Operating instructions
Bluetooth Mesh base station

EIO404

Contents

1   Preliminary note

You will find instructions, technical data, approvals and further information using the QR code on the unit / packaging or at www.ifm.com.

1.1   Symbols used

✓   Instruction requirement

▶
▷   Reaction, result

[...]   Designation of keys, buttons or indications →

 Cross-reference

!   Important note
      Non-compliance may result in malfunction or interference

ⓘ   Information
     Supplementary note

1.2   Warnings used

	NOTE
	Warning of damage to property

	CAUTION
	Warning of personal injury
	▷ Slight reversible injuries may result.

	WARNING
	Warning of serious personal injury
	▷ Death or serious irreversible injuries may result.

1.3   Safety symbols on the unit

⚠ Observe instructions in chapter ➜ Electrical connection

1.4   Change history

Version	Subject	Date
00	New creation of the document	01/2022

2   Safety instructions

► The unit described is a subcomponent for integration into a system.

– The system architect is responsible for the safety of the system.

– The system architect undertakes to perform a risk assessment and to create documentation in accordance with legal and normative requirements to be provided to the operator and user of the system. This documentation must contain all necessary information and safety instructions for the operator, the user and, if applicable, for any service personnel authorised by the architect of the system.

► Read this document before setting up the product and keep it during the entire service life.

► The product must be suitable for the corresponding applications and environmental conditions without any restrictions.

► Only use the product for its intended purpose (➜ Intended use).

► If the operating instructions or the technical data are not adhered to, personal injury and/or damage to property may occur.

► The manufacturer assumes no liability or warranty for any consequences caused by tampering with the product or incorrect use by the operator.

► Installation, electrical connection, set-up, operation and maintenance of the product must be carried out by qualified personnel authorised by the machine operator.

► Protect units and cables against damage.

► Replace damaged units, otherwise the technical data and safety will be impaired.

2.1   Cyber security

NOTE

Device operation in an unprotected network environment.

▷ Unauthorised read or write access to data is possible.

▷ Unauthorised manipulation of the device function is possible.

► Restrict access to authorised users (e.g. password-protected access).

► New password assignment for Bluetooth access.

[!] The device may only be used under the operating conditions specified in the data sheet.

3   Intended use

The base station EIO404 communicates via Bluetooth Mesh with e.g. the Bluetooth Mesh Adapter EIO344.

The base station can be configured via Bluetooth and an APP.

All available functions can be accessed via moneo|blue. The APP is available for Android and IOS in the App Store.

Likewise, configuration is also possible via the Ethernet interface.

The Bluetooth Mesh adapters can be integrated via the two configuration options.

!   The unit is not suited for environments with particular requirements on mechanical stability (e.g. shock/vibration).

The unit is intended for indoor use only.

► Observe the operating conditions (➔Technical data at www.ifm.com)

