HUB-SE100

Operating Instructions

Valid SIINEOS version: from 2.10.3
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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-SE100 is intended exclusively for use in the industrial sector and is used for monitoring machines, systems and processes.

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/or installers who connect the product with other units, configure it and commission it.

The document is intended for technicians who monitor machinery and production units and are responsible for maintenance and repairs when faults become apparent.

1.1. Scope of delivery

1 x HUB-SE100

1 x voucher for a SIINEOS licence

1 x Operating Instructions as a PDF

1.2. Recommended accessories

You can order optional accessories for your HUB-SE100 at in.hub. Please contact service@inhub.de for this.

- Power supply unit for the HUB-SE100
  Item number: A400052
- Adapter cable from M8 to M12 connector
  Item number: A1000347

1.3. Other applicable documents

In addition to this document, please also observe the following:

- User Manual for the SIINEOS IoT operating system, available for download at https://marketplace.contiinuum.inhub.de/apps/siineos
- Operating Instructions for other devices that you wish to plug in or connect, available for download at https://download.inhub.de

1.4. Disposal

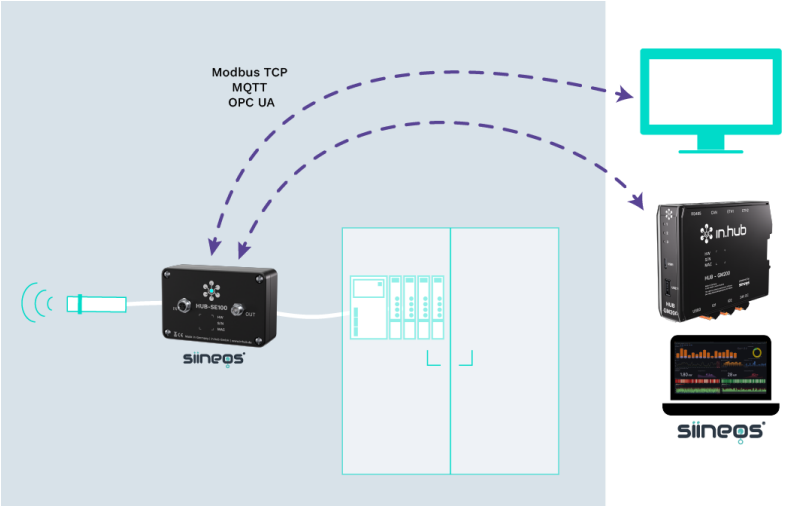
Please observe the national regulations.

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-SE100 is connected directly to the connection lead of a sensor, enabling it to receive, store, and visualise the sensor data and share it with external systems.

The data can be further processed using SIINEOS and made available via various interfaces, either wirelessly or via a wired connection.



Thanks to the use of standard interfaces (M8 connectors), the HUB-SE100 can be deployed in or on existing machinery and systems to ensure a secure connection between the production-side control system and the company's internal IT environment.

A major advantage of the HUB-SE100 is its plug & play installation, meaning that no circuit diagrams have to be consulted to locate the correct sensor terminal inside the control cabinet.

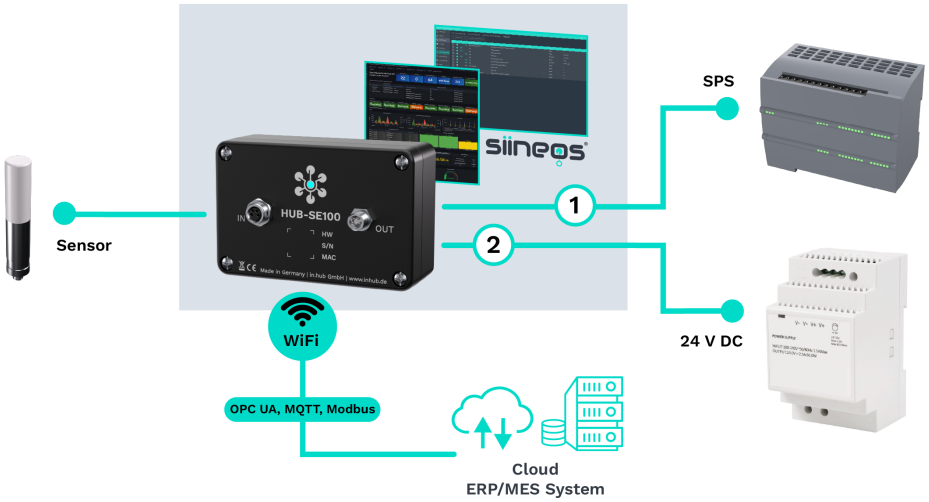
2.1. Intended use

The HUB-SE100 is ideal for:

