

System configuration

flow

Home Energy Management System



Energy management controller
XEM470

Dated: 07/2023

We reserve the right to make changes of a technical nature

:hager

EN

01	Introduction/system overview	
01.01	Target group	04
01.02	Document contents	04
01.03	Energy management with Hager flow	05
01.03.01	Applications	05
01.03.02	System benefits	06
02	Safety information	
02.01	General safety information	07
02.02	Network requirements and password protection.....	07
03	Procedure	
03.01	Do everything on site or plan the installation virtually?	08
04	Logging in to myHager	
04.01	System requirements – Mobile device	09
04.02	Connecting to Hager Cloud	09
05	Managing customer’s flow installations	
05.01	Home page – Overview of all customer installations	10
05.02	Service information	10
05.02.01	Filtering by customer installation status	10
05.02.02	Monitoring device statuses.....	11
05.03	Creating a new project.....	11
05.03.01	Adding an installation	11
05.03.02	Managing devices.....	12
06	Configuration & commissioning	
06.01	Calling up configuration	13
06.02	XEM470 energy management controller (EMC).....	14
06.02.01	Adding the EMC	14
06.02.02	Entering general information about the customer installation	14
06.02.03	Connecting the EMC to the Cloud	15
06.03	XEM900 energy storage system.....	16
06.03.01	Configuring the energy storage unit	16
06.03.02	Connecting the energy storage unit with flow	18
06.04	witty solar charging stations	20
06.04.01	Compatible charging stations.....	20
06.04.02	Configuring charging stations.....	20
06.04.03	Connecting charging stations with flow	23

06.05	Integrating energy meters	25
06.05.01	Compatible energy meters	26
06.05.02	Adding an energy meter	26
06.05.03	Connecting energy meters with flow	27
06.06	Controlling consumers via the I/O interface	28
06.06.01	Adding an I/O interface.....	28
06.06.02	Configuring an I/O interface.....	29
06.06.03	Connecting an I/O interface to flow	29
06.07	Status indicators in the Cloud	30
07	Handover & access authorisations	
08	Visualisation for the customer	
08.01	Dashboard	33
08.01.01	flow animation	33
08.01.02	Widgets.....	33
08.02	Energy diagrams	34
08.02.01	Examples of statistics.....	34
08.03	e-Mobility - All charging operations at a glance	36
08.03.01	Charging statistics & charging history	36
08.03.02	Charging diagram	36

01 Introduction/system overview

The **flow home energy management system** manages the flow of electrical power in single-family homes. An **energy management controller (EMC)** is needed to get started. It is the central control unit of the flow system. The EMC controls the photovoltaic energy generated on site to ensure that the ratio of self-consumption is as high as possible. Additional components, such as energy storage units, electric charging station(s) and additional measuring and control devices, increase the self-sufficiency level of the house. You can create custom concepts that suit your individual circumstances perfectly.

01.01 Target group

This document is intended for installers of the Hager flow energy management system.

Installation must only be carried out by qualified electricians who have successfully completed the relevant professional training and are familiar with all the relevant standards and regulations required for installation and other construction phases. The required tasks must only be performed by trained specialists. Hager recommends that specialists should participate in a seminar on the flow home energy management system in order to become certified flow partners.



Note

Specialists must also provide evidence of certification before purchasing and commissioning a flow energy storage system.

01.02 Document contents

This document provides information on how to configure and commission the flow home energy management system and how to hand it over to the customer. It also provides tips and tricks on how to use the application software. It does not cover how to assemble and install the devices in question. Neither is it filled with lots of information about the functions of the system, as the software is intuitive.



Note

Read the installation instructions supplied with the product for information on the installation and assembly of the devices in question.

The illustrations and descriptions in this manual are for clarification purposes only and may differ from the actual state of the software due to regular improvements being made.

For general information on energy management using flow,

► see our website **[hager.com](https://www.hager.com)**

01.03 Energy management with Hager flow

01.03.01 Applications

Installation without an energy storage unit

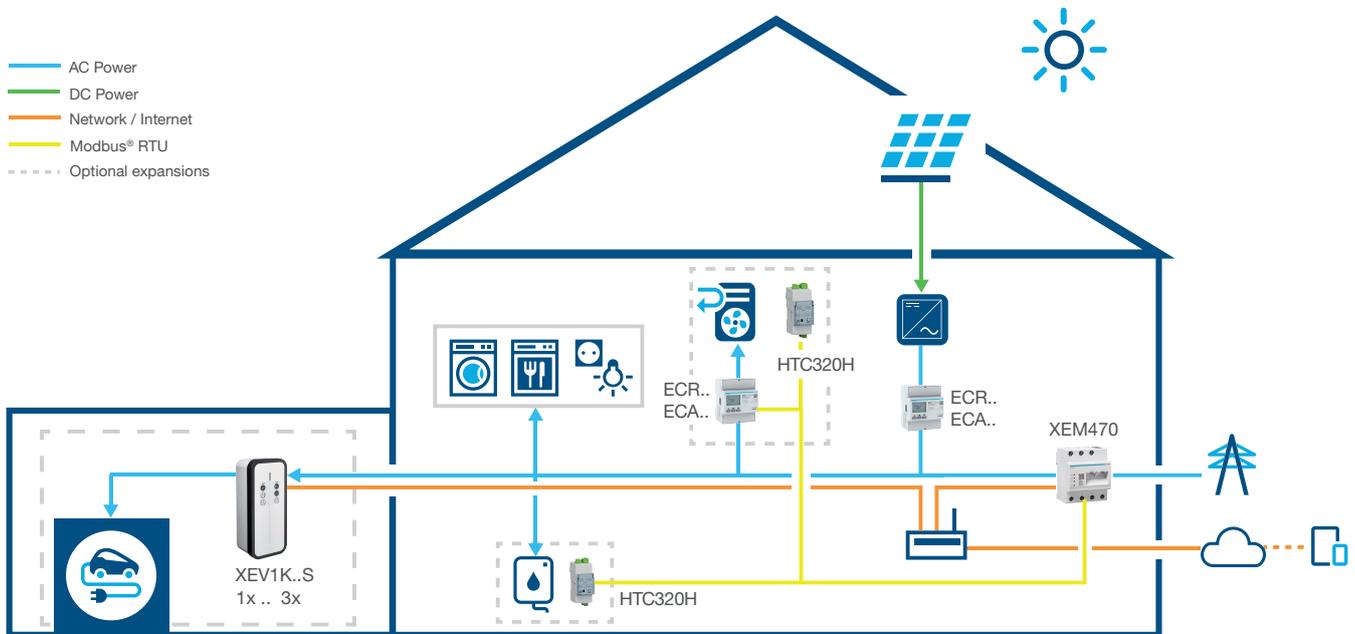


Figure 1: Application without an energy storage unit

Installation with an energy storage unit

ⓘ Please contact your local Hager sales support for availability in your country.

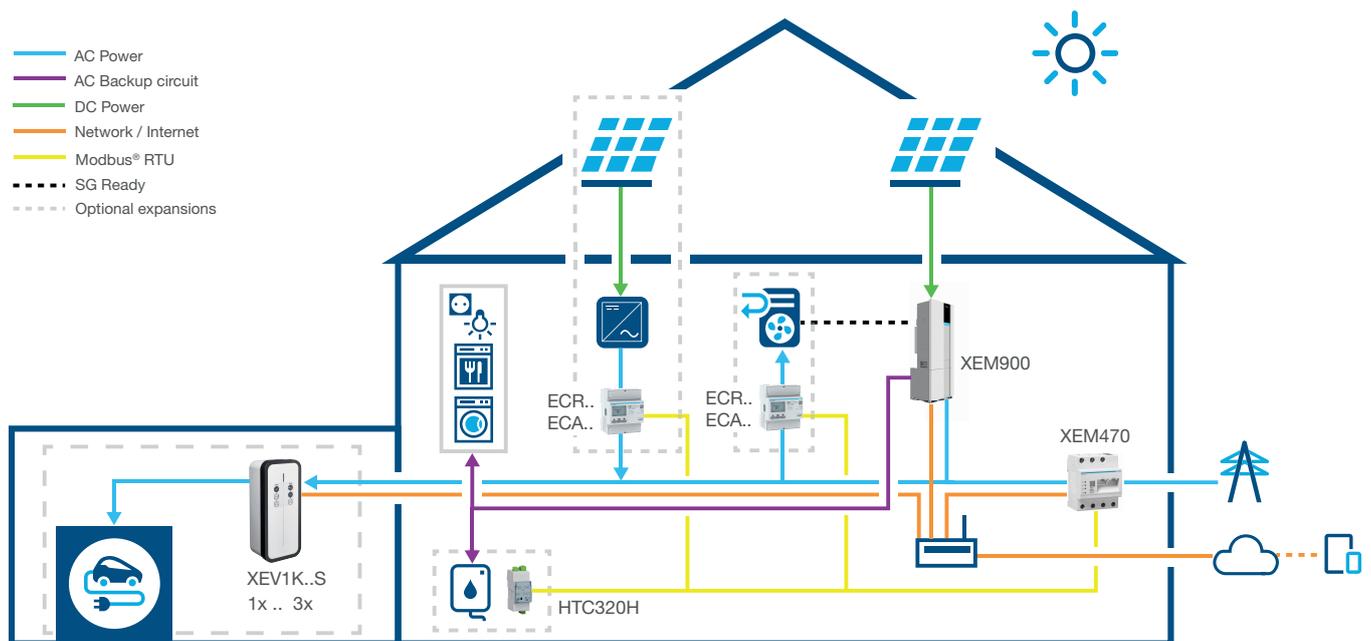


Figure 2: Application with an energy storage unit

01.03.02 System benefits

flow provides an intuitive software interface, which can be expanded in different stages. The modular expansion options let the home's level of self-sufficiency be continuously increased. The modular design also lets you design a custom system for every client.



The basic package consists of an EMC, an energy meter for PV power measurement (for external PV systems) and a network router connected to the Hager Cloud. The electricity generated by the PV system can be calculated and distributed to the electricity consumers in the house with these components alone.

The range of functions provided by flow can be flexibly expanded by adding optional devices:



Additional **energy meters** can be used to determine the individual loads of the various consumers. This improves transparency regarding power consumption and makes it easier to control costs.



The **I/O interface** enable HVAC devices, such as a heat pump, to be connected.



flow comes with permanently active **blackout protection** for **charging stations**. This prevents the house installations from being overloaded when charging electric vehicles. End customers can also set a charge planning function individually using the flow software. The flow system controls when an electric vehicle will be charged, which vehicle should be charged first and whether it is more economical to charge vehicles with self-generated electricity or electricity from the grid.



The system is most self-sufficient if an **energy storage unit** is integrated in the installation. This increases the self-consumption of PV power and allows the energy to be stored for use at a later time. The **isolator switch** integrated in the energy storage unit prevents excessive amounts of self-generated electricity from flowing back to the electricity provider unused. flow collects the information needed to distribute this power to its own consumers in a logical manner.

02 Safety information

02.01 General safety information



Warning

Before commissioning the flow system, check in person that the customer's electrical installation is configured to handle the total load of all connected electrical consumers and equipment, including charging station(s), and is designed in accordance with the relevant operating mode and relevant standards.

A qualified electrician must test and appropriately retrofit the system in accordance with the applicable regulations.

Only devices compatible with the system may be used in the flow installation.

Failure to observe these instructions may result in damage to the system, fire or other hazards.

02.02 Network requirements and password protection



Caution

A local network router is required to commission and operate flow. The router must be configured as a DHCP server.

A permanent and stable DSL Internet connection is required to connect to the Hager Cloud and to communicate with online services (weather, location etc.).

