in.hub

HUB-CX400

Operating Instructions

Valid SIINEOS version: from 2.10.0
Document version 1.0 | Publication date:
23. April 2026

Table of Contents

Legal information

Safety information

This documentation contains information that you must observe for your personal safety and to prevent material damage. Read the safety information carefully and always keep this documentation within easy reach.

The safety information is presented in descending order of hazard level as follows:

DANGER

Indicates an immediate hazard to humans. Failure to comply will lead to irreversible injuries or death.

WARNING

Indicates an identifiable hazard to humans. Failure to comply may lead to irreversible injuries or death.

CAUTION

Indicates an identifiable hazard to humans or potential material damage. Failure to comply may lead to reversible injuries or material damage.

ATTENTION

This gives you information that may lead to material damage if not complied with.

NOTE

A note gives you useful information on specific actions and issues.

TIP

A tip gives you tips, tricks or recommendations from in.hub that have proven to be helpful in handling the products.

Qualified personnel

The product associated with this documentation may only be handled by personnel qualified for the respective task. The device may only be installed, commissioned and operated in compliance with the associated documentation and the safety information contained therein.

Based on their training and experience, qualified personnel are able to recognize risks and avoid potential hazards when handling these products.

Knowledge of PCs, operating systems and web applications is a prerequisite. General knowledge in the field of automation technology is recommended.

Intended use

The HUB-CX400 is intended exclusively for use in the industrial sector and is used for monitoring machines, systems and processes. Process data can be recorded, processed, controlled and analysed using the connection options provided. It is also designed to act as a central network and management layer for all gateways and modules within the in.hub architecture.

in.hub products may only be used for the applications specified in the corresponding technical documentation.

If third-party products and components are used, they must be recommended or approved by in.hub.

Proper storage, set-up, assembly, installation, commissioning, operation and maintenance are essential for the correct and safe operation of the products.

The permissible ambient conditions must be complied with. Instructions in the associated documentation must be followed.

Brands

All designations marked with the “®” symbol are registered trademarks. The other designations in this document may be trademarks whose use by third parties for their own purposes may infringe the rights of the owner.

Disclaimer

in.hub accepts no liability for product malfunctions resulting from improper handling, mechanical damage, incorrect application and improper use.

The contents of this document have been checked for conformity with the product described. However, deviations cannot be ruled out, so that we cannot guarantee complete conformity. The information in this publication is regularly reviewed. Necessary corrections are included in subsequent editions.

1. General information

This document contains all the information you need to commission and use the device/software.

The document is intended for service technicians, system administrators and installers who connect the product with other units, configure it and commission it.

1.1. Scope of delivery

1 x HUB-CX400

1 x Operating Instructions as a PDF

1.2. Recommended accessories

- Wi-Fi dongle: TP-Link USB Wi-Fi Adapter 5 GHz / 2.4°GHz
  Item number: A1000243
- 4G LTE industrial USB modem (EU)
  Item number: A5000017
- USB flash drive HUB-RT100 with real-time clock
  Item number: A5000021

1.3. Other applicable documents

In addition to this document, please observe the following documents. You can find these in the in.hub download portal at https://download.inhub.de:

- User Manual for the IoT (Internet of Things) operating system SIINEOS
- Operating Instructions for other devices that you wish to plug in or connect

