



Operating instructions
Bluetooth® Mesh IO-Link adapter
EIO344

GB

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1 Preliminary note

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

1.1 Legal and copyright information

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- Bluetooth® is a registered trademark of Bluetooth SIG Inc.
- Apple®, the Apple logo, iPhone and iPod Touch are trademarks of Apple Inc., registered in the U.S. and other countries. The App Store is a service mark of Apple Inc.
- iOS® operating system is a registered trademark of Apple Inc.
- Google® is a registered trademark of Google LLC.
- Android® operating system is a registered trademark of Google LLC.
- Android, Google Play and the Google Play logo are trademarks of Google Inc.

1.2 Symbols used

- ✓ Requirement
- Instructions
- ▷ Reaction, result
- [...] Designation of keys, buttons or indications
- Cross-reference
-  Important note
Non-compliance may result in malfunction or interference.
-  Information
Supplementary note

1.3 Warnings

Warnings indicate the possibility of personal injury and damage to property. This enables safe product handling. Warnings are graded as follows:



WARNING

Warning of serious personal injury

- ▷ If the warning is not observed, fatal and serious injuries are possible.



CAUTION

Warning of minor to moderate personal injury

- ▷ If the warning is not observed, minor to moderate injuries are possible.

ATTENTION

Warning of damage to property

- ▷ If the warning is not observed, damage to property is possible.

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, programming, configuration, operation and maintenance of the product must be carried out by personnel qualified and authorised for the respective activity.
- Protect units and cables against damage.
- Replace damaged units, otherwise the technical data and safety will be impaired.
- Observe applicable documents.

2.1 Safety symbol on the device



Safety symbol on the device:

- ▶ Adhere to the operating instructions for the safe operation of the device.

2.2 Cyber security

ATTENTION

When operating the device with deactivated password protection (Bluetooth)

- ▷ Unauthorised read or write access to data is possible.
- ▷ Unauthorised manipulation of the device function is possible.
 - ▶ Restrict access to authorised users.
 - ▶ Change the factory-set password for the Bluetooth interface.
 - ▶ Choose a password in accordance with company policy.

Bluetooth communication is always encrypted:

- after successful connection between the device and ifm moneo|blue
- in the Bluetooth Mesh network between the devices

3 Intended use

The device can be used:

- As a participant in a Bluetooth Mesh network of a Bluetooth Mesh IoT base station
- As a gateway between a connected IO-Link device and the Bluetooth Mesh IoT base station
 - To configure the connected IO-Link device
 - For monitoring the connected IO-Link device (process data, status and diagnostic information)
- As a repeater without a connected IO-Link device in a Bluetooth Mesh network

Permitted use:

- indoors
- Only use the device within the limits of the technical data: → Technical data.



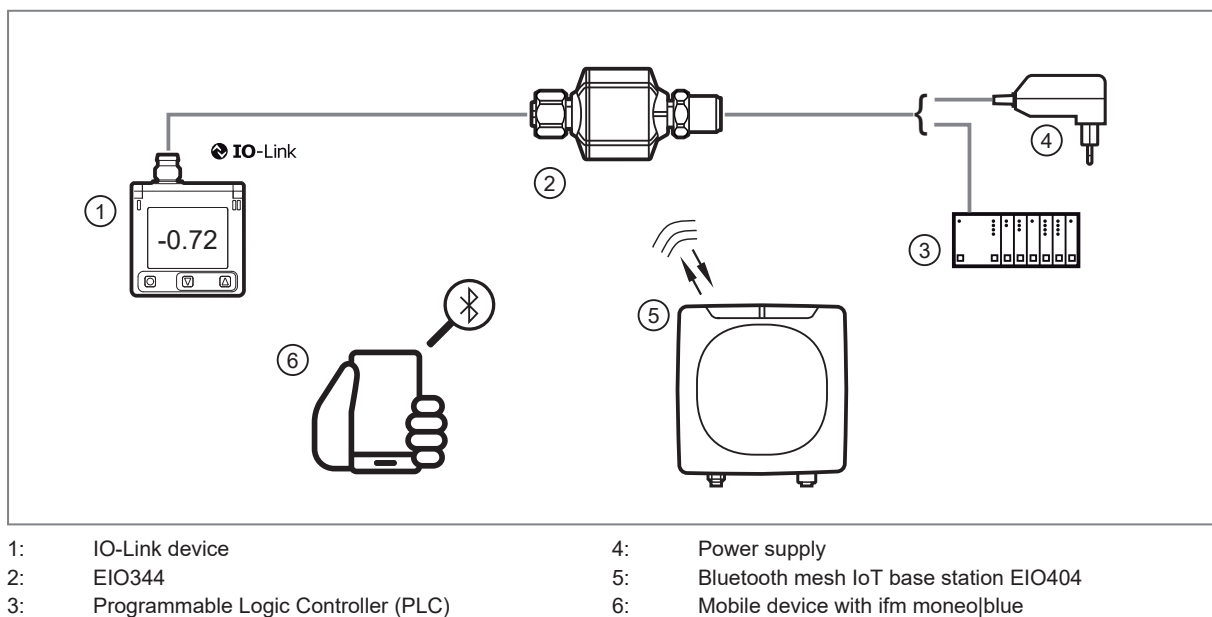
Notes relevant for approval: Package insert of the device and documentation.ifm.com

3.1 Foreseeable misuse

The device is not suitable for environments with special requirements for mechanical stability (e.g. shock/vibration).

The device is not suitable for use in critical applications. The data is not transmitted in real time.

3.2 Example application



4 Function

4.1 Visual indication

The device has a status LED for displaying status information, warnings and error states.

4.2 IO-Link interfaces

The device has 2 IO-Link interfaces.

Power supply / control signals (plug)

- Voltage supply
- Switching output OUT1
- Output OUT2 for analogue and digital signals (looped through from pin 2 of the process connection)
- IO-Link communication for parameter setting, control and monitoring of the device by an IO-Link master

Process connection (socket)

- Communication with an IO-Link device
- The device offers the "Device validation and data storage" function. The function offers the option of validating the IO-Link device connected to the device (manufacturer, identical design). In addition, data records of the connected IO-Link device can be backed up and restored to an identical IO-Link device if required.