Connection breakdowns or frequent disruptions can impair system functions and stability.

Appropriate cyber security measures must also be put in place to protect the local network against unauthorised access.



Caution

Failure to secure access accounts through adequate security measures jeopardises data security.

- All myHager access accounts must be protected with secure passwords.
- Passwords must be kept safe and protected against unauthorised access.

Failure to do so can result in data loss or theft, or even a third party taking control of the system in the worst-case scenario.



Hager privacy policy

Please read our privacy policy at

https://hager.com/_en/privacy/products-services/flow

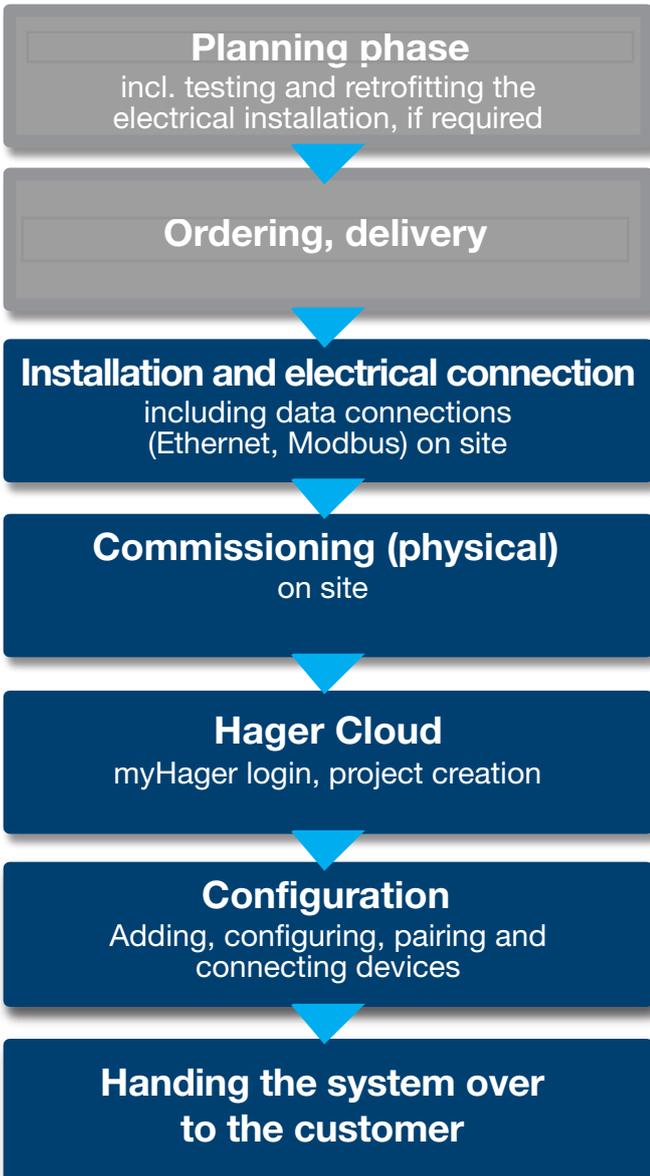
03 Procedure

03.01 Do everything on site or plan the installation virtually?

In principle, you can choose between two methods:

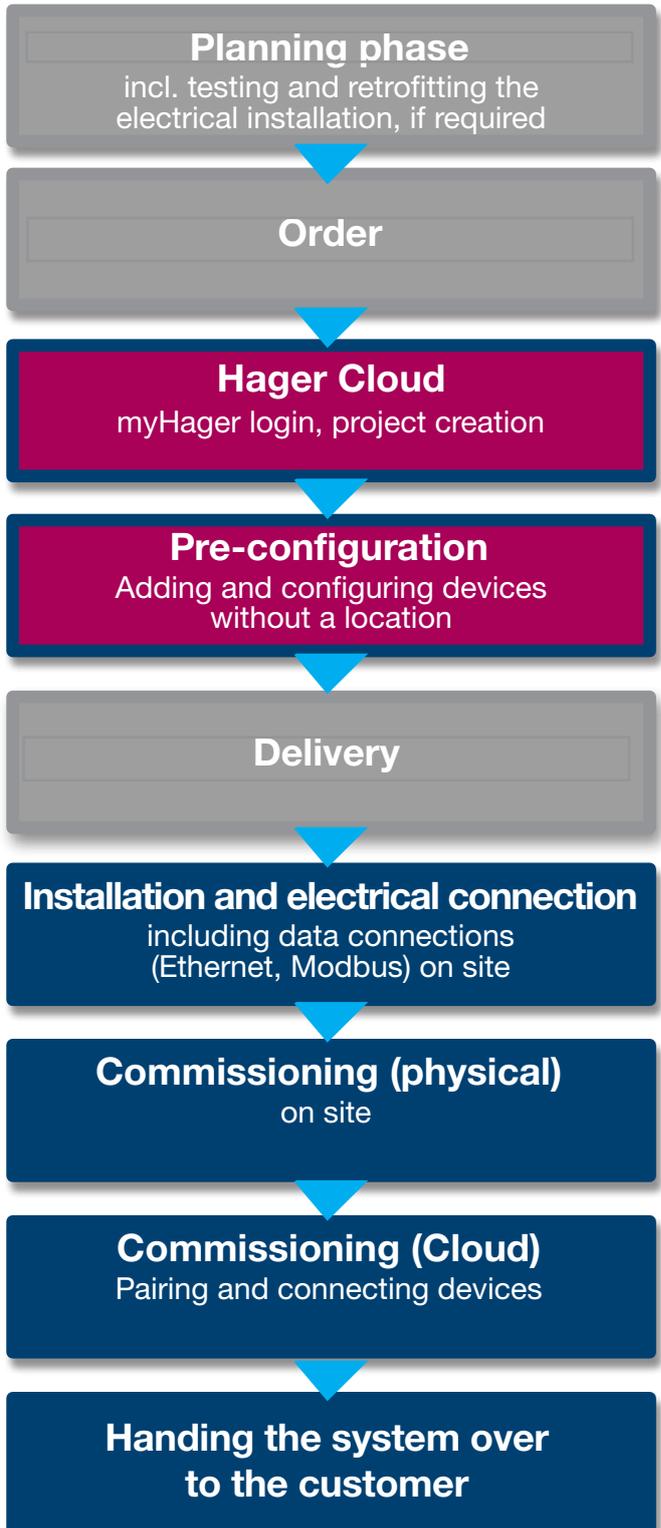
Procedure 1

(complete installation on site)



Procedure 2

(with preconfiguration in the Cloud)



04 Logging in to myHager

04.01 System requirements – Mobile device

The system is configured via the Hager Cloud. To run the software, you need a mobile device (laptop/tablet/smartphone) with a stable Internet connection and a compatible browser.

Mobile device	Browser	Version
	Google Chrome	69 +
	Mozilla Firefox	44 +
	Microsoft Edge	80 +
	Safari/Safari mobile	12.1 +/11 +

Table 1: Compatible browser

04.02 Connecting to Hager Cloud

The system is accessed exclusively via the Hager Cloud. You can access the Cloud website in the browser on your mobile device. As an installer, you manage all customer installations via your myHager business account on your mobile device. Customers receive the access details to their private myHager account after handover.

- Open the browser and go to the following link.
▶ <https://flow.hager.com>



Figure 3: myHager login – browser view



Note

If you do not already have a myHager account, you must first create a new myHager account.

- Click on "Register here".
- Follow the instructions on the website.
- Select the account type "Professional".

05 Managing customer's flow installations

05.01 Home page – Overview of all customer installations

The **Overview** menu shows you an overview of all customer installations. You can easily monitor or adapt all ongoing projects regardless of your location.

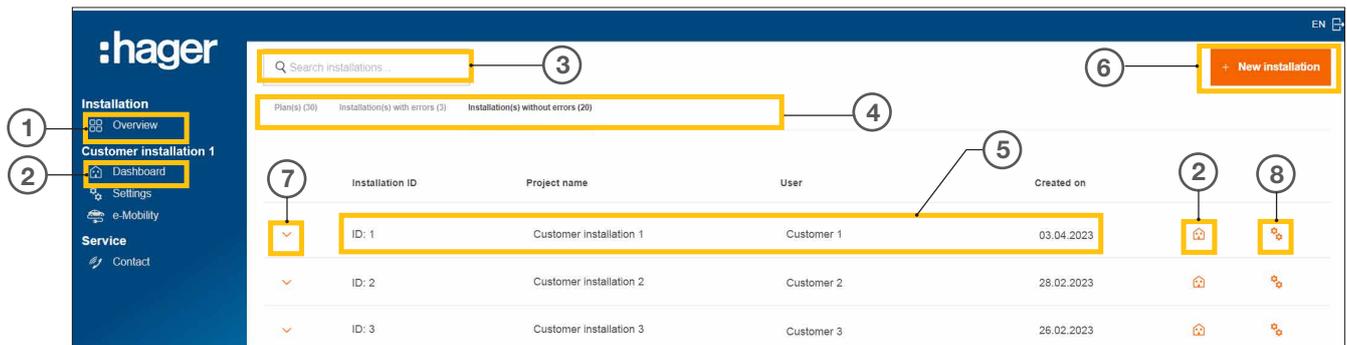


Figure 4: Home page – Overview of customer installations

- ① Overview (List of all customer installations)
- ② Dashboard (Visualisation of a customer installation)
- ③ Search field
- ④ Filter by status
- ⑤ Customer installation (example)
- ⑥ Create a new customer installation
- ⑦ Display all devices in a customer installation
- ⑧ Calling up configuration

05.02 Service information

The **Overview** menu provides two ways to check the status of a customer installation and its devices.

05.02.01 Filtering by customer installation status

Installers can filter by three categories. ④

Filter by planning status

You can preconfigure the devices in a customer installation. In this case, the devices will be added without a location, but not yet connected. The pairing process takes place on site.

All preconfigured devices are displayed in the **Plan(s)** tab.

Filter by Installation(s) with errors

All installations with at least one error are displayed in the **Installation(s) with errors** tab.

Filter by Installation(s) without errors

All properly functioning installations are shown in the **Installation(s) without errors** tab.

05.02.02 Monitoring device statuses

- Expand an installation to view its details. ⑦

You can now check the status of all devices.

ID: 1		Customer installation 1	Customer 1	03.04.2023		
Component ↑	Pairing ID	Status	Pairing			
EMC	XXXXXXXXXXXX					
	XXXXXXXXXXXX					

Figure 5: Service information – Device status (example)

Status meaning

- The device is correctly configured, linked and connected.
- The device is not connected or has at least one error.



Note

If you have any questions about flow or need support during commissioning, you can find the contact details for our technical support team in the Hager Cloud at ► **Service** ► **Contact**

05.03 Creating a new project

						EN	
Search installations ...							
Plan(s) (30) Installation(s) with errors (3) Installation(s) without errors (20)							
Installation ID	Project name	User	Created on				
▼ ID: 1	Customer installation 1	Customer 1	03.04.2023				
▼ ID: 2	Customer installation 2	Customer 2	28.02.2023				

Figure 6: Home page – Overview of customer installations

- Click on **+New installation**.
- You will be taken directly to configuration.



Note

The project ID is assigned automatically and therefore cannot be changed.