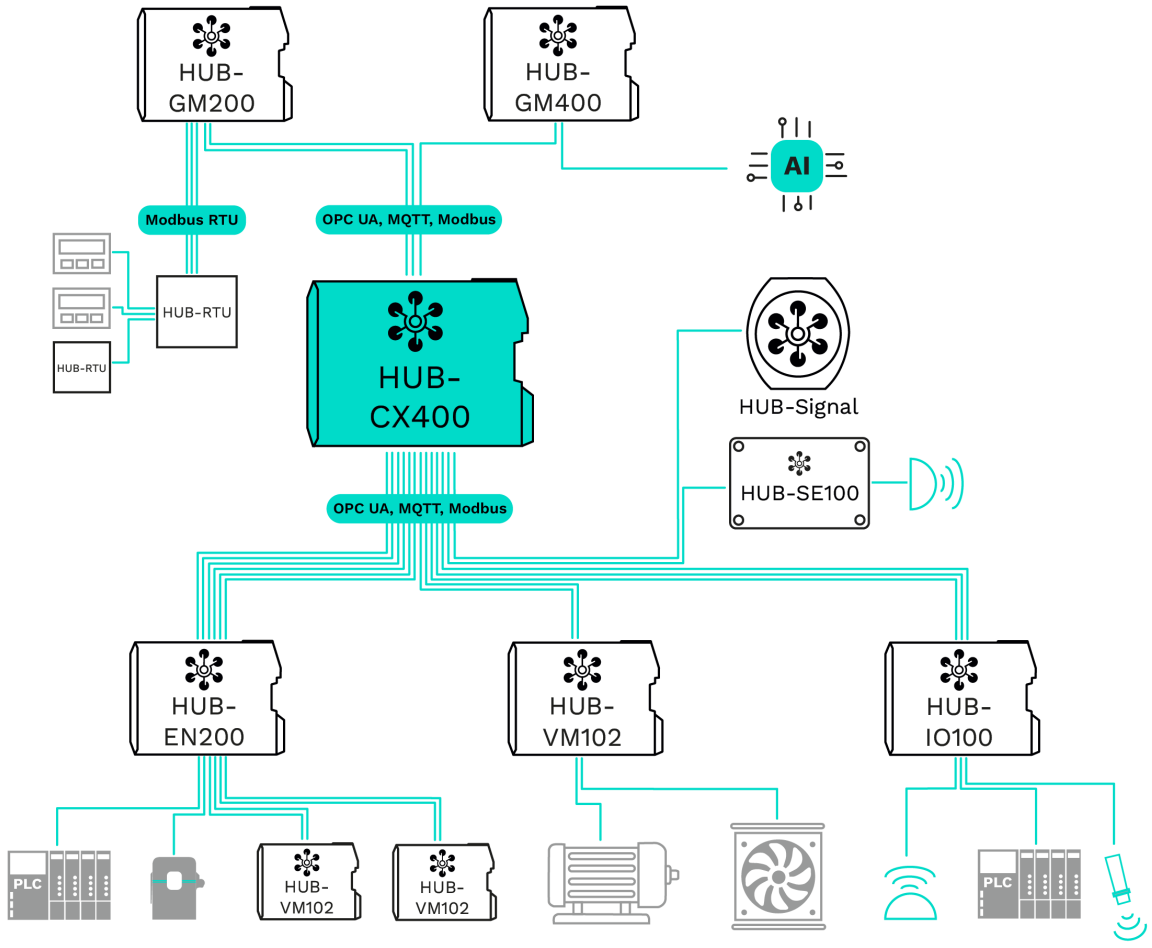
1.4. Disposal

Please observe the national regulations.

Do not dispose of the device with normal household waste, but appropriately for its nature and country-specific regulations, e.g. as waste electrical and electronic equipment (WEEE) or by commissioning a certified disposal company.

2. General product information

The HUB-CX400 forms the central network and management layer above all other gateways and modules in the in.hub product family. Whilst devices such as the HUB-EN200 or the HUB-VM102 capture signals and generate data, the HUB-CX400 ensures that these devices are managed in a structured manner, operated in a coordinated way, and that their data is consolidated.



HUB-CX400 at the heart of the in.hub product family

The HUB-CX400 can therefore form the core of an IoT infrastructure and handle device management for all connected systems and devices. Updates or installations can be rolled out and versioning can be managed centrally.

The higher computing and memory capacity of the HUB-CX400 compared to the other modules permits the processing of numerous parallel tasks as well as AI applications.

To ensure the device is up and running quickly, the Device Management app is pre-installed alongside the SIINEOS standard operating system, allowing for centralised management of the hardware, software and apps.