► IP67 protection rating

The received process data is used for plant monitoring

3.1 Example of technical set-up
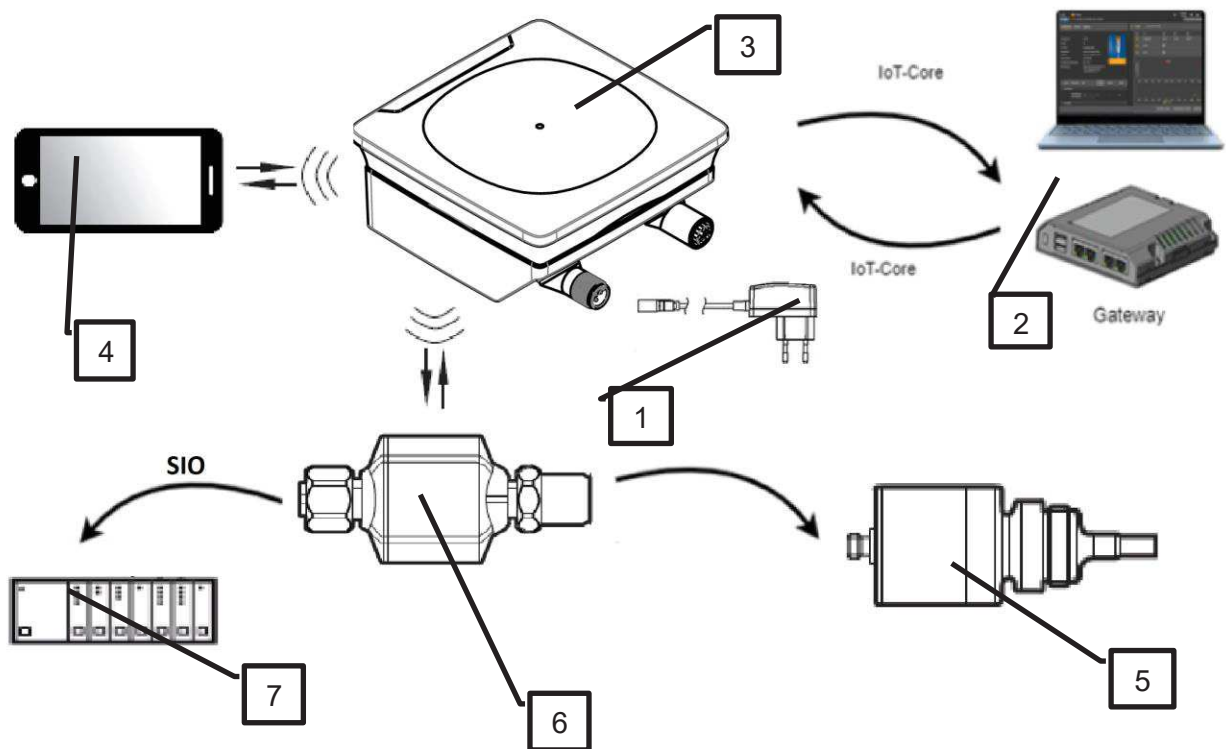
Fig. 1: Application example

1: Power supply
2: Laptop with moneo or Gateway
 3: EIO404 base station
4: Mobile device with moneo|blue via Bluetooth LE
5: Example sensor
6: BT Mesh adapter (e.g. EIO344) via BT Mesh
7: PLC to receive switching signals

4   Connection possibilities

The EIO344 has several connection possibilities, which also include various functions.

4.1   Ethernet interface with IoT core

The device has an Ethernet interface.

M12 socket

► Ethernet communication (data acquisition)
► Parameter setting of BT-Mesh network
► Parameter setting of Ethernet interface
► Setting of further parameters

Ethernet is a globally standardised technology (ISO/IEC 11801) for communication.

4.2   Bluetooth

The following functions are supported with a mobile device:

► Parameter setting of BT-Mesh network
► Parameter setting of Ethernet interface
► Setting of further parameters

M12 connector

➔ Power supply

4.3   Bluetooth Mesh

Once Bluetooth Mesh is set up, the EIO404 automatically establishes the connection to the BT Mesh Adapter (EIO344).

The BT Mesh adapter must be integrated into the BT Mesh network for this purpose.

See EIO344 operating instructions www.ifm.com.

Up to 50 BT Mesh adapters can be connected to the BT Mesh base station.