4.2.1 IO-Link

IO-Link is a communication system for connecting intelligent sensors and actuators to automation systems. IO-Link is standardised in the IEC 61131-9 standard.



General information on IO-Link at [io-link.ifm](https://io-link.ifm.com)



Input Output Device Description (IODD) with all parameters, process data and detailed descriptions of the device at documentation.ifm.com

IO-Link offers the following advantages:

- Interference-free transmission of all data and process values
- Parameter setting in the running process or presetting outside the application
- Parameters for identifying the connected devices in the system
- Additional parameters and diagnostic functions
- Automatic backup and restore of parameter sets in case of device replacement (data storage)
- Logging of parameter sets, process values and events
- Device description file (IODD - Input Output Device Description) for easy project planning
- Standardised electrical connection
- Remote maintenance

4.3 Bluetooth LE

The device supports communication via Bluetooth Low Energy (LE). The following functions can be performed via Bluetooth LE:

- Parameter setting of the adapter
- Parameter setting of the IO-Link interface of the device
- Parameter setting of the connected IO-Link device

4.4 Bluetooth mesh

The device supports the Bluetooth Mesh protocol.

Together with an EIO404 Bluetooth Mesh IoT base station and additional EIO344 Bluetooth Mesh IO-Link adapters, the device can be operated in a Bluetooth Mesh network.

The device offers the following functions in a Bluetooth Mesh network:

- Parameter setting of the adapter
- Parameter setting of the connected IO-Link device
- Monitoring of process data (interval: 1 s ... 24 h)



Detailed information on the Bluetooth Mesh IoT base station EIO404: documentation.ifm.com

4.5 ifm IoT-Core

The device has the ifm IoT-Core. The ifm IoT-Core represents the functionality of the device. The functionality consists of a set of data, services and events. The elements of the ifm IoT-Core are arranged in a JSON object in a hierarchical tree structure. The ifm IoT-Core makes these elements available to the outside world via standard interfaces (e.g. HTTP) . This allows the user and other devices to access data (parameters, process data), events and functions (services) of the device.



The functions of the ifm IoT-Core of the device are only available via the Bluetooth Mesh IoT base station EIO404.

5 Installation

For installation, the following optional accessories are available. documentation.ifm.com

6 Electrical connection



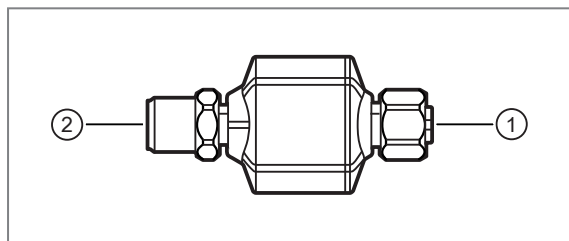
The unit must be connected by a qualified electrician.

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

Voltage supply according to SELV, PELV.

- ▶ Disconnect power.

6.1 Overview



- 1: Process connection
- 2: Power supply / controller

6.2 General notes on wiring

The threaded connections in the device correspond to the M12 standard. To ensure compliance with the specified protection rating, only cables that comply with this standard may be used. In the case of self-assembled cables, the system manufacturer is responsible for the protection rating.

- ▶ Use connectors with gold-plated contacts.
- ▶ During installation, place the connectors vertically so that the coupling nut will not damage the thread.
- ▶ Before connecting the connector, check that there is an undamaged O-ring in the socket.
- ▶ Observe the coding of the connectors during installation.
- ▶ Provide all outgoing cables with suitable strain relief after a maximum of 200 mm.

For the cULus area of application:

- ▶ Only use UL-certified cables of category CYJV 2/7/8 with suitable technical data to connect the device.

6.3 Process connection

The device is connected to an IO-Link device via the process connection.

- Maximum cable length 20 m



The device must not be externally supplied via the M12 port. Pins 1, 2 and 3 are connected through.

Wiring:



- 1: L+ supply
- 2: OUT2 linked through
- 3: L- supply
- 4: IO-Link
- 5: n.c.

- ▶ Connect the connector with the device.
- ▶ For connection, use an M12 connector (minimum protection rating: IP67 / IP69K).
- ▶ Tighten the coupling nut.

- min. tightening torque: 0.6 Nm (tightening by hand)
- max. tightening torque: 1.5 Nm (using a torque wrench).

When used as a Bluetooth repeater:

- ▶ Close the unused connection with a protective cap (→ Accessories).

6.4 Power supply / control signals

The device is connected to the power supply and, if necessary, to a control device (PLC, IO-Link master) via the port.

- Max. cable length for digital signals: 200 m
- Max. cable length for analogue signals: no recommendation, depending on receiver.



CAUTION

The port has no overcurrent protection.

- ▷ Risk of fire
- ▶ Protect circuits.

Wiring:

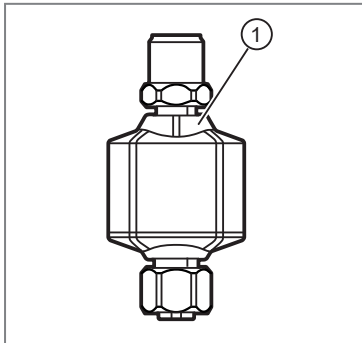


- 1: L+ supply
- 2: OUT2 linked through
- 3: L- supply
- 4: OUT1 switching output or IO-Link

- ▶ Connect the port to the supply voltage / controller.
- ▶ For connection, use an M12 connector (minimum protection rating: IP67 / IP69K).
- ▶ Tighten the coupling nut.
- min. tightening torque: 0.6 Nm (tightening by hand)
- max. tightening torque: 1.5 Nm (using a torque wrench).

