INSTRUCTION MANUAL

Add-On Module
HUB-RT100 &
HUB-MRT100

Version 1.2 / 12.07.2023

Table of contents

1 Legal notice

Warning concept

This manual contains information that you must observe for your personal safety and to prevent damage to property. Warnings are presented in decreasing order of hazard level as follows:

⚠️ **DANGER**

Indicates a direct hazard for humans. Irreversible injuries or death will result if not observed.

⚠️ **WARNING**

Indicates a recognizable hazard for humans. Irreversible injuries or death may result if not observed.

⚠️ **CAUTION**

Indicates a recognizable hazard for humans or possible damage to property. May lead to reversible injuries or damage to property if not observed.

ATTENTION

Information on potential damage to property. May cause damage to property if not observed.

> **NOTE:** Under "Note", you will find tips, recommendations, and useful information on specific actions and facts.

If several hazard levels occur, the warning for the highest level is always used. If the triangle warning against personal injury is used in a warning, then a warning against property damage can also be added to the same warning notice.

Qualified personnel

The product associated with this documentation may only be handled by personnel qualified for the respective task. Furthermore, the product may only be handled in compliance with the associated documentation and the safety and warning instructions contained therein. Due to their training and experience, qualified personnel are equipped to recognize and avoid potential hazards when handling these products.

Basic knowledge required

Knowledge of personal computers, operating systems, and programming is a prerequisite. General knowledge in the field of automation technology is recommended.

Safety instructions

Before commissioning the product, be sure to read the safety regulations carefully and observe the corresponding information in the manual. Always keep the Instruction Manual within reach.

Intended use

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, setting up, assembly, installation, commissioning, operation, and maintenance are essential for the correct and safe operation of the product.

The permissible environmental conditions must be complied with. Information in the associated documentation must be observed.

Trademarks

All names marked with the symbol "®" are registered trademarks. Other names in this document may be trademarks whose use by third parties for their own purposes may infringe on the rights of the owners.

Disclaimer

The content of this publication has been checked for conformity with the hardware described. Nevertheless, discrepancies cannot be ruled out, so we do not assume any liability for its completeness and correctness. The information in this publication is reviewed on a regular basis. Any corrections needed will be included in the subsequent editions.

2 General information

This operating manual contains all the information you need for commissioning and using the HUB-RT100 or the HUB-MRT100. It is intended both for installers and testers who commission the device themselves and for service and maintenance technicians who install extensions or perform fault analyses.

2.1 Scope of delivery

1 x HUB-RT100 or HUB-MRT100

1 x Instruction Manual (PDF)

2.2 General instructions for use

in.hub GmbH assumes no liability for malfunctions of the device resulting from improper handling, mechanical damage, incorrect application and use for other than the intended purpose. Improper handling of the device can significantly reduce the service life of the product.

2.3 Intended use

HUB-RT100 and HUB-MRT100 are intended exclusively for use in industrial applications.

2.4 Safety requirements

The product should be handled in accordance with the following DIN standards:

- DIN EN 61340-5-1:2017-07 Electrostatics – Part 5-1: Protection of electronic components against electrostatic phenomena – General requirements

- DIN EN 61010-1:2020-03 Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements

- DIN EN 60664-1:2008-01 Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements, and tests

2.5 Disposal

The device and the battery must be disposed of separately.

Do not dispose of the device and battery in household waste, but hand them in at a local collection point.

2.6 Service & Support

If you have any questions about specific use cases or about technical parameters, please contact us.

Mail: service@inhub.de

Phone: +49 371 335 655 00 (Technical Sales Staff)

These details will connect you with the appropriate contact.

3 Product information

HUB-MRT100 is a USB stick that stores and plays back the system clock time on the one hand and process data on the other. HUB-RT100 stores only the system clock time.

Both add-on modules have been specially developed for use in industrial environments and ensure the correct system time especially at locations with frequent disturbances of the electricity supply. HUB-MRT100 additionally has an F-RAM, so that the last written process data can be saved and replayed.

3.1 Principle of operation

The HUB-RT100 or HUB-MRT100 is plugged into the USB interface of an in.hub gateway, e.g. the HUB-GM200.

If SIINEOS is installed on the gateway, then you can synchronize the system time via the software interface. See *Setting the time in SIINEOS, page 8*.

