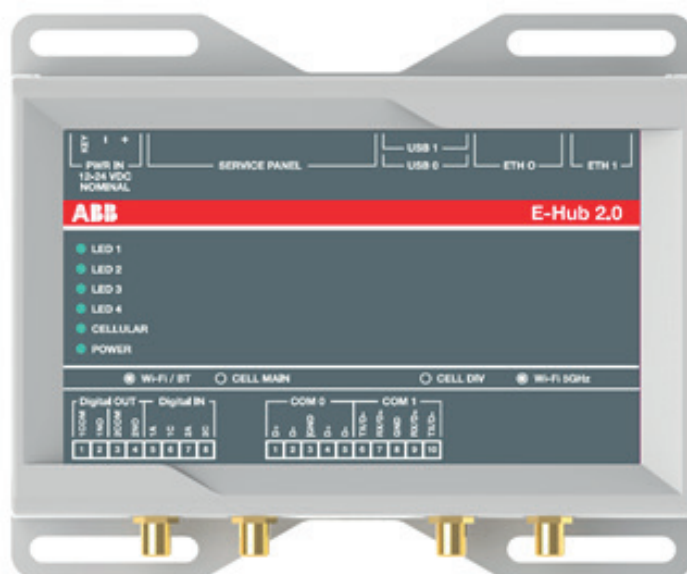# E-Hub 2.0

User manual

Trademarks

All trademarks, registered trademarks, logos, trade names, products names contained in this document are the property of their respective owners.

Intended Audience of this Document

This document is intended for system integrators: skilled persons with a thorough knowledge in linking together, physically or functionally, different computing systems and software applications to operate as a coordinated whole in compliance with the applicable regulations.

Revision History

Revision	Description	Date
0-1	Preliminary release	September 2019
0-2	Market release	January 2020

CONTENTS

INTRODUCTION

1 - Contents

Overview   This manual describes the characteristics of E-Hub 2.0.

Recipients   In accordance with standard IEC 60050, this manual is aimed at two user profiles:

- expert persons, in electric environment (IEV 195-04-01): persons with sufficient training and experience to enable them to perceive the risks and avoid the hazards potentially created by electricity
- persons trained in an electrical environment (IEV 195-04-02): persons suitably informed or supervised by electrical technicians to enable them to perceive the risks and avoid the hazards potentially created by electricity

> ⓘ **IMPORTANT: in this manual the tasks are specifically indicated that can be performed by trained persons in an electrical environment. All the remaining tasks described in the manual must be performed by trained persons in an electrical environment.**

ABB accepts no liability for damage to property or personal injury due to failure to comply with the instructions contained in this document.

2 - Safety

Safety Prescriptions

⚠	**HAZARD**
	ACCIDENTAL CONTACT WITH LIVE POINTS CAN CAUSE SHOCK, BURNS AND RESULT IN DEATH.
	Do not try to use the product in any way, before having read this instruction manual
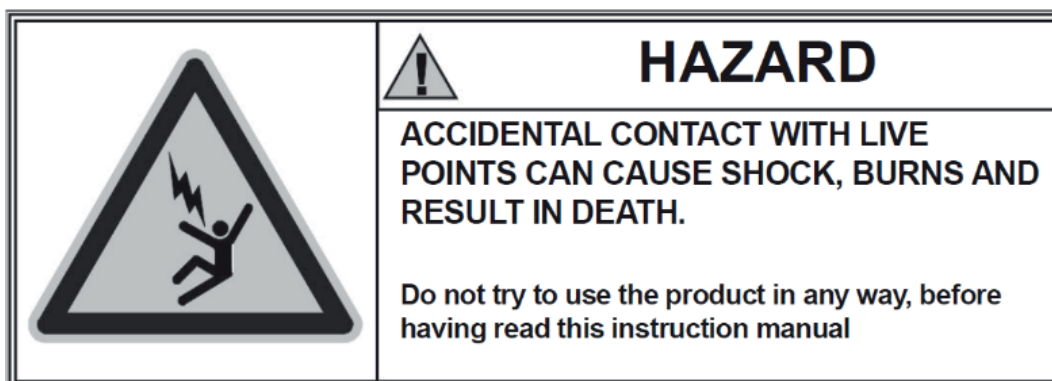
⚠ **HARZARD! ELECTRIC SHORK RISK! In the case of persons who are not authorized to work on pants carrying live voltage in accordance with local legislation, in order to avoid any potential electrical risk during assembly, installation, maintenance or removal of the E-Hub 2.0 from service, disconnect or lock out all electrical supplies.**

⚠ **WARNING!**

- Detailed descriptions of the standard installation, use and maintenance procedures and principles for operating in safety are not included: it is important to note that this document contains safety and caution indications against certain methods (of installation, use and maintenance) that could harm persons, damage devices or make them less safe.

- These warnings and alarms do not encompass all conceivable installation, use and maintenance methods recommended or not recommended by ABB that could be applied and possible consequences and complications of each conceivable method. Neither will ABB investigate all these methods.

- Anybody who used maintenance procedures or devices, recommended by ABB or not has to check thoroughly that neither personal safety nor safety devices are placed in danger by the installation method, use, maintenance or by the instruments used; for further information, explanations or specific problems contact the nearest ABB.

- This manual has been written only for qualified persons and is not to be intended as substitute for a suitable course or experience with the safety procedures for this device.

- For products provided with communication, the purchaser, the installer or the final customer are responsible for applying all the IT security measures to prevent risks arising from the connection to communications networks; these risks comprise amongst other things the use of the product by unauthorized persons, the alterations of its normal operation, access to and modification of information.

- The purchaser, the installer or the final customer and person responsible for ensuring that safety warnings and notices are displayed and also that all the access points and operating devices are safely locked when the switchgear is left unattended.

- All the information contained in this document is based on the latest information available at the moment of publication. We reserve the right to modify the document at any moment without prior notice.

Warnings

⚠ **WARNING! READ THE FOLLOWING MANUAL CAREFULLY BEFORE INSTALLING OR WORKING ON E-HUB 2.0**

- Keep this manual carefully with all the other available documents, including: Getting Started for first installation, electrical diagrams, drawings and any descriptive notes.
- Keep these documents available during the E-Hub 2.0 installation, operating and maintenance step to facilitate the following operations.
- Install the unit in compliance with the environmental, electrical and mechanical limits described in the product documentation.
- E-Hub 2.0 has been designed to operate with voltage and current values within the rated limits: do not install in systems that work at values exceeding these rated limits.
- Follow the safety procedures set by your company.
- Do not open lids or doors, do not work on devices before disconnecting all circuits and checking that they are disconnected with a measuring instrument.

3 - Cyber security

Disclaimer

It is the sole responsibility of the customer to provide and continuously ensure a secure connection between the product and the customer network or any other network. The customer is required to establish and maintain any appropriate measures (including but not limited to the installation of firewalls, application of authentication measures, encryption of data, installation of anti- virus programs, etc.) to protect the product, the network, its system and the interface against any kind of security breach, unauthorized access, interference, intrusion, leakage and/or theft of data or information. ABB and its affiliates are not liable for damage and/or losses related to such security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information.

TCP/IP based protocols and used IP ports

To set up an IP firewall the following table summarizes the IP ports used by the device.

Interface	Port	Type	Default state	Description
ETH0/Wi-Fi/Cellular	53	UDP	Closed/Outbound	DNS (Name resolution)
ETH0/Wi-Fi/Cellular	123	UDP	Closed/Outbound	SNTP (Time synchronization)
ETH0/Wi-Fi/Cellular	443	TCP	Closed/Outbound	HTTPS (Send data to cloud platform)
ETH1	22	TCP	Open/Inbound	SSH (ABB maintenance access)
ETH1	80	TCP	Open/Inbound	HTTP (Web server)
ETH1	443	TCP	Open/Inbound	HTTPS (Web server)
ETH1	53	UDP	Open/Inbound	DNS (Name resolution)
ETH1	67	UDP	Open/Inbound	DHCP (Dynamic IP)
ETH1	68	UDP	Open/Inbound	DHCP (Dynamic IP)
ETH1	69	UDP	Closed/Outbound	TFTP (Transfer configuration files)
ETH1	502	TCP	Open/Inbound	Modbus TCP (Device configuration)
ETH1	502	TCP	Closed/Outbound	Modbus TCP (Field devices communication)

4 - Warning Messages Used in this Document

Warning Messages for Harm to Persons

To indicate an imminently hazardous situation which, if not avoided, will result in death or serious injury, the following message is used:

DANGER!
Sign (if necessary)
TEXT THAT EXPLAINS THE HAZARD AND THE CONSEQUENCES OF NOT AVOIDING IT
Text that explains how to avoid this hazard

To indicate a potentially hazardous situation which, if not avoided, could result in death or serious injury, the following message is used:

WARNING!
Sign (if necessary)
TEXT THAT EXPLAINS THE HAZARD AND THE CONSEQUENCES OF NOT AVOIDING IT
Text that explains how to avoid this hazard

To indicate a potentially hazardous situation which, if not avoided, could result in minor or moderate injury, the following message is used:

CAUTION!
Sign (if necessary)
TEXT THAT EXPLAINS THE HAZARD AND THE CONSEQUENCES OF NOT AVOIDING IT
Text that explains how to avoid this hazard

Warning Messages for Damage to Property

To indicate potential risks of damage to the supported product (or to other property), the following message is used:

NOTICE
Sign (if necessary)
Text that explains how to avoid damaging the supported product (or other property)

5 - Warning: Power Supply Safety

⚠️ **WARNING!**

ELECTRIC SHOCK HAZARD

Failure to supply power correctly or to follow all operating instructions correctly, may create an electric shock hazard, which could result in personal injury or loss of life, and / or damage the equipment or other property.

To avoid injuries and safely supply power to the product, complete the following steps:

1. **Observe all the instructions for safety, installation, and operation**
2. **Make sure your hands are dry**
3. **Make sure that all the cables used:**
   - **Are in good condition before using them**
   - **Meet the product requirements and comply with the relevant standards and regulations**
4. **Position cables with care. Do not position cables in places where they may be trampled or compressed by objects placed on them**
5. **Make sure that the power-points and plugs are in good condition before using them**
6. **Do not overload the power-points and plugs**
7. **Make sure that the product maintains a proper grounding connection**
8. **Use a power supply that meets the product requirements and complies with the relevant standards and regulations.**
9. **Connect power after the installation of the system has been completed**
10. **Never connect or disconnect the cables with the system or the external apparatus switched ON.**

6 - Caution: Wireless Safety

The antennas used in the product have to be installed with care, to avoid any interference with other electronic devices and to guarantee a minimum distance from the body (20 cm). In case of this requirement cannot be satisfied, the system integrator has to assess the final product against the SAR regulation.

CONVENTIONS USED IN THIS DOCUMENT

1 - Conventions for Signal Names

Convention	Description
GND	Ground
#	Active low signal
+	Positive signal; Positive signal in differential pair
-	Negative signal; Negative signal in differential pair
3.3	3.3 V signal level
5	5 V signal level
NC	No Connection
Reserved	Use is reserved to ABB

2 - Conventions for Signal Types

Convention	Description
I	Signal is an input to the system
O	Signal is an output from the system
IO	Signal may be input or output
P	Power and Ground
A	Analog signal
NC	No Connection
Reserved	Use is reserved to ABB

PRODUCT OVERVIEW

1 - Product Description

The E-Hub 2.0 is a IoT Gateway designed to deliver LTE connectivity with 3G fallback to industrial and lightly rugged applications.

Based on the TI AM335x Cortex-A8 (Sitara) processor family, with 1GB of RAM, 8GB of eMMC, and two MicroSIM card holders, these gateways are low-power and suitable for demanding use cases.

These products feature a wide range of connections[1]: according to the versions they can integrate an internal LTE Cat 1 modem (EU/NA), Wi-Fi and two Fast Ethernet ports.
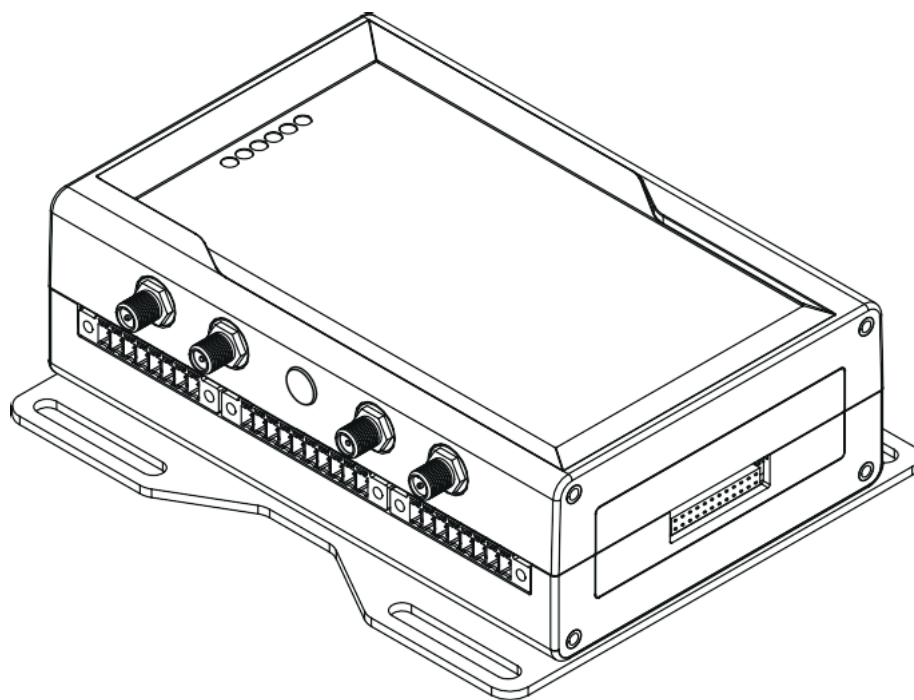
Fig. 1

[1] The features availability depends on the product versions

2 - Intended Use and Not Allowed Uses of the Product

The product is intended for professional use and must be installed by qualified personnel only.

The product must be installed in a secured location, accessible to authorized personnel only (for example in a cabinet / technical compartment).