5   Scale drawing
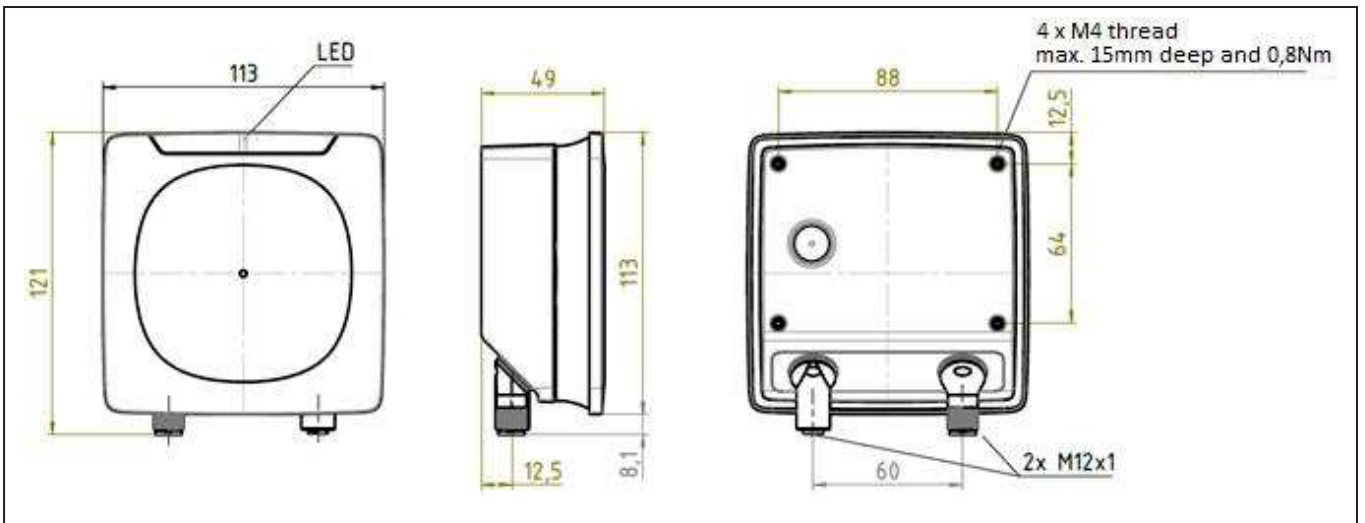
> **!** The max. tightening torque of the screws when mounting the unit is 0.8 Nm.

6   Installation

6.1   General installation instructions

> **!** When mounting several systems adhere to the minimum distances.

> **!** The max. tightening torque of the screws when mounting the unit is 0.8 Nm.
> Use M4 screws.
> The maximum insertion depth is 15 mm.

Information on the available mounting accessories is available on our website at www.ifm.com

6.2   Mechanical design
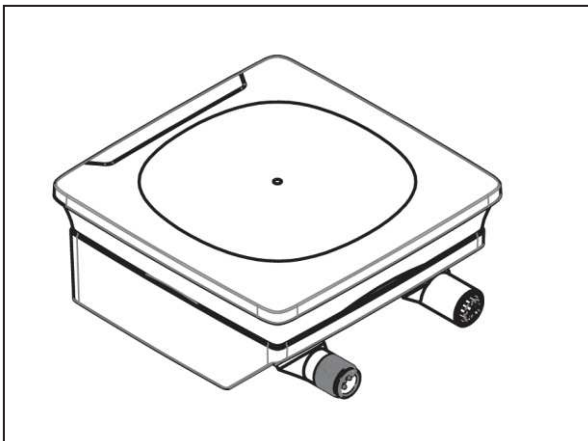
The connections can be rotated by 270°

6.3   Mounting options

For installation, the following optional accessories are available.

> **!**   The device can be mounted without the accessories. For installation, please use the threaded sleeves on the back of the unit. The required screws are not supplied with the device.