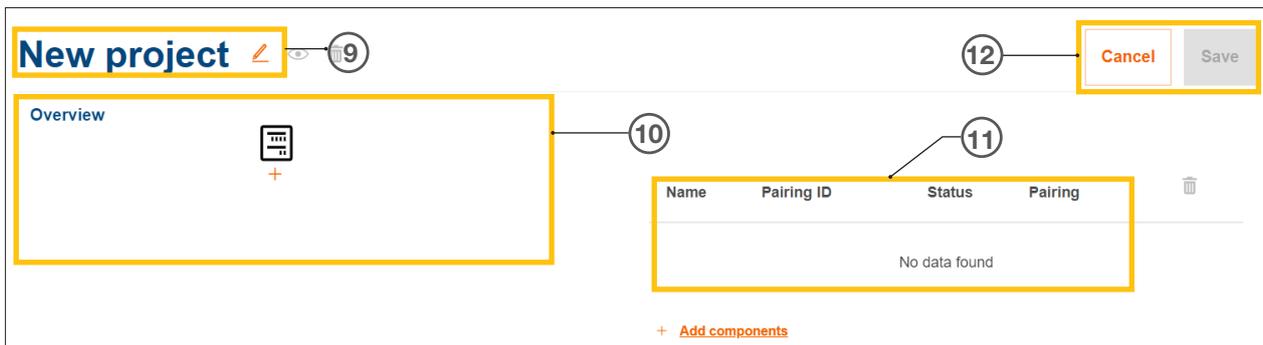


Figure 7: Creating a new project

- ⑨ Project name of the customer installation
- ⑩ Device overview (see Manage devices)
- ⑪ Device list with status (see Manage devices)
- ⑫ Save setting or cancel editing

- Assign a desired project name using the  button. ⑨
- Example: *Surname_customer-number*

i

Note

Save the project each time new devices are added. Only then can devices be successfully paired.

05.03.02 Managing devices

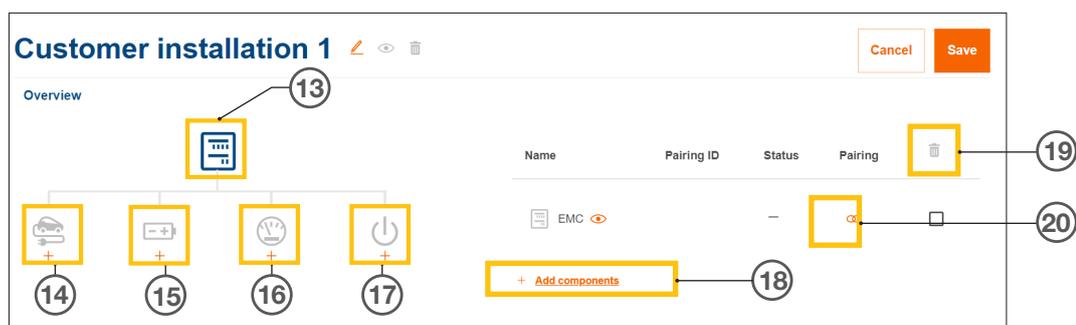


Figure 8: Device management

- ⑬ Energy management controller (EMC)
- ⑭ Charging station(s)
- ⑮ Energy storage system (ESS)
- ⑯ Power meters (energy meters)
- ⑰ I/O interface
- ⑱ Add devices
- ⑲ Remove devices
- ⑳ Edit devices

06 Configuration & commissioning



06.01 Calling up configuration

Note: When you create a new project, configuration opens automatically.
There are several ways to access configuration from the home page.

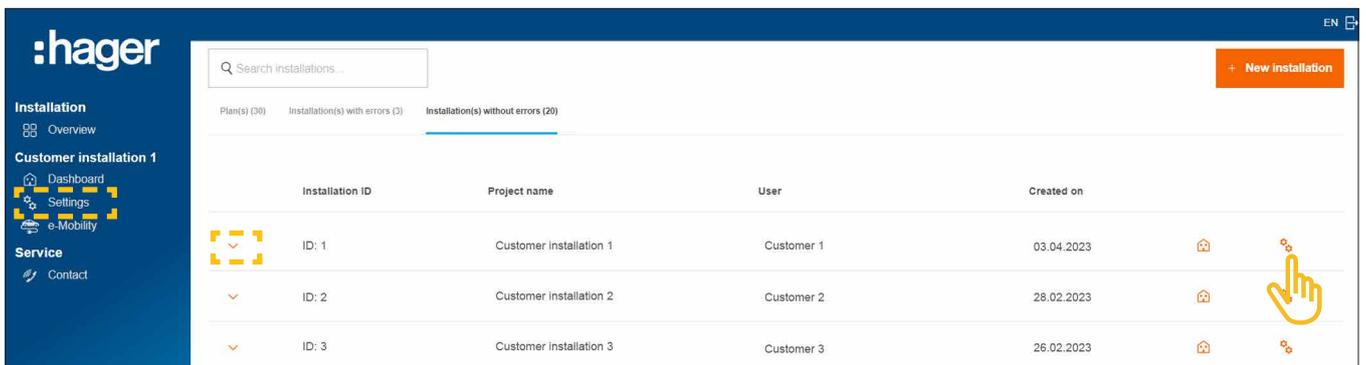


Figure 9: Calling up configuration

- Simply click on the symbol to the right of the installation you want to configure.
Configuration is called up.

Optional

- If the desired installation is already selected, click **Settings** on the left-hand side of the control bar.
- If devices are already integrated, expand the installation and click on one of the icons.

06.02 XEM470 energy management controller (EMC)



The XEM470 energy management controller (EMC) is always created as the first device as the central control unit of an installation.

06.02.01 Adding the EMC

- Add the EMC by clicking on the + sign under the device symbol in the overview, or select **+Add components**.

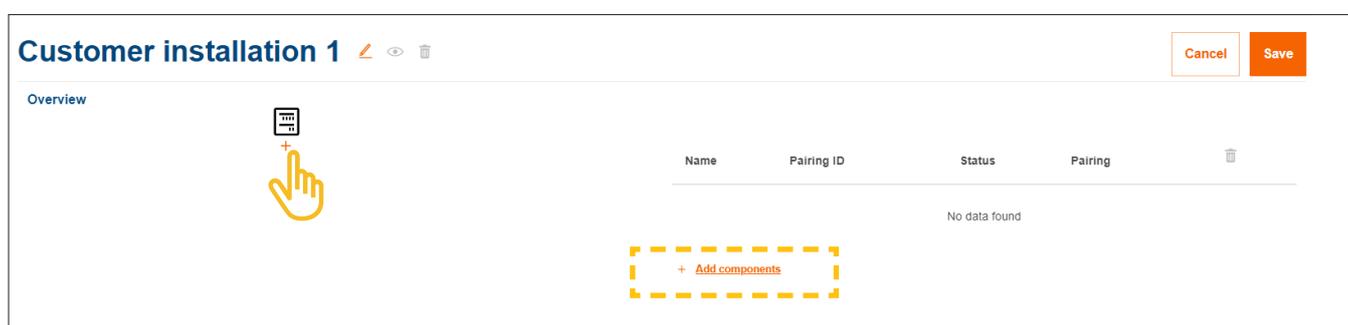


Figure 10: Adding the EMC

- Confirm the dialogue with **Store EMC**.

06.02.02 Entering general information about the customer installation

- Enter your customer's **location information**.

The location is used to determine the regional weather situation and weather forecast via an online service. flow uses the weather data to calculate the expected PV energy levels.

- Select the correct **Number of phases** of the house connection (*Single-phase* or *Three-phases*).
- Enter the rated current of the **Main protection** (*unit: A*).



Important note on thermal derating

We recommend **limiting the maximum effective current for flow to 80% of the rated value of the main fuse**. The value **Thermal derating** is preset accordingly. This reserve prevents the customer's electrical installation from being continuously operated at its thermal load limit, e.g. when charging electric vehicles.

As the responsible installer, you can adjust this value if the design of the electrical system permits. Observe the **EN 61439-1** technical connection rules.

- Only for installations with higher rated currents (> 63 A): Enter the appropriate current transformer ratio.
- Under **Feed-in Tariff**, enter the currently valid **Feed-in price** (PV to grid) in €/kWh.
- Under **Tariff price**, enter the currently valid electricity price per kWh.
- If required, add additional tariffs using **+Add a new import tariff**.
- **Save** your settings.

06.02.03 Connecting the EMC to the Cloud

Requirements:

- ☑ EMC is installed and operational. ▶ See installation instructions for the XEM470.
 - ☑ EMC is integrated into the customer's home network (LAN). The home network is connected to the Internet.
- Open the **Overview** tab.



Figure 11: Pairing the EMC

- Click on **Connect**.
- Scan the **QR code** on the sticker on the EMC. You can also enter the **short ID** printed on the sticker manually.
- Confirm with **Pair and save**.

After pairing successfully, the EMC automatically connects to the Cloud. Pairing status and connection status (**Status**) are displayed in the Cloud.

Name	Pairing ID	Status	Pairing	
 EMC 	XXXXXXXXXXXXXXXXXXXX			

Figure 12: Status of the EMC in the Cloud

All 3 status LEDs on the EMC should be green.

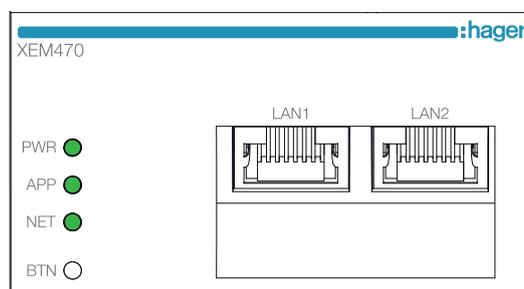


Figure 13: LED status indicator of the EMC

If a different status is shown ▶ see the XEM470 installation instructions.

06.03 XEM900 energy storage system

i Please contact your local Hager sales support for availability in your country.



06.03.01 Configuring the energy storage unit



Notes

Only qualified electricians certified by Hager are permitted to **commission** and **pair** the flow energy storage system.
System **configuration** can be flexibly adapted by the customer (admin) at a later date (exceptions: **pairing process** and **DSO specifications**).

- Add an energy storage unit by clicking the **+** sign under the battery icon in the **Overview** or select **+Add components**.

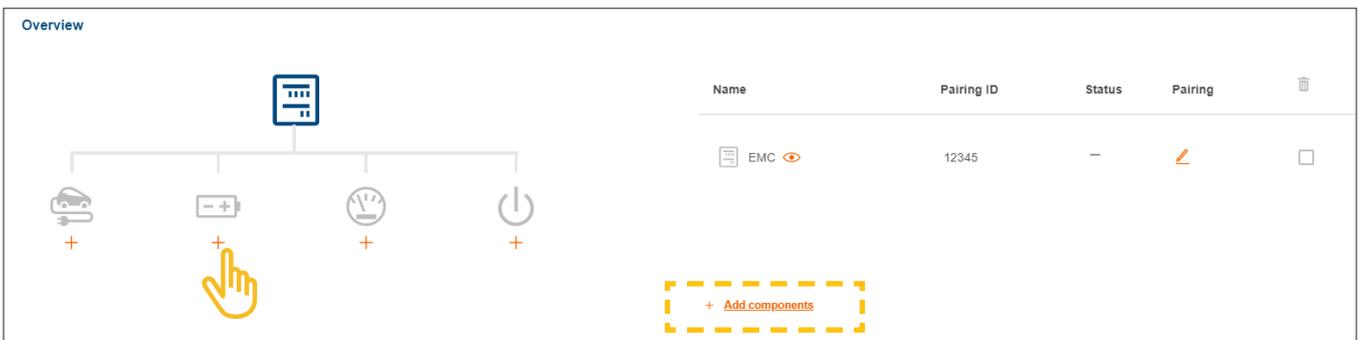


Figure 14: Creating an energy storage unit

- Confirm the dialogue with **Save Storage system**.