- Tapping into sensor signals outside the control cabinet simply by connecting the device in-line: no rewiring of the existing connections is required.
- Retrofitting and upgrading old machines with individual sensors without making any modifications to the machine
- Data logging
- Data visualisation
- Monitoring of measured values
- Alarming

2.2. Application scenarios

There are two possible applications for the HUB-SE100:



1. Use as an in-line signal extension between the control system and the sensor

   The HUB-SE100 is placed between the sensor and the control system and taps into the sensor signal without influencing it. The signal can continue to be processed in the control system and/or in SIINEOS using all the available functions, such as alarming, visualisation, data processing and forwarding, cloud services via apps, etc.

2. Used with its own power supply, it can convert a sensor into a stand-alone Wi-Fi sensor

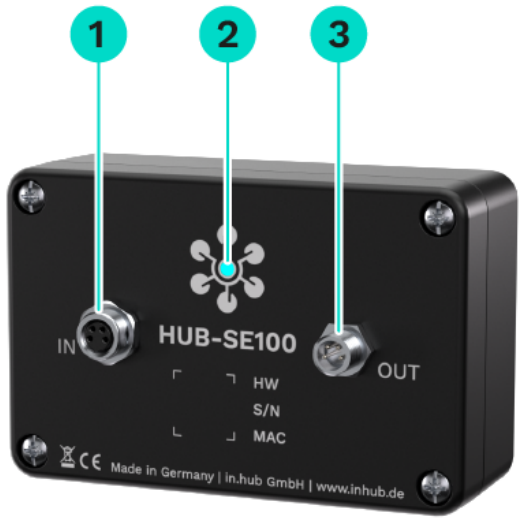
   If it is equipped with its own 24 V power supply, the HUB-SE100 can be connected to a sensor and send the sensor data directly to a network. This approach is suitable, for example, if you wish to retrofit a sensor independently of a control system and do not want – or are unable – to access the inside of the machine.

   For example: You want to monitor the ambient conditions around a machine at short notice and with minimal effort. The only equipment you need is the HUB-SE100, a suitable 24 V power supply unit, and a temperature and humidity sensor. Position the sensor in the desired location and connect its signal cable to the HUB-SE100. Then connect the power supply unit to the HUB-SE100 as well. You can now access SIINEOS using the IP address 192.168.124.1. The HUB-SE100 has already been created as an I/O unit in I/O management. All you have to do is configure the signals according to which sensor you are using.

In both cases, the HUB-SE100 allows you to do the following with the sensor data:

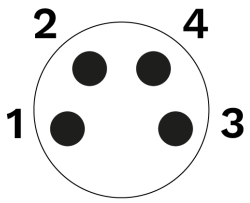
- Store or log it in the internal VictoriaMetrics database for up to 10 years
- Visualise it using Grafana and other apps
- Forward it via Wi-Fi using MQTT, Modbus TCP or OPC UA

2.3. Hardware – design and interfaces

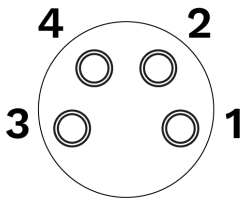


1	**IN**: M8 connector, 4-pin, male
2	LED
3	**OUT**: M8 connector, 4-pin, female

2.3.1. Pin assignment of the M8 connector



IN: M8 A-coded 4-pin male connector



OUT: M8 A-coded 4-pin female connector

Pin	Signal	Cable colour	Description
1	24 V	Brown	Power supply
2	4–20 mA	White	Analogue signal
3	GND	Blue	Ground / 0 V
4	0–10 V / DIN	Black	Analogue signal / digital input

2.3.2. LED display on the ETH socket

Colour	Meaning (function)
Green	The LED flashes when the Wi-Fi connection is working correctly. If the green LED lights up continuously, there is no Wi-Fi connection.
Yellow	You can configure the red LED in the signal settings.

3. Installation, connection and putting into operation

The chapter below explains how to install the HUB-SE100, connect sensors and/or control systems and get started with data acquisition in SIINEOS.

CAUTION

Keep the housing closed. Opening the housing invalidates the warranty.

If any malfunctions occur on the HUB-SE100, please contact service@inhub.de.

3.1. Installing the device

If the HUB-SE100 is to remain in place permanently or for a prolonged period, you can screw it to walls or machinery. Alternatively, if the device is intended for temporary use only, you can simply set it down without securing it.