6.3.1   Installation with angle bracket E80335
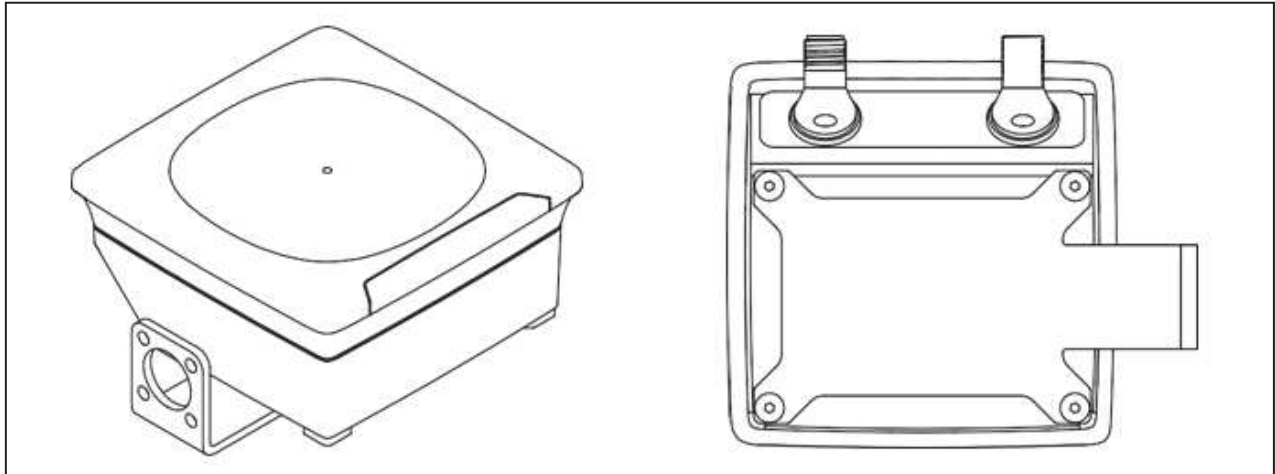
►   The angle bracket is for lateral mounting of the unit.

6.3.2   Installation with mounting device E803356

The mounting device is used to mount the device to a clamp.
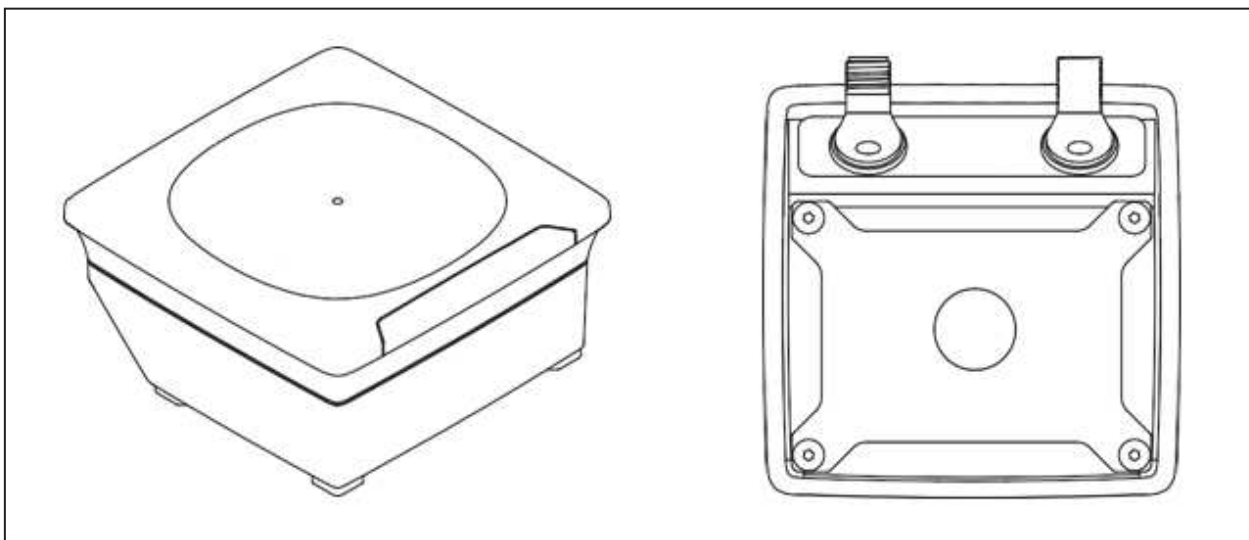
The following clamps can be used:
- ►   E21110 with a rod diameter of 12 mm
- ►   E20795 with a rod diameter of 14 mm
- ►   E21109 with a rod diameter of 14 mm