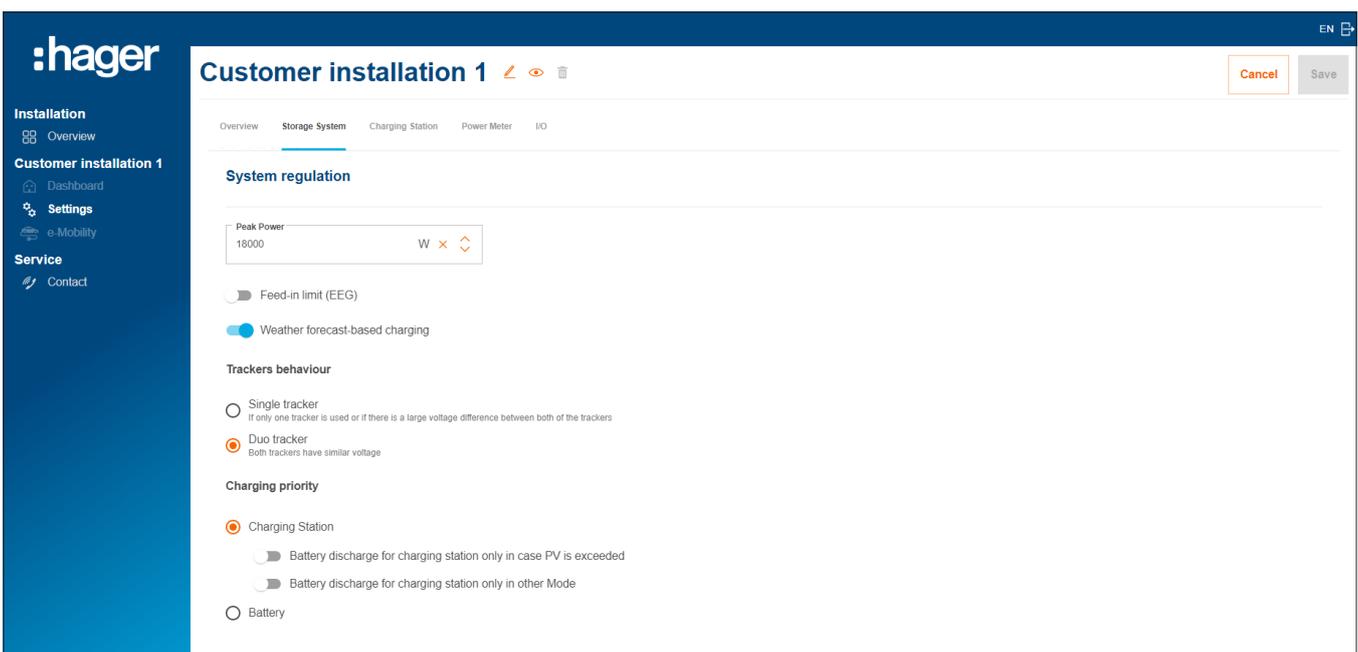


Figure 15: Energy storage unit – Basic settings (example)

- Configure the basic settings under **System regulation**. Parameters and values depend on the customer installation in question.
- Select the **charging priorities** according to customer requirements.
 - Use the **Charging Station** setting to select which electric vehicles are given priority when charging. You can find more detailed information about the options **PV surplus** and **Boost mode** in the section on **witty solar charging stations**.
 - When the **Battery** setting is activated, the energy storage unit is charged as a priority. This setting can also be changed by the customer (admin) later on.
- Under **Extended settings**, you can make additional settings and activate special functions if necessary. Observe the relevant information shown on the display.

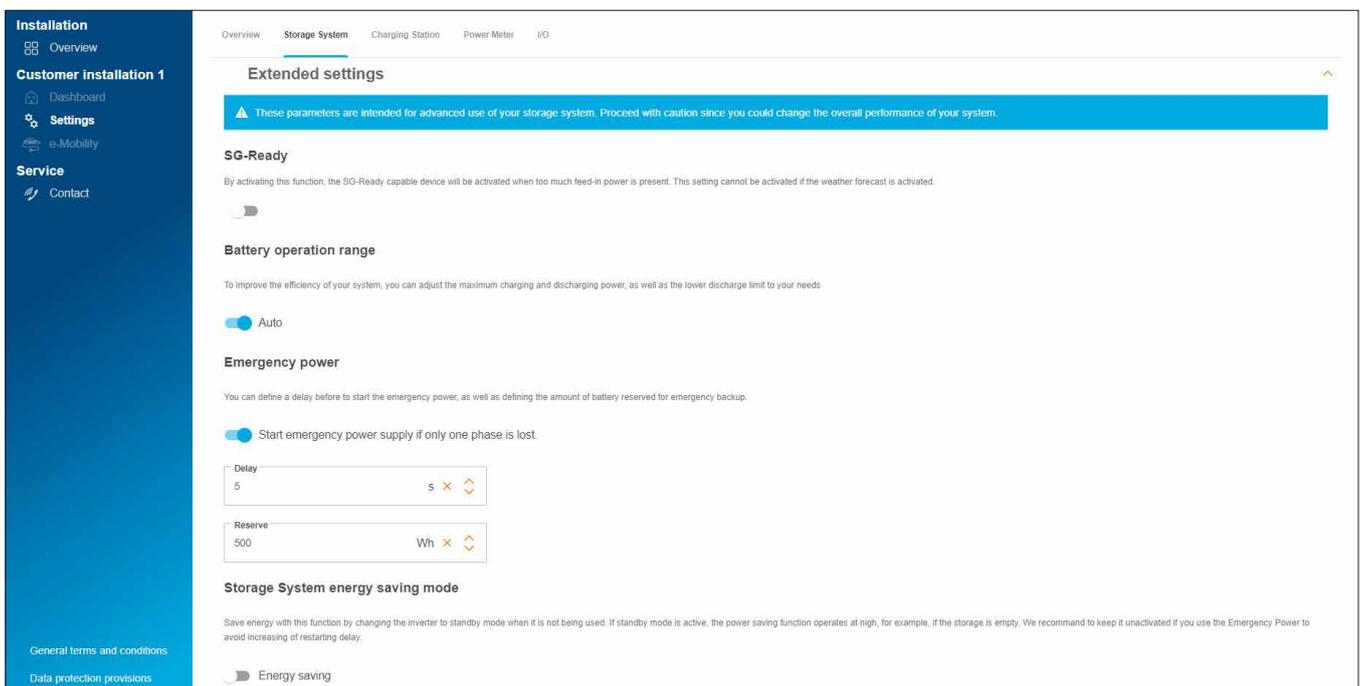


Figure 16: Energy storage unit – Advanced settings (example)



Caution!

The **DSO specifications** are preset and may only be changed when specific instructions are received from the network operator.

- If this occurs, contact Hager Support. ► **Service** ► **Contact**

- **Save** your settings.

06.03.02 Connecting the energy storage unit with flow

Requirements:

- ☑ The XEM900 energy storage system is installed and ready for use. ▶ See the installation instructions for the energy storage system.
- ☑ The XEM900 energy storage system is integrated into the customer's home network (LAN) (same subnet as the EMC). The home network is connected to the Internet.

The pairing process is initiated via the Cloud and controlled by the EMC. The energy storage system receives appropriate pairing data from the EMC over the LAN and automatically connects to flow after successful pairing.

- Open the **Storage System** tab.

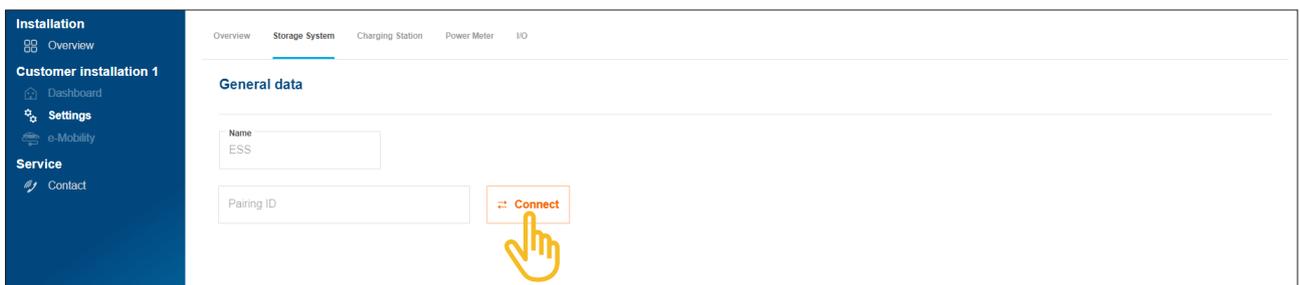
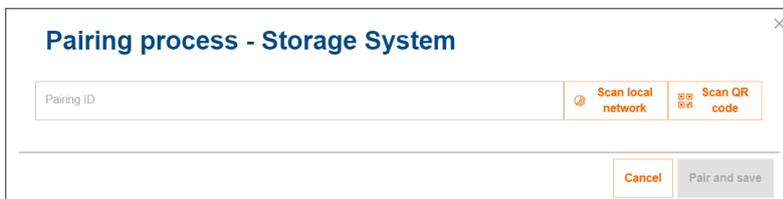


Figure 17: Pairing the energy storage unit

- Click on **Connect**.

The pairing dialogue opens.



- You have three different options for the pairing process:

- Use the **Scan local network** option to start automatic detection over the network and select the energy storage unit from the list of found devices
- Or scan the **QR code** on the energy storage unit's type label
- Or manually enter the **short ID** from the energy storage unit's type label.

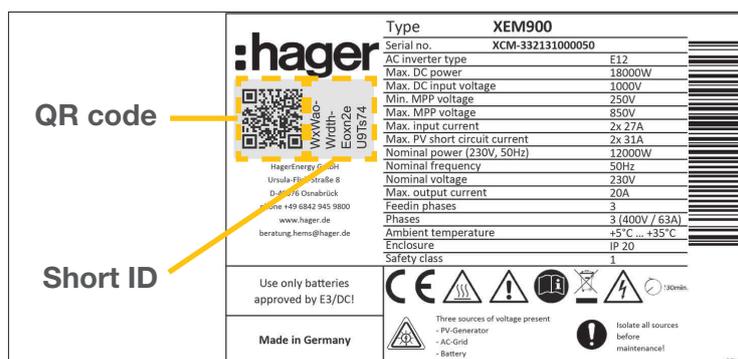


Figure 18: XEM900 type label

- Confirm with **Pair and save**.

After successful pairing, the energy storage system automatically connects to flow. Pairing status and connection status (**Status**) are displayed in the Cloud.

Name	Pairing ID	Status	Pairing	
 EMC 	XXXXXXXXXXXXXXXXXXXX	✓		<input type="checkbox"/>
 Storage System 	XXXXXXXXXXXXXXXXXXXX	✓		<input type="checkbox"/>

Figure 19: Status of the energy storage unit in the Cloud

If a different status is shown ► see the installation instructions for the energy storage unit.

06.04 witty solar charging stations



06.04.01 Compatible charging stations

Charging station	Order no.	Description	Note
	XEV1K22T2S	witty solar 22-kW charging station 1P/3P automatic switching for PV with RFID	22-kW variant for three-phase installations
	XEV1K07T2S	witty solar 7-kW charging station 1P with RFID	7-kW variant for single-phase installations
	XEV1K22T2TFS	witty solar 22-kW charging station 1P/3P automatic switching for PV	► Upgrade with RFID Kit recommended (order no. XEVA265)
	XEV1K..	witty start charging stations	► Upgrade with communication board required (order no. XEVA260)

[As at: 2023-03]

Table 2: Compatible charging stations

06.04.02 Configuring charging stations

flow can be used with up to three charging stations (see **Compatible charging stations**).

- Add a charging station by clicking on the **+** sign under the vehicle symbol in the **Overview**, or select **+Add components**.