Intended Use

The E-Hub 2.0 must:

- Be installed in a secured location, only accessible to authorized personnel (for example in a cabinet / technical compartment), and not exposed to atmospheric agents
- Be used indoors only
- Be used with appropriate interconnecting and power cables
- Be used with an external DC power supply source that:
    - Must meet the requirements stated on the identification label of the product
    - Must deliver a maximum current of 2 A
    - Must include an external 2 A fuse on the line coming from the negative terminal

3 - Technical Specifications

The E-Hub 2.0 family is available in the following versions:

- E-Hub 2.0 standard version
- E-Hub 2.0 with 3G Europe
- E-Hub 2.0 with 3G North America

The specifications are the following, according to the respective versions:
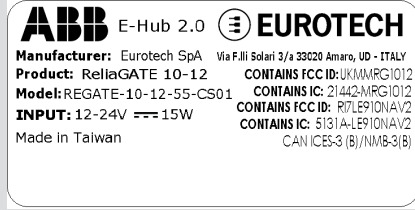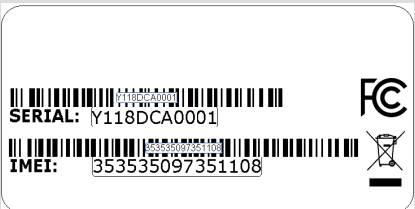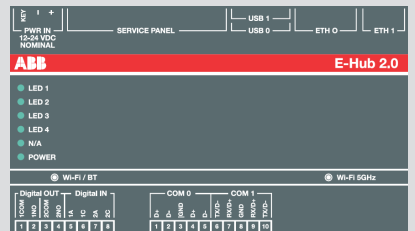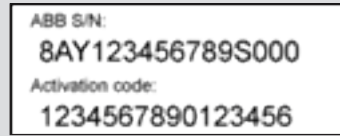
Specifications		Description According to Product Versions		
		E-Hub 2.0 std version	E-Hub 2.0 with 3G NA	E-Hub 2.0 with 3G EU
Processor		TI AM3352, 1 GHz, 1 Core		
Memory	RAM	1 GB, DDR3		
Storage	Embedded	8 GB eMMC		
Wired Interfaces	Ethernet	2x Fast Ethernet on RJ45 connectors		
	USB	3x Host 2.0 (noise and surge protected) on Type A connectors		
	Serial	1x RS-485: COM 0; Surge protected, Insulated 1x RS-232/485: COM 1; Surge protected, RS-485 termination and fail-safe resistors		
	Digital I/O (currently not supported)	2x Digital Input: 36 V, 1 kV Optoinsulate 2x Digital Output: 40 V AC/DC, 1 kV Optoinsulated, 500 mA, 1 kHz Max Switching		
	Expansion	Yes, for Side Expansion Modules		
Wireless Interfaces	Internal Cellular Modem	No	LTE Cat 1 (NA) 3G Fallback	LTE Cat 1 (EU) 3G Fallback
	Wi-Fi/Bluetooth	802.11a,b,g,n / BLE 4.2		
	Antennas (external)	2x RP-SMA Wi-Fi/Bluetooth	2x SMA Cellular 2x RP-SMA Wi-Fi/Bluetooth	

Specifications		Description According to Product Versions		
		E-Hub 2.0 std version	E-Hub 2.0 with 3G NA	E-Hub 2.0 with 3G EU
Other	RTC	Yes (backup supercap)		
	Watchdog	Yes (system level)		
	TPM	TPM 2.0		
	Sensors	Temperature (inside the product)		
	LEDs	1x Power 1x Cellular Connection 4x Customized Functions		
	Buttons	1x Reset 1x Programmable		
	SIM Card Holder	2x MicroSIM card holders (user accessible)		
Power	Input	Nominal: 12 or 24 VDC; Range: 9 to 30 VDC with transient protection		
	Consumption	4 W typical; 15 W maximum		
Environment	Operating Temperature	-40 to +70 °C[2]		
	Storage Temperature	-40 to +85 °C		
	Relative Humidity	5 to 95% (non-condensing) at +40°C		

(2) Software ensures that the system doesn't exceed the maximum operating temperature (+70 °C)

4 - Product Labels

The following labels are placed on the product:

Label example	Label type and content	Label position
ABB E-Hub 2.0 (F) EUROTECH Manufacturer: Eurotech SpA Via F.lli Solari 3/a 33020 Amaro, UD - ITALY Product: ReliaGATE 10-12 CONTAINS FCC ID: UKMMRG1012 Model: REGATE-10-12-55-CS01 CONTAINS IC: 21442-MRG1012 INPUT: 12-24V ⎓ 15W CONTAINS FCC ID: RI7LE910NAV2 CONTAINS IC: 5131A-LE910NAV2 Made in Taiwan CAN ICES-3 (B)/NMB-3(B)	**Part Number Label** ABB and Eurotech logo Manufacturer name Manufacturer address (EU versions only) Product number Model number (xx = product version) Power supply specifications* FCC information (US versions only) ISED information (NA versions only)	On the underside of the product
SERIAL: Y118DCA0001 IMEI: 353535097351108 FC	**Serial Number Label** Serial number MAC ID number IMEI number CE mark (EU versions only) FCC mark (EU versions only) WEEE symbol (EU versions only)	On the underside of the product
(Topside label: E-Hub 2.0, LED 1-4, N/A, POWER, Wi-Fi / BT, Wi-Fi 5GHz, Digital OUT, Digital IN, COM 0, COM 1)	**Topside Label** ABB logo ABB product name Interfaces name	On the top side of the product
ABB S/N: 8AY123456789S000 Activation code: 1234567890123456	**ABB Serial Number Label** ABB serial number Activation code	On the left side of the product

* the symbol ⎓ stands for direct current

NORMS AND CERTIFICATIONS

---

1 - CE Marking

Some versions of the product described in this document are CE marked; for more information see "Technical Specifications" on page 10.

ABB is not responsible for the use of this product together with equipment (for example: power supplies, personal computers, etc.) that are not CE marked and not compliant with the requirements specified in this document.

---

2 - Directive RED 2014/53/EU

Some versions of the product described in this document meet the requirements of the Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonization of the laws of the Member States relating to the making available on the market of radio equipment.

For more information see "Technical Specifications" on page 10.

Modification Statement   ABB has not approved any changes or modifications to this product by the user. Any changes or modifications could void the user's authority to operate the product.

---

3 - FCC Marking

Some versions of the product described in this document are FCC marked; for more information see "Technical Specifications" on page 10.

ABB is not responsible for the use of this product together with equipment (for example: power supplies, personal computers, etc.) that are not FCC marked and not compliant with the requirements specified in this document.

4 - FCC/ISED Regulatory Notices

Modification Statement

ABB has not approved any changes or modifications to this product by the user. Any changes or modifications could void the user's authority to operate the product.

ISED Canada Regulatory Notices

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.

2. This device must accept any interference, including interference that may cause undesired operation of the device.

This radio transmitter 21442-MRG1012 has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Antenna Types	Frequency Band	Antenna Gain
Cellular 50Ω Dipole	700 MHz	6.63 dBi
	850 MHz	6.63 dBi
	1700 MHz	6.00 dBi
	1900 MHz	8.51 dBi
Wi-Fi / Bluetooth 50Ω Dipole	2.5 GHz Wi-Fi 802.11a,b,g,n / BLE 4.2 BLE	5.47 dBi
	Bluetooth 5 GHz Wi-Fi 802.11a,b,g,n	7.07 dBi

The E-Hub 2.0 has been certified with the following antennas:

Antenna Types	Manufacturer and Model	Notes
Wi-Fi/Bluetooth 50Ω Dipole	Linx Technologies ANT-DB1-RAF-RPS Taoglas MA950.W.A.LBICG.005	Taoglas MA950.W.A.LBICG.005: Certified operation: 2.4GHz/5.8GHz MIMO_1 antenna is interfaced to
		2.4GHz WiFi/Bluetooth RP-SMA 2.4GHz/5.8GHz MIMO_2 antenna is interfaced to 5GHz WiFi RP-SMA Opération certifiée: L'antenne 2.4GHz/5.8GHz MIMO_1 est connectée au RP-SMA WiFi / Bluetooth à 2,4 GHz L'antenne 2.4GHz/5.8GHz MIMO_2 est connectée au RP-SMA WiFi 5 GHz
Cellular 50Ω Dipole	Taoglas GSA.8827.A.101111 Taoglas MA950.W.A.LBICG.005	Taoglas MA950.W.A.LBICG.005: Certified operation: LTE MIMO_1 antenna is interfaced to CELL MAIN
		SMA LTE MIMO_2 antenna is interfaced to CELL DIV
		SMA Opération certifiée: L'antenne LTE MIMO_1 est connectée au SMA
		CELL MAIN L'antenne LTE MIMO_2 est connectée au SMA
		CELL DIV

RF Radiation Exposure Statement

This product complies with FCC and ISED radiation exposure limits set forth for an uncontrolled environment. The antenna should be installed and operated with minimum distance of 20 cm between the radiator and your body.

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.

FCC Class B Digital Device Notice

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and

2. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation This product generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this product does cause harmful interference to radio or television reception, which can be determined by turning the product OFF and ON, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna

- Increase the separation between the product and the receiver

- Connect the product into an outlet on a circuit different from that to which the receiver is connected

- Consult the dealer or an experienced radio/TV technician for help

ISED Class B Ddigital Device Notice

ICES-003 Class B Notice - Avis NMB-003, Classe B.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Labeling Information

The following information is stated on the product labels:

- Contains FCC ID: RI7LE910NAV2

- Contains FCC ID: UKMMRG1012

- Contains IC ID: 5131A-LE910NAV2

- Contains IC ID: 21442-MRG1012

- CAN ICES-3 (B)/NMB-3(B)

5 - Restrictions on 5 GHz Wi-Fi Usage

Channel Number	Frequency (MHz)	Europe (ETSI)	North America (FCC)
36	5180	Indoor Usage Only	Indoor Usage Only
40	5200	Indoor Usage Only	Indoor Usage Only
44	5220	Indoor Usage Only	Indoor Usage Only
48	5240	Indoor Usage Only	Indoor Usage Only
52	5260	Not Supported	Not Supported
56	5280	Not Supported	Not Supported
60	5300	Not Supported	Not Supported
64	5320	Not Supported	Not Supported
100	5500	Not Supported	Not Supported
104	5520	Not Supported	Not Supported
108	5540	Not Supported	Not Supported
112	5560	Not Supported	Not Supported
116	5580	Not Supported	Not Supported
120	5600	Not Supported	Not Supported
124	5620	Not Supported	Not Supported
128	5640	Not Supported	Not Supported
132	5660	Not Supported	Not Supported
136	5680	Not Supported	Not Supported
140	5700	Not Supported	Not Supported
149	5745	Not Supported	Supported
153	5765	Not Supported	Supported
157	5785	Not Supported	Supported
161	5805	Not Supported	Supported
165	5825	Not Supported	Supported

EU Restrictions on 5 GHz Wi-Fi Usage

Due to EU restrictions on 5 GHz Wi-Fi bands the E-Hub 2.0 is limited to indoor operation and should only be operated in the frequency band 5150 MHz – 5250 MHz (U-NII-1) covering 20 MHz channels (36,40,44,48) and 40 MHz channels(38,46).

Dynamic Frequency selection (DFS) as master or slave is not supported by the E-Hub 2.0 .

FCC Restrictions on 5 GHz Wi-Fi Usage

Due to FCC restrictions on 5 GHz Wi-Fi bands the E-Hub 2.0 is limited to indoor operation within the frequency band 5150 MHz – 5250 MHz (U-NII-1) covering 20 MHz channels (36,40,44,48) and 40 MHz channels(38,46).

Dynamic Frequency selection (DFS) as master or slave is not supported by the E-Hub 2.0.

6 - Antennas List

The E-Hub 2.0 has been certified with the following antennas:

Antenna Types	Manufacturer and Part Number
Wi-Fi / Bluetooth	Linx Technologies ANT-DB1-RAF-RPS
	Taoglas MA950.W.A.LBICG.005
Cellular	Taoglas GSA.8827.A.101111
	Taoglas MA950.W.A.LBICG.005

NOTICE
Within the EU, antennas have to be used in compliance with the RED requirements. Within the US/Canada, antennas have to be used in compliance with the FCC/ISED requirements.

7 - RoHS 3 Compliance

The product, including all its components and its sub-assemblies, have been manufactured in compliance with the Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

8 - REACH Compliance

The product is certified according to the REACH Directive, taking in account Substances of Very High Concern (SVHC), as specified in the list published by ECHA (European Chemical Agency) at the time of the design.

9 - WEEE Compliance

In compliance with the Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE), the symbol on the right, shown on the product or within its literature, indicates separate collection for electrical and electronic equipment (EEE) that has been placed on the market after 2005.

The product, at the end of its life cycle, must be collected separately and managed in accordance with the provisions of the current Directive on waste of electrical and electronic equipment.
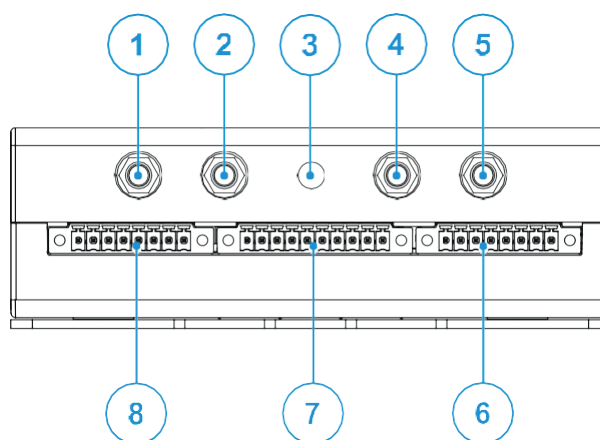
Because of the substances present in the product, improper disposal can cause damage to human health and to the environment.

To avoid any possible legal implications, contact your local waste collection body for full collect and recycling information.