2.1. Intended use

The HUB-CX400 is ideal for:

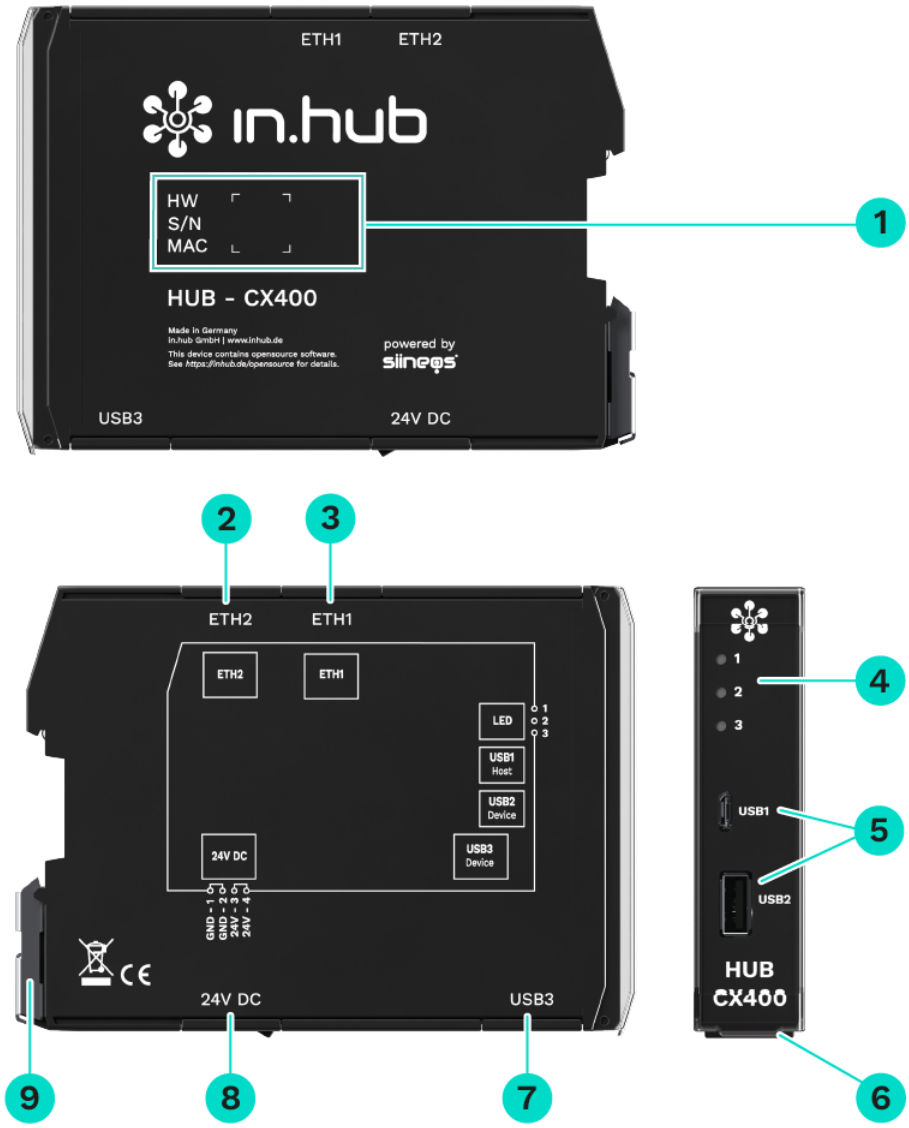
- Centralised device management
- Process monitoring using machine learning / AI algorithms
- Use as a process-control computer and traceability server
- Use as a remote access point for remote maintenance via VPN

2.2. SIINEOS system software

The HUB-CX400 uses the Linux-based SIINEOS operating system to run InCore & Docker apps. SIINEOS is accessible via a management console (SMAC) and can be configured there. All network parameters are also set up here to enable communication with other network components.

In addition to SIINEOS, the Device Management app is installed on the HUB-CX400. It serves as the central hub for all other gateways and modules in the in.hub product family. This allows you to monitor multiple devices in different locations, apply software updates and install licences all at the same time.