7 Operating and display elements

7.1 Overview



1: LED: Status

7.2 Status LED

LED	Description	Colour	State	Type	Description
Status	Operation indication	Green	Off	Error	Voltage too low
			On	Normal operation	Device functions reliably
			Flashing (double flashing)	Warning	Optical identification
			Flashes (200 ms on, 800 ms off)	Note	Firmware update NOTE! Wait until the connection is established.
	Interference display	Red	On	Device replacement	Hardware failure ¹
			Flashes (1 Hz)	Error	Temperature of the circuit board outside the tolerance range
			Flashes (1 Hz)	Note	Short circuit at the switching output
			Flashes (1 Hz)	Note	Invalid IO-Link process data ¹
			Flashes (1 Hz)	Note	Incorrect data storage
			Flashes (1 Hz)	Note	Invalid output configuration ¹
			Flashes (1 Hz)	Warning	No Bluetooth Mesh connection
	Bluetooth status	Blue	On	Note	Bluetooth active
			Flashes (double flash, once)	Note	Mesh provisioning successful (following device ID message)

¹ Output response: The switching output OUT1 assumes the specified value in the event of an error (→ parameter FOU1)

8 Set-up

For initial set-up:

- ▶ Attach the sticker supplied in the packaging to the device.
- ▶ Connect the device properly.
 - ▷ The device starts.
 - ▷ The status LED shows the status of the device.
- ▶ Access the device with the selected parameter setting option.
- ▶ Change the factory-set password for the Bluetooth interface, [Bluetooth password \(→ 15\)](#).
 - ▷ The security mode of the Ethernet interface is enabled.
- ▷ The device can be configured.

9 Parameter setting

The device can be configured via the following interfaces:

- Bluetooth LE interface:
 - ifm moneo|blue
- IO-Link interface
 - ifm moneo|configure
- Ethernet interface (ifm IoT-Core):
 - ifm IoT Core Visualizer
 - ifm IoT Core REST API

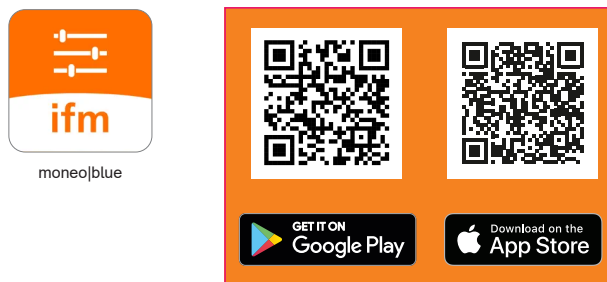


The parameter setting can be carried out with or without a sensor or actuator connected.

9.1 Notes on parameter setting

9.1.1 Installing ifm moneo|blue

ifm electronic provides the ifm moneo|blue app for accessing the device via the Bluetooth interface. The app is available in the Apple App Store and the Google Play Store.



To install ifm moneo|blue:

- ▶ Scan the QR code using your mobile device.
 - ▷ The app page in the App Store or Google PlayStore opens.
- ▶ Install ifm moneo|blue.
 - ▷ ifm moneo|blue is installed on the mobile device.

9.1.2 Installing ifm moneo|configure



Information on ifm moneo|configure: ifm.com/cnt/moneo

- ▶ Download ifm moneo|configure.
- ▶ Start the laptop/PC.
- ▶ Log in with administrator rights.
- ▶ Install and licence ifm moneo|configure (→ installation instructions ifm moneo).
- ▷ ifm moneo|configure is installed.

9.1.3 Bluetooth password

Access to the device via Bluetooth LE can be protected with a password.

The factory-set Bluetooth password consists of the last 6 digits of the device's serial number (e.g. 100000**138488**).

The serial number is printed on the packaging and on the device.

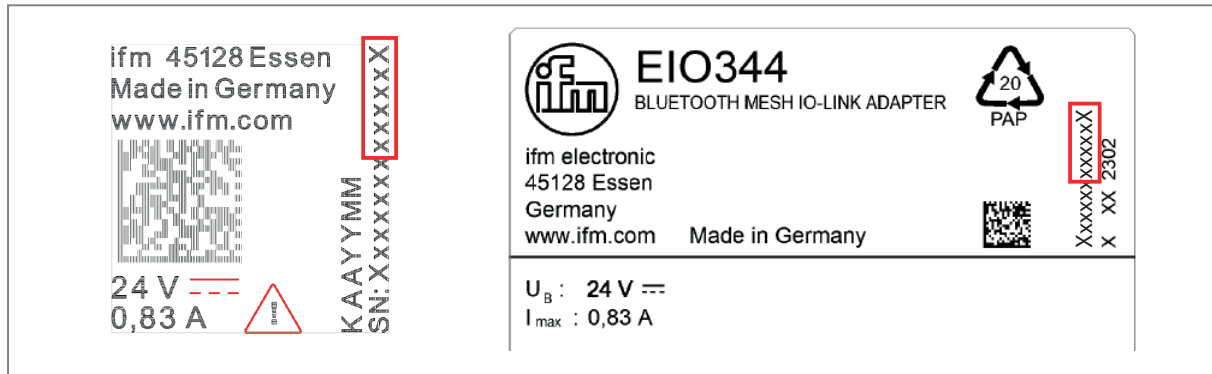


Fig. 1: Indication of the serial number: On the device (left) and on the packaging (right)

When accessing the device with the ifm moneo|blue app for the first time, the user is prompted to activate the password function and change the factory-set password.

The user-specific password can be reset to the factory-set password using the command Back-to-Box. The user name "Administrator" associated with the password cannot be changed.

The Bluetooth password has no influence on access to the device via the IO-Link and the IoT-Core interface.

9.1.4 Integrating the device into a Bluetooth Mesh network

To integrate the Bluetooth Mesh IO-Link adapter as a participant in a Bluetooth Mesh network, the device must be provisioned for the network via a Bluetooth Mesh IoT base station.



Options for provisioning a Bluetooth Mesh IO-Link adapter: → Operating instructions EIO404

General procedure for provisioning a Bluetooth Mesh IO-Link adapter (example ifm moneo|blue):

Requirements:

- ✓ ifm moneo|blue is installed on the mobile device, [Installing ifm moneo|blue](#) (→ [14](#)).
- ✓ Bluetooth Mesh IoT base station EIO404 is started and ready for operation.
- Position the Bluetooth Mesh IO-Link adapter EIO344 near the base station (distance: max. 15 m).

