



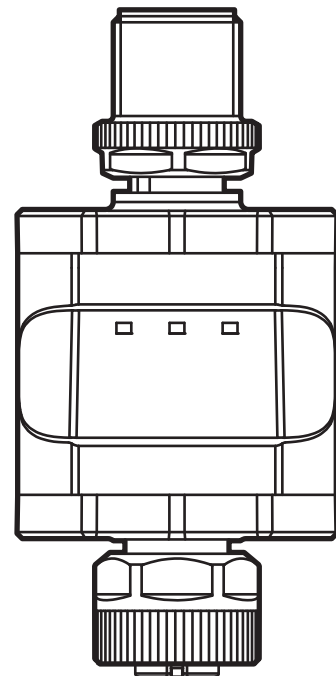
Operating instructions
IO-Link data splitter

E43406

E43410

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80282431 03 / 2020



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1 Preliminary note

Technical data, approvals, accessories and further information at www.ifm.com.

1.1 Symbols used

▶ Instructions

> Reaction, result

→ Cross-reference



Important note

Non-compliance may result in malfunction or interference.



Information

Supplementary note.

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2 Safety instructions

- The device described is a subcomponent for integration into a system.
 - The manufacturer is responsible for the safety of the system.
 - The system manufacturer undertakes to perform a risk assessment and to create a 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 manufacturer 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 (→ Functions and features).
- 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.

3 Functions and features

The IO-Link data splitter E434xx allows decoupling of sensor information via an IO-Link master without having to change the existing plant configuration or controller.

The decoupled sensor information (e.g. switching output signals or analogue values) can, for example, be recorded and evaluated in a cloud application. Connection to or disconnection from the IO-Link master is possible at any time without influencing the active machine functionality.



On delivery the data splitter is immediately ready for operation (plug & play) for many applications (→ 8).



On delivery only read access is possible (→ 4.2).

The device can be configured for write access (→ 8).



Sensors with pulse or frequency output on OUT1 (pin 4) are not supported.

▶ Check if the signal generated by the sensor is also provided via IO-Link.

▶ Check if the IO-Link transmission speed is fast enough for the application (for example in case of very rapid switching frequencies)
→ Technical data sheet.

3.1 Application area

The device is suitable for use in industrial applications.



The connected sensor / actuator (→ Fig. 4.1) must have IO-Link functionality.

For system integration the Y cable EVC843 is required (→ Accessories).

3.1.1 Device types

Order no.	Electrical design	Output logic (figures)
E43406	PNP	→ 6.1
E43410	NPN	

3.1.2 Restriction of the application area



The device must not be integrated into an existing IO-Link connection.

- The device is intended for indoor use only.
- For the possible influence of the sensor signals → 9.2.

4 Function

4.1 System integration

The prerequisite is a conventional sensor / actuator system without IO-Link that consists of a sensor / actuator and a respective counterpart:

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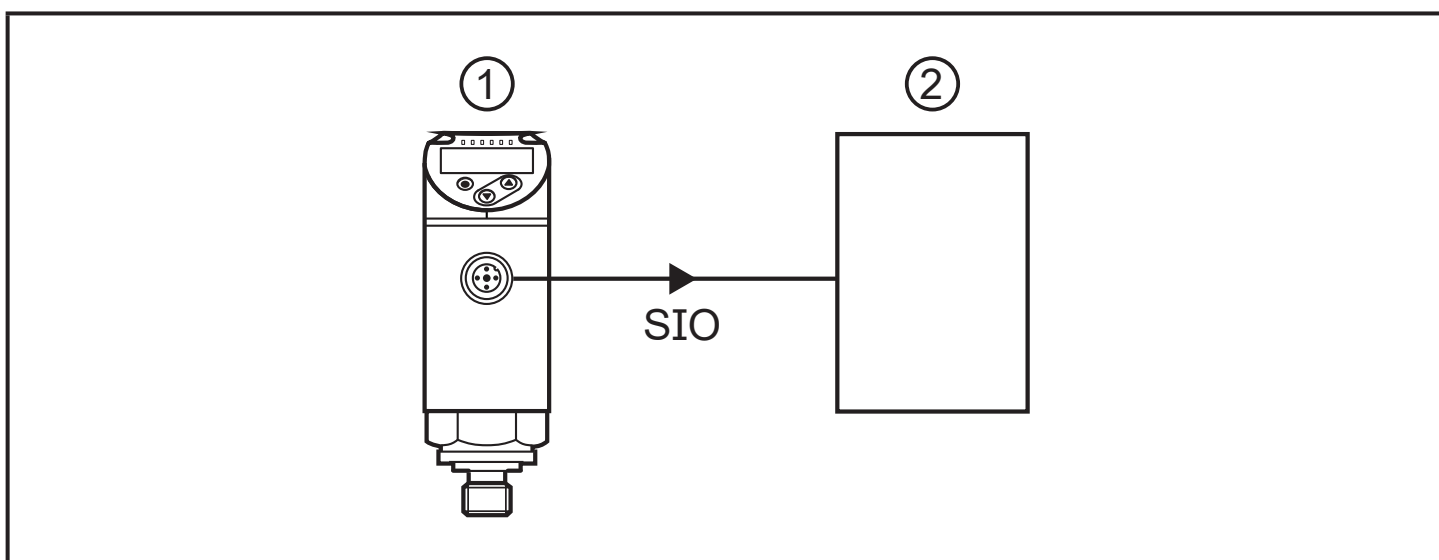