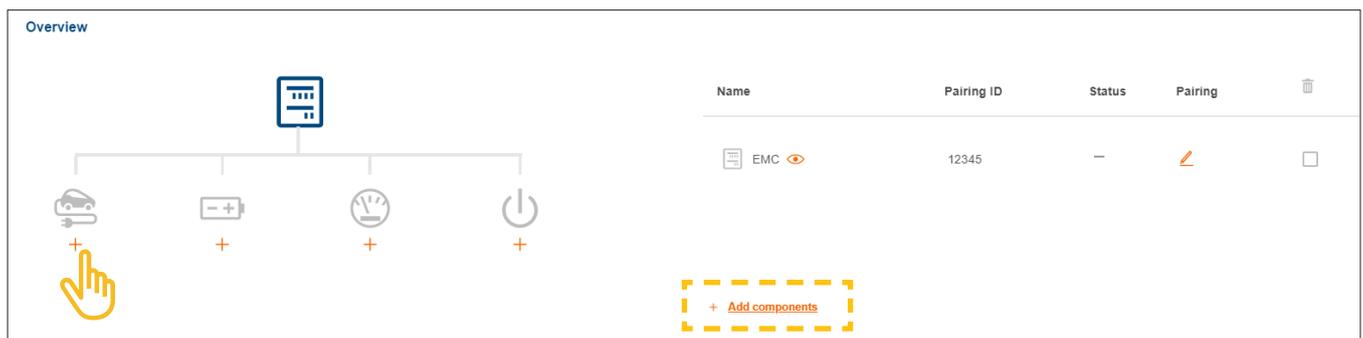


Figure 20: Adding a charging station

- Enter a name for the charging station and confirm the dialogue with **Save Charging Station**.

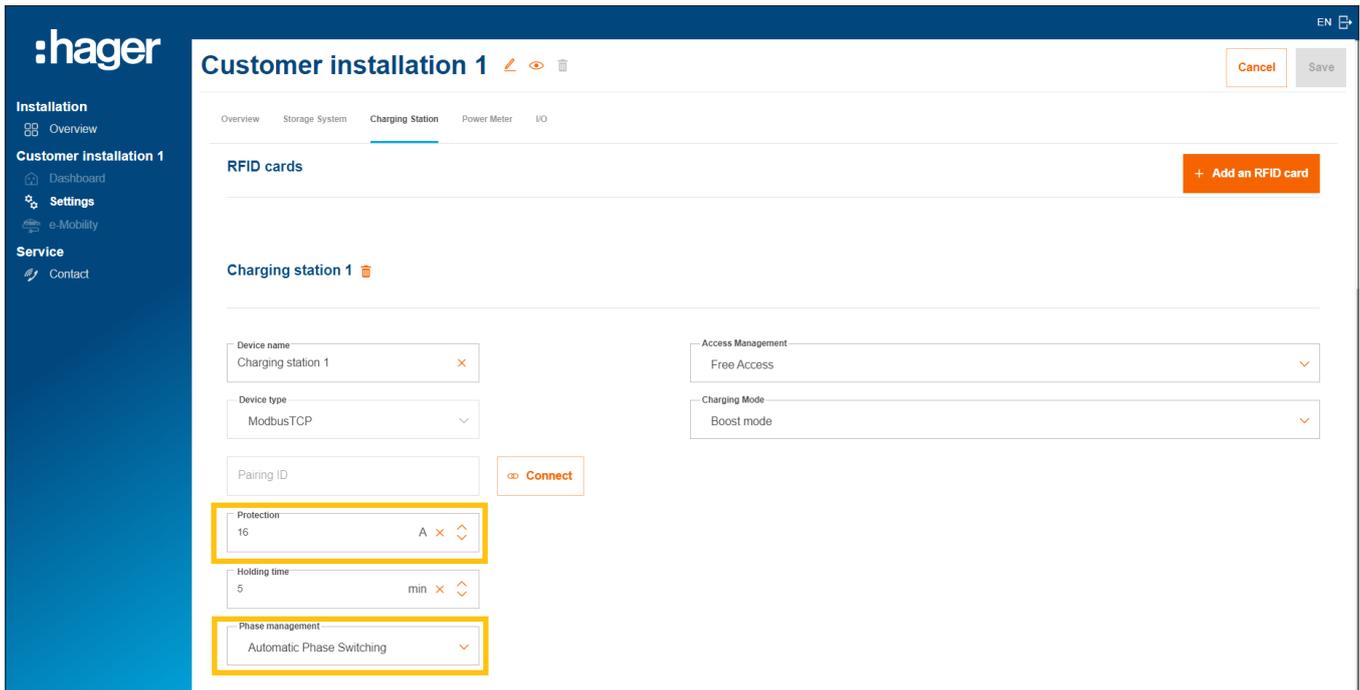


Figure 21: Configuring a charging station (example)

- Enter the desired charging current for this charging station.
- Select the appropriate **Phase management**. Recommendation: **Automatic Phase Switching**.

Managing charging authorisations for charging stations

Depending on customer requirements, charging access can be defined as free access or can be configured to require user authentication.

- Set the desired access type for each charging station. The customer (admin) can later adjust the settings and grant additional charging authorisations at any time.

Access Management	Meaning	Max. number
Key 	Charging access after unlocking with the supplied key	2
Free Access	Free charging without authentication	-
RFID 	Charging access after authentication with RFID card	10

Table 3: Types of access for charging stations

Registering RFID cards

If the **RFID card** access type has been selected for a charging station, register the two supplied RFID cards using the **+Add an RFID card** button.

- Enter a user name and the ID printed on the card for each RFID card.
- You can use the **Valid until** field to limit the duration of the charging authorisation if necessary.

Additional RFID cards are available as accessories from the online catalogue at **hager.com** (order no. XEVA400). You can register a maximum of 10 cards per customer installation.

Setting the charging mode

- Select a **Charging Mode** (see table). This setting can also be changed by the customer (admin) later on.

Charging mode	Meaning	Other specifications
Boost mode	<ul style="list-style-type: none"> – Blackout protection only. – No charging optimisation. – Depending on availability, electric vehicles are charged using PV power or mains power. 	Holding time [min] (recommendation: 5 min)
PV surplus	<ul style="list-style-type: none"> – Electric vehicles are charged exclusively using surplus PV power. <ul style="list-style-type: none"> ▶ See info box "Note on charging mode "PV surplus"". – Optimises self-consumption of PV energy. 	Holding time [min] (recommendation: 5 min)
Safe PV surplus	<ul style="list-style-type: none"> – Electric vehicles are primarily charged with self-generated electricity from the PV system. – Optimises self-consumption of PV energy. – Amounts of charging energy can be freely defined. 	Holding time [min] (recommendation: 5 min), Energy amount [kWh]
Efficient PV surplus	<ul style="list-style-type: none"> – Electric vehicles are primarily charged with self-generated electricity from the PV system. – Optimises the self-consumption of PV energy. – Amounts of charging energy can be freely defined. – Charging times can be freely defined. 	Holding time [min] (recommendation: 5 min), Energy amount [kWh], day of week and target time [hh:mm]

Table 4: Charging strategies

- Further specifications must be made (see table) depending on the charging mode.
- **Save** your settings.



Note on charging mode "PV surplus"

Based on the charging specifications from vehicle manufacturers, electric vehicles require a minimum charging current of 6 A per phase to start the charging operation. In three-phase installations, the **Automatic Phase Switching** only switches to three-phase charging when a PV surplus of at least 4.1 kW is available.



Note on charging prioritisation for installations with energy storage units

Available PV energy can be prioritised either for charging the energy storage unit or for charging electric vehicles. The desired prioritisation can be defined in the **Storage System** menu tab under **Charging prioritisation**. The default setting is **Charging Station** (both options are activated). If the option **Battery** is selected, the energy storage unit is always fully charged before electric vehicles can be charged.



Note on charge planning

Desired charging times and charging levels should not be set additionally in a vehicle app. Flow always prioritises the charge planning settings configured in the Hager Cloud. Please make your customers aware of this.

06.04.03 Connecting charging stations with flow

Requirements:

- The charging station is installed and ready for use. ► See the instruction installations for the charging station.
- The charging station is integrated in the customer's home network (LAN) (same subnet as the EMC).

- Open the **Charging Station** tab.

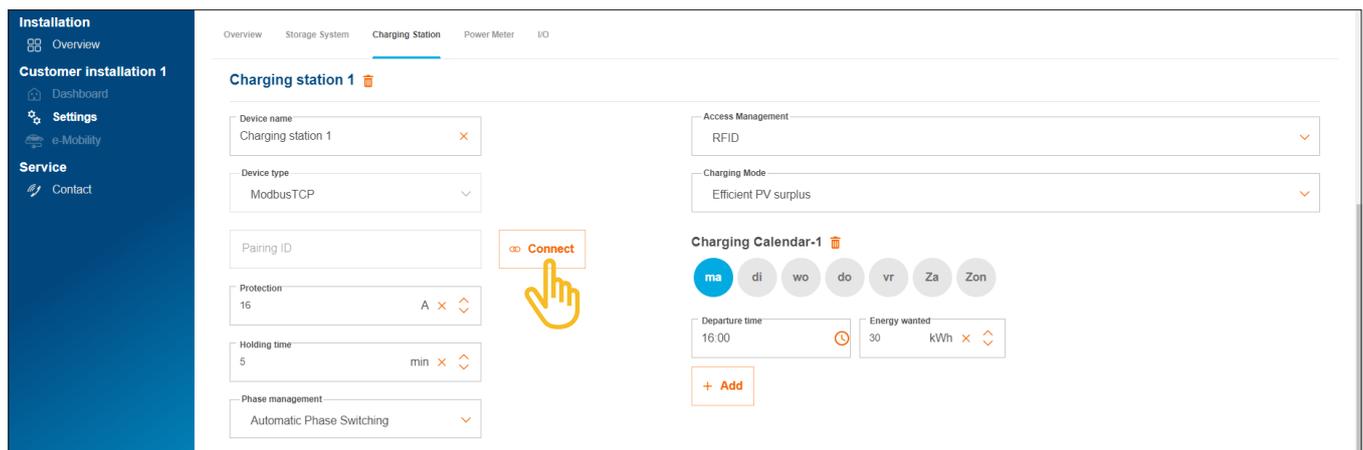


Figure 22: Pairing the charging station

- Click on **Connect**.
- Select **Scan local network** to start automatic detection over the network. The printed **MAC address** (Modbus®TCP) can also be entered manually.
- Confirm with **Pair and save**.

After successful pairing, the charging station automatically connects to flow.

witty solar LED indicators

Status of the charging station



Flashing green light

Charging station is waiting for an electric vehicle to be connected



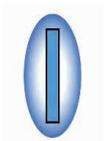
Pulsing green light

Electric vehicle is being charged with maximum power



Flashing blue light

Electric vehicle is waiting for the charging operation to commence or the charging operation is not complete (with solar charging optimisation)



Pulsing blue light

Electric vehicle is being charged in a controlled manner (with solar charging optimisation)

Table 5: LED status indicators of witty solar charging stations after successful pairing

If the LED status indicator does not flash or light up green or blue ► see the installation instructions for the charging station.

Pairing status and connection status (**Status**) are displayed in the Cloud.

Name	Pairing ID	Status	Pairing	
EMC	XXXXXXXXXXXXXXXXXXXX	✓		<input type="checkbox"/>
Storage System	XXXXXXXXXXXXXXXXXXXX	✓		<input type="checkbox"/>
Charging station 1	XXXXXXXXXXXXXXXXXXXX	✓		<input type="checkbox"/>

Figure 23: Status of a charging station in the Cloud

06.05 Integrating energy meters



Notes on total energy measurement:

Total energy measurement is performed by the EMC's integrated measurement device. This device records the current total household consumption and the percentage of power purchased from the grid.