6.3.3   Installation with fixing bars E80337
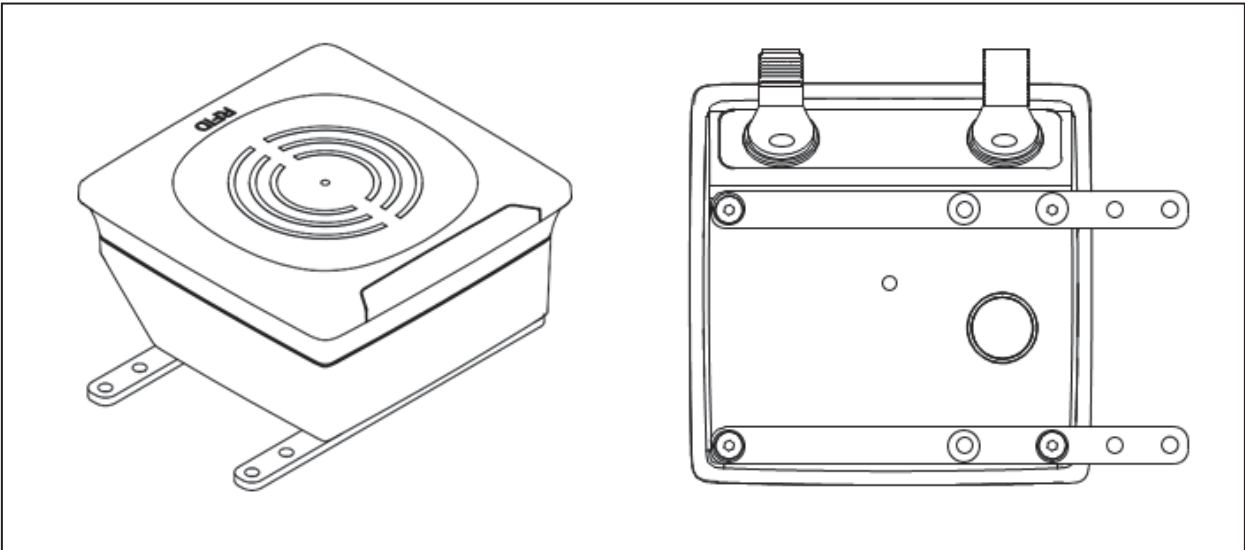
► Fix the unit with fixing screws to the designated location.

7   Electrical connection

! The unit must be connected by a qualified electrician.

Observe the national and international regulations for the installation of electrical equipment.

Voltage supply according to EN 50178, SELV, PELV.

⚠ CAUTION

Input current is not limited.

▷   No fire protection.

►   Protect circuits.

►   Disconnect power.

►   Connect the unit as follows:
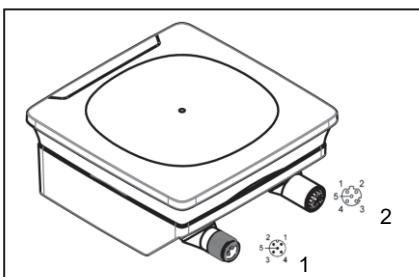
1: 5-pole M12 connector
• Power supply

2: 5-pole M12 female connector
• Ethernet connection

Fig. 3: Electrical connection

Pin	Power supply
1:	L+
2:	Not used
3:	L-
4:	Not used
5:	Not used

Table 1: M12 connector pin assignment

Pin	Ethernet connection
1:	TX+
2:	RX+
3:	TX-
4:	RX-
5:	Not used

Table 2: M12 socket pin assignment

! The device must not be externally supplied via the 5-pole M12 Ethernet connection (2).

7.1   Mounting the connector

To achieve the protection rating indicated in the data sheet, the following has to be observed:

►   Use IO-Link cable with IP class.

