implemented via switch.

The DHCP server on the master is deactivated in the delivery state and can be activated using the configuration via USB stick or in the web interface.

3.4 Configuration in series via USB stick

There is the option of configuring multiple P30 x-series units with the same settings. In this process, the configuration of a P30 x-series is saved on a USB stick and then transferred to other P30 x-series units.

Preparation

For configuration using a USB stick, the following materials are required:

- An empty USB stick, formatted with FAT32
- Computer

In addition, settings must be activated in the web interface (under Configuration > Device) that permit the configuration to be read out and imported:

- "Allow USB init": Enables the readout of the configuration. This setting must be activated on the charging station which provides the configuration.
- "Allow USB config": Enables the import of the configuration. This setting must be activated in the charging station to which the configuration is transferred.

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Necessary steps

The following steps are required to transfer the configuration from one P30 x-series to another P30 x-series:

- Creating a configuration
- Read out configuration
- Adapting the configuration file
- Import configuration

3.4.1 Create configuration

If this has not yet been done, a first P30 x-series must be configured with the desired settings. These settings serve as the basis for the configuration of additional P30 x-series.

The easiest way to configure the charging station is via the web interface. On the graphical user interface the available settings and selection fields are provided with short explanations.

Information

Not all settings available in the web interface can be transferred via USB stick to additional charging stations.

3.4.2 Read out configuration

In order to be able to transfer the configuration of one P30 x-series to additional P30 x-series, the USB stick must be connected to the USB interface (in the connection panel) of the operationally ready and already configured charging station. The charging station automatically transfers the configuration to the USB stick and displays the process on the display. When finished, the charging station indicates that the USB stick can be removed by displaying "remove usb".

Information

Do not remove the USB stick during the writing process! Otherwise it cannot be used for another configuration.

3.4.3 Adapt configuration file

To adapt the configuration file, the USB stick must be connected with a computer. The configuration file was saved on the USB stick in the directory `CFG` as a `*.conf` file. To use the file to configure other charging stations, the file name and parts of the content must be adapted.

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Adapting the filename

The filename contains the serial number of the charging station from which the configuration was read out. This serial number must be deleted from the filenames.

A configuration file without a serial number in the filename can be used for the configuration of multiple charging stations. If the configuration is only valid for exactly one charging station, the filename must include the serial number of the desired charging station.

Adapting the content

The specific configurations that only apply to one charging station must be adapted or deleted in the configuration file.

All settings are listed in the configuration file. The individual sections are marked with [Name]. The name of the parameter (designation) is to the left of the equal sign ("="). The value is located to the right.

To adapt and delete the specific configurations, proceed as follows:

1) Open the configuration file with a text editor
2) Change the following entries:
   ▶ `AmountConnectors=[x]`
   The number of charging stations in the charging network must be adapted here.
3) Delete the following entries completely:
   ▶ `ChargeBoxIdentity=[xxx]`
   ▶ `Connect2ConnectorSerial[x]=[xxx]`
   ▶ `HOTSPOT_SSID=[xxx]`
   ▶ `HOTSPOT_KEY=[xxx]`
4) Save the file

Information

By deleting all `Connect2ConnectorSerial` entries, the charging station automatically searches for other charging stations in the charging network. The number of charging stations specified under `AmountConnectors` is the number searched for.

Adapting the configuration (optional)

The configuration may need to be adapted manually. Each of the settings listed can be adapted by editing the value to the right of the equal sign "=".

Example of a possible adaptation to the configuration

Original configuration	Adapted configuration
`AuthorizationEnabled=`**true**	`AuthorizationEnabled=`**false**

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Information

Invalid settings are not applied.

3.4.4 Import configuration

To load the configuration into another P30 x-series, the USB stick must be plugged in to the desired charging station. The configuration will be imported automatically and adopted after a restart.

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4 Web interface

The necessary settings (main menu "Configuration") for the communication of the charging station are configured in the web interface. The configuration for the entire charging network is done via the master.

The actual size of the web interface may differ depending on the device variant.

A network connection is required to access the web interface of the master. The network connection can be made via LAN, WLAN, WLAN access point or mobile communications (e.g. with PC or mobile terminal).

The master web interface can be accessed by entering the IP address of the master in a web browser.

The IP address of the master is determined differently depending on the connection type.

