isH4Cube

MANUAL

THORSIS TECHNOLOGIES

CERTIFICATE OF CONFORMITY

According to EC Directive 2014/30/EU (electromagnetic compatibility) of February 26th 2014 and according to EC Directive 2011/65/EU (RoHS II) of June 8th 2011. We hereby declare, that the device indicated below in its design and construction, is in conformity with the essential safety and health requirements of the EC Directive 2014/30/EU. The devices do not contain material as declared in the EC Directive 2011/65/EU (RoHS II). All applied RoHS exemptions according to Annex III of 2011/65/EU (RoHS II) are listed on page 22 of this manual.

CHANGES OR MODIFICATIONS NOT APPROVED BY THORSIS TECHNOLOGIES VOID THE VALIDITY OF THE DECLARATION.

Device type	Order number
isH4Cube	14400-0201

STANDARD USED: DIN EN IEC 61326-1:2022-11

Manufacturer
Thorsis Technologies GmbH
Oststr. 18
39114 Magdeburg
Germany

Magdeburg, 2026-03-01

Dipl.-Inf. Michael Huschke,
General Manager

UK DECLARATION OF CONFORMITY

Thorsis Technologies GmbH declares as manufacturer under sole responsibility, that the products down in the list complies with the requirements of following UK legislation:

- S.I. 2019/1246 The Product Safety, Metrology and Mutual Recognition Agreement (Amendment)(EU Exit) regulations 2019
- S.I. 2020/852 The Product Safety and Metrology (Amendment)(EU Exit) regulations 2020
- S.I. 2016/1091The Electromagnetic Compatibility Regulations 2016
- S.I. 2012/3032 The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

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STANDARDS USED: DIN EN IEC 61326-1:2022-11
CERTIFICATION: NONE

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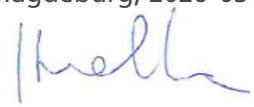
Magdeburg, 2026-03-01



Dipl.-Inf. Michael Huschke,
General Manager

UK CA

Table of Content

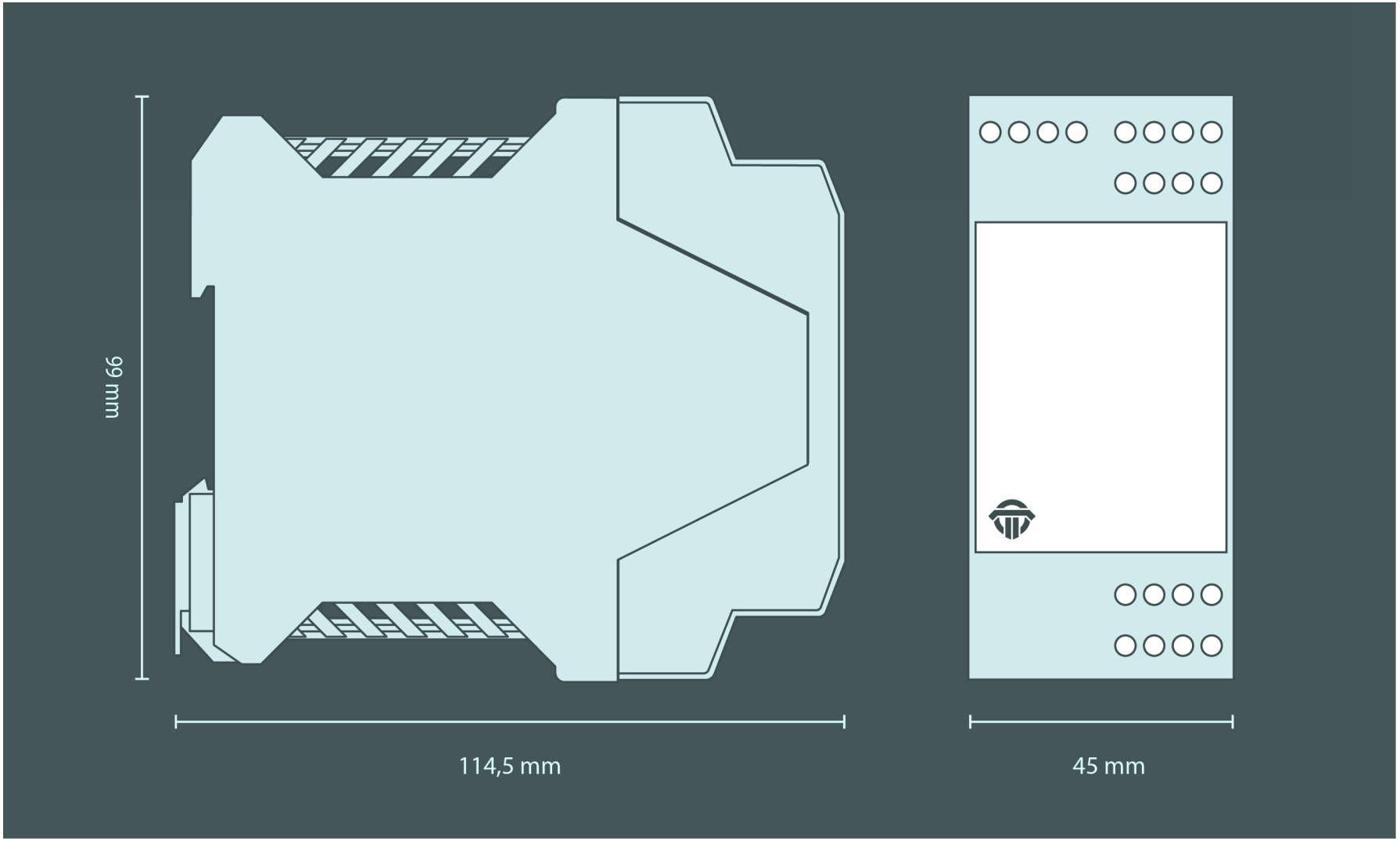
1. Introduction

The isH4Cube is an Ethernet gateway for the connection of HART instruments to an Ethernet network.
The gateway translates from wired HART into a number of different industrial Ethernet protocols like HART-IP, Modbus-TCP or Profinet.
The gateway provides 4 HART connections, each one equipped with a separate HART modem. This allows to run the 4 channels independently.
By processing HART requests on different channels simultaneously, system performance is increased significantly.
All 4 channel are galvanically isolated and provide an optionally usable 240 Ohm loop resistor.