► See **Applications** (figures 1 and 2).



In some circumstances, **customer installations with energy storage units** may require total energy measurements to be performed by the energy storage unit due to the design of the system. You can change this setting accordingly using the parameter **Wiring Topology**.



Notes on energy measurement of the energy storage system:

In **customer installations with an energy storage unit**, the EMC receives continuous measurement data from the energy storage system via the LAN (Modbus® TCP). This data includes the current battery state of charge, the current charging currents at the input and the power consumption of all consumers connected to the emergency circuit of the energy storage unit.

► See **Application with energy storage unit** (figure 2).



Notes on PV power measurement:

In **customer installations with an energy storage unit**, the energy storage system records the current PV energy yield of **PV systems connected directly to the energy storage unit** and the amount of energy fed back to the grid. The EMC receives the measurement data from the energy storage system via the LAN (Modbus® TCP). ► See **Application with energy storage unit** (figure 2).

In **customer installations with an external PV inverter**, an additional energy meter is required. The EMC receives the measurement data from the energy meter via Modbus® RTU.

► See **Adding an energy meter**.



Measuring further individual power consumers:

Adding additional energy meters allows the energy demands of individual (heavy) consumers in the house to be recorded and displayed in a more differentiated manner. Every additional energy meter improves transparency for the customer and lets them monitor their costs more specifically. The EMC receives the measurement data from the energy meters via Modbus® RTU.

Example – Heat pump:

If a heat pump is integrated into the flow system, we recommend recording the power consumption of the heat pump separately with a dedicated energy meter.

06.05.01 Compatible energy meters

All of the Modbus® energy meters from our **ECRxx** and **ECAxx** series can be used as energy meters with flow.

► You can find compatible meters for any customer installation in our online catalogue at **hager.com**. Our range includes meters with a wide range of properties, such as different measuring methods (direct or indirect with current transformers), rated currents and number of phases.

06.05.02 Adding an energy meter

- Add an energy meter by clicking on the **+** sign under the energy meter symbol in the **Overview** or select **+Add components**.

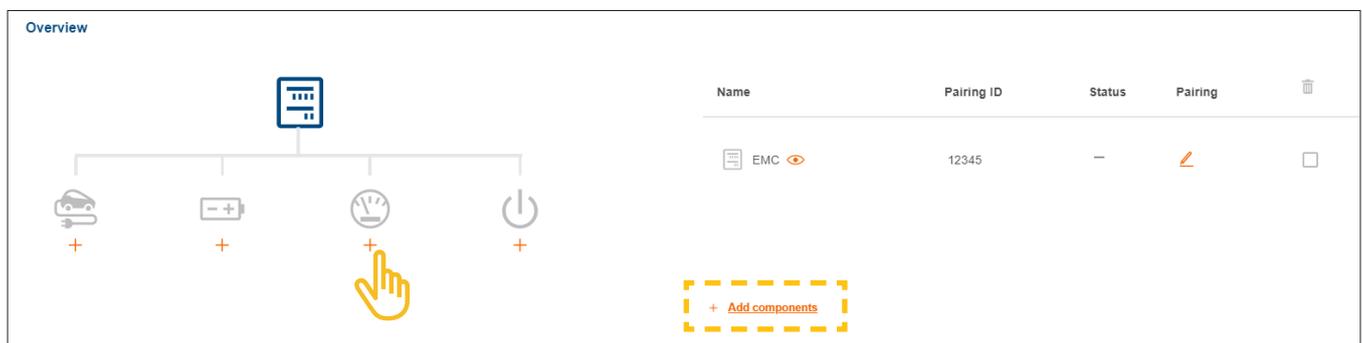


Figure 24: Adding an energy meter

- Enter a unique **device name**.
- Confirm the dialogue with **Save Sub Meter**.

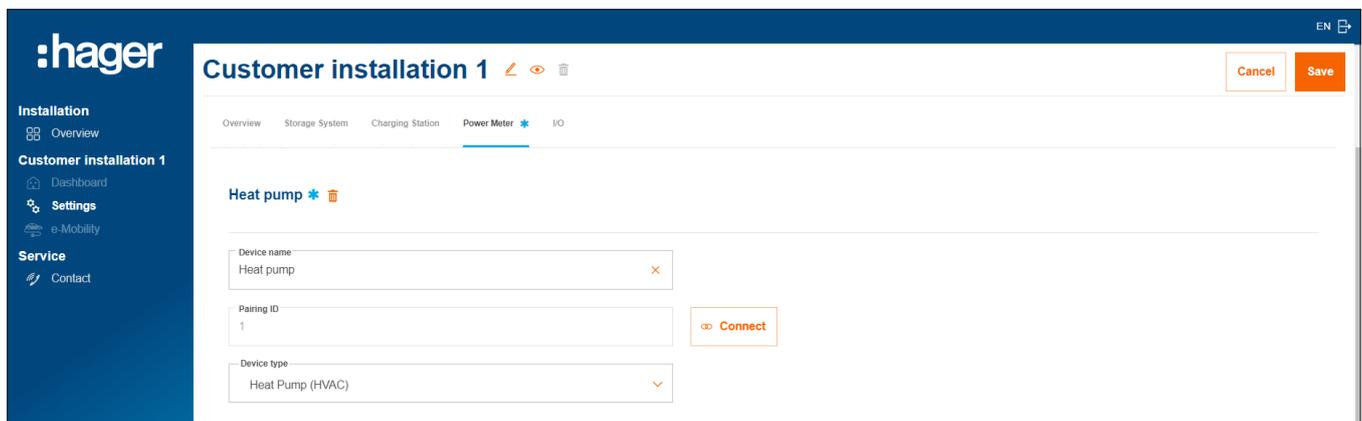


Figure 25: Configuring an energy meter (example)

- Select the appropriate device type, e.g. "Heat Pump (HVAC)" or "PV inverter".
- For PV energy meters, specify the maximum power (peak) of the external PV system.
- **Save** your settings.

06.05.03 Connecting energy meters with flow

Requirements:

- ☑ An ECRxx or ECAXx energy meter is installed and ready for operation.
 - ▶ See the installation instructions for the energy meter.

i

Important information about the counting direction of PV energy meters

The external PV inverter must be connected to the output terminals of the PV energy meter. The direction of the arrow must point from the distributor to the inverter, not vice versa.

- ☑ The energy meter is connected to the EMC via the Modbus® interface.
- ☑ The energy meter is addressed and configured as an energy meter for flow (see info box).

i

Notes on addressing and configuring energy meters

All compatible Hager **ECRxx/ECAXx** energy meters are preset at the factory for use with flow.

Parameter	Setting
Addr (Modbus® address)	[1 ... 239]
bAUd RAte (Data rate)	19200
PARity (Parity)	EVEN
StOP bitS (Stop bit)	1
←→ (Measuring direction)	bidirEct. (bidirectional)

Only the **Modbus® addresses** need to be programmed on the devices. Recommendation:

- Energy meter for heat pump: Modbus® address "1"
- Energy meter for external PV system: Modbus® address "10"

- Open the **Power Meter** tab.

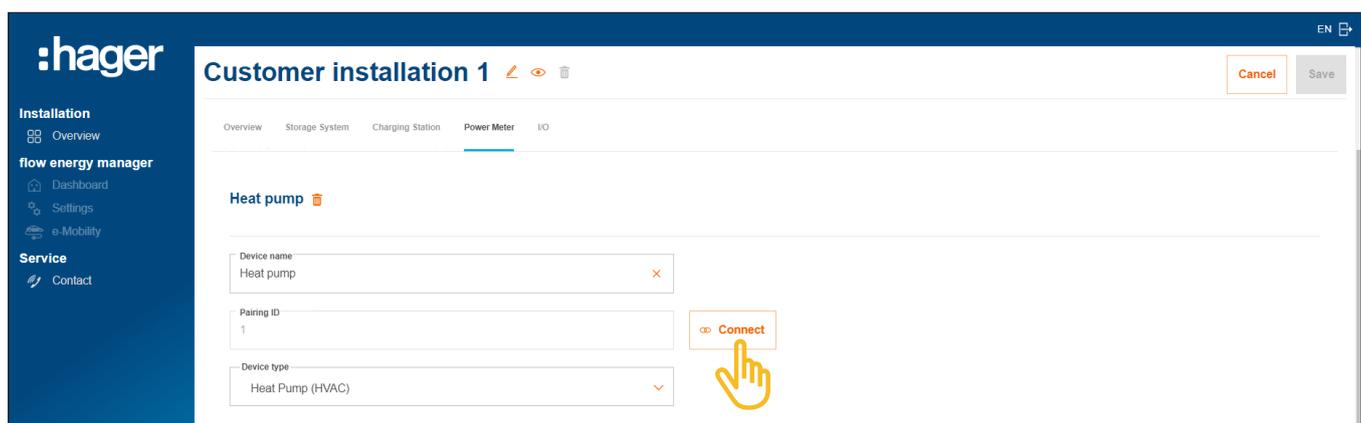


Figure 26: Connecting an energy meter (example)

- Click on **Connect**.
- Enter the Modbus® address of the energy meter in the **Pairing ID** field. The address entered must match the address programmed on the meter.
- Confirm with **Pair and save**.
A connection is established automatically.

06.06 Controlling consumers via the I/O interface



Controlling a heat pump:

In **customer installations without energy storage units**, a heat pump can be actively controlled using an **I/O interface (accessories, order no.: HTC320H)**. The interface must be created and configured in the configuration as an I/O device. Communication with the EMC takes place via Modbus® RTU.

In **customer installations with energy storage units**, a heat pump can be controlled via the **SG-Ready interface** that is already integrated in the energy storage system. ► See the installation instructions for the energy storage unit. In this case, an I/O device of the type "Heat Pump (HVAC)" is automatically created in flow configuration.

Connecting a heat pump to flow provides several advantages in terms of how the heat pump operates in the system:

- On-demand timing control
- Inrush current surge protection prevents the system from overloading
- Optimises self-consumption of PV energy
- Helps to achieve desired charging targets of the energy storage unit and charging station(s)

06.06.01 Adding an I/O interface



Note

This step is not required for customer installations **with a heat pump that is directly connected to the SG-Ready interface of the energy storage unit**.

- Add an I/O interface by clicking the **+** sign under the I/O symbol in the **Overview**, or select **+Add components**.

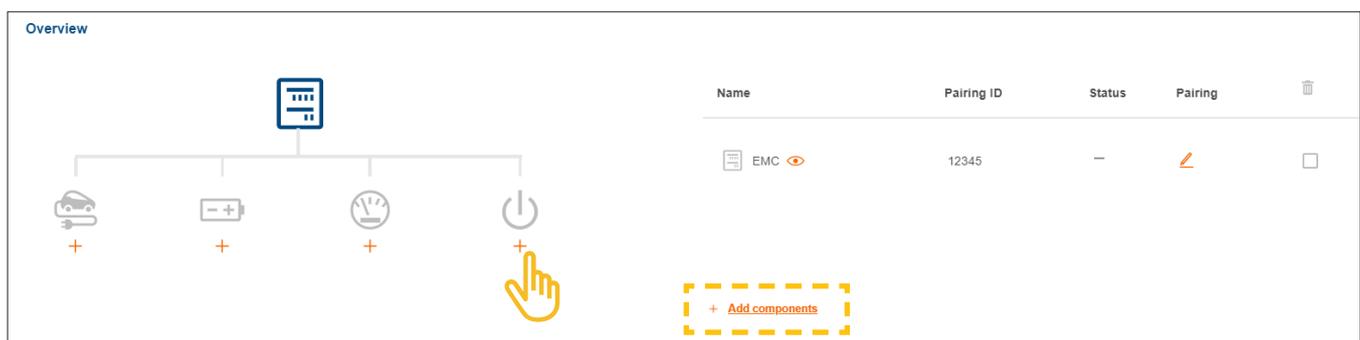


Figure 27: Adding an I/O interface

- Give the interface a unique **device name**.
- Confirm the dialogue with **Save I/O interface**.