WLAN access point	The IP address of the WLAN access point is printed on the configuration label.
Router with integrated DHCP server	The charging station automatically receives an IP address via the DHCP server of the router. The IP address is displayed on the charging station display when the charging station is (re)started. The IP address can also be determined via the router.
Master with local DHCP server	The local DHCP server has been activated for the master, which automatically gives the master the following IP address: **192.168.42.1** The DHCP server of the charging station is deactivated in the delivery state and can be activated via the configuration in the web interface.

A login is required to use the web interface.

The login data for the first login in the web interface is printed on the configuration label. The configuration label is in a pouch affixed to the installation materials. For security reasons, change the password after the initial login. In doing so, observe the password guidelines, refer to 4.2 User menu.

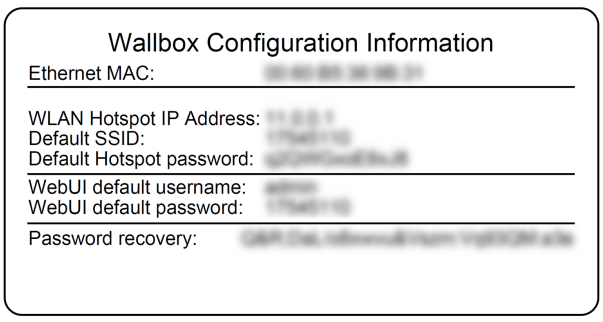

Fig. 4-5: Configuration label

After successful login, the start page of the web interface opens.

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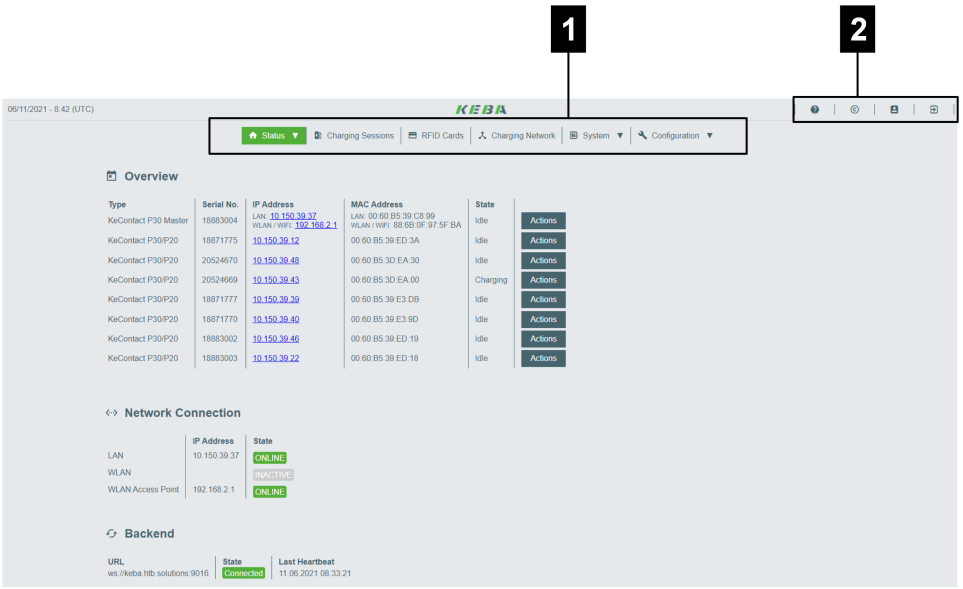

Fig. 4-6: Web interface start page

1 ... Main menu	2 ... User menu

The following chapters provide an overview of the possibilities of the web interface. A detailed description of the individual configuration options can be found directly in the web interface next to the respective configuration entry.

Also see about this

User menu [} 27]

4.1 Main menu

The main menu is divided into the following areas:

- Status
- Charging Sessions
- RFID Cards
- Charging Network
- System
- Configuration

4.1.1 Status

The page is divided into the following areas:

Overview

Here, basic information about all charging stations in the charging network is displayed (such as serial number, IP address, operating state, etc.).

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When the respective IP address is clicked, a new browser window displays information about the charging, such as total energy, energy of a charging session, power, voltage, current, status and event log. The scope of the displayed information is variant-dependent.

An "Actions" button is located next to each listed charging station. When the button is clicked, the following functions are available:

Start Charging	Authorizes a charging session without an RFID card having to be held before the sensor. This function is only available with the authorization function enabled.
Stop Charging	Ends the active charging session.
Restart	Restarts the charging station.
Unlock	Unlocks the charging plug on the charging station (not for the vehicle). For an active charging session, the charging session is ended first and then the charging plug is unlocked.

Network Connection

Here, information about the network interfaces (LAN, mobile communications, WLAN and WLAN Access Point) of the master is displayed.