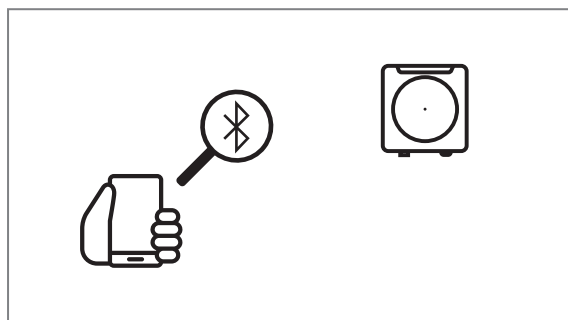


Fig. 2: Step 1 Establishing a connection to the Bluetooth Mesh IoT base station EIO404

- Use the parameter setting software to establish a connection to the Bluetooth Mesh IoT base station.
- ▷ The parameter setting software has access to the Bluetooth Mesh IoT base station.

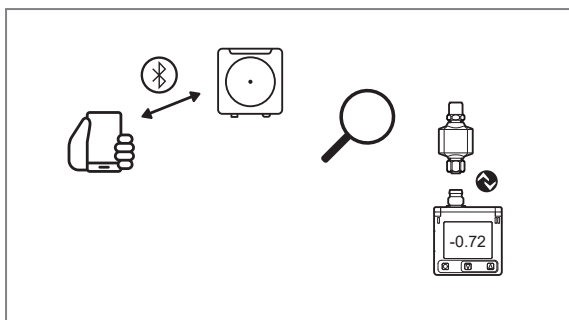


Fig. 3: Step 2: Search for available Bluetooth Mesh IO-Link adapters EIO344

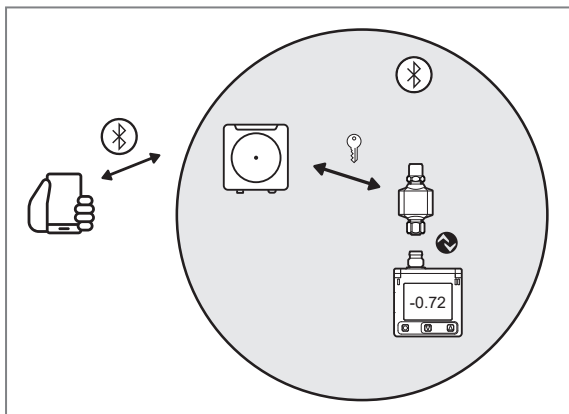


Fig. 4: Step 3: Provision the Bluetooth Mesh IO-Link adapter

- Use the parameter setting software to search the Bluetooth Mesh IoT base station's environment for available Bluetooth Mesh IO-Link adapters.

- ▷ All available adapters that have not yet been provisioned are displayed.

- Provision the adapter.

- ▷ The Bluetooth Mesh IoT base station integrates the adapter into the Bluetooth Mesh network.

- ▷ The parameter setting software has access to the adapter and the connected IO-Link device.

After provisioning, the Bluetooth Mesh IoT base station automatically establishes a connection to the Bluetooth Mesh IO-Link adapter. The connection is established directly or via additional Bluetooth Mesh IO-Link adapters EIO344.

Cyclical process data is sent to the Bluetooth Mesh IoT base station at defined time intervals. The process data can be read out there and used for system monitoring.

9.1.5 Device validation and data storage

The user can choose how the IO-Link ports are to behave with regard to the device validation and the storage / recovery of parameter data of the connected IO-Link device.

The following options are available:

Option	Validation of the IO-Link device	Backing up the parameter data	Restoring the parameter data
[No check and clear]	No	No	No
[Type compatible V1.0 device]	Yes, check for compatibility with IO-Link standard V1.0.	No	No
[Type compatible V1.1 device]	Yes, check for compatibility with IO-Link standard V1.1.	No	No
[Type compatible V1.1 device with Backup + Restore]	Yes, check for compatibility with IO-Link standard V1.1 and identity of design (vendor ID and device ID).	Yes, automatic storage of the parameter data; changes to the current parameter data are saved.	Yes, recovery of the parameter data when connecting an identical IO-Link device with factory settings.
[Type compatible V1.1 device with Restore]	Yes, check for compatibility with IO-Link standard V1.1 and identity of design (vendor ID and device ID).	No, there is no automatic backup; changes of the current parameter data will not be stored.	Yes, recovery of the parameter data when connecting an identical IO-Link device with factory settings.

9.2 Parameter setting: Bluetooth LE interface

The device can be accessed via the Bluetooth LE interface either directly or indirectly via an EIO404 Bluetooth Mesh IoT base station.

The ifm moneo|blue app is required for parameter setting via the Bluetooth LE interface, [Installing ifm moneo|blue](#) (→ [14](#)).

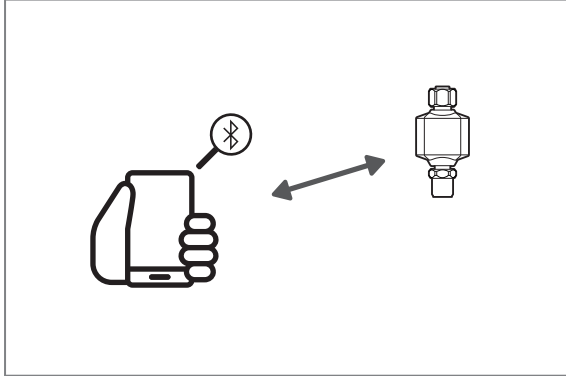


Fig. 5: Direct connection to the device

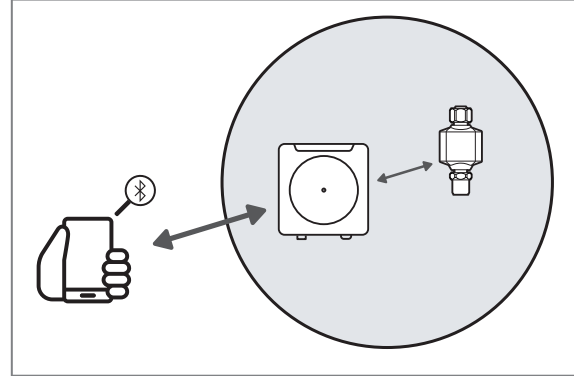


Fig. 6: Indirect connection to the device via EIO404

To access the device via the Bluetooth LE interface:

Requirements:

- ✓ ifm moneo|blue is installed on the mobile device, .
- ✓ Bluetooth is activated on the mobile device.
- ✓ The device is close to the mobile device (distance: max. 15 m).
- ▶ Connect the Bluetooth Mesh IO-Link adapter to the supply voltage.
- ▶ Start ifm moneo|blue.