INTERFACES OVERVIEW

1 - Front Side Interfaces Overview

The Front Side Interfaces are as follows:

Fig. 2 Front Side Interfaces Layout

Ref#	Description
1	Antenna connector for 2.4 GHz Wi-Fi / Bluetooth
2	Main antenna connector for Internal Cellular Modem: CELL MAIN (only for E-Hub 2.0 with 3G)
3	Reserved for factory optional Global Navigation Satellite System (GNSS)
4	Diversity antenna connector for Internal Cellular Modem: CELL DIV (only for E-Hub 2.0 with 3G)
5	Antenna connector for 5 GHz Wi-Fi
6	Not available
7	COM 0/1 connector
8	Digital I/Os connector

2 - Rear Side Interfaces Overview

The Rear Side Interfaces are as follows:
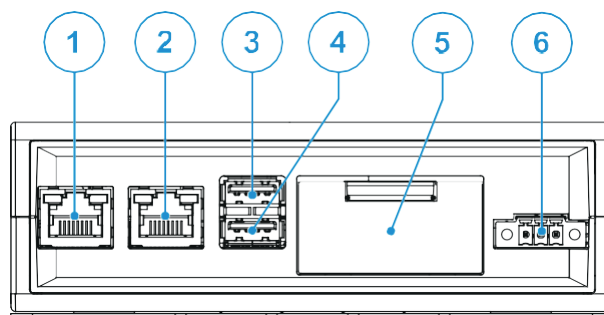
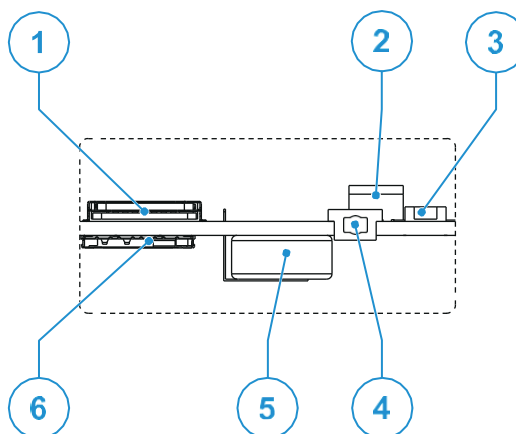**Fig. 3 Rear Side Interfaces Layout**

Ref#	Description
1	Ethernet ETH 1 connector
2	Ethernet ETH 0 connector
3	USB 0 connector
4	USB 1 connector
5	Service Panel
6	Power IN connector

3 - Service Panel Interfaces

The Interfaces available in the Service Panel are as follows:

Fig. 4 Service Interfaces layout

Ref#	Description
1	Combo MicroSD (push-pull) + MicroSIM (pull-lever) cards holder. The MicroSD card holder is disabled.
2	DIP-switch for serial ports configuration
3	Programmable pushbutton
4	Hardware reset pushbutton
5	RTC backup supercap (not removable)
6	MicroSIM card holder (push-pull)

4 - Right Side Interface Overview

The Right Side Interface is as follows:
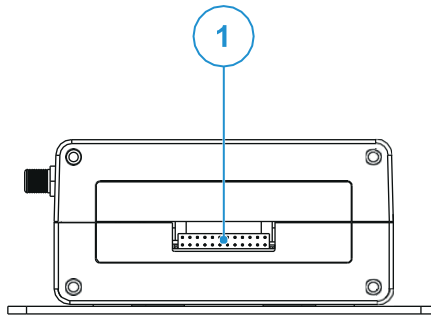
Fig. 5 Right Side Interfaces Layout

Ref#	Description
1	Expansion connector

5 - Left Side Interface Overview

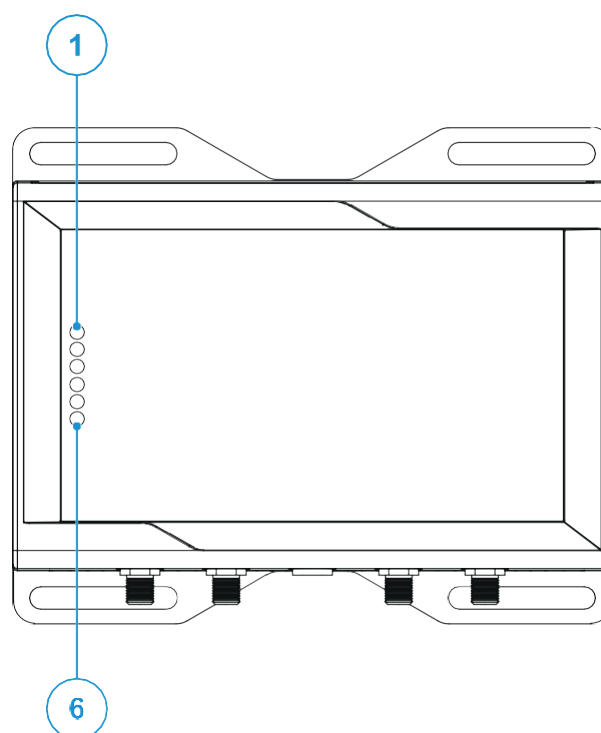The Left Side Interface is as follows:
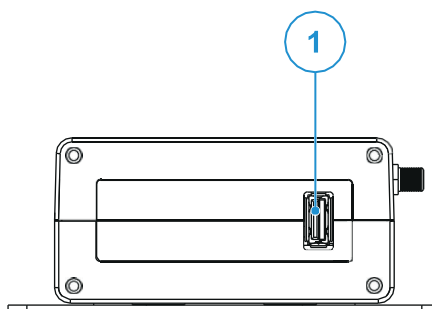
Fig. 6 Left Side Interface Layout

Ref#	Description
1	2.0 Host USB connector (ready to interface optional USB accessories)

6 - LED Indicators Overview

The LED Indicators are as follows:

Fig. 7 LED Indicators Layout

Ref#	Use and Status	Color
1	LED 1: Cloud Connection LED ON: Connection OK LED OFF: No connection after 3 attempts	Green
2	LED 2: Fieldbus Data Collection LED Blinking: Data collection in progress LED OFF: No data collection	Green
3	LED 3: FW Update LED ON: FW Update Error LED Blinking: Update in progress	Amber
4	LED 4: System Status LED OFF: System OK LED ON: Error LED Blinking fast: TFTP service ON LED Blinking slow: System recovery	Amber
5	N/A (E-Hub 2.0 std version) CELLULAR (E-Hub 2.0 with 3G) LED ON: Internal Cellular Modem ON LED Blinking: Internal Cellular Modem connected to cellular network	Green
6	POWER LED ON: Product powered by the external source LED OFF: Product not powered by the external source	Blue

INTERFACES IN DETAIL

1 - Wi-Fi and Bluetooth

The E-Hub 2.0 provides the following Wi-Fi / Bluetooth function:

2.5 GHz Wi-Fi 802.11a,b,g,n / BLE 4.2 BLE Bluetooth

5 GHz Wi-Fi 802.11a,b,g,n

The internal circuitry allows for 2.5 GHz Wi-Fi and Bluetooth coexistence. The antennas connectors are placed on the front side.

Wi-Fi Specifications

- Integrated 2.4 & 5G GHz Power Amplifier (PA) for WLAN solution
- WLAN Baseband Processor and RF transceiver Supporting IEEE Std 802.11a/b/g/n
- WLAN 2.4/5 GHz SISO (20/40 MHz channels)
- Baseband Processor
    - IEEE Std 802.11a/b/g/n data rates and IEEE Std 802.11n data rates with 20 or 40 MHz SISO
- Fully calibrated system. Production calibration not required
- Medium Access Controller (MAC)
    - Embedded ARM™ Central Processing Unit (CPU)
    - Hardware-Based Encryption/Decryption using 64-, 128-, and 256-Bit WEP, TKIP or AES Keys
    - Supports requirements for Wi-Fi Protected Access (WPA and WPA2.0) and IEEE Std
    - 802.11i (includes hardware-accelerated Advanced Encryption Standard (AES))
    - Designed to work with IEEE Std 802.1x
- IEEE Std 802.11d,e,h,i,k,r PICS compliant
- New advanced co-existence scheme with BT/BLE
- 2.4/5 GHz Radio
    - Internal LNA and PA
    - Supports: IEEE Std 802.11a, 802.11b, 802.11g and 802.11n
- Supports 4 bit SDIO host interface, including high speed (HS) and V3 modes.

2.4 GHZ TX Output Power

Maximum RMS output power measured at 1dB from IEEE spectral mask or EVM.

Parameter	Value
Operation frequency range	2412 to 2484 MHz
Output Power	17 dBm @ condition: 1 Mbps DSSS

5 GHZ TX Output Power

Maximum RMS output power measured at 1dB from IEEE spectral mask or EVM.

Parameter	Value
Operation frequency range	4910 to 5825MHz
Output Power	16.8 dBm @ condition: 6 Mbps OFDM

Bluetooth Specifications

- Supports Bluetooth 4.2
- Includes concurrent operation and built -in coexisting and prioritization handling of Bluetooth, BLE, audio processing and WLAN
- Dedicated Audio processor supporting on chip SBC encoding + A2DP:
  - Assisted A2DP (A3DP) support - SBC encoding implemented internally
  - Assisted WB-Speech (AWBS) support - modified SBC codec implemented internally

BLE Specifications

- Fully compliant with BT and BLE dual mode standard
- Support for all roles and role-combinations, mandatory as well as optional
- Supports up to 10 BLE connections
- Independent buffering for LE allows having large number of multiple connections without affecting BR/EDR performance

2 - Internal Cellular Modem (only for E-Hub 2.0 with 3G connectivity)

The E-Hub 2.0 supports the following Telit LE910 modem variants, according to product versions based on the geographic area of usage:

Version	Modem variant	Technology
E-Hub 2.0 with 3G NA	Telit LE910-NA1 - North America	LTE Cat 1 3G Fallback
E-Hub 2.0 with 3G EU	Telit LE910C1-EU - Europe	LTE Cat 1 3G Fallback

The antennas connectors are placed on the front side.

Internal Cellular Modem Specifications (According to Product Versions)

Product Features
- Rx Diversity and MIMO DL 2x2
- LTE FDD Cat.1, 3GPP compliant
- Built in UDP/TCP/FTP/SMTP stack

LTE Data
- Uplink up to 5 Mbps
- Downlink up to 10 Mbps

Supported RF Bands

TELIT LE910 variant	Technology	4G bands	3G bands	2G bands
LE910-NA1 - North America	LTE Cat 1 (NA) 3G Fallback	B2, B4, B5, B12/B13	B2, B5	-
LE910C1-EU - Europe	LTE Cat 1 3G Fallback	B1, B3, B7, B8, B20, B28A	B1, B3, B8	B3, B8

TX Output Power
Class 3 (0.2W, 23 dBm) @ LTE

LTE - Single Antenna Operation Notes

Single LTE antenna operation can be supported; however, typically, wireless carriers (Mobile Network Operators) impose restrictions. Please consult with your carrier before considering single LTE antenna usage.

For optimum performance of the cellular interface, ABB recommends the use of both CELL MAIN and CELL DIV antenna connectors.

Main Antenna Requirements

Telit LE910C1-EU - Europe Version

Feature	Value
Frequency range	Depending by the frequency band(s) provided by the network operator
Bands	See "Supported RF Bands" on the previous page
Impedance	50 Ohm
Input power	33 dBm(2 W) peak power in GSM 24 dBm average power in WCDMA & LTE
VSWR absolute max	$\leq$ 10:1
VSWR recommended	$\leq$ 2:1

Telit LE910-NA1 - North America version

Feature	Value
Frequency range	Depending by the frequency band(s) provided by the network operator
Bands	See "Supported RF bands" on the previous page
Impedance	50 Ohm
Input power	> 24dBm Average power
VSWR absolute max	$\leq$ 10:1
VSWR recommended	$\leq$ 2:1

Second Antenna Requirements (for Antenna Diversity)

Telit LE910-NA1 - North America Version

Feature	Value
Frequency range	Depending by the frequency band(s) provided by the network operator
Impedance	50 Ohm
VSWR recommended	$\leq$ 2:1

Telit LE910C1-EU - Europe Version

Feature	Value
Frequency range	Depending by the frequency band(s) provided by the network operator
Impedance	50 Ohm
VSWR recommended	$\leq$ 2:1

The MicroSIM Card Holders

The E-Hub 2.0 includes the following MicroSIM card holders:

- 1st MicroSIM card holder:
    - Integrated in a Combo MicroSD (push-pull) + MicroSIM (pull-lever) cards holder
    - Placed on the top side of the circuit board in the Service Panel
- 2nd MicroSIM card holder:
    - Push-pull card holder
   - Placed on the bottom side of the circuit board in the Service Panel

Only the 1st MicroSIM card holder must be used for cellular connectivity.

How to Insert / Remove the MicroSIM Card

If you are using the holder on the top side of the circuit board

To insert the MicroSIM card, complete the following steps:

1. Orient the MicroSIM card with the contacts facing the circuit board and the cut corner - highlighted with the letter **A** - facing the holder
2. Push the MicroSIM card in the holder
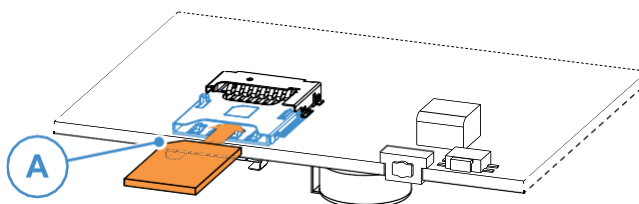
Fig. 8

To remove the MicroSIM card, pull the eject lever: use a pen tip to simplify the operation:
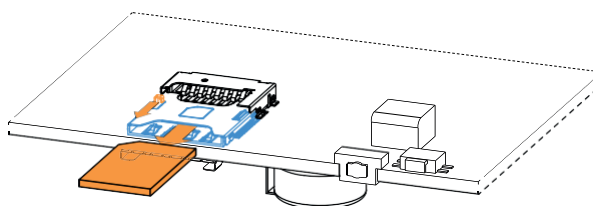
Fig. 9

3 - COM Ports

The E-Hub 2.0 provides the following COM ports:

- 1x RS-485: COM 0; Surge protected, Insulated, Half Duplex
- 1x RS-232/485: COM 1; Surge protected, RS-485 termination and fail-safe resistors (Default: RS-232)

COM ports specifications:

- The COM ports are surge protected
- Maximum supported baud rates are:
  - For RS-232 mode: up to 450 kbps
  - For RS-485 mode: up to 1.75 Mbps

The COM connectors are available on the front side.

Note for Termination Resistors for COM 1 in RS-485 Mode

COM 1 has 2 pairs of pins (each signal is doubled):

- If the E-Hub 2.0 is located at the beginning, or at the end, of a RS-485 chain, spare pair of pins can be used to connect permanently standard axial resistor 120 Ohm, if the application requires that
- If the E-Hub 2.0 is not at the beginning or at end of the RS-485 chain, two options are available:
  - Option 1: one pair of pins can remain not connected
  - Option 2: one pair of pins can be used to connect the previous device of the chain, and the other pair can be used to connect the following device of the chain

---

Note for Fail-Safe Resistors for COM 0 in RS-485 Mode

Fail-safe resistors (1.21 kΩ) are already inserted by default, and cannot be removed by the user.