Backend

Information about the OCPP backend (such as connection status and address) is displayed here.

4.1.2 Charging Sessions

This page displays details about the charging sessions of the last 12 months. The "Export" button lets you export the charging sessions of the selected period as `*.csv` file.

A currently active charging session is displayed with the "PWMCharging" status. Various filter functions let you search for certain charging sessions. For example, you can filter for charging sessions that have a certain start date or for which a certain RFID card was used.

4.1.3 RFID Cards

This page provides an overview of all stored RFID cards including their authorizations. RFID cards can be taught-in, edited and deleted. RFID cards can also be exported and imported as `*.csv` file.

4.1.4 Charging Network

The configuration of the charging network is carried out in this area.

The area offers the following options:

- Charging Preferences
- Operating Mode

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- Charging Network Parameters
- Chargepoint Parameters

Charging Preferences

A charging profile for the charging station can be defined here.

Depending on the current occupancy of the charging station and the current available in the entire charging network, the charging station charges according to the set profile. If no current limit is set, the maximum available current is used for charging.

Charging Network Settings

The nominal supply voltage of the charging station is selected here and the current limits for the charging network can be set.

With 1- or 2-phase charging vehicles, asymmetrical loading of the 3 phases may occur. For such vehicles, the maximum charging current can be set in this area. The charging station then detects whether the vehicle is a 1-, 2- or 3-phase charging vehicle and, if necessary, reduces the charging current to the set value. If "0" is entered, this function is deactivated.

You can also set whether charging should continue after a power failure. This setting is disabled by default.

Operating Mode

Here is determined whether the charging station is operated as a single charging station or as a master charging station in a charging network.

The number of clients must be entered for a charging network. In addition, all attached client charging stations must be entered with their respective serial numbers. Otherwise, the client charging station will not be recognized by the master charging station in the network. The serial number is printed on the rating plate of the client charging station.

Both the master charging station and all attached client charging stations can be enabled ("available") or disabled ("out of service") individually. If the charging station is disabled during a charging process, the charging process will be stopped. When the charging station is disabled, the LED bar slowly flashes orange and the display shows that the charging station is out of operation.

Chargepoint Parameters

The connection type (1-phase or 3-phase) of the charging station is selected here. For a 1-phase connection, the power cable wire that is used can also be selected. For a charging network, the connection type of the client charging stations can also be selected.

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If a client charging station loses the connection to the master, or if an error occurs at the master, a specification can be made for the maximum charging current at which charging is to be continued. If "0" is entered, the charging process is terminated in the event of an error and the charging station is put into "out of operation" mode.

4.1.5 System

The area offers the following options:

- Software Update
- Mobile Communications Info
- Logging
- DSW Settings
- Factory Data Reset
- Signed measurement data export
- Signed log data export
- Restart System
- Certificates

Software-Update

The currently installed software versions are displayed. A software update can also be performed here.

Mobile Communications Info

Information about the mobile communications connection is displayed and the connection to the selected mobile communications network can be tested.

Logging

The event log can be downloaded here.

DSW Settings

The DIP switch settings of each charging station in the charging network can be displayed here.

Factory Data Reset

The "Reset" button resets the configuration of the charging station to the factory settings and all stored data (charging sessions, taught-in RFID cards, web interface password, etc.) is deleted.

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Signed measurement data export

The signed measurement data records can be exported here, which can be used for billing charging sessions. This function is only available for device variants with specific suitability.

Signed log data export

The signed log data records containing an event log can be exported here. This function is only available for device variants with specific suitability.

WebUI Certificates

For an encrypted connection, certificates can be imported in *.pfx format. A connection to the web interface can be encrypted. The following certificates are available:

WebUI certificates

Certificate	Purpose
Https WebUI	Encrypted connection to the web interface

Restart System

The master can be restarted with this button.

4.1.6 Configuration

The configuration of the charging station is carried out in this area.

Information

The DIP switch settings are independent of the web interface configuration and cannot be overwritten by software.

The area offers the following options:

- Device
- Network connection
- Routing
- Proxy
- OCPP
- OCPP Certificates
- External TCP meter
- Display text

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Information

The settings made are only applied after the "Apply" button has been pressed.