For direct access to the device:

- ▶ Search for the Bluetooth Mesh IO-Link adapter in moneo|blue and pair it with the mobile device.
- ▷ ifm moneo|blue has access to the device.

For indirect access to the device via a Bluetooth Mesh IoT Base Station:

- ▶ Search for the Bluetooth Mesh IoT Base Station in moneo|blue and pair it with the mobile device.
 - ▷ ifm moneo|blue has access to the Bluetooth Mesh IoT Base Station.
- ▶ Search for the Bluetooth Mesh IO-Link adapters and provision the device found.
- ▷ ifm moneo|blue has access to the device.

9.2.1 Available parameters and commands

9.2.1.1 Identification information

Name	Description	Value range	Access
[Product name]	Product name	EIO344	ro ¹
[Vendor]	Vendor	ifm electronic gmbh	ro ¹
[Serial number]	Serial number	E.g. 100000138488	ro ¹
[Hardware Revision]	Hardware version	E.g. AA	ro ¹
[Firmware Version]	Firmware version	E.g. V1.36	ro ¹

Name	Description	Value range	Access
[Adapter name]	Device-specific name for display in Bluetooth Mesh networks Factory setting: Serial number of the device, e.g. ifm SN: 100000138488)	E.g. mesh_adapter01	rw ¹

¹ Read only

9.2.1.2 Bluetooth Mesh network

Name	Description	Value range	Access
[Mesh send interval]	Interval at which process data is sent from the adapter to the Bluetooth mesh IoT base station (value in ms)	1000 ms ... 86400000 ms	rw ¹
[Link Quality]	Connection quality of the adapter in the mesh network (value in %)	0% ... 100%	ro ²

¹ Read and write

² Read only

9.2.1.3 Switching output

Name	Description	Value range	Access
[Output config]	Configuration of the switching output	- Auto: The values for the parameters [FOU1] and [switching bit] are set automatically - Manual: The user sets the parameters [FOU1] and [switching bit] manually - Off: Switching output deactivated	rw ¹
[Switching bit]	Position of the value of the switching signal in the IO-Link data	0...255	rw ¹
[FOU1]	Behaviour of the switching output OUT1 in case of a fault	- OFF: Off - ON: On	rw ¹

¹ Read and write

9.2.1.4 Device validation and data storage

Name	Description	Value range	Access
[Validation / Datastorage]	Behaviour of the port when connecting an IO-Link device in the as-delivered state NOTE! Observe the notes on validation and data storage: Device validation and data storage (→ □ 16)	- No check and clear - Type compatible V1.0 device - Type compatible V1.1 device - Type compatible V1.1 device with Backup + Restore - Type compatible V1.1 device with Restore	rw ¹
[Vendor ID]	IO-Link ID of the manufacturer that is to be validated	0...65535	rw ¹
[Device ID]	IO-Link ID of the device to be validated	0...16777215	rw ¹

¹ Read and write

9.2.1.5 Adapter

Name	Description	Value range	Access
[Device Status]	Display of the current device and diagnostic state	• Device OK • Bluetooth LE connected • No valid IO-Link process data available • No IO-Link process data available • Master port no device connected • Mesh not provisioned • Mesh connection lost • Switching output wrong setup • Master wrong data storage setup • Mesh bad signal • Mesh sending problems • Mesh too much traffic • Master port short circuit • Switching output short circuit • Under temperature • Over temperature • Undervoltage • Hardware Error	ro ¹
[Operating hours]	Operating hours since delivery (value in h)	e.g. 10 h	ro ¹
[Internal Temperature]	CPU temperature of the device (value in °C)	e.g. 35°C	ro ¹

¹ Read only

Commands:

Name	Description
[Back to box reset]	All settings are reset to the factory settings and communication is blocked until the next time the device is switched off and on. (Back-to-Box)
[Application reset]	All settings are reset to the factory settings, except for the following parameters: • Application-Specific Tag • Function Tag • Location Tag • Bluetooth password • Bluetooth Mesh network

9.3 Parameter setting: IO-Link interface

The device has the profile of an IO-Link device. ifm provides a device description file (IODD - IO Device Description).

Parameter setting is carried out using suitable software, e.g. ifm moneo|configure. For parameter setting via the IO-Link interface, the device must be connected to an IO-Link master.

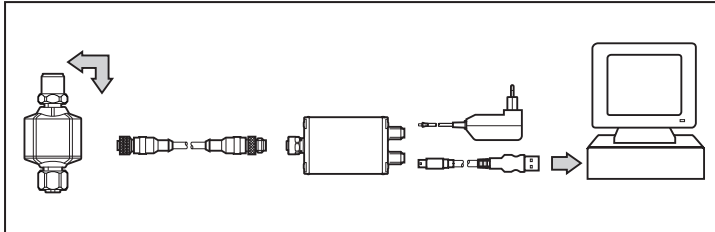


Fig. 7: Application example: Parameter setting with a PC

To configure the device via the IO-Link interface:

Requirements:

- ✓ ifm moneo|configure is installed and licensed from the PC/laptop, [Installing ifm moneo|configure](#) (→ [14](#)).
- ▶ Connect the device with an IO-Link master.
- ▶ Connect the IO-Link master to the laptop/PC.
- ▶ Start ifm moneo|configure and update the device catalogue.
- ▶ Establish a connection to the IO-Link master in ifm moneo|configure.
 - ▷ ifm moneo|configure recognises the IO-Link master and the connected device.
- ▶ Call up the editor view of the device.
 - ▷ The device can be configured.

9.3.1 Available parameters and commands



A detailed description of all parameters, process data, system commands and the available events is provided in the IO-Link interface description of the device: documentation.ifm.com

As an IO-Link device, the device offers the following data.