Note for Fail-Safe Resistors for COM 1 in RS-485 Mode

To insert the RS-485 fail-safe resistors, use the DIP switch available in the Service Panel.

Switches meaning

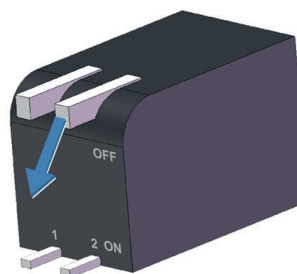Default DIP switch configuration is OFF; this means no resistors inserted.

Fig. 10

SW #	Signal	Description
1	RS232_RX/485_D+ Line	ON: 4.7 kΩ pull-up resistor inserted on COM 1
2	RS232_TX/485_D- Line	ON: 4.7 kΩ pull-down resistor inserted on COM 1

COM Connector Specifications

Connector Layout:

Connector Pinout:

Pin #	Signal	Type	Description
1	COM 0: D+	O	COM port 0: RS-485: A (D+ Line)
2	COM 0: D-	O	COM port 0: RS-485: B (D- Line)
3	COM 0: IGND	P	Ground (isolated)
4	COM 0: D+	I	COM port 0: RS-485: A (D+ Line)
5	COM 0: D-	I	COM port 0: RS-485: B (D- Line)
6	COM 1: TX/D-	O	COM port 1: RS-232: TX RS-485: B (D- Line)
7	COM 1: RX/D+	I	COM port 1: RS-232: RX RS-485: A (D+ Line)
8	COM 1: GND	P	Ground (not isolated)
9	COM 1: RX/D+	I	COM port 1: RS-232: RX RS-485: A (D+ Line)
10	COM 1: TX/D-	O	COM port 1: RS-232: TX RS-485: B (D- Line)

Connector Specifications:

- Base strip, Header
- Gender: Male
- Type: 10-pin, 3.5 mm pitch

Mating Connector Specifications:

- Pluggable screw terminal block;
- Gender: Female
- Type: 10-pin, 3.5 mm pitch
- Example:
  Manufacturer: Shenzhen Connection Electronics Co., Ltd.
  Part Number: MC 1,5/10-STF-3,5 - 1847204 (or equivalent)

4 - Ethernet Ports

The E-Hub 2.0 provides 2x 10/100 Mbps Ethernet ports:

- ETH 0
- ETH 1

The Ethernet connectors are available on the rear side.

Ethernet Specifications

Feature	Description
Network Standard	IEEE 802.3u 10/100-BaseTX. IEEE 802.3x full-duplex flow control.
Speeds	10/100-BaseTX interfaces with MAC
Notes	The interfaces are noise and surge protected. The RJ-45 connector has integrated magnetics.

ETH 0/1 Connectors Specifications

Connector Layout:
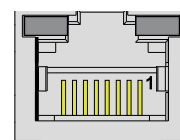
Connector Pinout (pins not listed are not connected):

Pin #	Signal	Type	Description
1	TX+	O	Transmit Data +
2	TX-	O	Transmit Data -
3	RX+	I	Receive Data +
6	RX-	I	Receive Data -

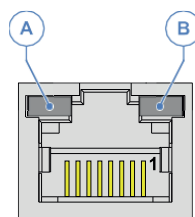**Connector Specifications:**

- RJ-45 socket
- Gender: Female

Mating Connector Specifications:

- RJ-45 plug
- Gender: Male

Connector LEDs Layout:

LEDs Meaning:

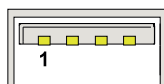| Ref #	LED Color	LED Meaning
A	Yellow	Activity
B	Green	Link

5 - Host USB Ports

The E-Hub 2.0 provides 3x Host 2.0 USB ports (Noise and Surge Protected) for general purpose applications:

- USB 0 on the rear side; max load: 500 mA

- USB 1 on the rear side; max load: 500 mA

- USB 2 on the left side; max load: 1000 mA (ready to interface optional USB accessories).

USB 0/1 Connectors Specifications

Connector Layout:

Connector Pinout:

Pin #	Signal	Type	Description
1	V+	P	+5V
2	D-	IO	Negative data
3	D+	IO	Positive data
4	GND	P	Ground

Connector Specifications:

- USB Type-A socket

- Gender: Female

Mating Connector Specifications:

- USB Type-A plug

- Gender: Male

USB 2 Connector Specifications
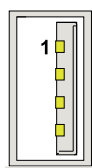
Connector Layout:

Connector Pinout:

Pin #	Signal	Type	Description
1	V+	P	+5V
2	D-	IO	Negative data
3	D+	IO	Positive data
4	GND	P	Ground

Connector Specifications:

- USB Type-A socket

- Gender: Female

Mating Connector Specifications:

- USB Type-A plug

- Gender: Male

6 - Expansion Connector

The E-Hub 2.0 provides, on the right side, an expansion connector with the following interfaces:

- I/O additional Module

- LoRa additional module

7 - The Programmable Pushbutton

The E-Hub 2.0 provides a pushbutton in the Service Panel.

If the pushbutton is pressed for 4 seconds the TFTP service will be enabled (mandatory during the provisioning) and the LED 4 will blink.

If the pushbutton is pressed for 30 seconds the unit will be reset to the initial factory configuration ! Please pay attention all the configuration data will be lost !
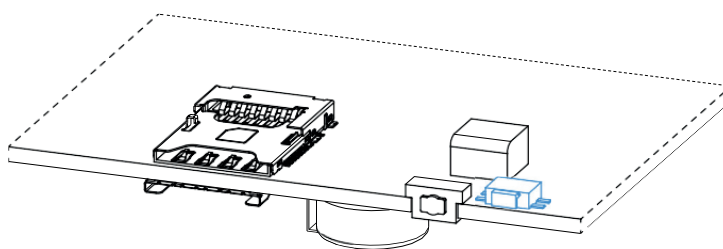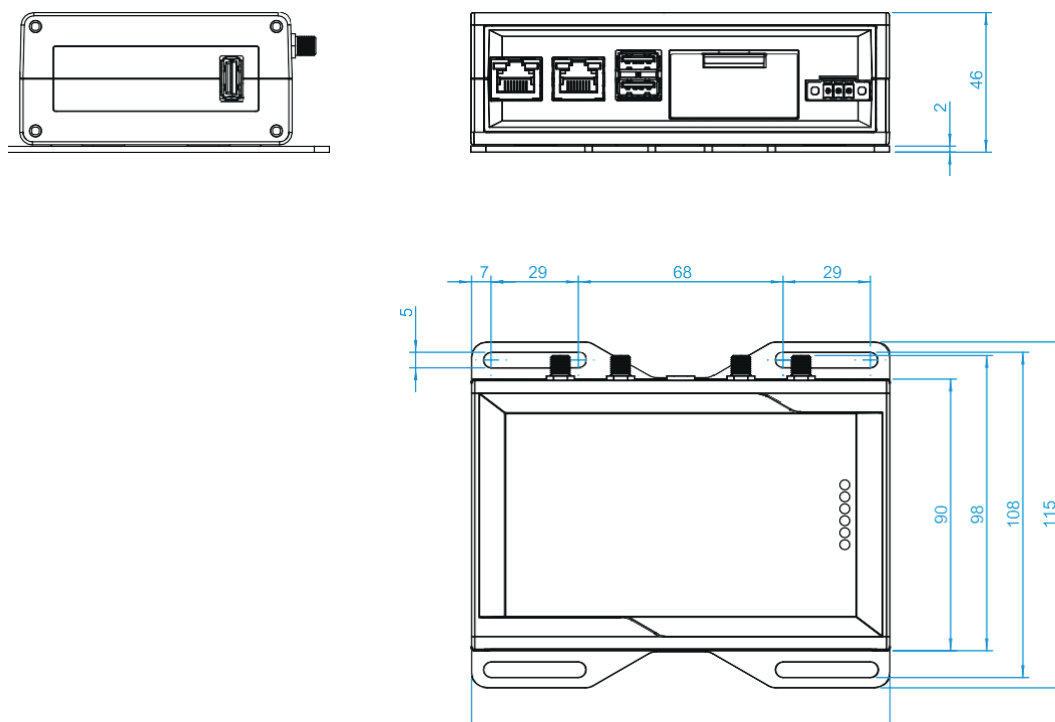

Fig. 11

MECHANICAL SPECIFICATIONS

1 - Product Mechanical Dimensions

The product electronics are housed in an ABS enclosure having the following dimensions: 139 (L) x 115 (W) x 46 (H); mm - Antennas Connectors and Mounting Bracket included.
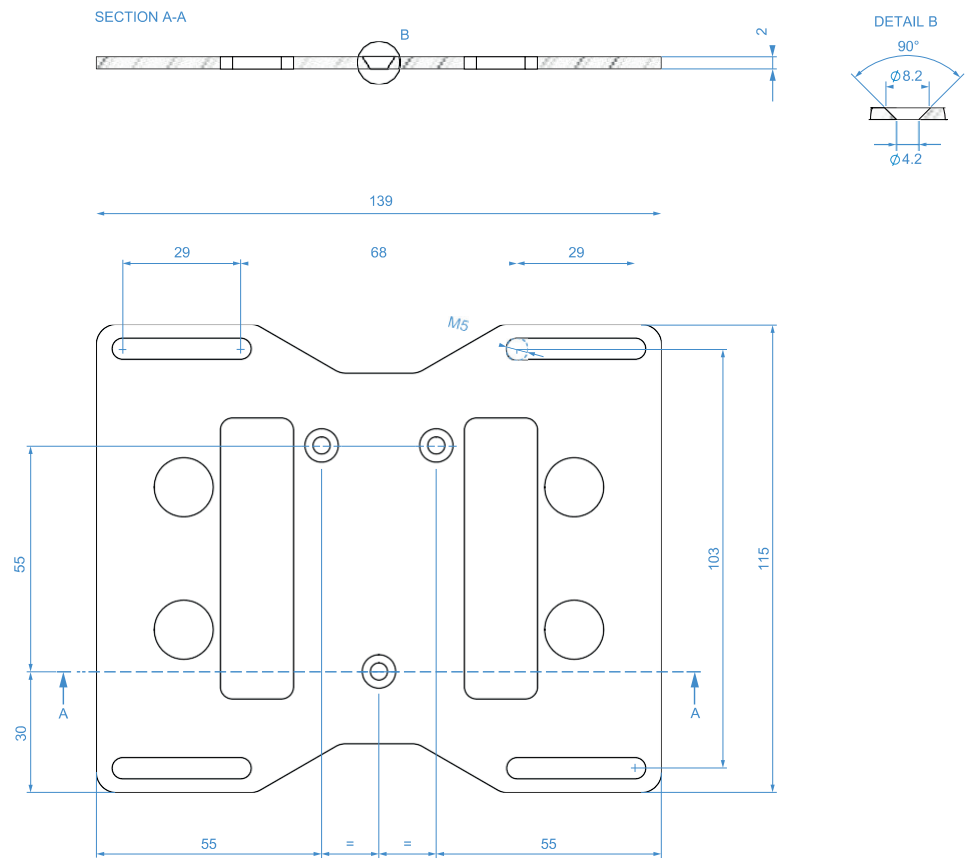
All dimensions are in millimeters.

Fig. 12

2 - Mounting Bracket Mechanical Dimensions

The Mounting Bracket fastened on the bottom side of the E-Hub 2.0 has the following dimensions.

All dimensions are in millimeters.

Fig. 13

HOW TO INSTALL THE PRODUCT

The product is intended for professional use and must be installed by qualified personnel only.

The product must be installed in a secured location, accessible to authorized personnel only (for example in a cabinet / technical compartment).

By default, the E-Hub 2.0 comes with a DIN rail mounting clip fastened on the bottom side. You can use this to install the E-Hub 2.0.

Optionally, you can replace the DIN Rail Mounting Clip with the Mounting bracket (optionally available).
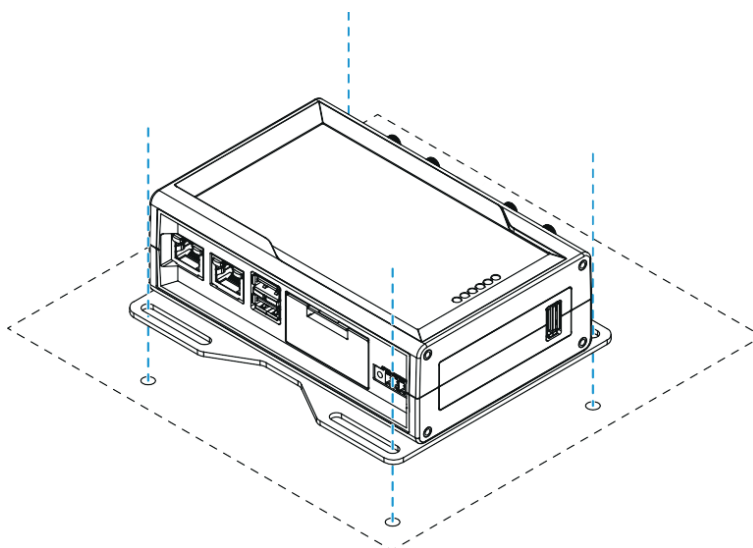
See also:

- "How to Install the Product Using the Mounting Bracket" below
- "How to Replace the Mounting Bracket with the DIN Rail Mounting Clip or Vice Versa" on page 37
- "How to Install/Remove the Product on/from a DIN Rail" on page 40

1 - How to Install the Product Using the Mounting Bracket

To install the product in place, complete the following steps:

1. See "Mechanical Specifications" on page 34
2. Use the 4 slots available on the Mounting Bracket
3. Add all the necessary mounting hardware to safely fasten the E-Hub 2.0 in place according to your installation requirements (for example use 4 x M5 screws, with a minimum length of 15 mm). **Material, type, and length of the screws, and the maximum torque applicable, depend on your installation requirements.**

The Mounting Bracket is made of 2 mm aluminum alloy 6061 T6.