2.3. Hardware – design and interfaces



Views of the HUB-CX400 including interfaces

1	Device-specific information is stored in a barcode: HW: Hardware revision S/N: in.hub internal serial number MAC: Hardware addresses of the Ethernet interfaces
2	Ethernet 2
3	Ethernet 1
4	LEDs displaying the operating status
5	USB1 (host) and USB2 (device)
6	Protective flap

	Can be opened upwards.
7	USB3 (Host)
8	24 V DC power supply
9	Clamping device for mounting on the DIN rail

3. Assembly

The HUB-CX400 must be installed on a DIN EN 60715 (35 mm) mounting rail. Observe the applicable safety and accident prevention regulations for specific areas of application, such as the Machinery Directive.

CAUTION

Electric shock due to conductive dirt can cause personal injury!

- If possible, work with the power supply switched off.
- Avoid conductive contamination.
- Only install devices in a control cabinet with the appropriate protection class.

RECOMMENDATION

Maintain a minimum distance of 25 mm between the cable duct and the edge of the housing. This applies to both the top and bottom edges. This makes installation easier.

3.1. Mounting the device on the DIN rail

1. Make sure that the system's power supply is disconnected.
2. Turn the module so that the mounting foot (metal clamping device) is pointing downwards.
3. Hold the device at an angle to the DIN rail.
   The recess on the back of the module is located above the mounting foot.
4. Click the module onto the DIN rail until you hear the mounting foot click into place.
5. After installation, check that the device sits firm and straight on the DIN rail.

3.2. Dismantling the device

1. Make sure that the system's power supply is disconnected.
2. Use a screwdriver to pull the mounting foot (metal clamping device) downwards and remove the module from the DIN rail.

Removing the HUB-CX400 from the DIN rail

4. Installation

Read these instructions carefully and observe the safety instructions and warnings provided.

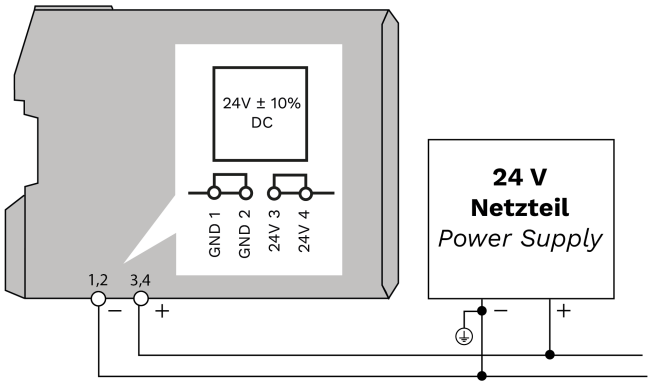
4.1. Connecting a power-supply unit

CAUTION

An incorrect power supply can cause irreparable material damage.

- Ensure that the power supply complies with the nominal voltage (of 24 V ± 10%).

1. To make installation easier, you can remove the plug with the terminal contacts from the **24 V DC** interface.
2. Clamp the power connection cable into the plug. Observe the following schematic diagram when doing this:



Schematic diagram of the power supply

5. First steps with SIINEOS

This chapter contains the first steps for your work with SIINEOS. Details on the configuration and settings of your device in SIINEOS are described in separate user documentation, which is published with each new software version of SIINEOS. This allows you to benefit from new features and improvements in the SIINEOS software.

NOTE

SIINEOS updates and the user documentation can be downloaded from the download portal at https://download.inhub.de/siineos/.

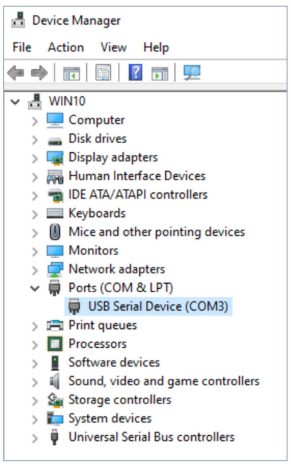
5.1. Connecting HUB-CX400 with the PC

1. Use a Micro-USB cable to connect your PC with the HUB-CX400.
   In most cases, the USB connection provides enough power to operate the HUB-CX400 without having to connect an extra power supply.