9.3.1.1 Identification

Name	Description	Value range	Access
[Vendor Name]	Vendor	ifm electronic gmbh (default)	ro ¹
[Vendor Text]	Vendor	www.ifm.com (default)	ro ¹
[Product Name]	Product name	EIO344	ro ¹
[Product ID]	Product code	EIO344	ro ¹
[Product Text]	Product designation	Bluetooth Mesh IO-Link Adapter	ro ¹
[Serial Number]	Serial number	e.g. 000194610104	ro ¹
[Hardware Revision]	Hardware version	E.g. AA	ro ¹
[Firmware Revision]	Firmware version	E.g. V1.36	ro ¹
[Application-Specific Tag]		*** (Default)	rw ²
[Function Tag]		*** (Default)	rw ²
[Location Tag]		*** (Default)	rw ²

¹ Read only

² Read and write

System commands:

Name	Description
[Flash On]	Switch on status LED (ID 222)
[Flash Off]	Switch off status LED (ID 223)

9.3.1.2 Parameter

System commands:

Name	Description
[Application reset]	All settings are reset to factory settings, except for the application-specific indicator, system indicator, location indicator, Bluetooth password, Bluetooth Mesh network (ID 129)
[Back-to-Box]	All settings are reset to factory settings and communication is blocked until the next switch-off and switch-on (ID 131)
[Reset Bluetooth Password]	Reset the Bluetooth password to the factory setting (last 6 digits of the serial number) (ID 208)
[IO-Link 1.1 system test command 240, event 8DFE appears]	System test event 8DFE appearing (ID 240)
[IO-Link 1.1 system test command 241, event 8DFE disappears]	System test event 8DFE disappearing (ID 241)
[IO-Link 1.1 system test command 242, event 8DFF appears]	System test event 8DFF coming (ID 242)
[IO-Link 1.1 system test command 243, event 8DFF disappears]	System test event 8DFF disappearing (ID 243)

9.3.1.3 Diagnostics

Name	Description	Value range	Access
[Device Status]	status of the device	0: Device is OK 1: Maintenance required 2: Out of specification 3: Functional check 4: Failure	ro ¹

¹ Read only

Name	Description	Value range	Access
[Operating hours]	Operating hours since delivery (value in h)	e.g. 10 h	ro ¹
[Temperature]	Current internal temperature (value in °C)	-40: -40 (°C) ... 85: 85 °C	ro ¹
[Parameter configuration faults]	Display of parameter setting errors (structure: → IO-Link interface description)	For each parameter: 0: No error 1: Error	ro ¹

¹ Read only

Detailed device status:

Name	Description	Value range	Access
[Event history]	List of the 20 most recently active events	Per list field • 0: noEvent (default) • 20480: Event 0x5000 – hardware error in the device • 25376: Event 0x6320 – parameter error • 16928: Event 0x4220 – permitted device temperature exceeded • 16912: Event 0x4210 – permissible device temperature not reached • 36059: Event 0x8CDB – flashing sequence active, device status = 1 (maintenance required) • 36350: Event 0x8DFE – test event 1, device status = 1 (maintenance required) • 36351: Event 0x8DFF – test event 2, device status = 1 (maintenance required)	ro ¹
[Event counter]	Structure with separate counters for all events (structure: → IO-Link interface description)	Per counter: • 0...2147482880	ro ¹
[Active Events]	Structure for displaying active events (structure: → IO-Link interface description)	Per event: • 0: no event • 1: event active	ro ¹

¹ Read only

System commands:

Name	Description
[Reset Event counter]	Reset event counter (ID 174)
[Reset event history]	Reset event history (ID 173)

9.3.1.4 Process data

Name	Description	Value range	Access
[Device Status]	status of the device	• 0: Device is OK • 1: Maintenance required • 2: Out of specification • 3: Functional check • 4: Failure	ro ¹

¹ Read only

9.4 Parameter setting: ifm IoT-Core

The ifm IoT-Core of the device is accessed exclusively via the ifm IoT-Core of a Bluetooth Mesh IoT Base Station EIO404.

Access options:

- IoT-Core Visualizer
- IoT-Core REST API

To access the IoT-Core structure of the device:

Requirements:

- ✓ The device is integrated into a Bluetooth Mesh network, [Integrating the device into a Bluetooth Mesh network](#) (→ [15](#)).
- ▶ Connect a PC/laptop to the Bluetooth Mesh IoT base station via the Ethernet interface.
- ▶ Use the chosen option to access the ifm IoT-Core of the Bluetooth Mesh IoT base station.
- ▷ The IoT-Core structure of the device is mapped in the substructure `meshnetwork/provisioning/mesh_adapter[x]`.

9.4.1 Available parameters and commands

9.4.1.1 Identification information

Substructure: `deviceinfo`

Available data points:

Name	Description	Value range	Access
<code>../serialnumber</code>	Serial number	E.g. 000194610104	ro ¹
<code>../swrevision</code>	Firmware version	E.g. V1.36	ro ¹
<code>../bootloaderrevision</code>	Bootloader version	E.g. V0.06	ro ¹
<code>../productinstanceuri</code>	Name of the root node in the IoT Core tree	E.g. B4-E3-F9-C7-54-43	ro ¹
<code>../eepromversion</code>	EEPROM version	E.g. V0.02	ro ¹
<code>../btmacaddress</code>	Bluetooth MAC address	E.g. B4-E3-F9-C7-54-43	ro ¹
<code>../hwrevision</code>	Hardware version	E.g. AA	ro ¹
<code>../producttext</code>	Product designation	Bluetooth Mesh IO-Link Adapter	ro ¹
<code>../vendor</code>	Vendor	ifm electronic gmbh	ro ¹
<code>../productname</code>	Product name	EIO344	ro ¹
<code>../productcode</code>	Product code	EIO344	ro ¹
<code>../devicename</code>	User-specific device name	E.g. mesh_adapter01	rw ²

¹ Read only

² Read and write

9.4.1.2 Adapter

Substructure: Adapter

The following parameters / commands can be read / written with a suitable configuration tool (e.g. moneo|blue) or via the IoT core



Access to the IoT core of the adapter is only possible via the EIO404 Bluetooth mesh IoT base station. The adapter must be registered with the base station (provisioned).