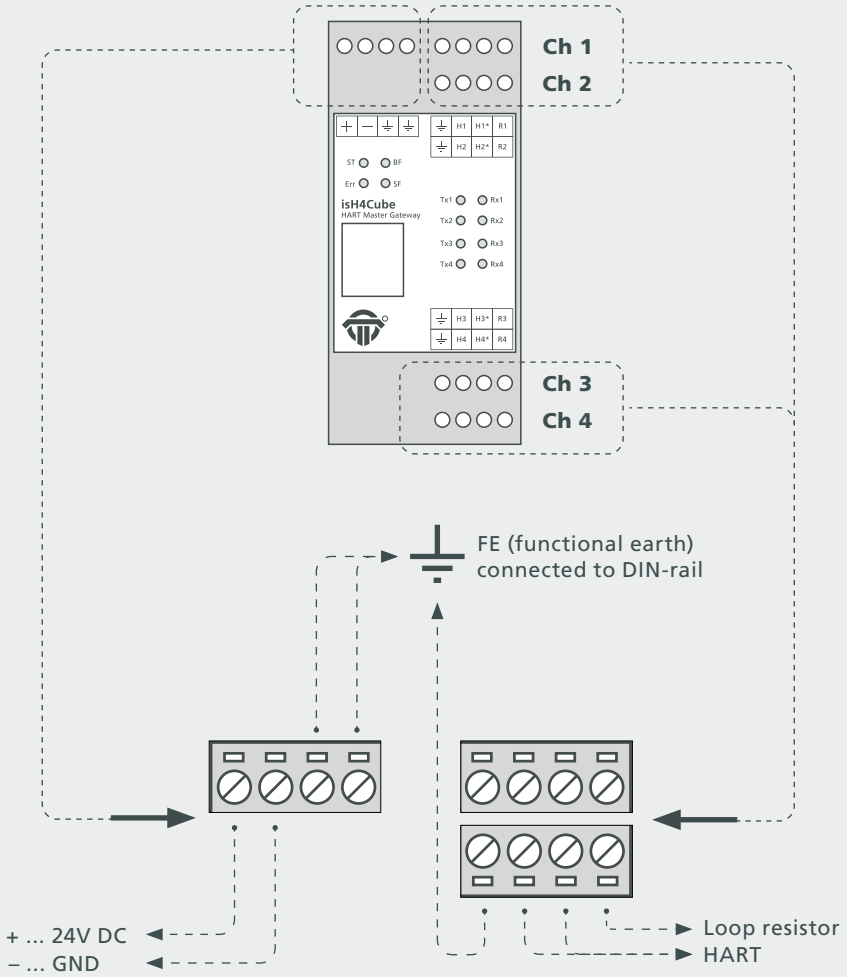
1.1 Technical details

isH4Cube	
Order code	**14400-0201**
Processor	ATSAM9X60D
RAM	64 MByte
Flash	256 MByte
Transmission rate	Ethernet: 10 Mbit/s – 100 Mbit/s HART: 1200 Bit/s
Power supply	19,2V .. 30V DC
Power consumption	60mA (typ. at 24V DC)
Galvanic isolation	yes
IP code	IP20
Body material	Polyamide
Dimensions (L x W x H)	114,5mm x 45mm x 99mm
Weight	approx. 200g
Operating temperature	- 20° C <= T_{amb} <= 70° C / -4° F <= T_{amb} <= 158° F
Storage temperature	- 40° C <= T_{amb} <= 85° C / - 40° F <= T_{amb} <= 185° F

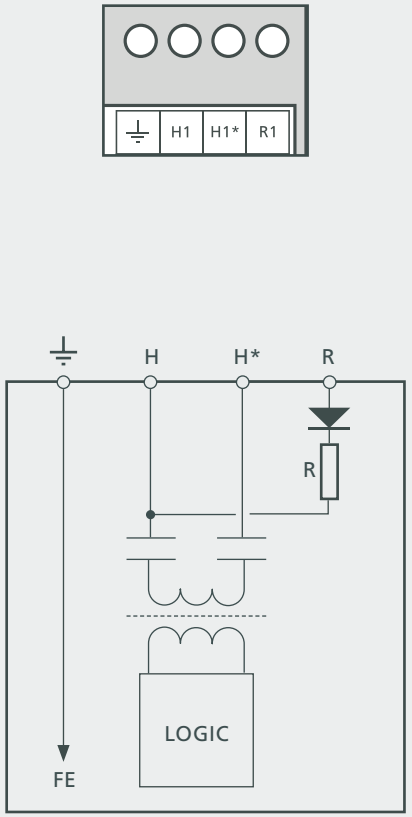
1.2 Dimensional Drawing



1.3 Pin assignment

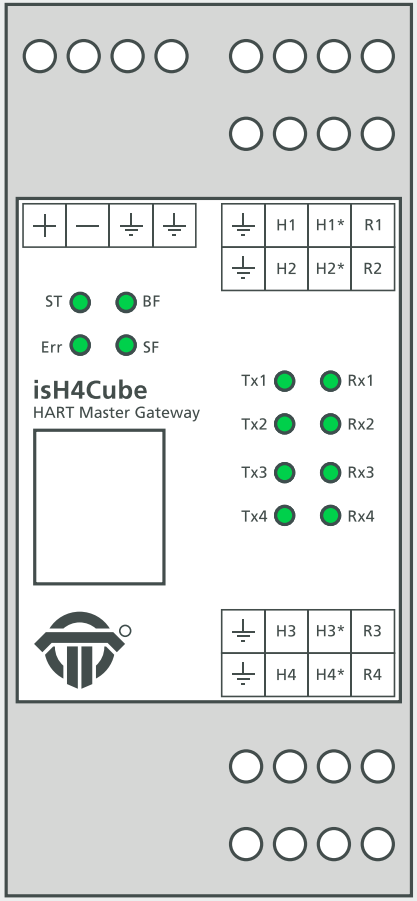


1.4 Schematic Diagram of input circuit



R.. loop resistor (240 Ohm)