06.06.02 Configuring an I/O interface

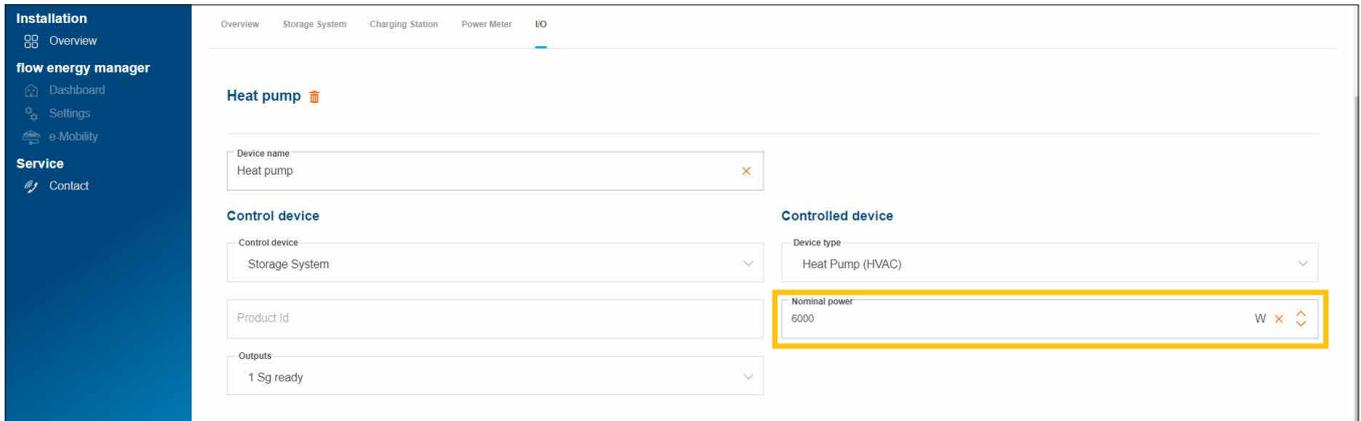


Figure 28: Configuring an I/O interface (example)

The device type "Heat Pump (HVAC)" is selected as default for heat pumps.

- Enter the rated output of the heat pump.
- **Save** your settings.

06.06.03 Connecting an I/O interface to flow

Note
This step is not required for customer installations **with a heat pump that is directly connected to the SG-Ready interface of the energy storage unit.**

Requirements:

- ☑ I/O interface HTC320H is installed and ready for operation. ▶ See the installation instructions for the I/O interface.
- ☑ I/O interface HTC320H is connected to the EMC via the Modbus® interface.
- ☑ I/O interface HTC320H is addressed and configured for flow.

- Open the **I/O** tab.

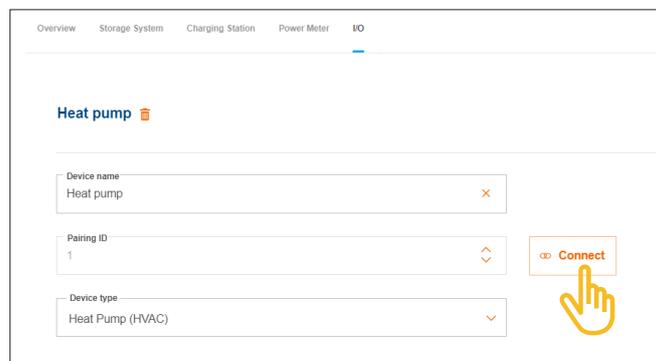


Figure 29: Connecting the I/O interface (example)

- Click on **Connect**.

- Enter the Modbus® address of the I/O interface in the field **Pairing ID**. The address entered must match the address programmed on the HTC320H.
- Confirm with **Pair and save**.
 The connection is established automatically.

06.07 Status indicators in the Cloud

Check the status of all devices at the end of the commissioning process. The number and type of devices vary depending on the customer's installation.

Name	Pairing ID	Status	Pairing	
EMC	XXXXXXXXXXXXXXXXXXXX	✓		<input type="checkbox"/>
Storage System	XXXXXXXXXXXXXXXXXXXX	✓		<input type="checkbox"/>
Heat pump	1	✓		<input type="checkbox"/>
External PV	10	✓		<input type="checkbox"/>
Heat pump	XXXXXXXXXXXXXXXXXXXX	✓		<input type="checkbox"/>
Charging station 1	XXXXXXXXXXXXXXXXXXXX	✓		<input type="checkbox"/>

Figure 30: Status indicators after commissioning (example)

07 Handover & access authorisations



After successfully commissioning the system, you transfer the flow installation and the associated admin rights to the customer. You will continue to have service access to the customer installation through your myHager business account (see **Managing customer's flow installations**). The customer creates a private myHager account to access flow.

- Open the **Overview** tab in configuration.
- Scroll to the section **Access rights**.

Access rights							
E-mail	Name	Valid until	Admin	Dashboard	Configuration	Invitation accepted	
installer@email.com			<input checked="" type="radio"/>	↙	↙	✓	<input type="checkbox"/>
customer@email.com			<input checked="" type="radio"/>	↙	↙	✓	<input type="checkbox"/>
+ Invite user							

Figure 31: Access rights



Write access



Read access

- Click on **+Invite user**.

Invite user

You can invite other installer or the end user. He will receive an email asking to create a MyAccount if needed, then to connect to flow to accept the invitation. The admin rights grant the ability to invite new user. Only one admin can be present within the installation.

Would you like to transfer admin rights to this user?

No
 Yes

Figure 32: Inviting a user

- Enter the valid **email** address of the customer who will manage the flow installation as an administrator in the future. This customer manages all access permissions for the system.
- Confirm the prompt by clicking **Yes**.
- **Send invitation**.

The customer automatically receives an email from us.

- Ask your customer to open this email and follow the instructions in it. If your customer does not already have a myHager account (Personal), this email will lead to the account creation page.

An admin is defined for every flow installation. After the customer logs in for the first time, the admin rights are automatically transferred to them. Your customer can invite additional users and grant them access permissions at any time.



Exchanging information with the customer

We recommend a brief informal exchange with the customer. This should include:

- Briefly demonstrating and explaining the **flow visualisation** (dashboard, diagrams, settings etc.) to the customer.
- **Offering flow system expansions and services** provided by your specialist electrical company.
- Mention the necessary **network security and password protection** measures (see **Safety information**).
- **Share a link to our website** for general information about flow:
 - ▶ **hager.com**

08 Visualisation for the customer

08.01 Dashboard

The dashboard is your customer's home page and provides an overview of status information for the customer installation. ► <https://flow.hager.com>

08.01.01 flow animation

The flow animation shows the current energy flows in the house.



Figure 33: flow animation on the dashboard

08.01.02 Widgets

The widgets are located on the dashboard under the flow animation. Widgets inform your customers about the current power consumption in the house, PV energy production, current CO₂ savings, electricity costs (purchase) and feed-in tariffs (sale).



Figure 34: Widgets on the dashboard

08.02 Energy diagrams



Your customer's dashboard displays detailed statistics in addition to the widgets. By selecting a time interval, your customers can review previous performance trends and view forecasts for a later period.

The statistics allow your customer to see

- Powers and forecast
- Distribution of my PV energy production
- Sources of my consumption
- Distribution of my consumption