Available data points:

Name	Description	Value range	Access
../operatinghours	Operating hours counter since delivery		ro ¹
../operatingstate	Display of the current device and diagnostic state	• 0: Device OK • 1: Bluetooth LE connected • 2: No valid IO-Link process data available • 3: No IO-Link process data available • 4: Master port no device connected • 5: Mesh not provisioned • 6: Mesh connection lost • 7: Switching output wrong setup • 8: Master wrong data storage setup • 9: Mesh bad signal • 10: Mesh sending problems • 11: Mesh too much traffic • 12: Master port short circuit • 13: Switching output short circuit • 14: Under temperature • 15: Over temperature • 16: Undervoltage • 17: Hardware Error	ro ¹
../temperature/cpu	CPU temperature of the device (in °C)	E.g. 32	ro ¹
../temperature/cpu/unit	Unit of the temperature value	°C	ro ¹

¹ Read only

Applicable services:

Name	Description
../application_reset/factoryreset	Resets settings (except: application specific identifier, system identifier, location identifier, Bluetooth password, Bluetooth mesh network).
../back_to_box/factoryreset	All settings are set to the factory settings and communication is blocked until the next time the device is switched off and on.
../signal	Trigger flashing of the LED on the device
../reboot	Restart the device.

9.4.1.3 Bluetooth LE

Substructure: bluetooth_le

Available data points:

Name	Description	Value range	Access
../bluetooth_name	Station name of the unit (string with max. 22 characters)	e.g. eio344_adapter01	rw ¹
../security/securitymode	Status of the security mode NOTE! The security mode does not show whether a password has been set or not.	0: disabled 1: enabled	ro ²
../security/password	Set password for Bluetooth LE authentication (Base64-encoded string) - Min. length: 4 - Max. length: 32 NOTE! The password has no influence on the mesh functionality.	E.g. YmxlX3Bhc3N3b3Jk	wo ³
../security/password_state	Current status of the Bluetooth password	0: Default Password - factory-set password (last 6 digits of the serial number) 1: User specific password - password set by the user 2: Password deactivated - password has been deactivated	ro ²

¹ Read and write

² Read only

³ write only

Applicable services:

Name	Description
../resetpassword	Reset password and disable security mode

9.4.1.4 Bluetooth Mesh network

Substructure: bluetooth_mesh

Available data points:

Name	Description	Value range	Access
../base_station_name	Name of the Bluetooth Mesh IoT base station EIO404 to which the device is connected. ¹	e.g. mesh_base	ro ²
../link_quality	Connection quality of the adapter in the mesh network (value in %)	• 0: 0% ... • 100: 100%	ro ²
../signal_strength	Signal strength to the next mesh adapter of the Bluetooth network (value in %) ¹	• 0: 0% ... • 100: 100%	ro ²
../provisioning_status	Status of the adapter	• 0: Bluetooth mesh not provisioned • 1: Bluetooth mesh provisioned • 2: Bluetooth mesh provisioning invalid credits • 3: Bluetooth mesh provisioning no space left • 4: Bluetooth mesh provisioning duplicate address • 5: Bluetooth mesh provisioning generic error	ro ²
../unique_id	Unique UUID of the Bluetooth mesh IO-Link adapter. Required for logging in and logging out.	e.g. 3A-45-E4-7B-8A-FE-DD-40-90-13-5A-2C-5E-69-81-04	ro ²
../send_interval	Interval at which process data is sent from the adapter to the Bluetooth mesh IoT base station (value in ms)	• 1000: 1000 ms ... • 86400000: 86400000 ms	rw ³

¹ Parameter can only be accessed via the Bluetooth mesh IoT base station EIO404.

² Read only

³ Read and write

9.4.1.5 Switching output

Substructure: switching_output

Available data points:

Name	Description	Value range	Access
../config	Configuration of the parameters of the switching output	0: Auto - The values for fou1 and bit_position are set automatically; if automatic configuration fails, the adapter flashes red 1: Manual - the user sets the values for fou1 and bit_position manually 2: Off - device deactivated	rw ¹
../fou1	Behaviour of the switching output [OUT 1] in case of a fault	2: ON 4: OFF	rw ¹
../bit_position	Position of the value of the switching output in the IO-Link stream	0...255	rw ¹

¹ Read and write

9.4.1.6 IO-Link master

Substructure: iolinkmaster/pin[1]

Available data points:

Name	Description	Value range	Access
../mode	Operating mode of pin 4 (US) of the port	0: Disabled - port deactivated 1: DI - digital input 2: DO - digital output 3: IO-Link - IO-Link data	rw ¹
../mastercycletime_actual	Current cycle time of the data transfer between port and IO-Link device (value in µs)	0: best possible cycle time 1: 1 µs ... 132800: 132800 µs	ro ²
../comspeed	Current transfer rate between port and IO-Link device	0: COM1 - 4.8 kBaud 1: COM2 - 38.4 kBaud 2: COM3 - 230.4 kBaud	ro ²
../mastercycletime_preset	Cycle time of the data transfer between port and IO-Link device (value in µs); only in IO-Link operating mode	0: Automatically set the best possible cycle time 1: 1 µs ... 132800: 132800 µs	rw ¹
../validation_datastorage_mode	Behaviour of the port when connecting a new IO-Link device, Device validation and data storage (→ 16)	0: No check and clear 1: Type compatible V1.0 device 2: Type compatible V1.1 device 3: Type compatible V1.1 device with Backup + Restore 4: Type compatible V1.1 device with Restore	rw ¹
../validation_vendorid	IO-Link ID of the manufacturer that is to be validated	0...655535	rw ¹
../validation_deviceid	IO-Link ID of the device to be validated	0...16777215	rw ¹
../portevent	Port event Structure: 0xYYZZ00 0xYY: Device Status - Status of the IO-Link devices 0xZZ: Connection Status - Status of the connection	Device status: 0x00: No IO-Link device connected 0x40: Wrong IO-Link device connected 0x80: IO-Link device connected and in PREOPERATE state 0xFF: IO-Link device connected and in OPERATE state Connection Status: 0x00: Port deactivated 0x01: Port activated, but no device connected 0x02: Port activated and in "IO-Link" operating mode 0x03: Port activated and in "DI" operating mode 0x04: Port activated and in "DO" operating mode 0x1B: Repetitions detected 0x1E: Short circuit detected at pin 4 0x42: Wrong revision of the IO-Link device 0x43: Wrong vendor ID (V1.1 Revision) 0x44: Wrong device ID (V1.1 Revision) 0x45: Wrong vendor ID (V1.0 Revision) 0x46: Wrong device ID (V1.0 Revision) 0x48: Wrong cycle time	ro ²