However, it is also possible to operate the stick with a different system software and a third-party hardware. For more information, see chapter *OPTIONAL: Integrating HUB-(M)RT100 into Linux, page 11*.

4 Assembly and commissioning

Observe the applicable safety and accident prevention regulations for specific areas of application, e.g. the Machinery Directive.

4.1 Plugging in the HUB-(M)RT100 and putting it into operation

1. Plug the HUB-MRT100 or the HUB-RT100 into the USB1 or USB2 port of your in.hub gateway.

    If there is not enough space in the control cabinet, you can also use a USB extension cable or a USB hub.

    As soon as the stick is plugged in, the LED in the stick lights up to indicate that the external real-time clock is operational.

2. Leave the stick plugged in permanently.

    Changing the battery becomes necessary when the system time no longer matches the local time with the HUB-(M)RT100 connected.

    See chapter *Changing the battery, page 9*.

4.2 Setting the time in SIINEOS

> **HINT:** The SIINEOS user documentation can be found in the *in.hub* download portal at https://download.inhub.de/siineos/. Check there regularly to always have the latest documentation at hand.

1. Log in to SIINEOS with your user data and navigate to **System > Date & time**.

Fig. 1: System > Date & time (example)

2. First click **Synchronize time via browser now** to ensure that the gateway's time is synchronized with the computer.

3. Click **Set hardware real-time clocks** to transfer the system clock time to the external real-time clock.

4. Leave the stick permanently plugged into the device, so that in case of power supply interruptions the gateway can always obtain the time from the HUB-(M)RT100 again.

4.3   Changing the battery

Note that the operating time of the HUB-(M)RT100 depends individually on the ambient conditions.

The service life guaranteed by the manufacturer is at least 5 years but can be up to 10 years under optimum environmental conditions.

> ⚠️ **CAUTION** Damage to components due to electrostatic charge!
> ➢ Avoid touching electronic contacts and components directly.
> ➢ Use e.g. ESD-compatible clothing or other measures to protect against charging.

1. Unscrew the 2 screws from the housing using a cross-head screwdriver and remove the housing.
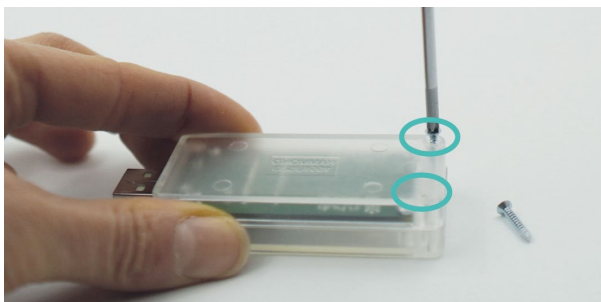

Fig. 2: Unscrew housing

2. Loosen the 4 screws on the board with the cross-head screwdriver and remove the other part of the housing.
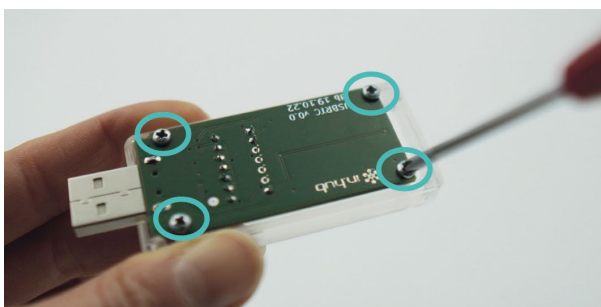

Fig. 3: Unscrew circuit board

3. Push the battery out of the battery compartment with a blunt, narrow item and insert a new battery.

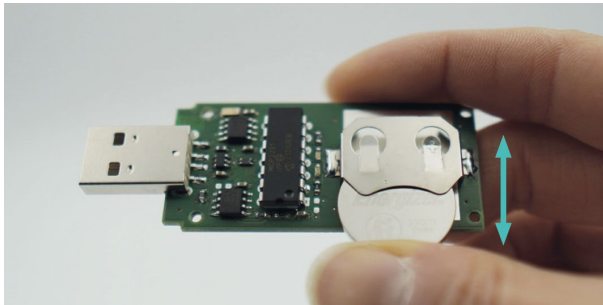   The label on the battery points upwards.