Fig. 4.1: Example of a conventional sensor system before integrating the data splitter

SIO = standard input-output mode; conventional switching mode

1: Sensor / actuator

2: Counterpart

The data splitter is installed using a Y cable between the sensor / actuator and the controller:

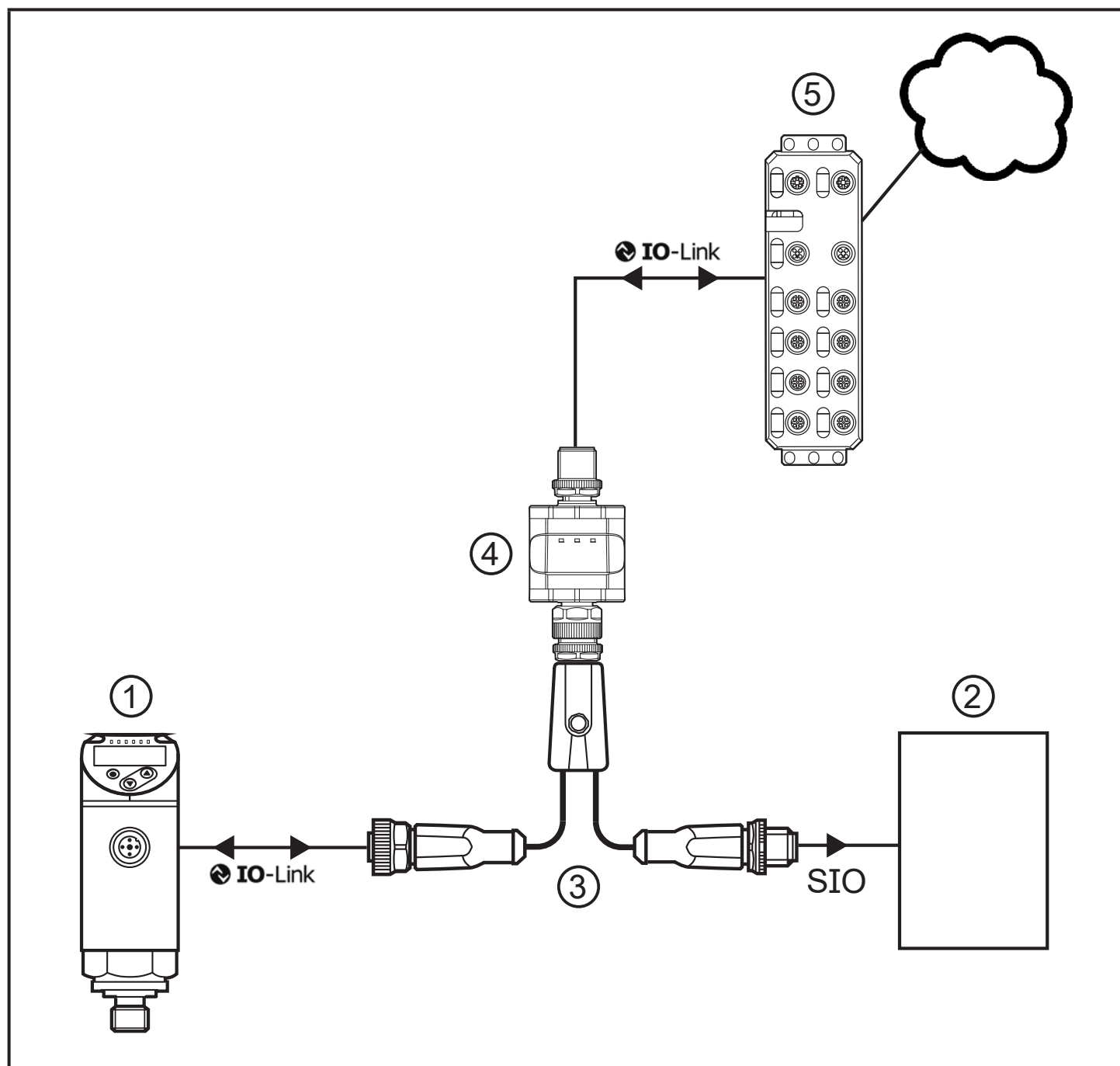


Fig. 4.2: Example of a system integration

- | | |
|---------------------------------------|-------------------------|
| 1: Sensor / actuator (IO-Link device) | 4: data splitter E434xx |
| 2: Controller / installation | 5: IO-Link master |
| 3: Y cable (EVC843) | |

In the configuration of fig. 4.2 the data splitter (4) switches the IO-Link device (1) initially operated in the SIO mode to the IO-Link mode, connecting the newly established IO-Link communication to the IO-Link master (5).

At the same time the data splitter (4) provides again all initial SIO signals of the sensor (1) to the controller / installation (2) so that the actual control task remains unchanged.

The SIO signals are generated even without connected IO-Link master (5) or active communication with the master so that the initial control task is carried out at any time.

It is now possible to read process and diagnostic data or to configure the sensor via the IO-Link master irrespective of the control task.

4.2 Write protection against unauthorised access