For wall mounting, use the four threaded holes on the back of the housing.

3.2. Connecting the HUB-SE100 between the sensor and the control system

1. Unplug the cable from the sensor and plug it into the M8 **OUT** connector on the HUB-SE100.

   You have now established the connection between the HUB-SE100 and the control system.

2. Use the M8 **IN** connector to connect the new cable between the HUB-SE100 and the sensor.

   NOTE: You are responsible for obtaining this cable.

3.3. Connecting the HUB-SE100 to a stand-alone sensor

NOTE

Only use a 24 V power supply unit. Ideally, you should use the in.hub power supply unit, which is available as an accessory. This is equipped with the required M8 connector.

1. Unplug the cable from the sensor and plug it into the M8 **IN** connector on the HUB-SE100.
2. Connect the 24 V power supply unit to the M8 **OUT** connector.

3.4. Putting the device into operation

1. On your PC, go to **Network & Internet** settings (or the equivalent area in your operating system) and show all available networks. From the list, select the Wi-Fi network of your connected HUB-SE100 device.

The Wi-Fi name is: SE100 [hardware ID]

For example: HUB-SE100 0863928041c5

2. Click **Connect**.

   The system may ask you to enter a PIN. If it does, click the link below the input field so that you can connect using a password instead.

3. Now enter **hubadmin** as the password.

   The connection to the HUB-SE100's Wi-Fi network has now been established.

4. You can now access the device in your browser via its static IP address: http://192.168.124.1 or http://se100.local.

3.4.1. Using the HUB-SE100 as an access point

For this application, you do not need to configure any further settings in SIINEOS on the HUB-SE100. With the factory settings, the device acts as an access point and provides a Wi-Fi network.

You can access the HUB-SE100 immediately by entering the fixed IP address http://192.168.124.1 or the address http://se100.local.

3.4.2. Integrating the HUB-SE100 into a corporate network

1. Log in to SIINEOS on the HUB-SE100 using the credentials **hubadmin**/**hubadmin**.
2. Go to **Networks > Wi-Fi** and configure the following settings:
   - **Mode**: Infrastructure (connect to an access point)
   - **Wi-Fi name**: Enter the Wi-Fi name of the corporate network. You can obtain this from your IT administrator.
   - **Wi-Fi password**: Enter the WiFi password for the corporate network. You can obtain this from your IT administrator.

     Automatic network detection will only work once you have logged into the corporate network.
3. To save your changes, click on **Save & close**.

   The connection to HUB-SE100 is terminated.
4. On your PC, go to **Network & Internet > Wi-Fi** (or the equivalent area in your operating system) to connect to the corporate network that also includes the HUB-SE100.

   The new IP address that you can now use to access SIINEOS on the HUB-SE100 can be obtained from your IT administrator.
5. Under **System > Date & time**, please also check that the **Current device date and time** are synchronised with your browser's system time. If not, click the **Synchronize time via browser now** button and save the settings.

TIP

In the event of an interruption to the corporate network, the Wi-Fi settings on the HUB-SE100 will always revert to **Access point (provide Wi-Fi)** mode so that you can access the device at all times. As soon as the corporate network becomes accessible again, the HUB-SE100 will switch back to **Infrastructure (connect to access point)** mode.

If that does not work:

- Briefly unscrew the cable from the **OUT** connector to disconnect the power supply.

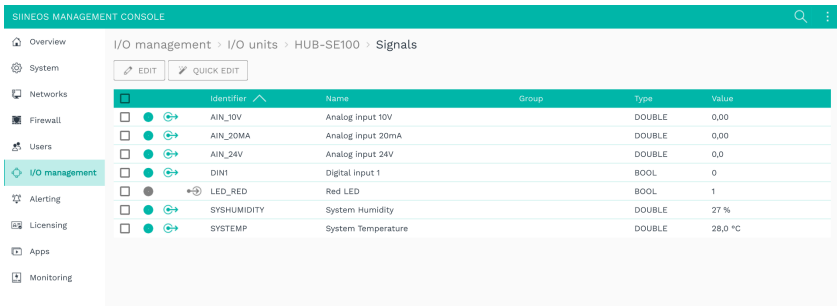
  – or –

- Restart the device. To do this, select **Restart device** from the hamburger menu in SIINEOS.

3.5. Configuring the signals of the HUB-SE100

1. In the SIINEOS of the HUB-SE100, navigate to **I/O management > I/O units** and select the created HUB-SE100.
2. Click on **Signals**.