Fig. 4: Change battery

4. Put the board back into the housing and screw first the board with the 4 short screws and then the housing with the 2 long screws.
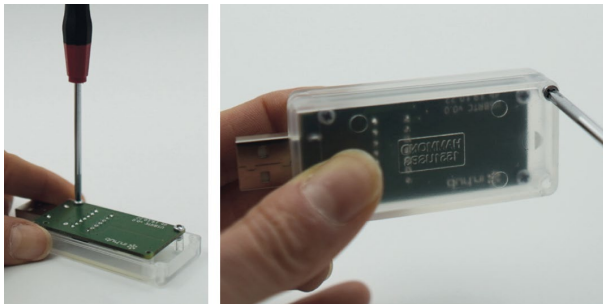

Fig. 5: Screw the board and housing together again

5 OPTIONAL: Integrating HUB-(M)RT100 into Linux

The two add-on modules HUB-MRT100 and HUB-RT100 are proprietary developments of in.hub, for which no standard drivers are available to use them out-of-the-box.

In order for the stick to be recognized by your individually developed system software, you must perform the following steps:

1. Integrate chip driver mcp2221.

2. Integrate RTC driver m41t80.

3. Only HUB-MRT100: Integrate F-RAM.

Detailed information for Linux can be found at https://github.com/in-hub/hub-mert100-linux.

This repository provides the driver source code or patches for the Linux kernel.

> **HINT:** This information is intended exclusively for software developers who have programmed the system software themselves.

6 Technical data

Data	Value
Connector type	USB 2.0 Type A
Transmission speed	Max. 400 Kbit/s
Operating voltage / operating current when connected via USB	4,75 ~ 5,25 V | ~ 61 mA
Quiescent current with battery operation	500 nA
Total battery charge	220 mAh
Lifetime of the battery	The service life guaranteed by the manufacturer is min. 5 years but can be up to 10 years under optimal environmental conditions.
Write and read cycles of the F-RAM (only for HUB-MRT100)	At least 10^{14} cycles
Temperature range	Operation: 0 °C to 50 °C Storage: -40 °C to 85 °C
Relative humidity	Operation: 20 % to 90 % RH non-condensing Storage: 10 % to 95 % RH non-condensing
Housing	Plastic (ABS), transparent Flammability class according to UL 94 HB
Conformity (incl. battery)	RoHS (Directive 2011/65/EU) REACH (EC Regulation 1907/2006)
Dimensions (L x H x W)	65 mm (or 77.2 mm for housing and connector) x 30 mm x 15.5 mm
Weight	25 g

7 EU Declaration of conformity

EU-Konformitätserklärung Nr. MRT100-1

EU Declaration of Conformity No.:

Wir/ We

in.hub GmbH
Technologie-Campus 1,

09126 Chemnitz, Germany

erklären in alleiniger Verantwortung, dass die Produkte

declare under our sole responsibility that the products

HUB-MRT100

auf die sich die Erklärung bezieht, den Anforderungen der folgenden EU-Richtlinien durch Einhaltung der folgenden harmonisierten Normen genügen:

to which this declaration relates are in conformity with the requirements of the following EU-directives by compliance with the following harmonised standards:

Richtlinie / Directive

2014 / 30 / EU - 26. Feb. 2014

Normen / Standards

DIN EN 61000-4-2:2009

DIN EN 61000-4-3:2011

DIN EN 61000-6-4:2011

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Weitere Normen, Bemerkungen

additional standards, remarks

Das Produkt stimmt mit den Anforderungen der Richtlinie 2014/30/EU überein. Eine oder mehrere in der zugehörigen EG-Baumusterprüfbescheinigung genannten Normen wurden bereits durch neue Ausgaben ersetzt. Der Hersteller erklärt für das Produkt auch die Übereinstimmung mit den neuen Normenausgaben, da die veränderten Anforderungen der neuen Normenausgaben für dieses Produkt nicht relevant sind.

The product complies with the directive 2014/30/EU. One or more norms mentioned in the respective EC type examination certificate were already replaced by new ones. The manufacturer declares that the product complies with the new valid norms, as the changed requirements mentioned there are not relevant for the product.

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Chemnitz, den 24.01.2023

Marco Neubert / Geschäftsführer

Ort und Datum der Ausstellung /

Name, Funktion und Unterschrift des Befugten /

Place and date of issue

Name, function and signature of authorized person

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