1.5 LEDs



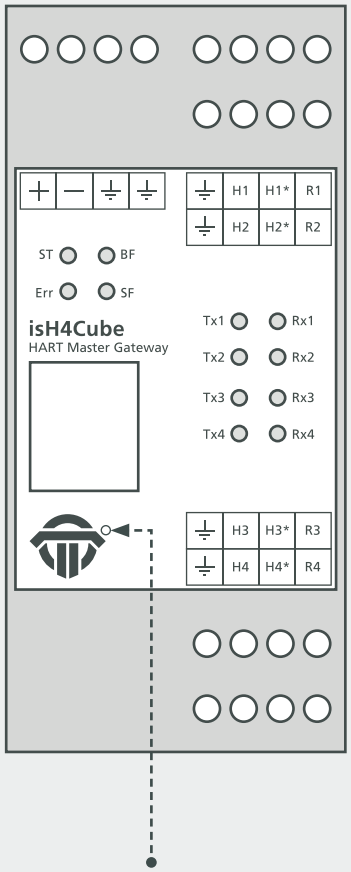
The isH4Cube shows 12 LEDs, 4 of them showing the status of the gateway, and 8 LEDs show the status of each channel with 2 LEDs per channel.

- **ST:** Status LED, shows red after power on, then switches to green while operational.
- **Err:** Error LED, signals red in case of an application error.
- **BF:** BusFailure (Profinet)
- **SF:** SystemFailure (Profinet)

After power on, all 4 LEDs show red for about a second, and then they switch to green. During boot process one LED after another switches off until only the ST LED remains green. At this moment the boot process is finished.

- **TX1-TX4:** green - the gateway is sending a HART message frame.
- **RX1-RX4:** green - the gateway receives a HART message.

1.6 Factory Reset



Reset button

It may happen that a user needs to reset all settings to factory default. For example someone changed the IP address or the password and did not remember. Or the IP address was set to DHCP and there is no DHCP service available. In all these cases the user can reset the hardware back to firmware defaults by using the Reset button. This button is located behind a small hole below the RJ45 connector.

Reset to default settings

Pressing the button for at least 5 seconds while the isH4Cube is operational will reset all settings to factory default and result in a reboot of the hardware. After the factory reset the IP address will have its default value of 192.168.0.10 and all settings will be reset to factory default.

Firmware recovery

The button also allows a complete recovery of the firmware. This might be helpful in case of a failed firmware upgrade. For example if the device firmware is corrupted due to a power loss during the upgrade, and the device fails to start, then the user can recover to the factory production version.
In order to perform a complete firmware reset, the user needs to:

- switch off power from the hardware
- press the button (e.g. with a paper clip) and hold
- apply power again while still holding the reset button and
- wait for at least 5 more seconds before releasing the reset button

After releasing the reset button, the firmware will take some time to reinitialize to default settings, do not disconnect from power. As a result of a firmware recovery, the hardware will have all settings and firmware version as it was after production. That means all firmware updates are undone and have to be repeated.

2. Hardware installation

2.1 Safety instructions

Installation notes

Installation, operation and maintenance must be made by qualified personnel only and in accordance with your local and national technical regulations and safety directives.

Do not repair the device yourself, but replace it with an equivalent device. Repairs may be performed by the manufacturer only.

The manufacturer is not legally responsible for damage resulting from failure to comply.

2.2 Specific conditions of use

The equipment shall be installed in an enclosure that provides a degree of protection not less than IP 54 in accordance with IEC/EN 60079-15 and that have been considered to be not accessible in normal operation without the use of a tool.

Transient protection shall be provided that is set at a level not exceeding 140 % of the peak rated voltage value at the supply terminals to the equipment.

The gateway must be mounted vertically on a 35 mm DIN rail.

The gateway isH4Cube is an open system and in accordance with UL/CSA approval an “open type.”
The gateway have to be installed in a control cabinet, appropriate housing or a closed electrical operation room accessible only to authorized maintenance staff.

2.3 Electrical installation

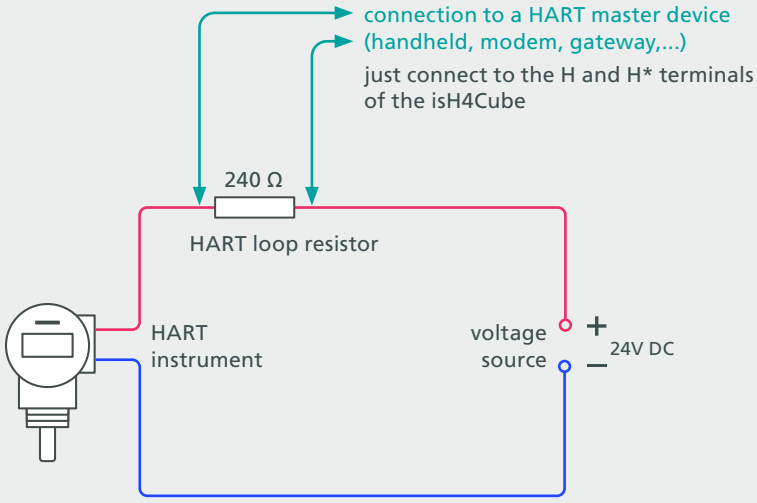
Before installation of the modules and wiring make sure that the system is off power.