Device

The basic settings for the charging station are configured here:

- Managing the authorization function
- Synchronizing the time of the charging station with the time of the browser (the charging station restarts after a time synchronization)
- Activating and deactivating the USB stick functions
- Deleting the event log (log file)
- Rated voltage to which the charging station is connected
- Behavior of the charging station after a power failure

Network Connection

Here the network communication (WLAN Access Point, SIM, APN connection data) can be selected and configured

Routing

Settings for necessary routing can be made here

Proxy

All the necessary configurations for using a proxy server can be found in this part.

OCPP

All the necessary configurations for connecting to an OCPP backend can be found in this part. The displayed configuration options vary depending on the selected transmission type.

If a connection to the KEBA eMobility Portal is established via the KEBA eMobility App, no settings need to be made here. If the settings are changed on the WebUI, those in the KEBA eMobility App are overwritten.

OCPP Certificates

For an encrypted connection, certificates can be imported in `*.pfx` format. The connection to the OCPP backend and charging station can be encrypted. The following certificates are available:

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OCPP certificates

Certificate	Purpose
Charge point certificate	Encrypted connection to the OCPP server
Central system root certificate	Certificate for logging in to the charging station at the OCPP backend (OCPP 1.6 JSON Security)
OCPP server certificate	Encrypted connection to the charging station
Manufacturer root certificate	Check of the signature for firmware updates (OCPP 1.6 JSON Security)

External TCP Meter

Here, a setting is configured for whether the measured values are read out from external meters in order to dynamically adapt the charging current. All necessary configurations for the external meter can be specified in this area.

Display Text

Here, you can make settings for the text that is shown on the display of the charging station describing various processes of the charging station. The language of the text can be changed, the display duration can be configured and the display text itself can be changed.

The text display is limited to 20 characters, and no umlauts or special characters can be used.

The abbreviations "Wh" and "kWh" must not be used in the display texts as they may be misleading to the user. These abbreviations are reserved for indicating transmitted energy. If either "Wh" or "kWh" are entered as display text anyway, this text is ignored and not shown on the display.

4.2 User menu

The user menu contains important information and settings for the user. It is divided into the following areas:

- Help
- Licenses
- User settings
- Logout

User settings

In this area, changes to the following user settings can be made:

Username and password

The web interface username and the corresponding password can be changed here. The following rules apply for assigning the password:

- At least 10 characters long

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- Maximum of 2 successive identical characters
- At least 3 of the following criteria are fulfilled:
  − 1 uppercase letter (A−Z)
  − 1 lowercase letter (a−z)
  − 1 number (0−9)
  − 1 special character

Language of the graphic user interface

The language of the graphic user interface can be changed here.

Remote service interface

The remote access to the charging station can be enabled here. This enables a service technician to access the charging station via an encrypted connection. These settings can also be configured on the OCPP backend.

Log level

For error diagnosis, it can be necessary to record the operations of the charging station in detail. This can be enabled in this area of the DEBUG mode. To ensure that the recorded data quantity is not too large, the duration for the detailed recording must also be specified.

Recovery key

If you forget the web interface password, you can reset it using the displayed recovery key. The recovery key can also be found on the configuration label.

Information

The recovery key absolutely must be kept in a safe place for the entire life of the product!

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5 Functions

The following chapters describe special functions of the charging station.

5.1 Load management in the local charging network

Load management in a local charging network allows multiple charging stations to operate on a common supply. The maximum power allowed by the supply line is divided by the master charging station.

Information

A charging process at a client charging station is only possible if there is a connection to the master charging station. This prevents the connection from being overloaded.

5.1.1 Equal allocation mode

If the parallel active charging stations in a local charging network request more power than the power supply provides (set maximum current), the available charging current is divided evenly across all charging sessions.

Charging current per charging station = set maximum current per phase / number of active charging sessions on this phase

If insufficient power is available for an additional charging process in the charging network (set minimum current is underrun), the new charging process will be lined up. Every 15 minutes, an active charging session is paused in sequence, lined up at the back of the line, and the next charging session in the line continues.

5.1.2 Unbalanced load compensation

Asymmetrical loads (unbalanced loads) can lead to an unstable network. To avoid unbalanced loads, a balance is established between the phases of the charging station during the charging process. The maximum current allowed for asymmetrical loads can be defined, but is determined by country-specific requirements.

The unbalanced load compensation can be defined for the entire charging network or individually for each charging station.

5.1.3 Current limiting

The current limiting for the charging station can be regulated in various ways.

- Setting by means of DIP switches locally on each charging station
- Assignment by the master

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- Assignment via UDP connection
- Readout of an external meter using Modbus TCP

If a current limit is specified via several different types, then the lowest preset value is used for the currently valid current limit.