   NOTE

   LED 1 indicates the status of the device. If the connection is working correctly, **LED 1** lights up and flashes after a while. SIINEOS runs on the module.

2. When you connect the HUB-CX400 for the first time, additional drivers are installed. Check Windows Device Manager to see if a new device has been created:



Windows Device Manager (example)

NOTE

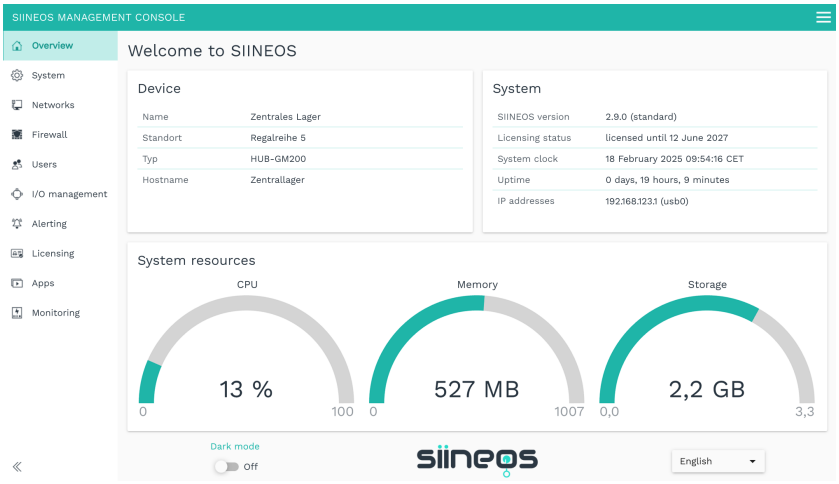
If the LED display does not light up and no drivers have been installed and no new device created, there is usually an insufficient power supply to the module. In this case, use an external power supply at the 24 V input.

5.2. Logging on to SIINEOS

We recommend that you use the latest versions of the **Firefox**, **Edge** or **Chrome** browsers for SIINEOS. Compatibility problems may occur with other or older browsers.

5.2.1. When logging on to SIINEOS for the first time

1. Connect the gateway or module to your PC using a micro USB cable (USB port on the front of the device).
2. Enter the following address in your browser:
   http://192.168.123.1
3. Log on with the initial user data (**hubadmin**/**hubadmin**).
   The SIINEOS Management Console opens.



SIINEOS start page (example)

On the start page, you will now see information about your system, such as the current SIINEOS version, the device name, location, type, system resources, etc.

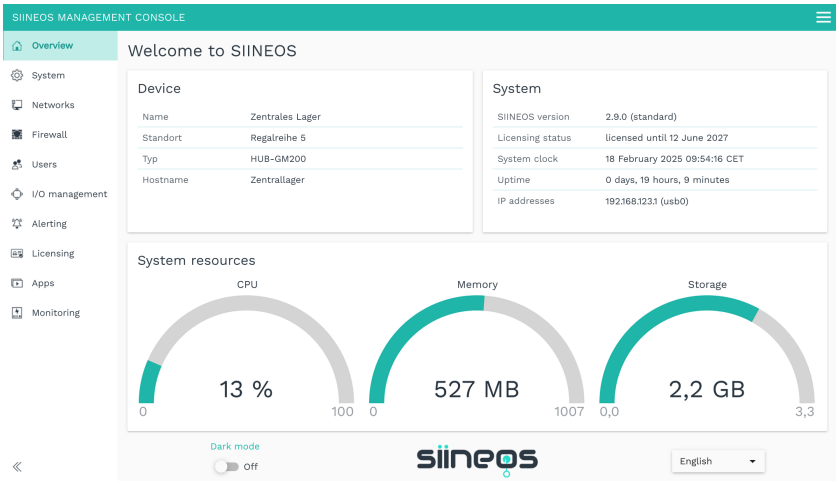
4. Select the **Users** page and change the password for the user **hubadmin**.