To supply the modules only power supplies with a secure electrically isolated extra-low voltage (SELV) may be used.

Cable entries and field wiring must be suitable for an operating temperature of at least +20° C above ambient.

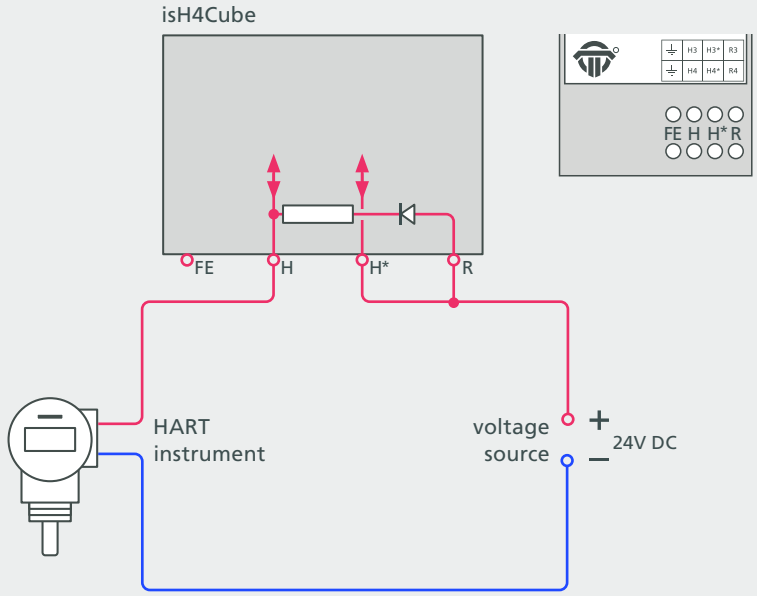
2.4 isH4Cube principle of operation

The illustration shows a schematic design of a basic HART loop.



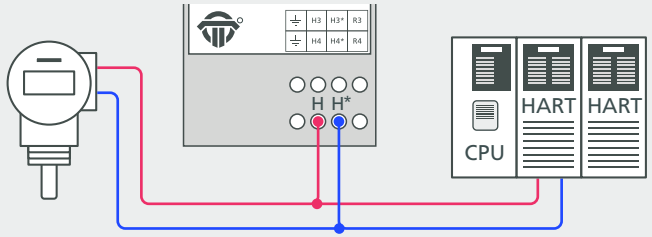
Any HART loop consists of (at least) a voltage source, a HART loop resistor and a HART instrument in series.

The illustration shows a possible integration of the isH4Cube into a HART loop.

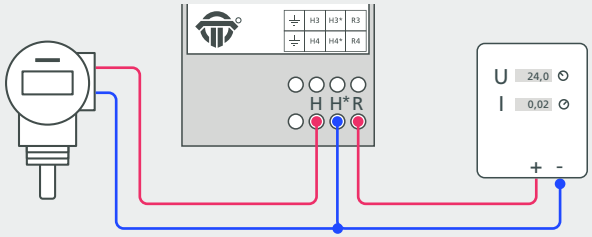


With the isH4Cube, the HART loop can use the internal resistor provided by the R-terminal of the isH4Cube.

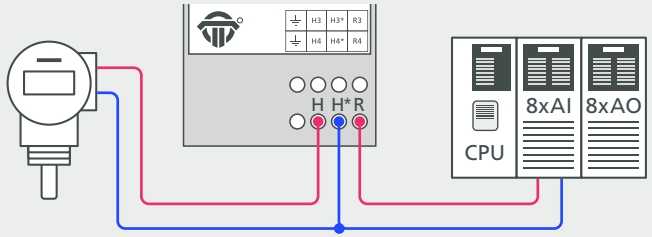
2.5 Connection of HART instruments to the isH4Cube



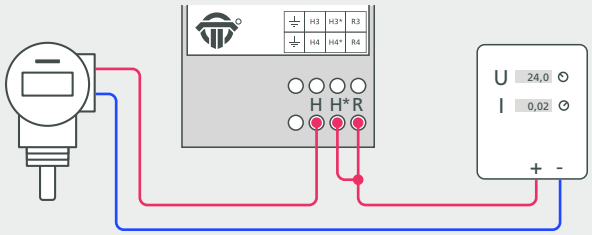
PLC with integrated
HART loop resistor



Power supply



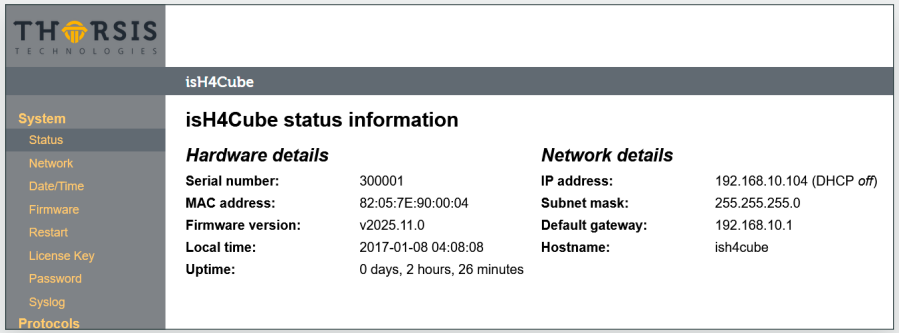
PLC without integrated
HART loop resistor