5.1.4 Phase-related load management

Phase-related load management is used for a charging network with charging stations with a 3-phase connection.

The charging station verifies how many phases a vehicle is charging and detects whether the vehicle is one that charges with 1, 2 or 3 phases.

This information is ultimately used to regulate the uniform charging current distribution to the 3 phases.

5.2 RFID authorization

Certain device variants are equipped with an RFID reader, which enables the authorization of a charging process with RFID cards in accordance with ISO 14443 and ISO 15693. The RFID authorization only allows a charging session to be started if an identification takes place by means of an RFID card. The authorization function is enabled and disabled in the web interface of the master.

In the case of a local charging network without a higher-level OCPP backend, all RFID cards must be taught in at the master. Up to 1000 RFID cards can be stored. After teaching in, the permitted RFID cards are stored at the master and are managed by it in the charging network. It is not possible to teach in RFID cards at a client charging station.

When connecting to an external OCPP backend, all RFID cards must be taught in at the OCPP backend. Any number of RFID cards can be stored. It is not possible to teach in the RFID cards directly at a charging station.

The first 1000 RFID cards are relayed from the OCPP backend to the master, where they are stored locally. This enables charging sessions to be authorized even if the connection fails temporarily. In case of a connection failure, authorization requests, depending on the authorization mode, are compared to the locally stored RFID cards.

5.2.1 Authorization modes

The authorization modes described below are available in the web interface if the authorization function has been activated.

Online authorization mode
This defines which storage location an authorization request is to be compared to.

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Mode	Description
FirstLocal	The authorization request is first compared to the locally stored RFID cards stored at the charging station. If the RFID card is not stored locally and a OCPP backend is used, a comparison takes place with the RFID cards stored at the OCPP backend. If no OCPP backend is used, this setting must be used for an authorization to be active.
FirstOnline	The authorization request is always compared to the RFID cards stored on the OCPP backend. There is no comparison to the locally stored RFID cards stored at the charging station.
OnlyLocal	The authorization request is always compared to the RFID cards stored locally at the charging station. No comparison is made to the RFID cards stored at the OCPP backend.

Offline authorization mode
This defines how an authorization request is handled if the connection to the higher-level OCPP backend fails.

Mode	Description
OfflineLocalUnknown Authorization	All RFID cards are accepted, even if they are not stored locally at the charging station. Only those RFID cards that are stored locally at the charging station and have a status other than "ACCEPTED" are rejected.
OfflineLocalAuthorization	Only RFID cards stored locally at the charging station with the status of "ACCEPTED" are accepted.
OfflineNoAuthorization	All RFID cards are temporarily accepted. As soon as the connection to the OCPP backend exists again, the RFID card is checked and, if an invalid RFID card is being used, the charging process is canceled.
OfflineNoCharging	Charging is not possible in case of a connection failure.
OfflineFreeCharging	In offline mode, authorization is deactivated.

5.2.2 Displays and signals

During RFID authorization, the charging station can display different light patterns on the LED bar and emit acoustic signals.

LED bar

Display	Description
Flashing green (every 3 seconds)	Authorization is done correctly.
Flashing blue (every 3 seconds)	The charging station is waiting for authorization to enable a charging process. Authorization necessary, either with RFID card or by an external input.
Illuminated orange (once)	The RFID card is invalid.

Acoustic signals

Signal	Description
Single tone	RFID card has been read.

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Signal	Description
Rising tone sequence	RFID card has been accepted.
Falling tone sequence	RFID card has been rejected (no authorization).

The charging station can also display a text concerning the RFID authorization, e.g. "accepted card". This text can be customized via the web interface.

5.2.3 RFID authorization without OCPP backend connection

The following options are available for managing RFID cards:

- At the RFID reader of the charging station
- In the web interface

Managing RFID cards at the RFID reader

Both the master RFID card and all client RFID cards can be taught in directly at the RFID reader of the charging station. To teach in an RFID card, no charging session may be active and no vehicle may be plugged into the charging station.

Teaching in a master RFID card

To access the "Service button", the housing cover and the connection panel cover must be removed.

1) Press and hold the "Service button" in the connection panel until the second signal tone is sounded (approx. 10s).
   The charging station will then automatically perform a restart, deleting all previously taught-in RFID cards, if necessary.
2) The charging station will be available again after 30 seconds.
3) After the waiting time, the first three segments of the led bar are illuminated. A master RFID card can be taught in for 30 seconds by holding it in front of the RFID reader.
   A successful teach-in process is confirmed by a rising tone sequence.