When the device is delivered the IO-Link master ((5) in fig. 4.2) only allows read access to the connected IO-Link device (1). Write access is not possible until the write protection has been removed.

To remove write protection:

- ▶ Connect and configure the device according to fig. 8.1 (→ 8).

4.3 IO-Link

This device has an IO-Link communication interface which requires an IO-Link capable module (IO-Link master) for operation.

The IO-Link interface allows direct access to process and diagnostic data (→ 4.1). Furthermore, communication with a USB IO-Link master is possible via a point-to-point connection (→ 8).

The IODDs necessary for the configuration of the data splitter and the connected IO-Link device, detailed information about process data structure, diagnostic information, parameter addresses and the necessary information about the required hardware and software can be found at www.ifm.com.

5 Installation

5.1 Installation location / installation environment

- ▶ Install the unit at a suitable location.
 - Observe the protection rating.
 - Avoid heat build-up or impermissible heating of the device.
 - Observe the maximum ambient temperature (→ Technical data).

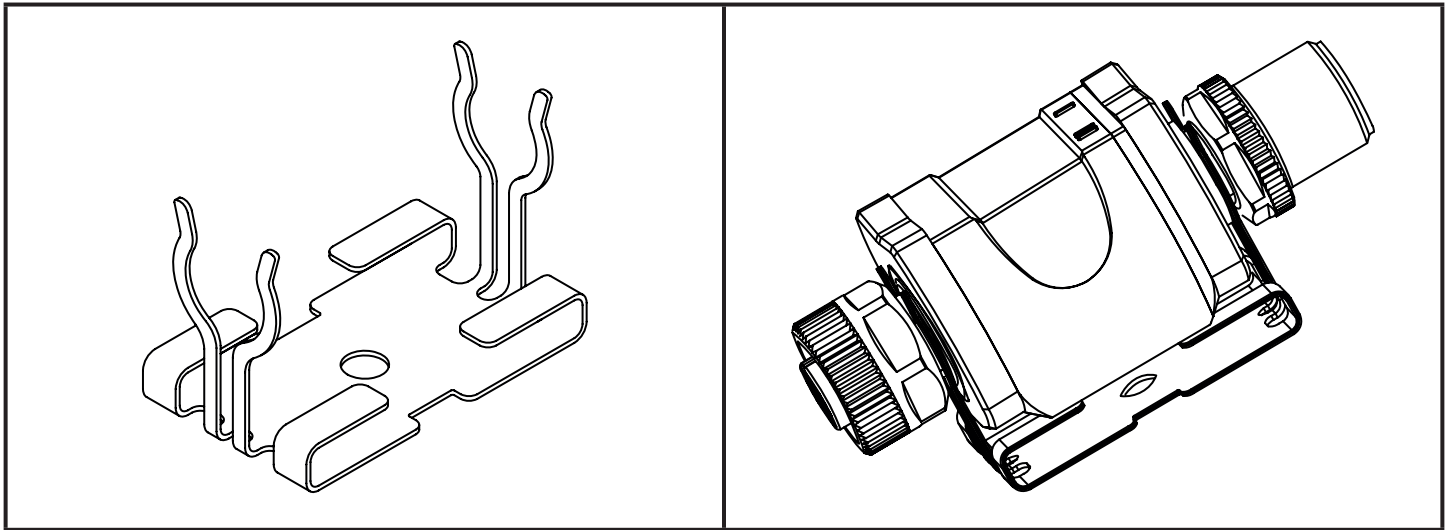
- ▶ Mount the device so that it is accessible. In case of concealed installation, mark the installation location in an appropriate way to ensure it can be found.