Power supply

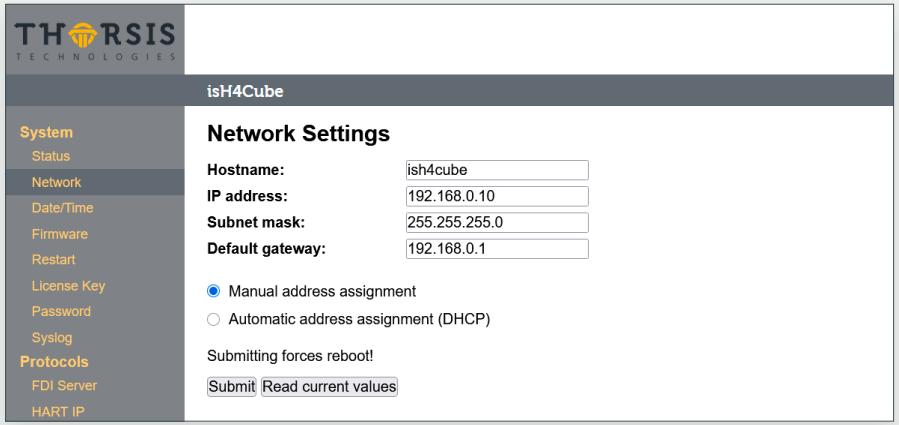
3. Web interface

3.1 Configuration of the IP address



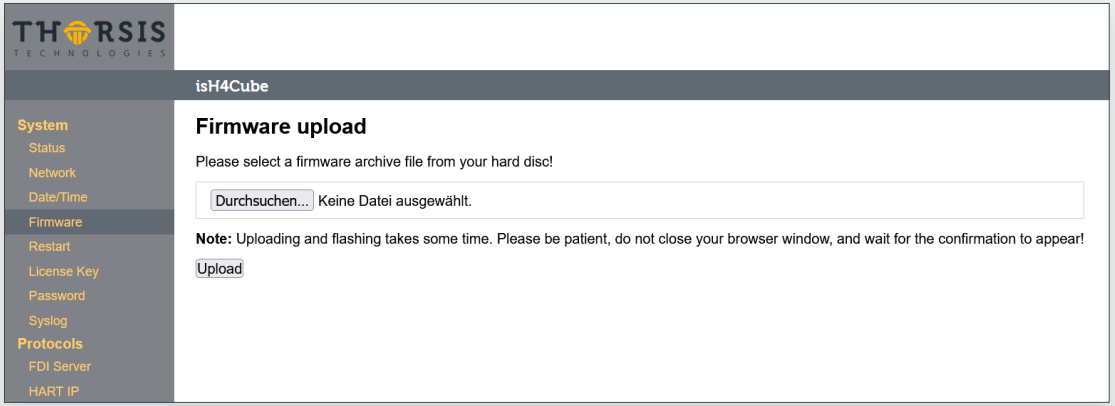
The default address of the gateway is: 192.168.0.10 subnet mask 255.255.255.0. Use your favorite browser to go the IP Address of your isH4Cube. You should see this website. This is an overview over the current status.

Click on „Network Settings“ and you will get to the configuration mask.



Here you can change the Hostname, the IP Address, the subnet mask and the default Gateway.
You can also choose to set the IP Address manually or with your DHCP Server. Pressing the Submit button applies the changes and restarts the gateway.

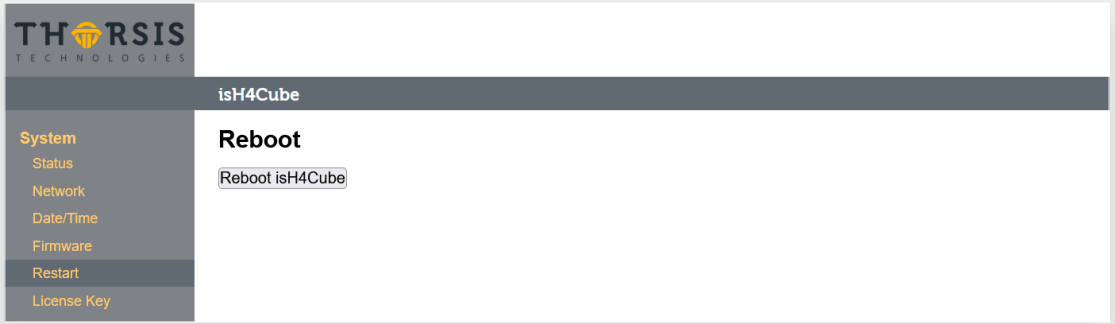
3.2 Update of the Firmware



If a new firmware is available for your device you can flash it using the web interface.
Go to the Menu Firmware and select the file you want to flash. Click the Upload button and wait until a confirmation appears that the upload was successful.

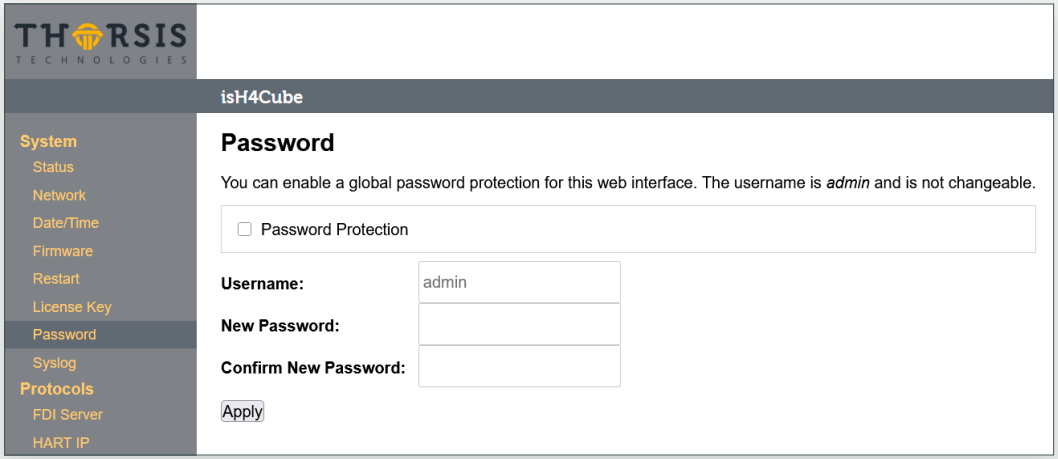
After the successful update, the isH4Cube must be restarted by using the Restart-function in the Web interface.