Teaching in a client RFID card

1) Hold the master RFID card in front of the RFID reader and wait for the rising tone sequence.
2) Then hold the client RFID card to be programmed in front of the RFID reader within 10 seconds and wait for the signal tone.
3) Confirm the teach-in process by holding up the master RFID card again within 5 seconds.
   A successful teach-in process is confirmed by a rising tone sequence.

Managing RFID cards in the web interface

RFID cards can be managed via the configuration in the web interface. The following functions are available:

- Teaching-in, editing or deleting an RFID card

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- Exporting or importing a list of stored RFID cards as `*.csv` file

Information

*It is recommended to use a text editor for editing the *.csv file. Otherwise the date can be interpreted incorrectly upon import.*

The following entries can be made during teaching-in and editing of an RFID card:

Eingabe	Beschreibung
Name of the Card	Name of the RFID card.
RFID Card – Serial No. (UID)	Serial number (UID) of the RFID card.
Expiry Date	Date up to which the RFID card is to be valid.
Master RFID Card	Set the RFID card as master RFID card. Only one card can be defined as master RFID card.
Status	Authorization of the RFID card. Here it is also possible to block an RFID card and thus prevent charging with the relevant RFID card.
Charging Station – Serial No.	Serial number of the charging station where the RFID card may be authorized. All or only certain charging stations in the charging network can be enabled for the RFID card.

5.2.4 RFID authorization with OCPP backend connection

If the charging station or a charging network is controlled by an OCPP backend, please note the following:

- Teach in RFID cards:
  All RFID cards must be "centrally taught in" at the OCPP backend.
- "Authorization" in the web interface to "ON":
  Each authorization request is relayed to the OCPP backend.
- "Authorization" in the web interface to "OFF":
  A charging process can only be started without holding up an RFID card if the predefined token set in the configuration is recognized and accepted by the OCPP backend.

Information

For information on the functionality and the required settings of the OCPP backend, refer to the specific manual of the system used.

5.2.5 Start charging process with RFID authorization

To start a charging process with RFID authorization, proceed as follows:

1) Plug the vehicle into the charging station.

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2) Hold the RFID card, which was previously taught in, in front of the RFID reader.
3) The rising tone sequence and the green flashing LED bar indicate that the RFID card has been accepted.
   The charging process can now be started by the vehicle.
4) If necessary, the charging process can be stopped prematurely by holding the same RFID card in front of the RFID reader again.

Information

Enable input X1

For special device variants, the enabling of a charging session can also be controlled via the enable input X1 (for connecting external components such as a timer, photovoltaic system or home control). If this function has been activated in the DIP switch settings, enabling a charging session will additionally require a correct signal on the enable input X1. Further information can be found in the "Installation Manual".

5.3 OCPP backend

The charging station offers the option of being connected to a central management system via the Open Charge Point Protocol (OCPP). OCPP, as an open application protocol, makes it possible to connect any central management system to the charging station regardless of the manufacturer or supplier. The following OCPP versions are supported:

- OCPP 1.5 via SOAP
- OCPP 1.6 via SOAP or JSON

Connection to an OCPP backend

When connecting to an OCPP backend, note the following:

- It is recommended that the master in the network be assigned a static IP address based on the MAC address of the device.
- Since the OCPP backend is usually not in the same network, the charging station must be assigned a "public IP address" which is routed to the internal IP address (NAT).
- The firewall must be configured so that communication between the charging station and the OCPP backend is possible.
- For a connection via VPN, the IP address of the VPN must be specified in the configuration (web interface) for the downlink.
- In the case of a mobile communications connection, it may be necessary for the required ports to be activated by the cellular service provider.

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Ports for communication via OCPP

For communication with an OCPP backend, the following ports must be enabled in the network:

Port	Protocol	Definition	Description
Custom (1025 - 65535)	TCP	Can be reached externally (incoming)	OCPP Charge Point Service: This service is related to the OCPP backend. ● The port can be freely selected or it is specified by the OCPP backend. However, the port may only be located in the range from 1025 to 65535. ● The selected port must be configured on the charging station.
Custom	TCP	Access to external (outgoing)	Port at which the OCPP backend can be reached.
123	UDP	Incoming and outgoing	Port for the time server of the charging station.

Supported messages

The following table provides an overview of the supported messages.