5.2.2. If you have already set up SIINEOS

1. In your browser, enter the individual IP network address that you have configured.
2. Log on with your user data and click on **Log in**.
   The SIINEOS Management Console opens.

5.3. Checking the SIINEOS version

1. Go to the SIINEOS start page by selecting the **Overview** page on the left.



“Overview” start page (example)

2. Check the **SIINEOS version** field to see which version is installed on your gateway.
3. Go to the download portal at https://download.inhub.de/siineos/ and check whether a new version of SIINEOS is available.

5.4. Installing SIINEOS updates

NOTE

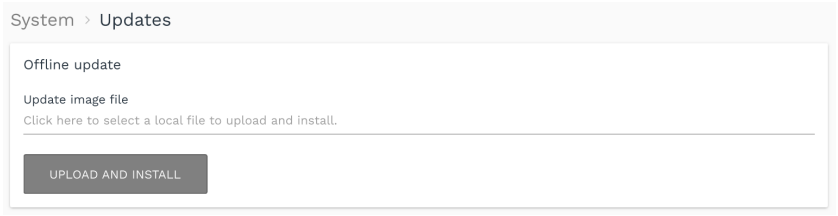
You can only upload updates on the **System** page if you have a valid SIINEOS licence.

If the licence has expired, you will be informed that you cannot import any updates.

1. Go to the download portal at https://download.inhub.de/siineos/ and select the required SIINEOS package.

   Two variants are available:

   - The complete software package in 64-bit architecture for the HUB-GM400 and the HUB-CX400
   - The complete software package in 32-bit architecture for modules, such as the HUB-GM200 or the HUB-EN200
   - SIINEOS Light without Docker containers with a smaller file size for the HUB-IO100
2. When the download is complete, go to the **System** page in SIINEOS and select **Updates**.



System > Updates

3. Click in the **Update image file** input field and select the software package provided by in.hub in `*.raucb` format from your local file-storage location.
4. Click on **Upload and install**.
   The installation will proceed automatically and takes about 1 minute. After a successful installation, you will be asked whether you want to restart the gateway.
5. Click on **Yes**.
6. After restarting, check that the new version of SIINEOS is displayed on the **Overview** page.
7. If the version has not been updated, proceed as follows:
   a. First delete your browser cache and refresh the page in your browser.
   b. if that doesn't work: Switch off the power to the gateway and switch it on again after a few seconds.
   c. Start SIINEOS and check the version number.

5.5. Managing licences

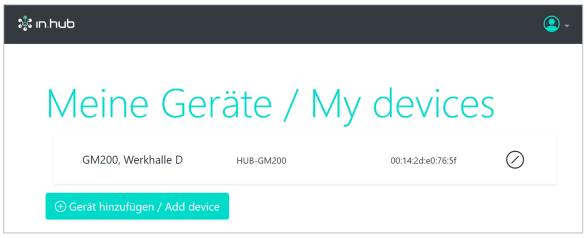
With every new SIINEOS-enabled device you purchase, you will automatically receive a SIINEOS licence for 3 years. You can update SIINEOS as often as you like during the licence period and install the latest version on the device.

Once the licence period has expired, you can either continue working with the currently installed version of SIINEOS or you can purchase another licence from in.hub to benefit from the further development and product improvement of SIINEOS.

If you need an app licence or want to extend one, please refer to the relevant User Manual.

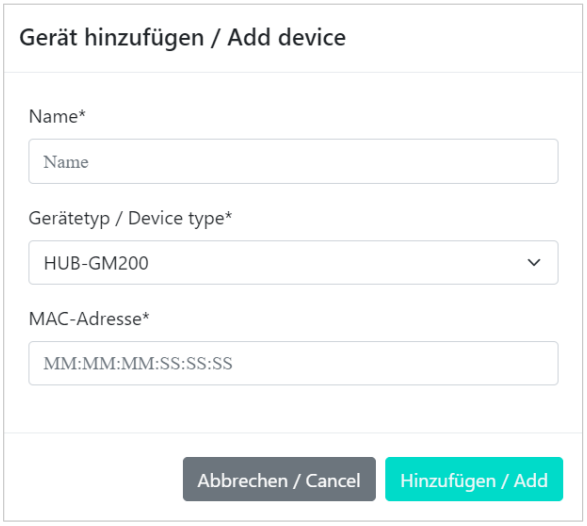
5.5.1. Requesting a voucher and activating a software licence

1. Please contact service@inhub.de and let us know which licence you require.
   You can activate the software licence with the voucher you receive from us.
2. Navigate to the website https://apps.inhub.de/ and register or log on if you are already registered.