3.3 Soft-Restart



To restart the gateway, go to the Restart menu and press the button “Reboot isH4Cube”.

3.4 Password protection

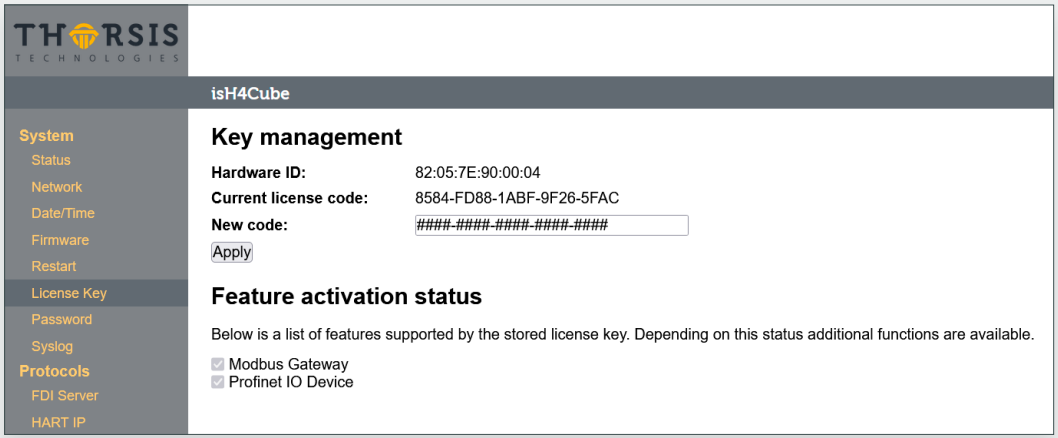


To enable a global password protection for the isH4Cube web interface, click on the Password menu on the left. Activate the Password protection by clicking in the checkbox. Enter your password and repeat it in the field below.

Click Apply to confirm your settings.

Please note, that the username is always *admin* and can not be changed.

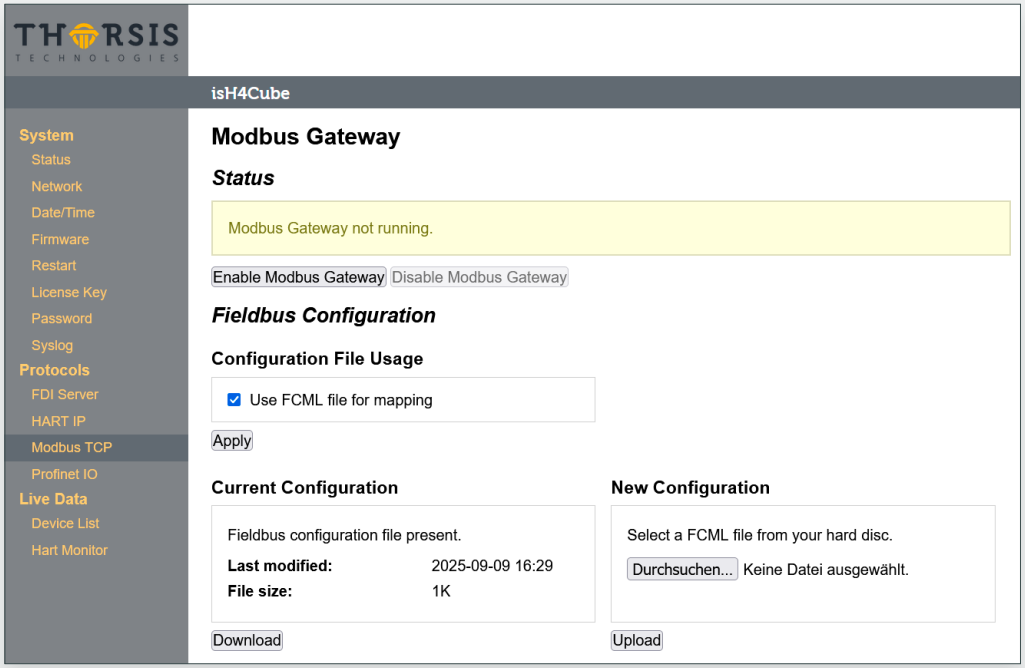
3.5 Activating MODBUS functionality



To unlock the MODBUS functionality, you need to enter a valid license code. Go to the License Key page and enter the key.
After clicking Apply, the MODBUS feature will be activated. To activate the Modbus Gateway switch to menu item “Modbus TCP” under “Protocols”. (see on page 17)