Message	OCPP 1.5	OCPP 1.6
Authorize	x	x
BootNotification	x	x
ChangeAvailability	x	x
ChangeConfiguration	x	x
ClearCache	x	x
DataTransfer	x	x
GetConfiguration	x	x
Heartbeat	x	x
MeterValues	x	x
RemoteStartTransaction	x	x
RemoteStopTransaction	x	x
Reset	x	x
StartTransaction	x	x
StatusNotification	x	x
StopTransaction	x	x
UnlockConnector	x	x
GetDiagnostics	x	x
DiagnosticsStatusNotification	x	x
FirmwareStatusNotification	x	x
UpdateFirmware	x	x

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Message	OCPP 1.5	OCPP 1.6
GetLocalListVersion	x	x
SendLocalList	x	x
CancelReservation		x
ReserveNow		x
ClearChargingProfile		x
GetCompositeSchedule		x
SetChargingProfile		x
TriggerMessage		x

5.4 Smart Home Interface

The charging station gives you the option to transmit information and receive commands via the User Datagram Protocol (UDP) or via Modbus TCP. For instance, this can be used for integration into a smart home.

5.5 Integration of external meters

The charging station can read out the measured values from external meters via Modbus TCP. This allows an intelligent calculation of the charging current provided to the vehicle, and the charging process is optimized. The measured values that are read out are included in the charging current specification. The following graphic shows the schematic structure of the system.

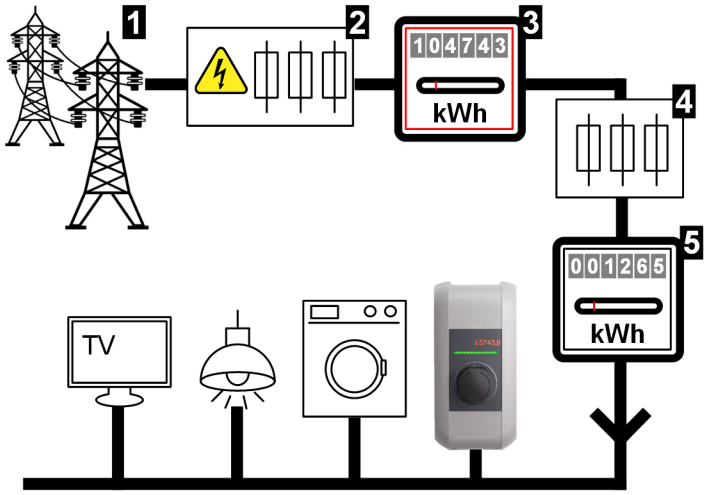

Fig. 5-7: Modbus TCP system overview

1 ... Public power grid	2 ... Pre-meter circuit breaker (high-capacity fuse, line circuit breaker, etc.)
3 ... Electricity meter of the network operator	4 ... Post-meter circuit breaker

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5 ... External meter (house connection meter)	

Information

The illustration provides an exemplary system overview and does not include all the necessary auxiliary devices required for safe operation of the system (e.g. line circuit breaker, residual-current device, etc.).

Domestic connection monitoring (Domestic Connection TCP Monitoring)

By means of the domestic connection monitoring, the charging vehicle can be dynamically provided with the available charging current, depending on the remaining consumers on the house connection. This ensures that the domestic connection safety device is not overloaded, and that it is not always necessary to select a lower charging capacity than would be possible with the vehicle and the installation.

The charging station can read out the current total energy supply from the power grid via meter 5.

The charging station can use this information to regulate the maximum charging current for a charging network such that the maximum current and power defined in the web interface is not exceeded (for details, see 5.5.3 Settings).

5.5.1 Connection

When connecting external meters please note the following:

- The connection is made via the Ethernet1 connection X4 (LSA+®). For this, the meter must be in the same network as the charging station.
- The meter must be connected with the same phase sequence as the charging station, so that the house load calculation and the charging optimization are carried out correctly. If it is necessary to connect the charging station beginning with phase 2 in order to better distribute the phase loads, the meter must also be connected beginning with phase 2.

5.5.2 Supported meters

The following counters can be read out from the charging station with the help of a **Janitza ProData 2 datalogger**.

Manufacturer	Model
ABB	B23 312-100
B-control	EM300
Herholdt	ECSEM113
Janitza	B23 312-10J

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Manufacturer	Model
Janitza	ECSEM114MID
Siemens	7KT1260

The following meters can be read out directly from the charging stations using Modbus TCP.