Fig. 14

2 - How to Replace the Mounting Bracket with the DIN Rail Mounting Clip or Vice Versa

How to Replace the Mounting Bracket with the DIN Rail Mounting Clip

To replace the Mounting Bracket with the DIN Rail Mounting Clip on the product, complete the following steps:

1. Remove the 3 screws that hold the Mounting Bracket in place

2. Remove the Mounting Bracket and the 3 spacers (H = 4mm; Ext. diam. = 14mm; Int. diam. = 7mm)

3. Place the DIN Rail Mounting Clip

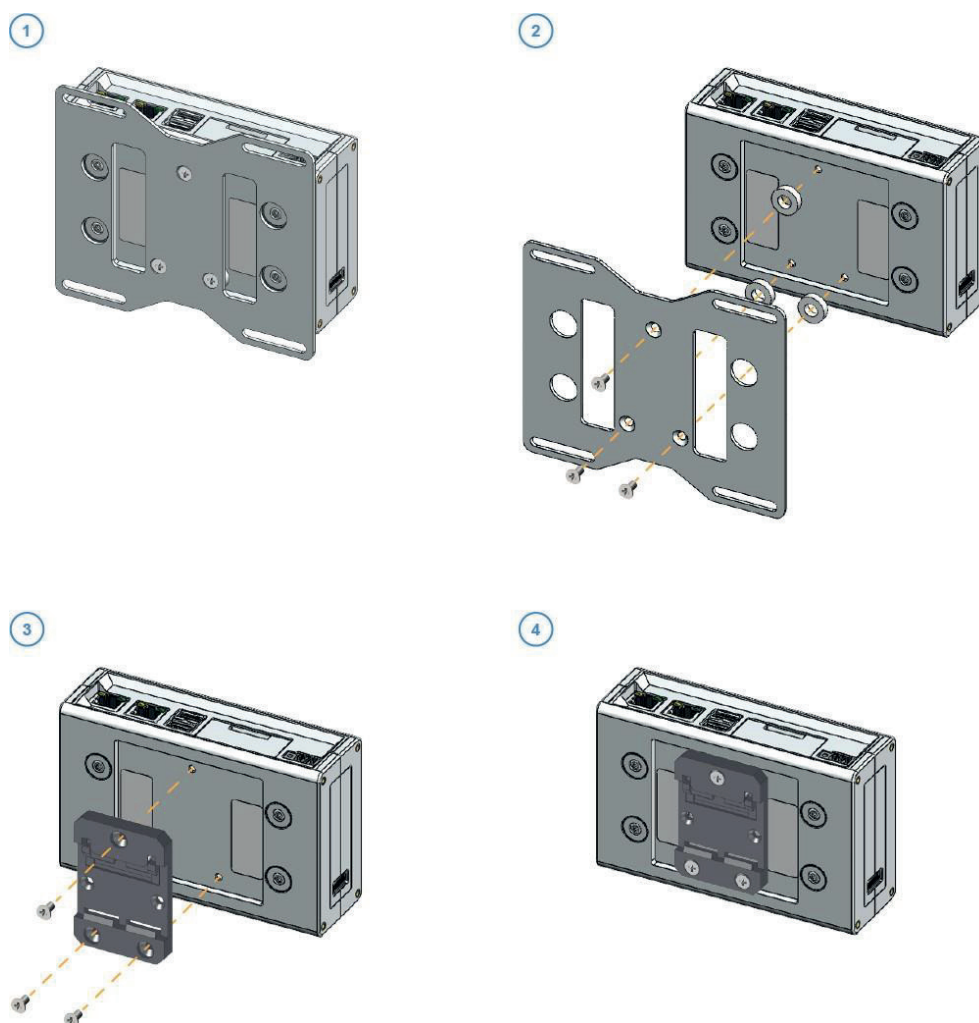4. Tighten the 3 screws removed at step 1 by applying a torque of 0.7 Nm

Fig. 15

How to Replace the DIN Rail Mounting Clip with the Mounting Bracket

To replace the DIN Rail Mounting Clip with the Mounting Bracket on the product, complete the following steps:

1. Remove the 3 screws that hold the DIN Rail Mounting Clip in place

2. Remove the DIN Rail Mounting Clip

3. Place the 3 spacers (H = 4mm; Ext. diam. = 14mm; Int. diam. = 7mm) and the Mounting Bracket

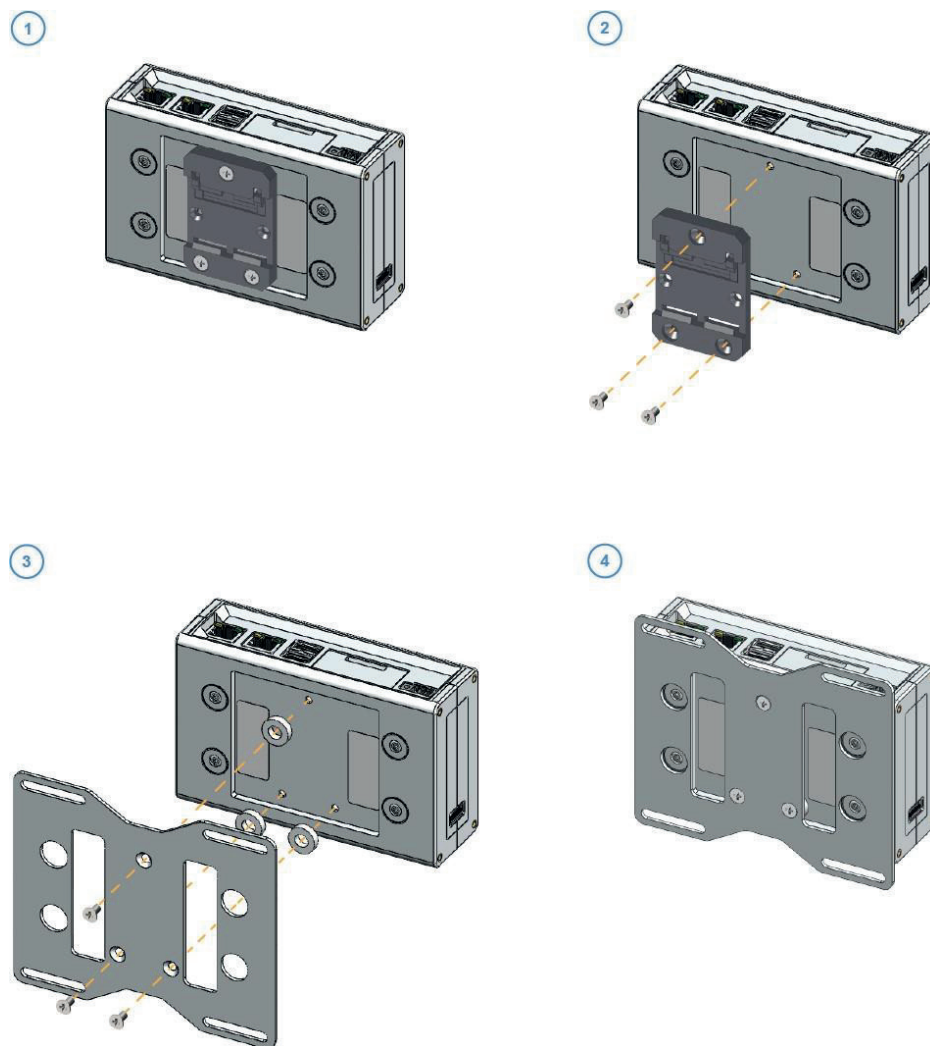4. Tighten the 3 screws removed at step 1 by applying a torque of 0.7 Nm

Fig. 16

Which Screws are Used with the Mounting Bracket or with the DIN Rail Mounting Clip

The 3 screws that hold in place the Mounting Bracket or the DIN Rail Mounting Clip have the following features:

- Phillips type H cross flat countersunk head screw KA35x12
- Fully threaded
- Stainless steel
- Example of Manufacturer and Part Number: Bossard BN 13580 2000997
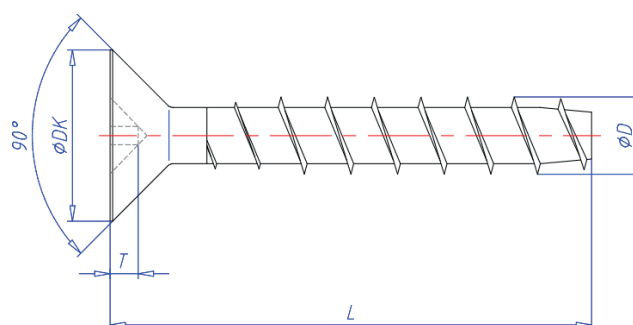
Fig. 17

Reference	Value (mm)
ΦDK	7.3
T	1.3
L	12
ΦD	3.5

3 - How to Install/Remove the Product on/from a DIN Rail

How to Install the Product on a DIN Rail

Prerequisite: Replace the Mounting Bracket with the DIN Rail Mounting Clip To install the product on a horizontal DIN rail, complete the following steps:

1. Hook the upper mobile latches of the DIN Rail Mounting Clip on the upper edge of the DIN rail

2. Push the product against the DIN rail. The lower latches of the DIN Rail Mounting Kit are locked on the DIN rail.
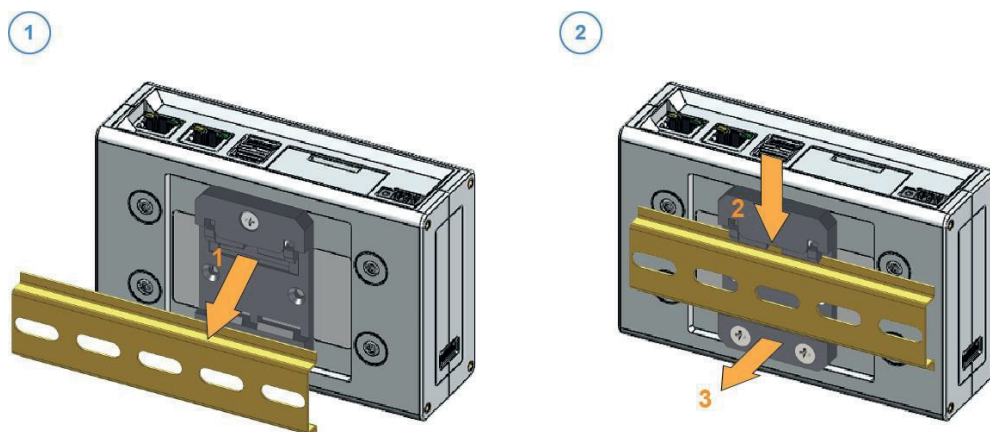

Fig. 18

How to Remove the Product from a DIN Rail

To remove the product from a horizontal DIN rail, complete the following steps:

1. Push downwards the upper mobile latches of the DIN Rail Mounting Clip. The lower latches are released from the DIN rail
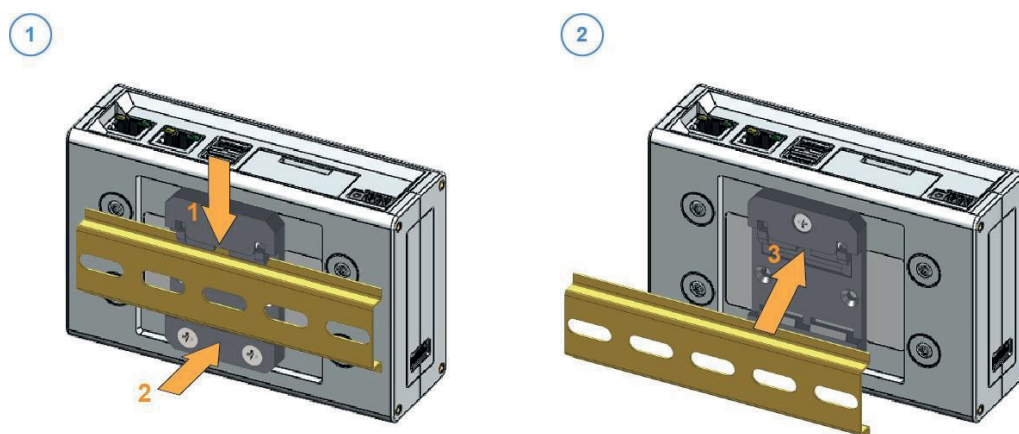
2. Pull the product out

Fig. 19

HOW TO SUPPLY POWER TO THE PRODUCT

This product is not provided with any ON/OFF switch.

The Power IN connector is the disconnecting means from the power supply network.

1 - Power Supply Specifications

Power supply	Nominal: 12 or 24 VDC; Range: 9 to 30 VDC with transient protection
Power consumption	4 W typical; 15 W maximum
Peak demand	< 15 W

Power IN Connector and Mating Connector Specifications

The power input is protected against: surge, noise, reverse polarity, over-voltage.

NOTICE
The Power IN connector is NOT protected against short circuit.
Always include an external fuse to protect the product!

The E-Hub 2.0 provides the Power IN connector on the rear side.

Connector Layout:

Connector Pinout:

Pin #	Signal	Type	Description
1	Power IN +	P	Positive power supply input
2	Power IN -	P	Negative power supply input
3	NC	NC	Not Connected

Connector Specifications:
- Base strip, Header
- Gender: Male
- Type: 3-pin, 3.5 mm pitch

Mating Connector Specifications:
- Pluggable screw terminal block
- Gender: Female
- Type: 3-pin, 3.5 mm pitch
- Example:
    - Manufacturer: Phoenix Contact
    - Part Number: MC 1,5/ 3-STF-3,5 - 1847068
    - (or equivalent)

2 - How to Supply Power and Turn ON the Product

⚠️ **WARNING!**

ELECTRIC SHOCK HAZARD

Failure to supply power correctly or to follow all operating instructions correctly, may create an electric shock hazard, which could result in personal injury or loss of life, and / or damage the equipment or other property.