►   Connect the connector with the unit. The arrow indicates the position of the coding.

►   Tighten the coupling nut.

►   Minimum tightening torque: 0.6 Nm (tightening by hand)

►   Maximum tightening torque: 1.5 Nm (using a torque wrench).

7.2   Removing the connector

►   Loosen the coupling nut and simultaneously press the connector against the unit.

7.3   UL application area

For use in the USA and Canada:

►   For connecting the device and the IO-Link sensor, use UL-certified cables of category CYJV 2/7/8 having suitable ratings.

7.4   Cable length

►   Maximum cable length of Ethernet connection: 20 m.

►   Maximum cable length of power supply: no recommendation.
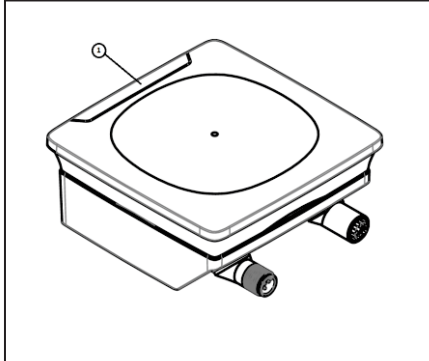
►   All cables must be provided with a strain relief approx. 200 mm behind the connectors.

8   Indicators, output response and troubleshooting

The indicator shows the current status of the unit via RGB LED.

8.1   RGB indicators

Colour	Designation
red	Fault indication
green	Operation indication
blue	Bluetooth

Fig. 4: RGB indicator

8.2   RGB status indication, output response and troubleshooting

The unit provides self-diagnostic options.

Errors are indicated by the red LED.

Type	Description	RGB status	Troubleshooting
---	The unit operates correctly	Green, on	---
2	Voltage too low	Off	Check voltage supply
---	Optical identification	Green, double flashing	
2	Electronics temperature outside the range	Red, 1Hz	
3	No Ethernet device connected	Red, 1Hz	Check Ethernet wiring
2	Hardware failure (HWF)	Red, on	Units faulty, please replace
3	No BT Mesh connection	Red, 1Hz	Check distances to the adapters
---	Bluetooth active	Blue, on	---
---	Mesh provisioning successful (following device ID message)	Blue, double flashing (once)	---
---	Device update	Green, flashing (200ms on, 800ms off)	Wait until the update is complete

Table 4: Troubleshooting 1: Warning, 2: Failure, 3: Note

9 Parameter setting

The parameters of this unit can be set via 2 interfaces. It is possible to read information or make changes via Ethernet or Bluetooth. Assigned information and changes are possible for each interface.

For Ethernet, connect the M12 connector to a hardware for parameter setting. The connection is established via Bluetooth with an app.

ℹ️ Information about suitable parameter setting software at www.ifm.com.

9.1 Parameter setting with a PC via Ethernet:

► Connect the Bluetooth Mesh Base to the PC via the Ethernet M12 connector:

Fig. 5: Parameter setting with a PC

► Change the parameter settings in the software.

► Transfer the parameter settings to the device.