Manufacturer	Model
ABB	M2M
ABB	M4M
Carlo Gavazzi	EM 24
Gossen Metrawatt	EM228X
Gossen Metrawatt	EM238X
KOSTAL	Smart Energy Meter
Siemens	7KM2200
TQ Systems	EM420
TQ Systems (B-control)	EM300 LR (EM420 compatible)
TQ Systems (B-control)	EM300 LRW (EM420 compatible)

Information

Detailed information about the meter installation can be found in the installation instructions of the meter manufacturer.

5.5.3 Settings

The Modbus TCP feature is disabled by default. If an external meter with a Modbus TCP network interface has been installed in the system, it must be configured in the web interface in advance.

The maximum permitted charging current per phase and the maximum permitted charging capacity for the entire charging network can be configured in the web interface (under Configuration > External TCP Meter).

If the connection to the external meter gets interrupted, you can use the web interface to configure the charging capacity at which charging is to continue. If "0" is entered or if the field remains empty, the charging processes are interrupted in the event that the connection to the external meter is interrupted.

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6 Maintenance

6.1 Diagnosis and troubleshooting

The FAQs on our website help to rectify possible errors that might occur:

www.keba.com/emobility-downloads

6.2 Software update

It is recommended to always keep the charging station up-to-date, as it contains functional enhancements and bug fixes. A software update is available on our website:

www.keba.com/emobility-downloads

The information and instructions for the current software package from the associated release notes must also be observed.

A software update may only be performed if no vehicle is plugged in at the charging station.

Information

The software update can take up to an hour. The update process is indicated by a slow orange flashing of the LED bar.

After the software update, the charging station restarts automatically. The LED bar will flash blue or green, depending on the authorization setting.

Information

The power supply must not be interrupted during the software update. Otherwise, the software update is not terminated correctly and further normal operation of the charging station is no longer guaranteed.

Software update at charging network

A software update for a charging network must be performed at the master charging station (P30 x-series). The master charging station relays the new firmware to the connected client charging stations (c-series) via the software update.

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6.2.1 Software update via web interface

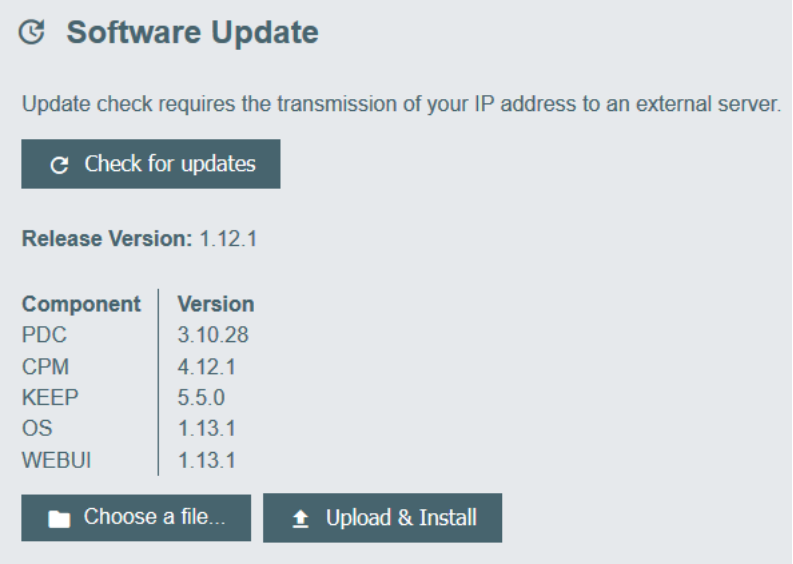

Fig. 6-8: Web interface software update

To perform a software update via the web interface, proceed as follows:

1) Download the current software for the charging station (`*.keb` file).
2) Log into the web interface of the charging station.
3) In the main menu under "System" select the item "Software Update".
4) Upload the current software using the "Choose a file ..." button.
5) Start the update process with the "Upload & Install" button.

6.2.2 Software update via USB stick

For a software update using a USB stick, this function must be activated in the configuration (web interface).

To perform a software update via a USB stick, proceed as follows:

1) Download the current software for the charging station (`*.keb` file).
2) Plug the USB stick into a PC.
3) Format the USB stick with FAT32.
4) Create a new directory on the USB stick with the name "`UPD`".
5) Copy the downloaded `*.keb` file into the "`UPD`" directory.
6) Connect the USB stick to the USB interface of the charging station. The update starts automatically.

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6.2.3 Software update via OCPP backend

The software update for the entire charging network can be performed via the OCPP backend.

To perform the software update an FTP link is required. The information downloaded from our website along with the software update contains the FTP link.

For details on using the FTP link, see the OCPP backend manual.

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