3.6 Protocols

3.6.1 Modbus status

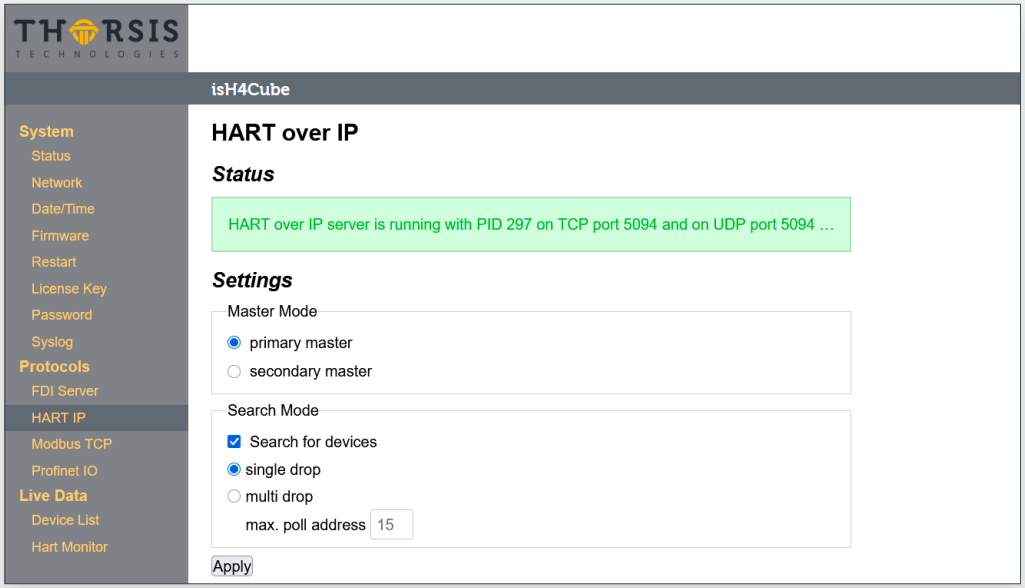


The menu “MODBUS Gateway” shows an overview of the MODBUS status. You can upload a FCML configuration file here, and you can start or stop the Modbus server.

Make note that the Modbus server cannot run simultanously with the FDI communication server or the Profinet functionality.

Stop the other functions first before starting the Modbus server.

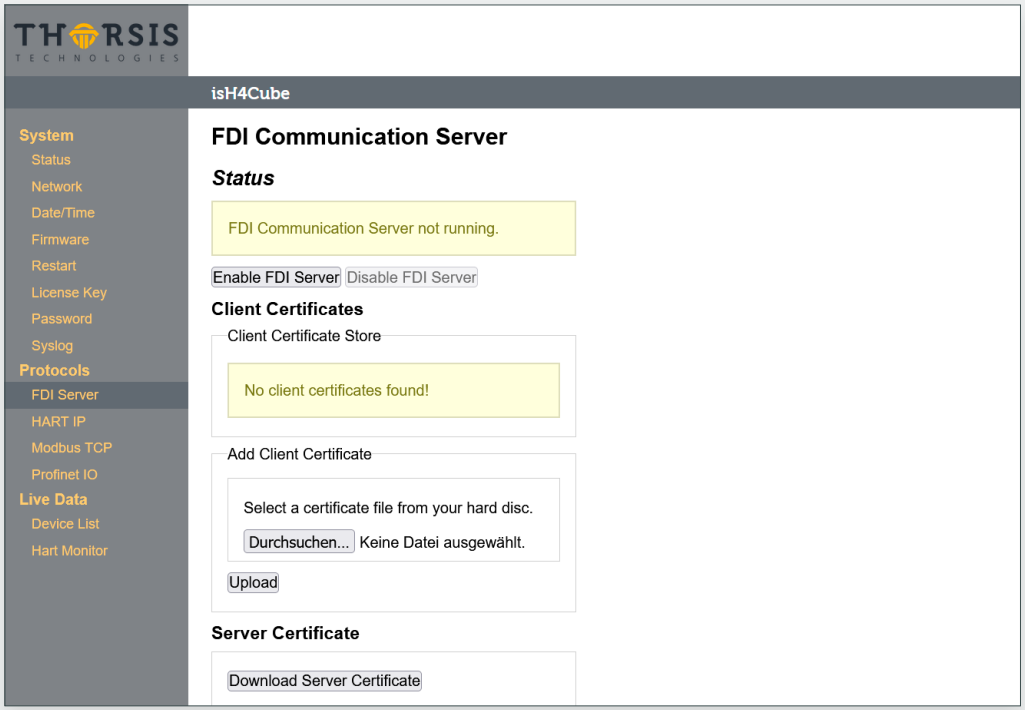
3.6.2 HART over IP



Enable or disable HART over IP under this menu item. You can also switch the master type of the 4 HART channels between Primary master and Secondary Master.

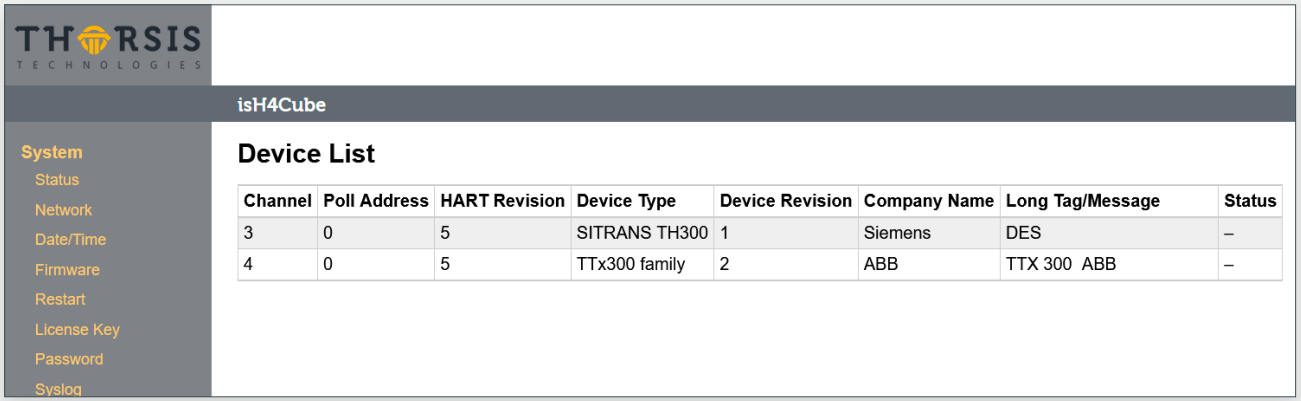
If you enable the “Search for devices” checkbox, then the gateway will permanently poll the 4 channels if it can detect the new sub-devices. Also select the range of poll addresses the gateway will include in the search for new sub-devices.