To avoid injuries and safely supply power to the product, complete the following steps:

1. **Observe all the instructions for safety, installation, and operation**
2. **Make sure your hands are dry**
3. **Make sure that all the cables used:**
   - **Are in good condition before using them**
   - **Meet the product requirements and comply with the relevant standards and regulations**
4. **Position cables with care. Do not position cables in places where they may be trampled or compressed by objects placed on them**
5. **Make sure that the power-points and plugs are in good condition before using them**
6. **Do not overload the power-points and plugs**
7. **Make sure that the product maintains a proper grounding connection**
8. **Use a power supply that meets the product requirements and complies with the relevant standards and regulations. In case of uncertainties, contact the ABB Technical Support Team (for more information see "How to Receive Technical Assistance")**
9. **Connect power after the installation of the system has been completed**
10. **Never connect or disconnect the cables with the system or the external apparatus switched ON.**

To supply power and turn ON the E-Hub 2.0, complete the following steps:

1. Setup a DC power source that:
   - Meets the E-Hub 2.0 power requirements
   - Deliver a maximum current of 2 A
2. Check the input voltage as close as possible to the Power IN connector. This is to compensate for any cable losses, caused by cable length and other cable characteristics
3. Make sure that the DC power source is turned OFF
4. Setup an external 2 A fuse on the line coming from the negative terminal of the DC power source
5. Connect the DC power source terminals ("Power IN +" and "Power IN -") to Pins 1 and 2 of the Power IN connector:
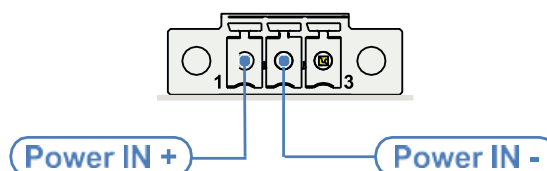

Fig. 20

3 - How to Trigger a Hardware Reset of the Product

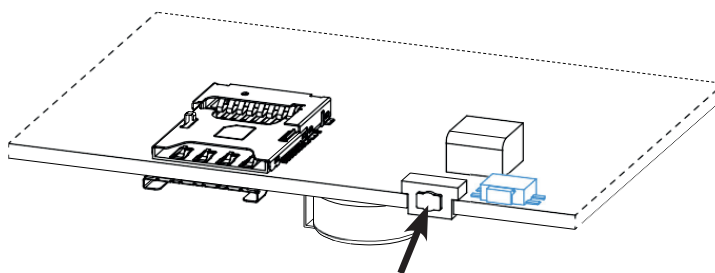To trigger a hardware reset of the E-Hub 2.0, push the reset pushbutton available in the Service Panel.

Fig. 21

HOW TO MAINTAIN THE PRODUCT

Periodically inspect the product to verify its integrity and to ensure proper operation. To maintain the product, complete the following steps:

1. Carefully read and understand the instructions contained in the section "Safety Instructions" on page 9
2. Safely remove the power supply
3. Verify the installation of the product
4. Clean the product

1 - How to Safely Remove the Power Supply

⚠️ **WARNING!**

ELECTRIC SHOCK HAZARD

Failure to remove power correctly may create an electric shock hazard, which could result in personal injury or loss of life, and / or damage the equipment or other property.

To avoid injuries and safely remove power supply from the product, complete the following steps:

1. **Make sure your hands are dry**
2. **Turn OFF all the power supply sources**
3. **Disconnect all the cables**
4. **Make sure that all the circuits are discharged.**

2 - How to Verify the Installation of the Product

To verify the installation of the product, complete the following steps:

1. Verify that the product is clean and not damaged
2. Verify that the LED indicators are visible and not damaged
3. Verify that all the locking parts (for example: screws, bolts, nuts) are correctly fastened
4. Verify that the product is installed correctly.

3 - How to Clean the Product

To clean the product, complete the following steps:

1. Never use detergents, aerosol sprays, solvents or abrasive sponges
2. To remove dust from the case of the product, use a dry, lint-free, cloth
3. To remove the dirt, use water-based, non-flammable, cleaner products.

BASIC CONFIGURATION VIA EKIP CONNECT 3

1 - Connect E-Hub 2.0

Warnings Do not incorrectly configure the software, as this can lead to inaccurate data results. Be sure that you laptop is connected directly to ETH1 of the E-Hub 2.0.

Connect E-Hub 2.0
- Please use **Ekip Connect 3** to connect E-Hub 2.0
- **Configure** ethernet settings

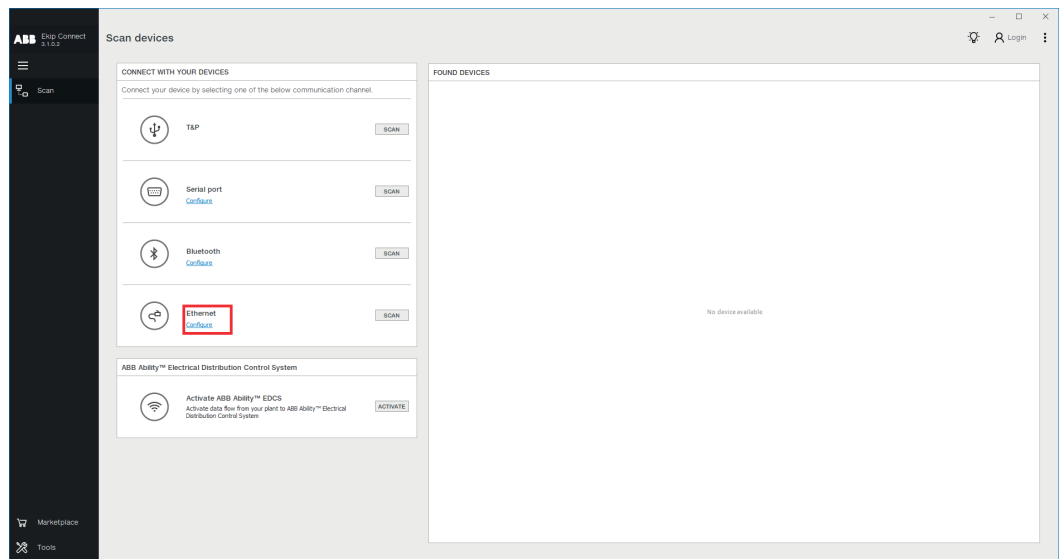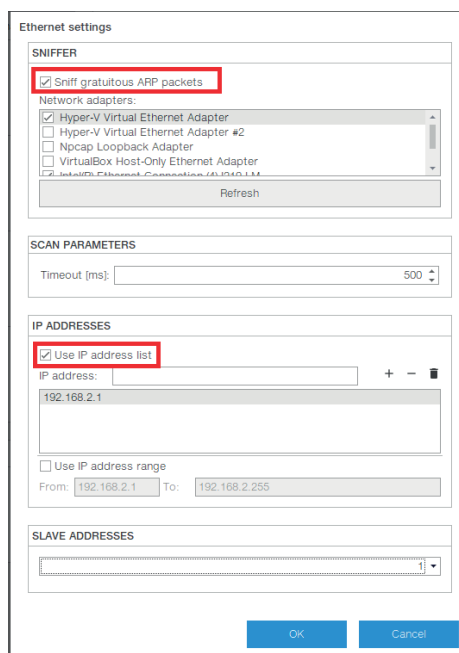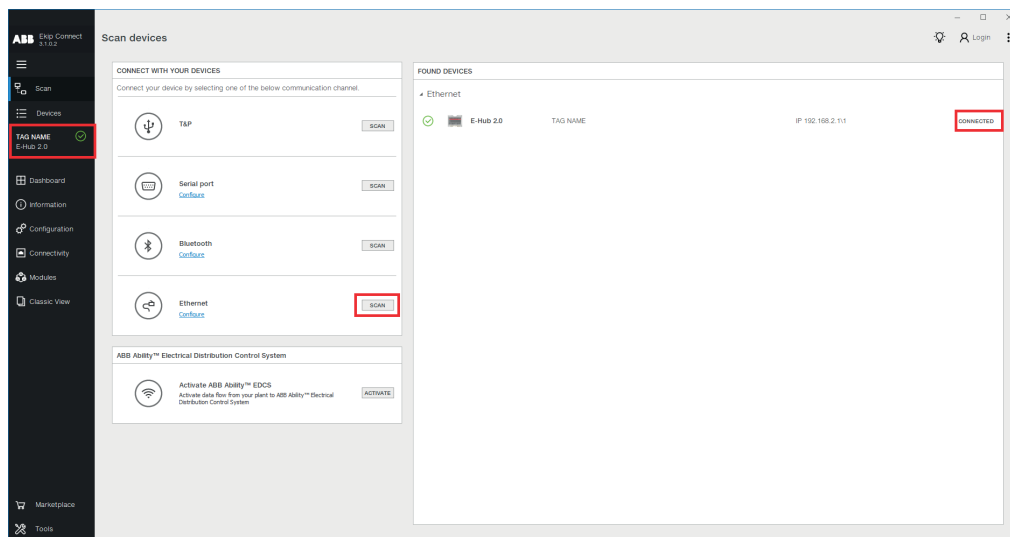Add to the IP addresses list the following value: 192.168.2.1

Fig. 22

Fig. 23
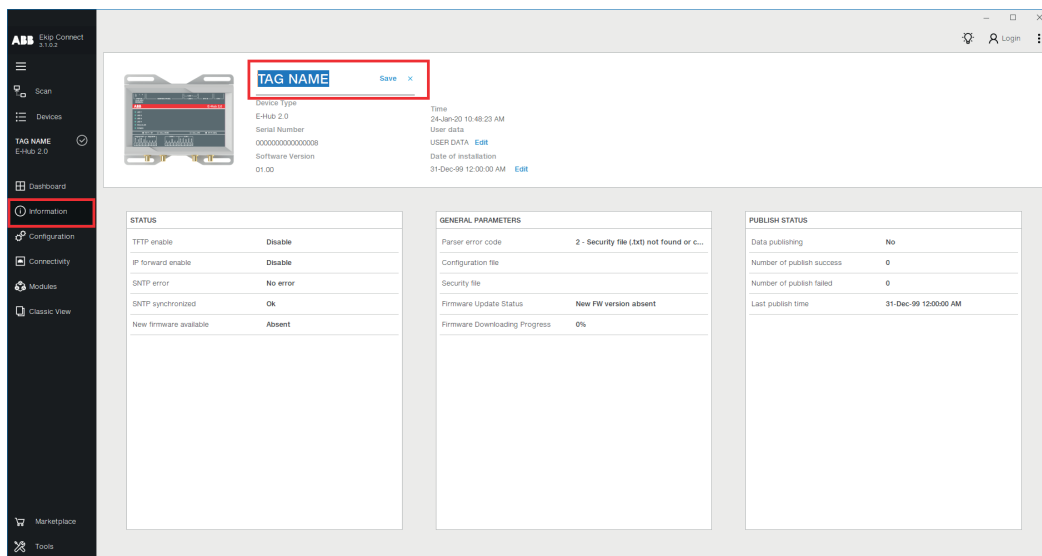
- **Scan** and **connect** E-Hub 2.0

Fig. 24

2 - General Settings

Basic setting

Click **Information** to enter the page of configure. Configure device's name, time and date of installation according to the actual situation.

Fig. 25

SNTP Settings

The **SNTP Settings** allows users to set time zone and SNTP for time synchronization.

- Click **Configuration** to enter the page of configure.
- Click **SNTP** box and select the appropriate **Time zone** in the drop-down list. Input a valid SNTP server address, then switch on **SNTP client enable**, E-Hub 2.0 will sync time with SNTP server.
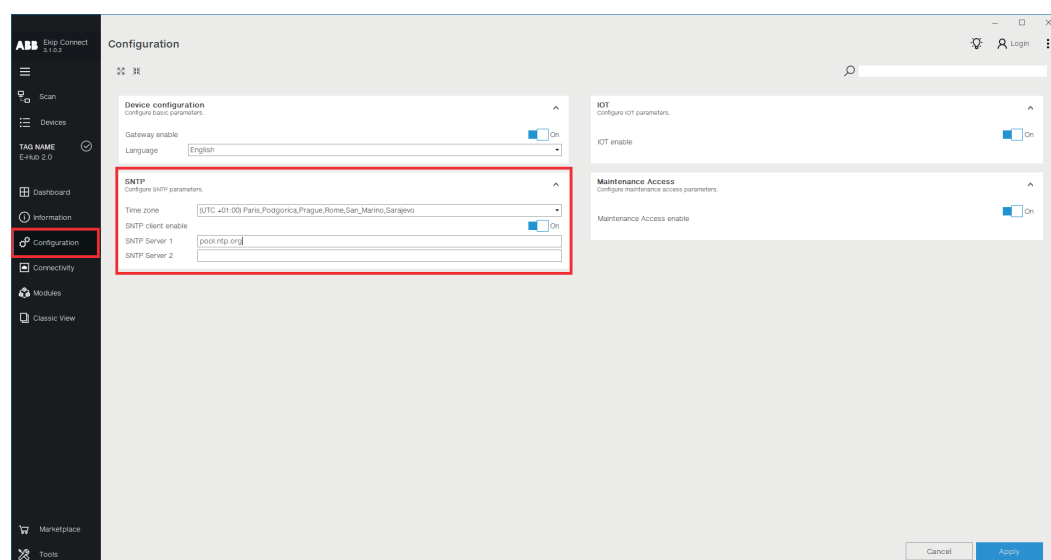

Fig. 26

Gateway enable

The **Gateway enable setting** allows user to access E-Hub 2.0's RTU devices.