My devices (example)

3. If you want to extend a software licence, click on the device on which the software licence is to be renewed under **My devices**;
   – or –
   if you want to activate the software licence for a new device, click on **Add device**.



Add device

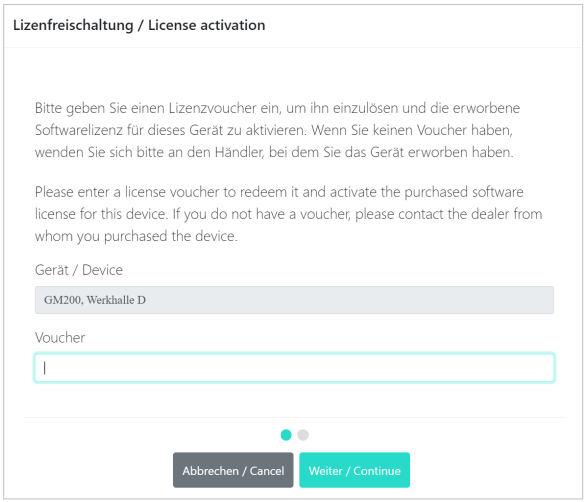
4. Enter the **Name** of the device, select the **Device Type** and enter the MAC address of the device.

   The MAC address can be found via **SIINEOS > Networks > Ethernet 1**.

   NOTE: Only the MAC address of Ethernet 1 is recognized and accepted.

5. Click on **Add**.

   The **License activation** page opens:

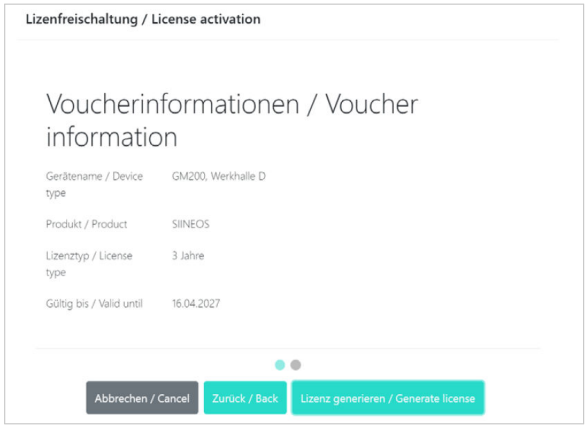


License activation

6. Copy the name of the voucher you received from in.hub into the **Voucher** field.

7. Click on **Next**.

   The information stored in the voucher, such as the term, product and validity, etc., will be displayed.

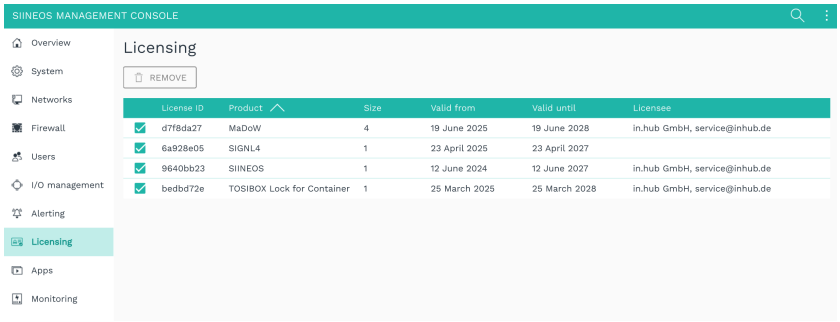


Voucher information (example: Activation of a SIINEOS licence valid for 3 years)

8. Check the details, especially whether the requested licence term matches the term specified here.
9. If the details are correct, click on **Generate license**.
   The licence file is downloaded automatically.