08.02.01 Examples of statistics

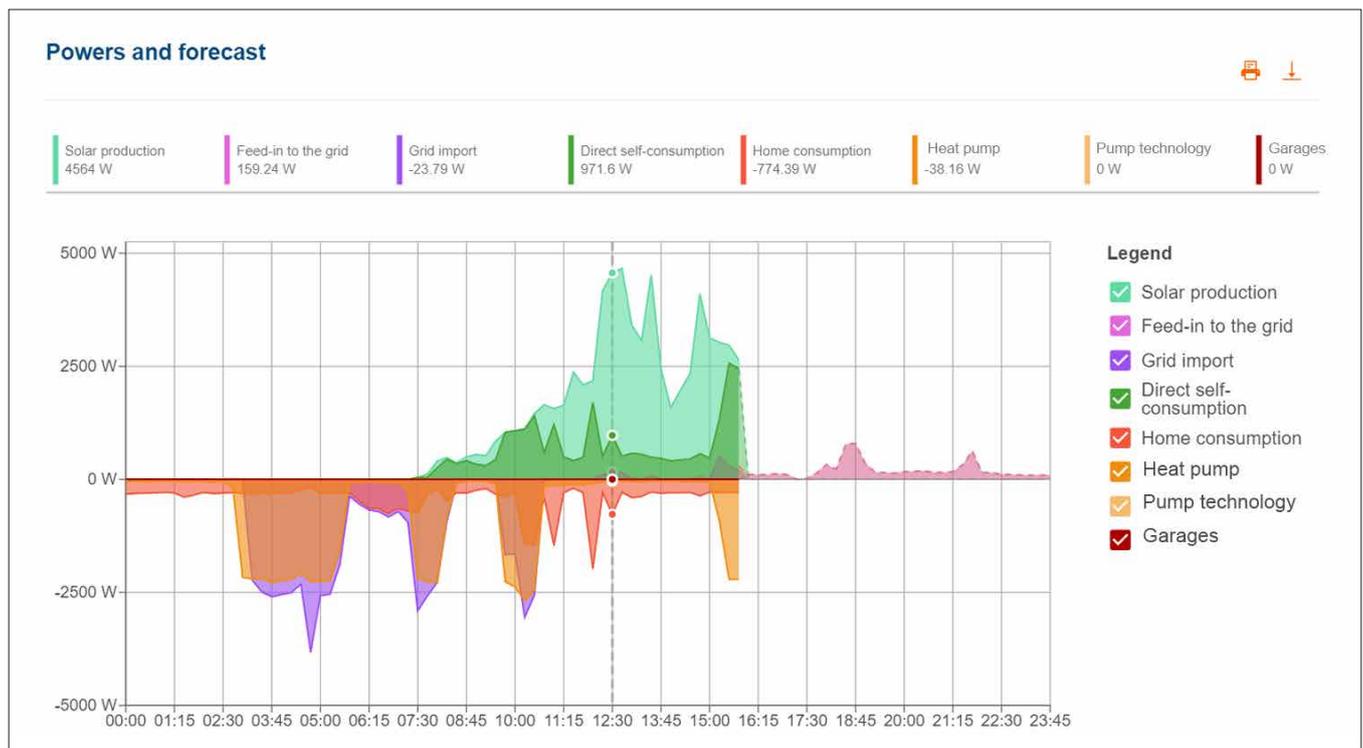


Figure 35: Energy diagram – Powers and forecast

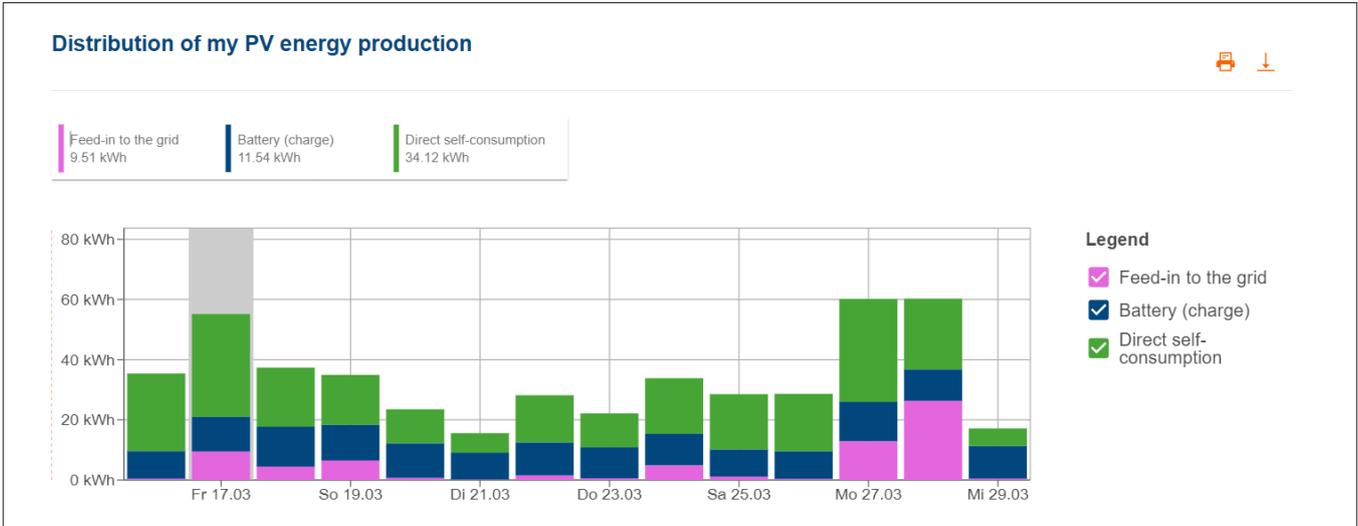


Figure 36: Energy diagram – Distribution of my PV energy production

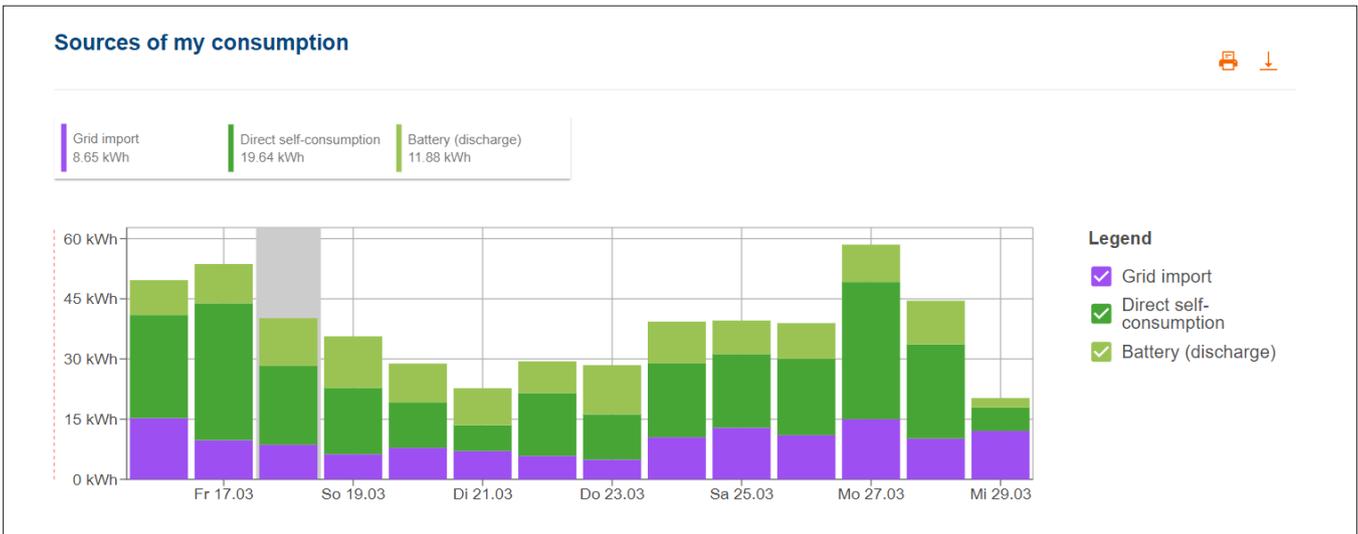


Figure 37: Energy diagram – Sources of my consumption

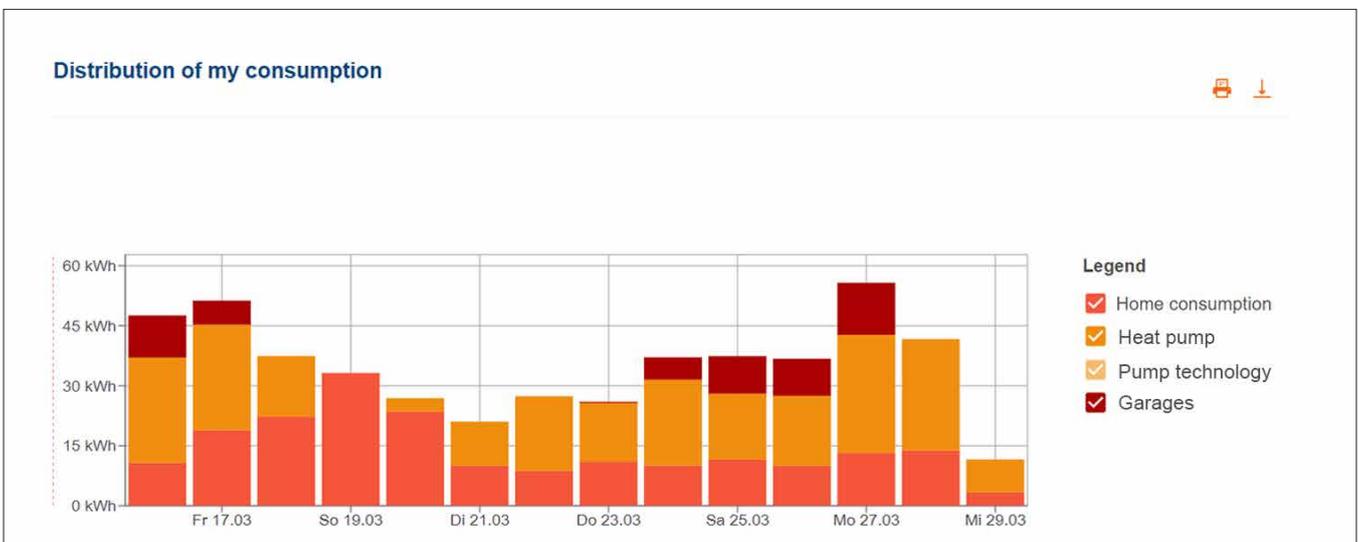


Figure 38: Energy diagram – Distribution of my consumption

08.03 e-Mobility - All charging operations at a glance

The **e-Mobility** menu contains statistics on all vehicle charging operations conducted with flow.

08.03.01 Charging statistics & charging history

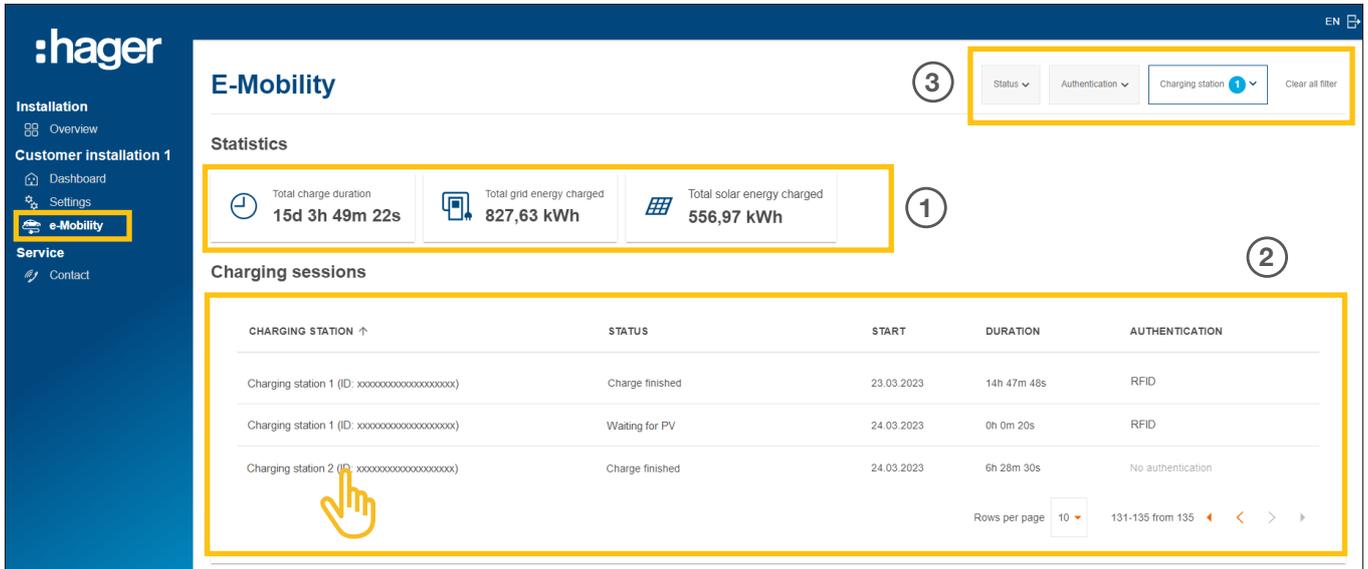


Figure 39: E-mobility – Statistics and charging history (example)

- ① Overall statistics on charge duration, total charged energy and the proportion of PV energy used
- ② List of all charging operations ► For more details, simply click on the list entry in question.
- ③ Filter by charging station, status etc.

08.03.02 Charging diagram

The charging diagram provides a visual overview of all charging events. For example, customers can identify charging peaks and see what percentage of self-generated PV energy was used. The time period to be displayed can be flexibly set using buttons.

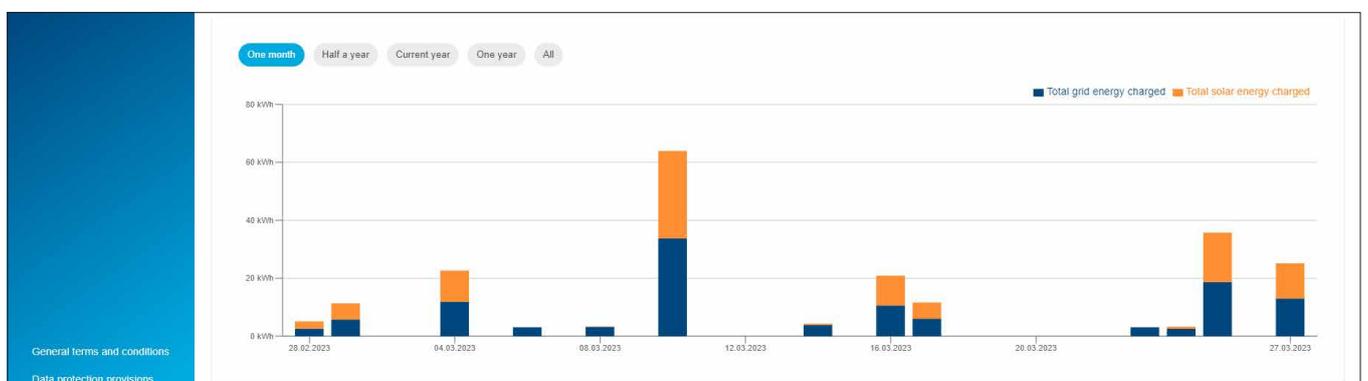


Figure 40: E-mobility – Charging diagram (example)



HagerEnergy GmbH

Ursula-Flick-Straße 8
49076 Osnabrück
Germany

T +49 541 760 268-0

F +49 541 760 268-199

info@hager.com

www.hager.com