- Click **Configuration** to enter the page of configure.
- Click **Device configuration** and switch on/off to enable/disable access RTU devices.
- Click "**Apply**" and **reboot** the E-Hub 2.0 to make setting validated.
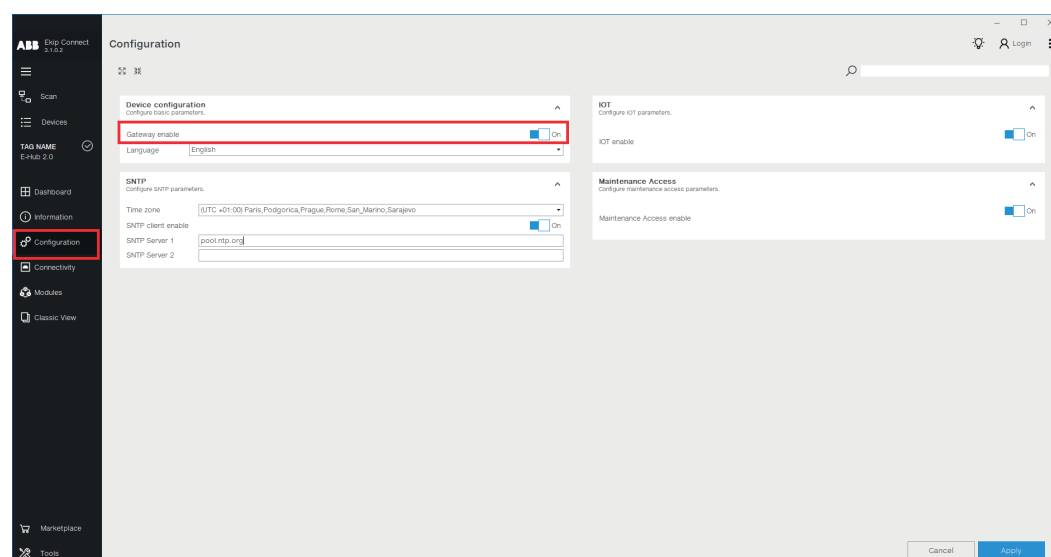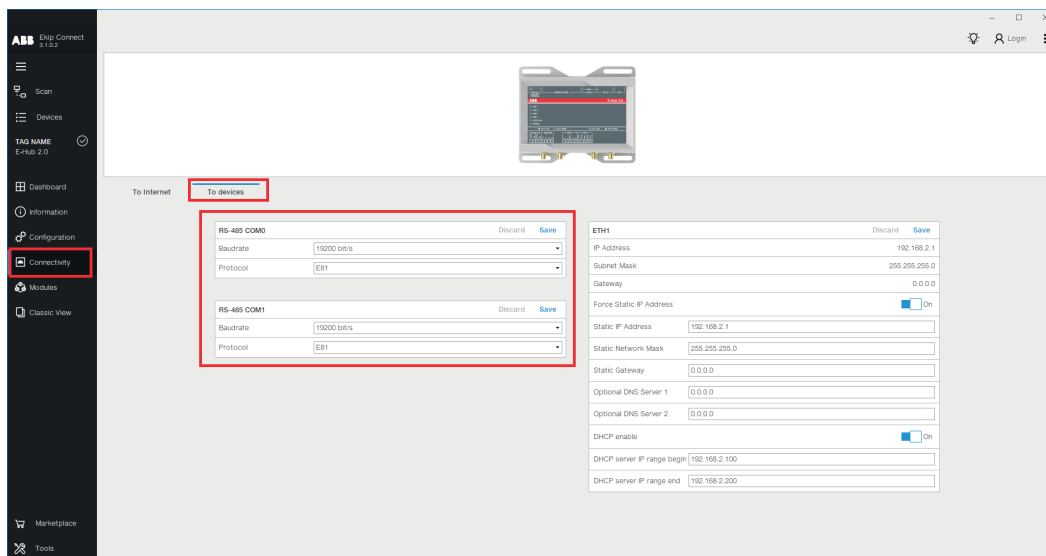

Fig. 27

Language   The E-Hub 2.0 only supports the **English** currently.

3 - Communication Settings

Connectivity Settings   This page will set the connectivity parameters.

- Click **Connectivity > To the devices**

Fig. 28

Serial Port Parameters

Parameters	Description	Default
Baud rate	RS-485 Port baud rate: 9600 bit/s 19200 bit/s 38400 bit/s	19200 bit/s
Protocol	E81: Even parity, 8 data bits, 1 stop bit O81: Odd parity, 8 data bits, 1 stop bit N82: None parity, 8 data bits, 2 stop bit N81: None parity, 8 data bits, 1 stop bit	E81

- Click **Save** the configuration.
- Reboot the E-Hub 2.0 will make the configuration valid.

- Click **Connectivity > To the devices**
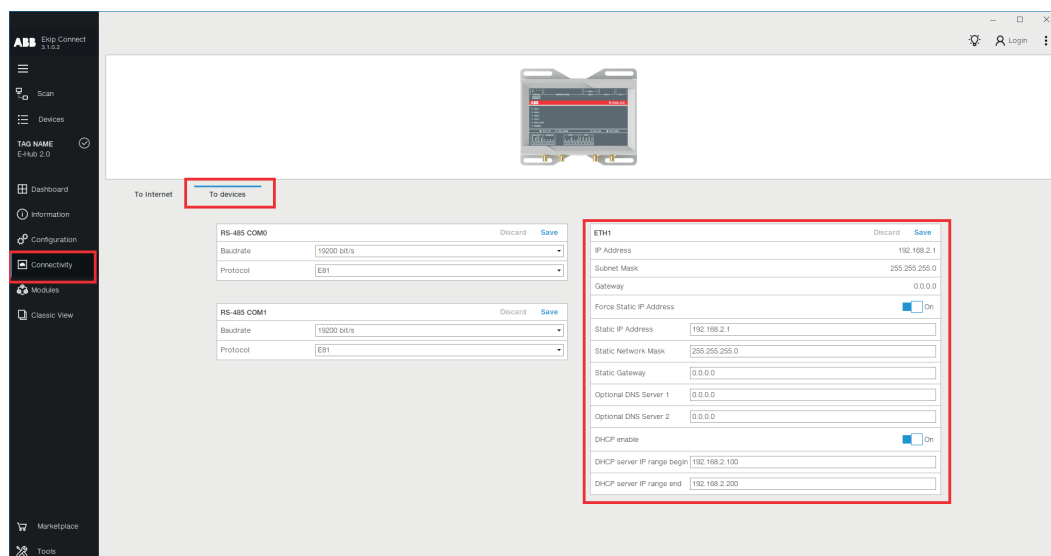
Fig. 29

Ethernet Port 1 Parameters

Parameters	Description	Default
Force Static IP Address	Switch on/off to use static IP address. To make the **Static** setting available, please enable the **Force Static IP Address**.	On for ETH1
Static IP Address	IP address on LAN port	192.168.2.1 for ETH1
Static Network mask	Subnet mask for LAN port	255.255.255.0
Static Gateway	Default gateway IP address	0.0.0.0
Optional DNS Server 1	DNS Server IP. Keep default value for ETH1	0.0.0.0
Optional DNS Server 2	DNS Server IP. Keep default value for ETH1	0.0.0.0
DHCP enable	Enable/Disable DHCP server for ETH1	On
DHCP server IP range begin	IP range begin that DHCP server dynamic distributing	192.168.2.100
DHCP server IP range end	IP range end that DHCP server dynamic distributing	192.168.2.255

- The custom should be careful if wants to change the ETH1 IP address. Make sure the input static IP address and the DHCP server IP range are correct and in the same LAN before save the configuration.
- Click Save the configuration.

  NOTE: *Please always remember the input ETH1 static IP address before save the changes.*

For the provisioning part please refer to the Getting started of the E-Hub 2.0.

ANNEX 1: ADDITIONAL I/O MODULE

The I/O module is a compact and lightweight device intended to be used together with your E-Hub 2.0 gateway.

I/O module is a fast and simple way to expand the capabilities of E-Hub 2.0 Gateway with extra digital and analog ports. Designed to be fitted to the side of the E-Hub 2.0, it is rated for the same level of reliability and operating temperature range. The digital section of I/O module provides 6x isolated digital inputs and 4x isolated digital outputs, while the analog section provides 2x protected current analog inputs and 2x protected voltage analog inputs.
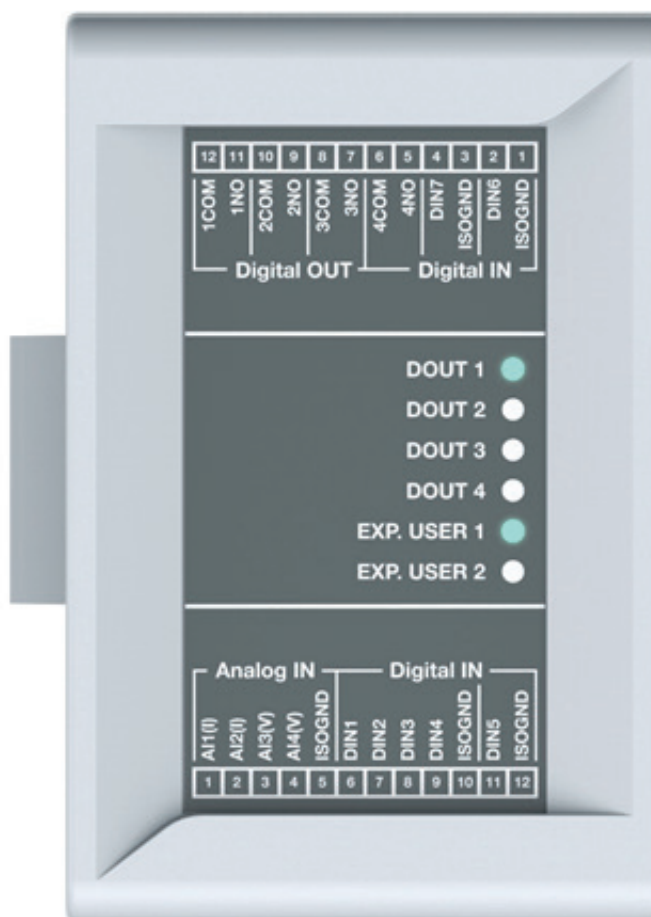

Fig. 30

1 - Product labels

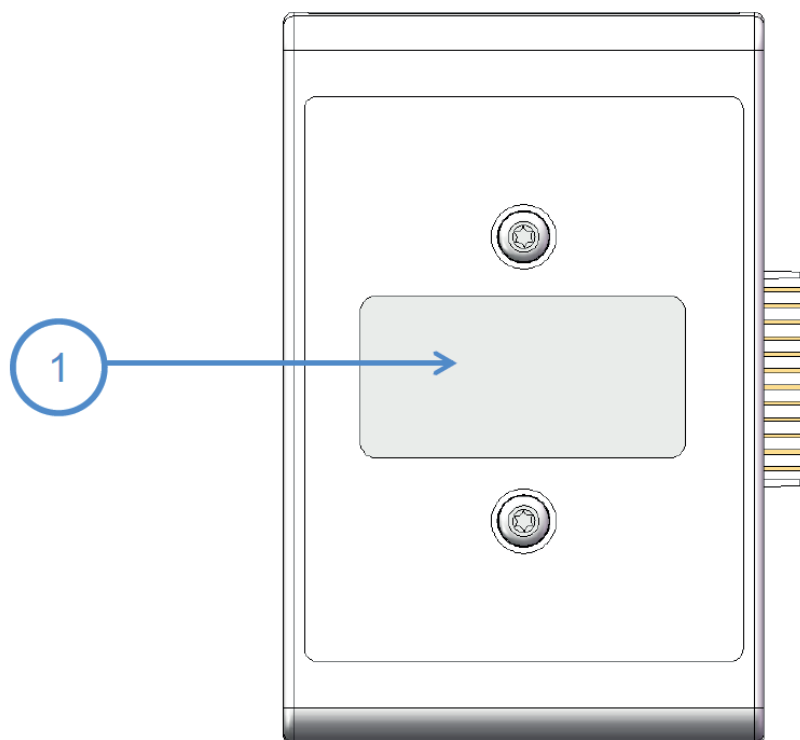The product label is located on the bottom side of the product.
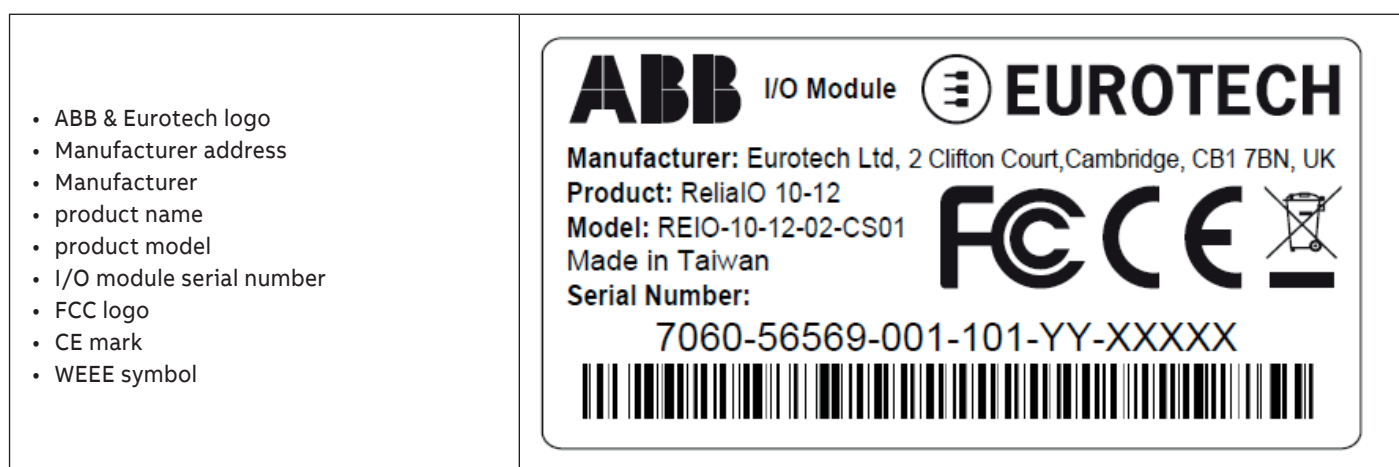

Fig. 31

• ABB & Eurotech logo • Manufacturer address • Manufacturer • product name • product model • I/O module serial number • FCC logo • CE mark • WEEE symbol	

DECLARATION OF CONFORMITY

1 - CE Marking

This product is CE marked.

The product meets the guidelines listed in the following sections.

ABB is not responsible for the use of this product together with equipment (eg power supplies, personal computers, etc) that are not CE marked and compliant with the requirements specified in this document.

This product is compliant with:

- Reduction of Certain Hazardous Substances (RoHS2)
- IP40
- CE
- IEC62368-1 Information Technology Equipment - Safety - Part 1: General Requirements
- Product compliance with part 15 of FCC

2 - WEEE compliance

In compliance with the Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE), the symbol above, shown on the product or within its literature, indicates separate collection for this electrical and electronic equipment (EEE) that has been placed on the market after 2005.

This product, at the end of its life cycle, must be collected separately and managed in accordance with the provisions of the current Directive on waste electrical and electronic equipment.

Because of the substances present in the product, improper use or disposal of the refuse can cause damage to human health and the environment.

id any possible legal implications, contact your local waste collection body for full recycling information.

3 - RoHS 2 compliance

The product described in this document, including all its components and its sub-assemblies, have been manufactured in compliance with the Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

4 - Electromagnetic Compatibility

Electromagnetic Compatibility (for EU)

Conditions of operation

This product meets the requirements of the EC Directive 2004/108/EC on electromagnetic compatibility.

This product is designed for use in industrial areas.

FCC compliance (for USA)

This device and its accessories comply with part 15 of FCC rules. Operation is subject to the following two conditions:

- This device and its accessories may not cause harmful interference.
- This device and its accessories must accept any interference received, including interference that may cause undesired operation.