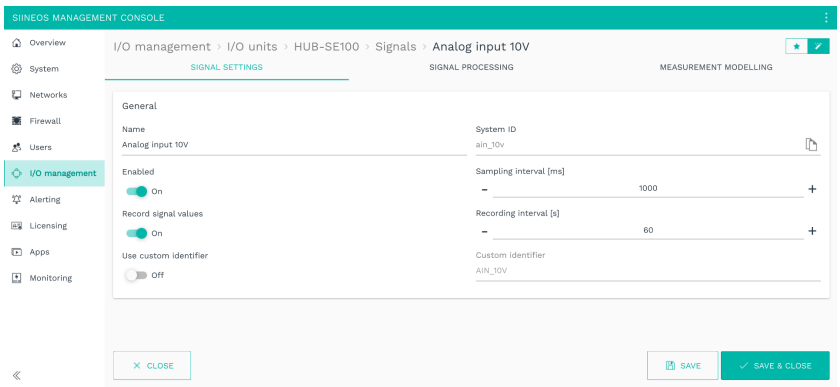
   The signals for all channels of the HUB-SE100 have already been created.



Signals of the HUB-SE100

3. Select the signal you want to configure.

   A window opens in which you will find three tabs.



“Signal settings” tab in “Advanced” viewing mode

4. Enable and configure the interface on the **Signal settings** tab.

a. Optional: Change the name of the interface.

b. Set the **Enabled** slider to **On**.

c. In the **Sampling interval** field, specify the interval at which the signal is to be sampled (in milliseconds).

d. Set the **Record signal values** slider to **On** if the values are to be recorded in the local VictoriaMetrics database.

e. In the **Recording interval** field, enter the desired time interval for the recording (in seconds).

5. Additional settings are available in **Advanced** viewing mode:
   a. **Use custom identifiers**: Set the slider to **On** if you want to enter your own identifier name.
   b. **Custom identifier**: Enter your own identifier name.
6. On the **Signal processing** tab, you can specify how the signal value is to be processed.
   A detailed description of the **Signal processing** tab can be found in the current SIINEOS User Manual.
7. Click on **Save**.
8. On the **Measurement modelling** tab, you specify how the measurements are to be visualized.
   A detailed description of the **Measurement modelling** tab can be found in the current SIINEOS User Manual.
9. Finally, click on **Save & close**.

4. 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 in.hub Marketplace at https://marketplace.contiinuum.inhub.de/apps/siineos.

5. Technical data for the HUB-SE100

Data	
Power supply	24 V DC, max. 500 mA
Typical power consumption	5 W
Max. power consumption	24 W
Processor	NXP® i.MX 6ULL, IMX6Y2CVM08Ax, 1 x ARM cortex-A7 CPU
Memory	RAM: DDR3L 1 GByte, Flash: 8 GByte
Data interfaces	Ethernet: 100 Mbit/s 1 x status LED (red/green)
Connections for peripheral devices	1 × analogue input, 4–20 mA 1 × analogue input, 0–10 V / digital input
Protocols	OPC UA server + client MQTT broker server + client Modbus TCP/IP broker client + server
Operating system	IIoT operating system SIINEOS (32 bit) for configuration and data visualization
Housing	Plastic (polyamide) black, flammability class UL 94 V0/5VA
Protection class	IP54
Dimensions	98 mm × 64 mm × 43 mm
Weight	150 g
Installation	Screw connection

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

SIINEOS	
Pre-installed software	**FlexPlorer**: Live data visualization

SIINEOS	
	Azure IoT Hub Connector: Connector to the Microsoft® IoT platform **Cloud of Things Connector**: Connector to the Telekom® IoT platform **InGraf**: Grafana data visualization **NumCorder**: Recording of scanned or entered barcodes / serial numbers **OPC UA server**: Counterpart to the OPC UA client, setting up of a server–client structure with one device **NodeRED**: Graphical programming of interfaces, services or hardware **PromEx**: Database configuration of VictoriaMetrics and Prometheus **TOSIBOX®**: Secure connectivity between the IoT devices **SIGNL4 Connector**: Forwarding of alarms to the SIGNL4 cloud
I/O interfaces to third-party systems/devices	**S7 PLC client**: Connector for the Siemens® S7 controller **Sensirion SPS30**: Temperature and humidity sensor **TBEN-S1-8DIP**: TBEN module from TURCK® **TBEN-S2-4AI**: TBEN module from TURCK® **IO-Link master** **IO-Link device**

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Service & Support: service@inhub.de | https://community.inhub.de

in.hub GmbH
Technologie-Campus 1
DE-09126 Chemnitz

+49 371 335 655 00
info@inhub.de