9.2 Parameter setting with a mobile device via Bluetooth

► Supply the Bluetooth Mesh base with voltage

► An app is used to search for and connect to the Bluetooth Mesh base station
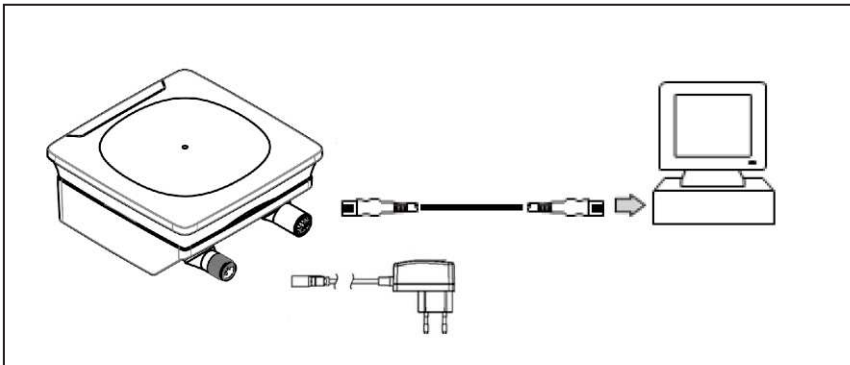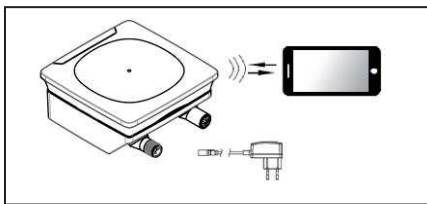

Fig. 6: Parameter setting with a mobile device

► Change the parameter settings in the software.

► Transfer the parameter settings to the device.

10 Set-up of the moneo configure application

10.1 moneo configure function

With moneo configure, the base station can be reached via the IoT interface.

10.2 System requirements

moneo configure is installed on a Windows operating system.
- Windows 7/10/11
- Ethernet interface

For this purpose, ifm also offers a ready-to-use system, an appliance (QHA200) with Linux and moneo installed.

10.3 Installation of moneo configure

► Open the installation file
► Follow the installation instructions

> [!] Update the IODD catalogue when using moneo configure for the first time.

10.4 Connection with a PC

► Connect the EIO404 with the PC via Ethernet
► Start the moneo software
► Search for participants and connect them

> [!] Information on moneo configure can be found in the software or in the manual.

11 Set-up of the moneo|blue application

11.1 moneo|blue's functions

With moneo|blue, the EIO404 transmits live data, which is displayed and allows the parameters to be set. Saved data can be read via a data file.

Acyclic parameters and cyclic process data can be read from and written to.

11.2 System requirements

To install moneo|blue on a mobile device such as smartphone or tablet an internet connection is recommended. moneo|blue can be downloaded from the "Apple APP Store" or "Google Play Store".
The mobile device must meet the following system requirements:
- Bluetooth 4.0
- iOS operating system version 8.0 or higher
- Android operating system version 4.3 or higher

11.3 Installation of moneo|blue

► Open the Apple APP Store or the Google Play Store
► Search for moneo|blue
► Follow the installation instructions

[!] Update the IODD catalogue when using the moneo|blue App for the first time.

11.4 Connect a mobile device

► Activate Bluetooth data transmission on the mobile device
► Position the mobile device within the range of EIO404
► Select the requested EIO404
► Enter the access password 0000

[!] You can find information about moneo|blue in the App description.

12 Copyright and trademarks

All trademarks and company names used are subject to the copyright of the respective companies.

EN

Apple® is a registered trademark of Apple Inc.

Google® is a registered trademark of Google LLC.

Bluetooth® is a registered trademark of Bluetooth SIG Inc.

iOS® operating system is a registered trademark of Apple Inc. Android® operating system is a registered trademark of Google LLC.

13 Approvals and certificates

The EU declaration of conformity, approvals and country-specific certificates are available at: www.ifm.com

Approval-related notes: ⟶   Packing slip

14 Maintenance, repair and disposal

The unit is maintenance-free.

► After use dispose of the unit in an environmentally friendly way in accordance with the applicable national regulations. Cleaning the unit:

► Disconnect the unit from the voltage supply.
► Clean the unit from dirt using a soft, chemically untreated and dry micro-fibre cloth.

EN

Bluetooth Zulassung

EIO344
EIO404

80308302 / 00

Europäische Union

Deutsch

Vor Inbetriebnahme die Bedienungsanleitung lesen und während der Einsatzdauer aufbewahren.