Specifications		Description
Processor	MCU	STM 32F072xx – 32 bit ARM Cortex M0
Memory	RAM	16KB SRAM with hardware parity
Storage	Embedded	128KB Flash
I/O interfaces	Digital Input	6x Digital Input Ports Input Range 0-36V Optoisolation 5kV (2.7kV RMS) Low Level Voltage: 0-1V High Level Voltage: 2-36V 0/1 Level Threshold: 1V/2V (Factory Option: Customizable)
	Digital Output	4x Digital Output Ports Optoisolation 5kV(2.7kV RMS) Open Drain Output Transistors: 60V (Optorelay) AC/DC Output: 0.5A MOSFET (with 0.5A Fuses)
	Analog Input	2x Current Analog Input Ports Input Range: 4-20mA 2x Voltage Analog Input Ports Input Range: 0-36V ADC Conversion: 12 bit Sigma Delta Sampling Frequency: 1kHz Max Input Protection Circuitry (5kV DC)
Other	LEDs	4x Digital Output Status 2x Programmable
Power	Input	Provided by E-Hub 2.0
	Consumption	0.3W Typical
Environment	Operating Temp	-25 °C to +85 °C
	Storage Temp	-40 °C to +85 °C
Certifications	Regulatory	FCC/ISED, CE
	Safety	EN 60950 (Including UL Deviations to EN62368-1)
	Environmental	RoHS2; REACH
	Ingress	IP40 (enclosure only, excluding connectors)
Mechanical	Enclosure	Material: ABS - Colour: aluminium
	Dimensions	90.3 x 59 x 43.7 mm (WxLxH)

MECHANICAL SPECIFICATIONS

1 - I/O module mechanical dimensions

The I/O modules are housed in an ABS enclosure having the following dimensions: 90.3 (W) x 59.0 (L) x 43.7 (H); mm

The I/O module enclosure is supplied on a mounting plate having the dimensions shown in the drawing (Figure 12.1) below:
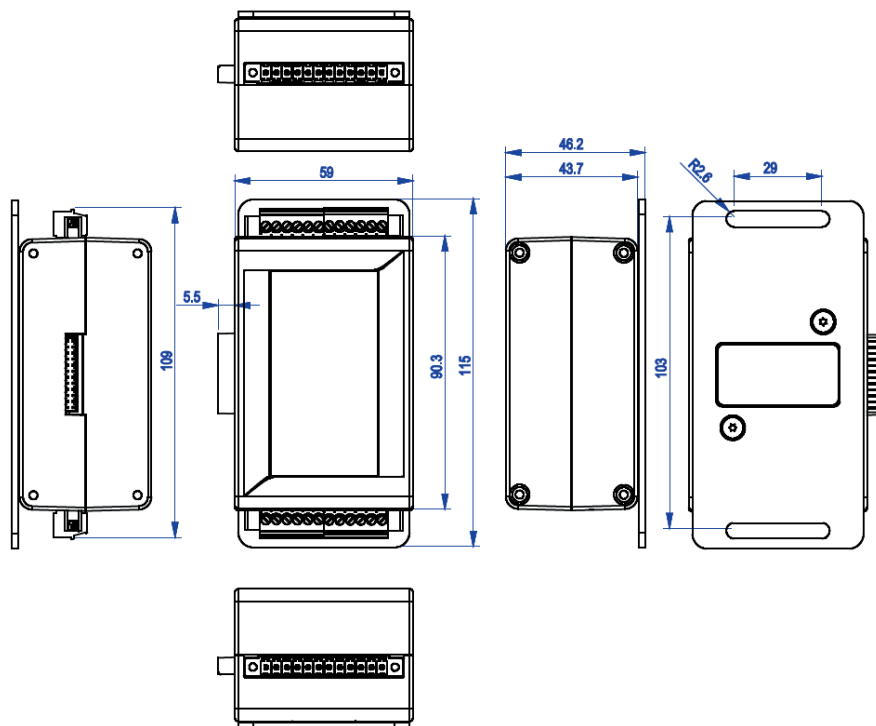
All dimensions are in millimetres.

Fig. 32

HOW TO INSTALL THE PRODUCT

1 - How to attach I/O module to E-Hub 2.0

- Attach the I/O additional module 10-12-xx unit to the E-Hub 2.0 as shown below using M2.5 x 5 CAP Head screw.
- Screw the I/O additional module module mounting plate to the same flat surface as the E-Hub 2.0
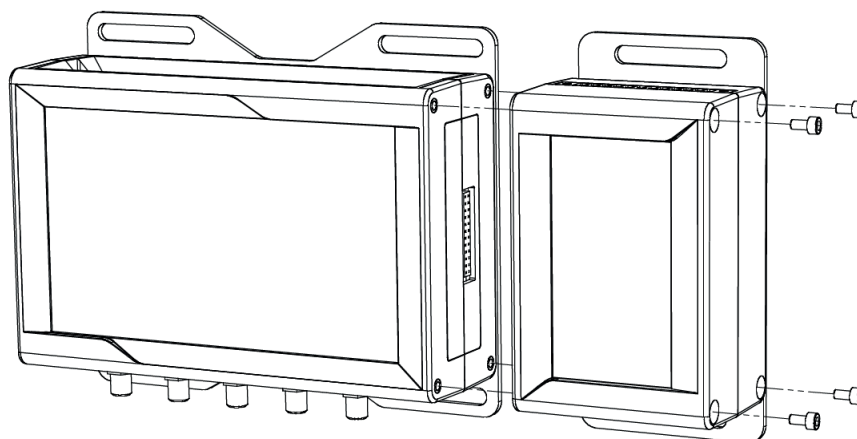

Fig. 33

Which screws are used

The 4 screws are used to attach I/O module to E-Hub 2.0:

- M2.5 x 5 CAP Head Hexagon Socket
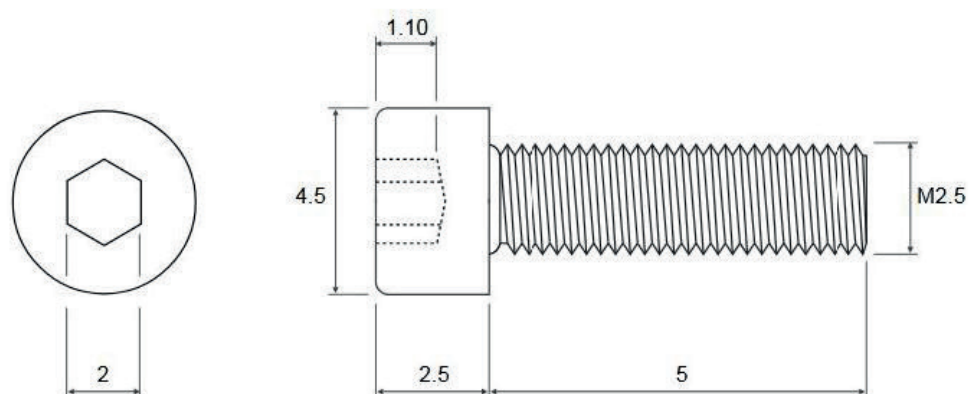- Black A4 Stainless steel, fully threaded

Fig. 34

2 - Basic configuration of I/O

AI setting
- Connect via Ekip Connect 3 as described in the chapter before
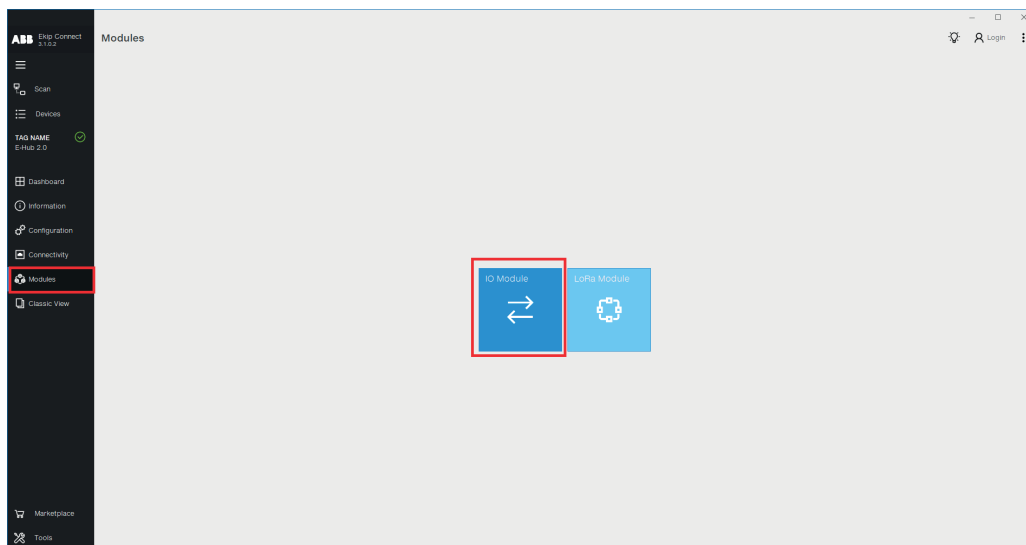- Click **Modules** → **I/O module**

Fig. 35

- Inside I/O module page, select **Analog** tab to configure AI channels.
- Channel 1, 2 for current analog input and 3, 4 for voltage analog input.
- Click **Add sensor** to enable the setting channel if there is no sensor set at this position.
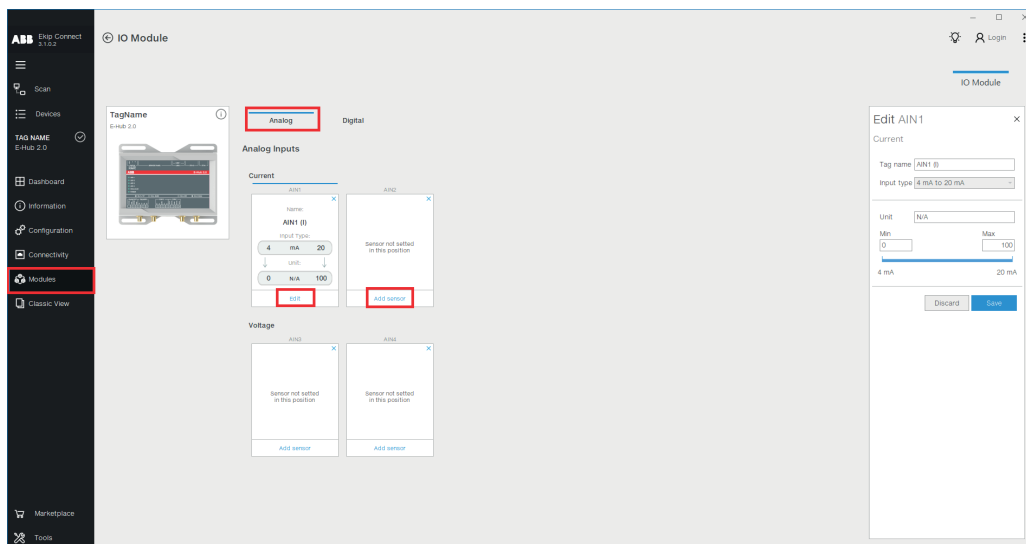- Click **Edit** to do the AI channel configuration.
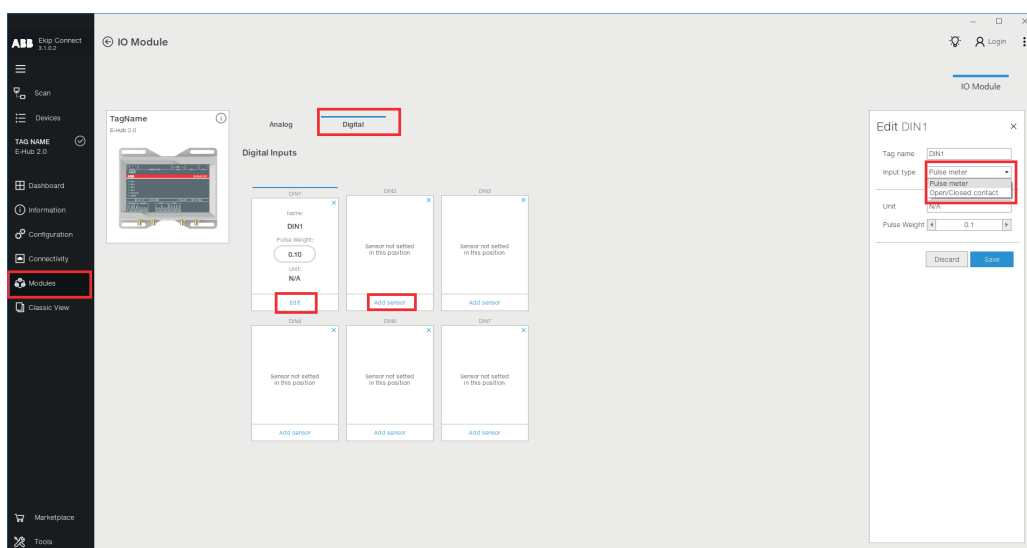

Fig. 36

Parameters

Parameters	Description	Default
Name	AI channel name	AI Channel No.
Input type	AI input types for this channel. Current AI: 4 mA to 20 mA Voltage AI: 0 V to +36 V	Current AI: 4 mA to 20 mA Voltage AI: 0 V to +36 V
Unit	Unit for the measurement	N/A

Parameters	Description	Default
Min	Minimum value for the measurement, corresponding to the lower bound of input type.	0
Max	Maximum value for the measurement, corresponding to the upper bound of input type.	100

ⓘ *NOTE: Please configure the AI channels according to the real environment. The AI channels data will be upload to the cloud after finishing the provision process.*

DI setting
- Click **Modules → I/O module**
- Inside I/O module page, select **Digital** tab to configure DI channels.
- DI could be configured as Pulse meter or Open/Close contact.
- **Pulse meter**: measuring value will be increased one weight at each pulse
- **Open/Close contact**: digital value 0 and 1 will be transferred into meaningful words set in **status 0** and **status 1**.

Fig. 37

Parameters

Parameters	Description	Default
Name	AI channel name	AI Channel No.
Input type	**DI input types for this channel:** Pulse meter Open/Close contact	Pulse meter
Unit	Unit for the measurement	N/A
Pulse weight	Increment for Pulse meter.	0.1
Status 0	**For Open/Close contact type:** Meaning of status 0	Status 0
Status 1	**For Open/Close contact type:** Meaning of status 1	Status 1

ⓘ *NOTE: Please configure the DI channels according to the real environment. The DI channels' data will be upload to the cloud after finishing the provision process. If there is type changing in the DI channel, please do a re-provisioning process to make the changes valid.*

ABB