5.5.2. Adding a licence file to SIINEOS

1. In SIINEOS, navigate to **Licensing**.
   In the list, you will find all software licences that you have purchased and uploaded. The check mark in the first column indicates that the licence is valid.



“Licensing” page (example)

2. Click on **Add license**.
3. Select the licence file from your file directory and click on **OK**.
   The licence is added to the list. From that point on, you can implement updates again or return to using a blocked app.
4. To remove a licence again – because it has become invalid, for example – select the licence ID and click on **Remove**.
   This will not delete the licence file itself, but only remove it from the list.

NOTE

Make sure that the system time of your device is correctly set and/or synchronized. Otherwise, the licence-file upload may fail.

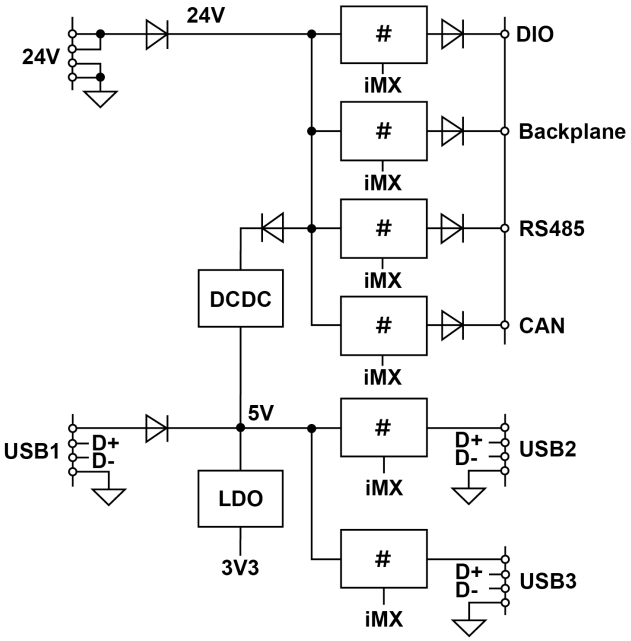
6. Technical data

Data	
Power supply	24 V DC ± 10 %
Max. power consumption	120 W
Processor	NXP® i.MX 8QuadXPlus, 4 x ARM Cortex-A35
Memory	2 GB LPDDR4 RAM, 8 GB eMMC
Data interfaces	USB1: Host (Micro USB) USB2: Device (USB-A) USB3: Device (USB-A) 2 x Ethernet: 100 Mbit/s 3 x status LEDs
Protocols	OPC UA server + client MQTT broker server + client Modbus TCP/IP broker client + server
Operating system	IIoT operating system SIINEOS (64 bit) for central device management tasks
Housing	Plastic (polyamide) black, flammability class UL 94 V0
Protection class	IP20
Dimensions	139 mm × 100 mm × 25 mm
Weight	158 g

Ambient conditions	
Temperature range	Storage: –40°C to 85°C Operation: 0°C to 50°C
Humidity	Storage: 10% to 95% RH, non-condensing Operation: 20% to 90% RH, non-condensing
Operating altitude	Max. 2,000 m above sea level

Storage	
Recording interval	Minimum 1 second
Storage	Up to 8 GB usable
Data export	VictoriaMetrics

6.1. USB interface specifications

USB connections	
Max. power consumption for **USB1** (Micro-USB on the front of the device)	5 W (1 A) May vary depending on the device connected: • On a 24 V power supply, the power consumption is 0 • On a 5 V power supply provided exclusively by USB, the digital and analogue outputs cannot be used.
Max. power output for **USB2** and **USB3**	2.5 W (500 mA) each with 24 V supply
Support for	Full, high and low speed (480, 12 and 1.5 Mbit/s)
Circuit diagram*	

*The hash (#) in the circuit diagram indicates the overload protection.

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The original language of this document is German.

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