- Hiermit erklärt die ifm electronic GmbH, dass die Geräte EIO344 und EIO404 der Richtlinie 2014/53/EU entsprechen.
- Der vollständige Text der EU-Konformitätserklärung, Technische Daten, Anleitungen, Zulassungen, Kontakte und weitere Informationen unter documentation.ifm.com.

WARNUNG! Der Betrieb dieses Gerätes kann Funkstörungen in Wohngebieten verursachen.

- Das Gerät hat folgende Arbeitsfrequenzen und Sendeleistungen:

Funktechnologie	Frequenzband	max. Sendeleistung
Bluetooth	2,4 GHz	10 dBm

- Aufgrund der Human-Exposure-Vorschrift einen Mindestabstand zwischen Gerät und Personen von 20 cm einhalten.
- Das Gerät sendet Funkwellen aus, die möglicherweise den Betrieb von elektronischen Geräten in der Nähe beeinträchtigen, darunter Herzschrittmacher, Hörelemente und Defibrillatoren. Wenn Sie einen Herzschrittmacher oder ein anderes implantiertes Medizinprodukt haben, verwenden Sie das Gerät nicht ohne vorherige Rücksprache mit Ihrem Arzt oder dem Hersteller Ihres Medizinprodukts. Halten Sie einen Sicherheitsabstand zwischen dem Gerät und Ihren Medizinprodukten ein und sehen Sie von der weiteren Verwendung des Gerätes ab, wenn Sie eine dauerhafte Beeinträchtigung Ihres Medizinprodukts beobachten.

Great Britain

English

Read the operating instructions before set-up and keep them for the duration of use.

- ifm electronic gmbh hereby declares that the devices EIO344 and EIO404 are in compliance with the relevant statutory requirements.
- The full text of the Declaration of Conformity, technical data, instructions, approvals, contacts and further information is available at: documentation.ifm.com.

WARNING! The operation of this device can cause radio interference in residential areas.

- The device has the following operating frequencies and transmitter powers:

Radio technology	Frequency bands	Max. transmitter power
Bluetooth	2.4 GHz	10 dBm

- Due to radio frequency exposure limits this device should be installed and operated with a minimum distance of 20 cm between the device and the body of the user or nearby persons.
- The device emits radio waves that may interfere with the operation of electronic devices in the vicinity, including pacemakers, hearing aids and defibrillators. If you have a pacemaker or other implanted medical device, do not use the sensor without first consulting your doctor or the manufacturer of your medical device. Keep a safe distance between the device and your medical products and refrain from further use of the device if you observe permanent impairment of your medical devices.

USA

English

Only valid for: EIO344, EIO404

FCC information:

Supplier's Declaration of Conformity

Models: EIO344, EIO404

U.S. Responsible Party

ifm efector inc.

1100 Atwater Drive / Malvern, PA 19355, Phone: +1 800 441 8246

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

1. This device must not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications to this device that have not been expressly approved by ifm could void the user's authority to operate the equipment.

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 equipment 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 equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment 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 equipment and receiver.
- Connect the equipment 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.

RF Exposure Info

Due to radio frequency exposure limits this device should be installed and operated with a minimum distance of 20 cm between the device and the body of the user or nearby persons.

The measurement results comply with the FCC limit per 47 CFR §2.1091 for the uncontrolled RF Exposure of mobile devices.

Canada / Canada

English

Only valid for: EIO344, EIO404

ISED note:

This device contains licence-exempt transmitters/receivers that comply with Innovation, Science and Economic Development Canada's licence-exempt RSSs.

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 device complies with ISED RSS-102 radiation exposure limits set forth for an uncontrolled environment when the device is installed and operated with a minimum separation distance of 20 cm between the device and any human body.

Français

Valable uniquement pour : EIO344, EIO404

Avis ISDE:

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet appareil respecte les limites d'exposition aux rayonnements ISDE RSS-102 définies pour un environnement non contrôlé lorsque l'appareil est installé et utilisé avec une distance de séparation minimale de 20 cm entre l'appareil et tout corps humain.