3.6.3 FDI Server



Menu item “FDI Server” provides settings to enable communication to field devices by using the new FDI standard. These settings include the upload and download of certificates.
You can also start and stop the FDI server here. Make note that the FDI server cannot run concurrently with enabled Modbus or Profinet functionality. If necessary stop these other functions first before starting the FDI server.

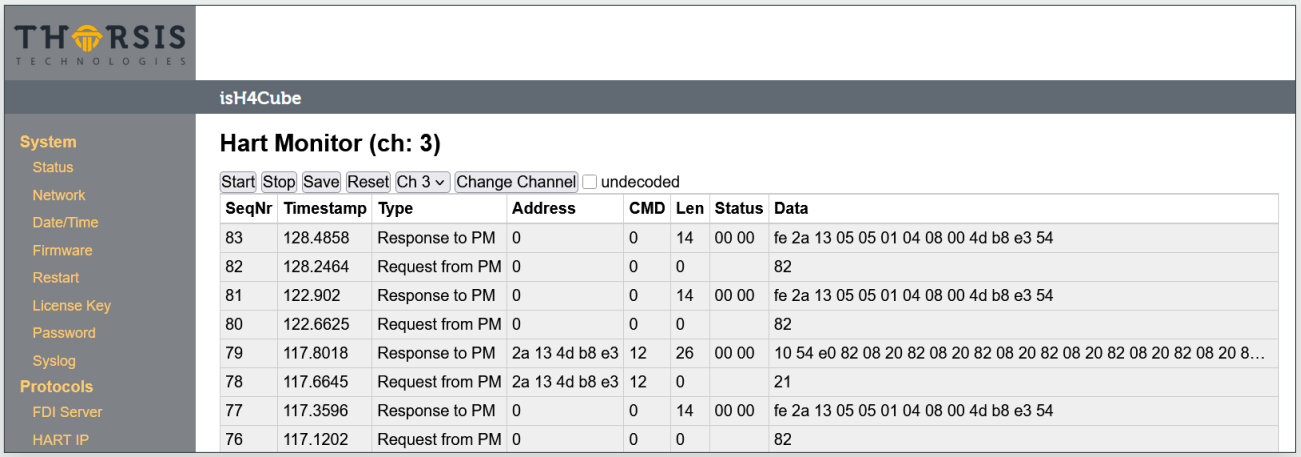
3.7 Device List



Channel	Poll Address	HART Revision	Device Type	Device Revision	Company Name	Long Tag/Message	Status
3	0	5	SITRANS TH300	1	Siemens	DES	–
4	0	5	TTx300 family	2	ABB	TTX 300 ABB	–

The isH4Cube keeps track of connected HART sub-devices. All detected HART Instruments connected to one of the 4 channels are displayed on this page.

3.8 HART protocol monitor



SeqNr	Timestamp	Type	Address	CMD	Len	Status	Data
83	128.4858	Response to PM	0	0	14	00 00	fe 2a 13 05 05 01 04 08 00 4d b8 e3 54
82	128.2464	Request from PM	0	0	0		82
81	122.902	Response to PM	0	0	14	00 00	fe 2a 13 05 05 01 04 08 00 4d b8 e3 54
80	122.6625	Request from PM	0	0	0		82
79	117.8018	Response to PM	2a 13 4d b8 e3	12	26	00 00	10 54 e0 82 08 20 82 08 20 82 08 20 82 08 20 82 08 20 82 08 20 8…
78	117.6645	Request from PM	2a 13 4d b8 e3	12	0		21
77	117.3596	Response to PM	0	0	14	00 00	fe 2a 13 05 05 01 04 08 00 4d b8 e3 54
76	117.1202	Request from PM	0	0	0		82

The isH4Cube contains a integrated protocol monitor for diagnosis and troubleshooting. The protocol monitor will display all HART Messages of one of the 4 channels on this page. You can select the channel, which the protocol monitor shall listen to. Only 1 channel can be monitored at a time.

4. Declaration of RoHS Conformity

As a result of our product testing and due to legal requirements (as of December 12, 2019), Thorsis Technologies GmbH confirms that the information below accurately complies with the restrictions on substances according to Directive 2011/65/EU (RoHS2), including phthalates (DEHP, BBP, DBP, DIBP), according to Directive 2015/863/EU and according to Regulation (EC) No. 1907/2006 (REACH-Regulation).

With regard to the information contained in this report, Thorsis Technologies GmbH relies on the statements and information provided by its suppliers and service providers. In accordance with DIN EN 50581 the information contained in the report includes a supplier declaration on exemptions and can be used as evidence for the preparation of technical documentation.

This information is based on our current knowledge and information provided by our suppliers and is subject to change. Current and future products that comply with the requirements of Directive 2011/65/EU (RoHS 2) will be marked accordingly on our website and packaging.

Thorsis Technologies GmbH does not use in its products none of the substances listed in Annex XVII of the REACH Regulation in concentrations exceeding the limits falling within the scope of the Regulation. In order to ensure a high level of product safety to our customers and to comply with legal requirements, we have reviewed the implementation of the REACH Regulation in accordance with the Candidate List updated on 01.17.2023. According to Article 33 of the REACH Regulation, Thorsis Technologies GmbH is obliged to notify candidate substances that are contained in its products with a mass fraction of more than 0.1%.

5. Document History

Version	Date	Description
1.0	04.07.2026	initial version

THORSIS TECHNOLOGIES

Thorsis Technologies GmbH
Oststr. 18
39114 Magdeburg
Germany

Tel +49 391 544 563-1000
Fax +49 391 544 563-9099
info@thorsis.com
www.thorsis.com