¹ Read and write

² Read only

Applicable services:

Name	Description
../validation_useconnecteddevice	Validate the IO-Link device

9.4.1.7 IO-Link device

Substructure: iolinkmaster/pin[1]/iolinkdevice

Available data points:

Name	Description	Value range	Access
../status	Status of the connected IO-Link device	0: State not connected - State not connected 1: State preoperate - State PREOPERATE 2: State operate - State OPERATE 3: State communication error - State communication error	ro ¹
../vendorid	IO-Link ID of the manufacturer	e.g. 310: ifm electronic	ro ¹
../deviceid	IO-Link ID of the IO-Link device	e.g. 712: ifm pressure sensor, PV7003	ro ¹
../productname	Product name of the IO-Link device	e.g. PV7003	ro ¹
../serial	Serial number of the IO-Link device	e.g. 000008500706	ro ¹
../applicationspecifictag	Application specific identification (application tag)	e.g. sensor1_machine3	rw ²
../pdin	Input data (pin 4)	"DI" operating mode: 0x00: OFF 0x01: ON "IO-Link" operating mode: - Process value in hexadecimal representation	ro ¹
../pdout	Output data (pin 4)	"DO" operating mode: 0x00: OFF 0x01: ON "IO-Link" operating mode: - Process value in hexadecimal representation	rw ²
../iolinkevent	IO-Link event	See note	ro ^{1 3}

¹ Read only

² Read and write

³ Parameter only available if operating mode pin 4 (US) = IO-Link and IO-Link device is connected to the port

Applicable services:

Name	Description
../iolreadacyclic	Read a parameter of an IO-Link device (acyclic)
../iolwriteacyclic	Write a parameter of an IO-Link device (acyclic)

Note IO-Link events:

The device supports IO-Link events. IO-Link events are event and error messages. IO-Link events can be generated in the IO-Link master and in the connected IO-Link devices. IO-Link events generated in the IO-Link devices are forwarded to the IO-Link master and stored there.

An IO-Link event message has the following structure:

Byte 0...1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
Event Code	Source	Validity	Type	Mode	Instance

Legend

- Instance
- IO-Link Event Qualifier: Trigger
- 1 byte
 - 0x00: unknown
 - 0x01: PL (Physical Layer)
 - 0x02: DL (Data Layer)
 - 0x03: AL (Application Layer)
 - 0x04: APPL (Application)

• Mode	IO-Link Event Qualifier: Event trigger	1 byte	• 0x40: One-time event or warning (single shot) • 0xC0: Error disappeared • 0x80: Error appeared
• Type	IO-Link Event Qualifier: Event category	1 byte	• 0x10: Notification • 0x20: Warning • 0x30: Error
• Validity	Validity of the process data	1 byte	• 0x00: Valid • 0x40: Invalid
• Source	IO-Link Event Qualifier: Event source	1 byte	• 0x00: IO-Link device • 0xFF: IO-Link master
• Event Code	IO-Link event code (bytes are swapped!)	2 bytes	→ IO-Link specification

10 Troubleshooting

Errors, warnings and status messages are indicated by the status LEDs: [Operating and display elements](#) (→ [12](#))



In the event of an error (status LED flashes red), the device status provides detailed diagnostic information.

Fault description	Cause of the fault	Corrective measures
The device is connected to the power supply, status LED is off	Supply voltage too low	► Check the voltage supply
The device is connected to the power supply, status LED lights up red	Hardware error, the device is defective	► Replace device
The status LED flashes red, device status: [Over temperature] or [Under temperature]	Temperature of the circuit board outside the tolerance range	► Check the ambient temperature
The device is provisioned on Bluetooth Mesh base station, the status LED flashes red, device status: [Mesh connection lost]	No connection to the Bluetooth Mesh network	► Check the distance to the next receiver
The status LED flashes red, device status: [Switching output short circuit]	Short circuit at the switching output	► Check wiring
The status LED flashes red, device status: [Switching output wrong setup]	Invalid output configuration	► Check the configuration of the switching output OUT1
The status LED flashes red, device status: [Master wrong data storage setup]	Incorrect data storage	► Check vendor ID and device ID of the connected IO-Link device

ifm moneo provides additional status and diagnostic information in online mode: → [ifm moneo online help](#)

11 Maintenance, repair and disposal

The unit is maintenance-free.

- ▶ Contact ifm in case of malfunction.
- ▶ Do not open the housing as the unit does not contain any components which can be maintained by the user. The unit must only be repaired by the manufacturer.
- ▶ Clean the device using a dry cloth.
- ▶ Dispose of the unit in accordance with the national environmental regulations.

11.1 Firmware update

The firmware of the device can be updated ifm moneo|blue.



New firmware available on the product detail page of the device: documentation.ifm.com



For information on updating the firmware of several Bluetooth Mesh IO-Link adapters at the same time: → Operating instructions EIO404



The firmware update must not be interrupted.

- ▶ Do not restart the device during the update process.
- ▶ Wait until the update is complete.

Requirements:

- ✓ The firmware file of the Bluetooth Mesh IO-Link adapter is saved in the file system of the mobile device.
- ✓ ifm moneo has been launched.
- ▶ Establish a connection to the Bluetooth Mesh IO-Link adapter.
- ▶ Call up the editor view of the Bluetooth Mesh IO-Link adapter.
- ▶ In the header: Click on ⬆.
- ▶ Click on [Browse].
- ▶ Select new firmware file.
 - ▷ The menu page shows the selected firmware file.
- ▶ Click on [Import].
 - ▷ A message appears that new firmware is available for the adapter.
- ▶ Click on [Update].
 - ▷ New firmware is transferred to the Bluetooth Mesh IO-Link adapter.
 - ▷ Firmware is updated.
 - ▷ The adapter reboots.
- ▷ New firmware is installed on the Bluetooth Mesh IO-Link adapter.