The maximum distance between the individual IO-Link components is 20 m.

Maximum distance between (3) and (2), fig. 4.2: → Technical data of the connection cables used and of the other connected components. Maximum 30 m.

5.2 Installation procedure

If required, the device can be fixed with a mounting clip.



Mounting clip
(fasten with M4 screw or cable ties)

Mounting clip with attached device

The mounting clip is not supplied with the device (→ Accessories).

- ▶ Connect the device with a suitable cable.
- ▶ Connect the device to the IO-Link device, installation and IO-Link master using the Y-cable EVC843 according to fig. 4.2.

6 Electrical connection



The unit must be connected by a qualified electrician.
The national and international regulations for the installation of electrical equipment must be adhered to.

Voltage supply according to EN 50178, SELV, PELV.

- ▶ Disconnect power.
- ▶ Connect the unit as follows:

Core colours	
BK	black
BN	brown
BU	blue
WH	white
GY	grey
Connections	
(1): to the master	
(2): to the Y cable	
(3): to the IO-Link device	
(4): to the installation	

(A): electrical separation

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Connection of the data splitter E434xx:		
	to the master (1)	1: L+ (from the master) 2: not connected 3: L- (from the master) 4: C: IO-Link
	to the Y cable (2)	1: L+ (from the installation) 2: C/Q: IO-Link 3: L- (from the installation) 4: switching output OUT1 / IO-Link ¹⁾ PNP (E43406) or NPN (E43410) 5: not connected



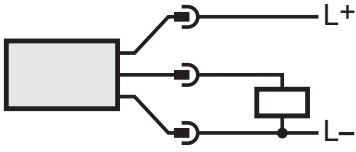
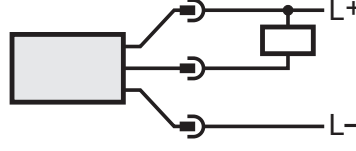
Using the Y cable EVC843 (→ 4.1) automatically ensures correct wiring.


Connection of the Y cable EVC843:		
	to the data splitter (2)	1: L+ (from the installation)
		2: C/Q: IO-Link
		3: L- (from the installation)
		4: switching output OUT1 / IO-Link ¹⁾
		5: not connected
	to the IO-Link device (3)	1: L+ (from the installation)
		2: switching output / analogue output OUT2, if available
		3: L- (from the installation)
		4: C/Q: IO-Link
		5: not connected
	to the installation (4)	1: L+ (from the installation)
		2: switching output / analogue output OUT2, if available
		3: L- (from the installation)
		4: switching output OUT1 / IO-Link ¹⁾ PNP (E43406) or NPN (E43410)
		5: not connected


¹⁾ During parameter setting (→ 8)

6.1 Electrical design of the output stage

► Observe the electrical design of the type used:

Type	Electrical design	Output logic (general)
E43406	PNP	
E43410	NPN	

 Pin 2 and pin 5 of the IO-Link device (connection (3) (→ 6)) are connected through to the installation side (4) in the Y cable EVC843. So for IO-Link devices with a signal on pin 2 (e.g. second switching output or analogue output) this signal is passed on unchanged to the installation.

 Connections (1) and (2) of the data splitter are electrically isolated (A).

7 Display

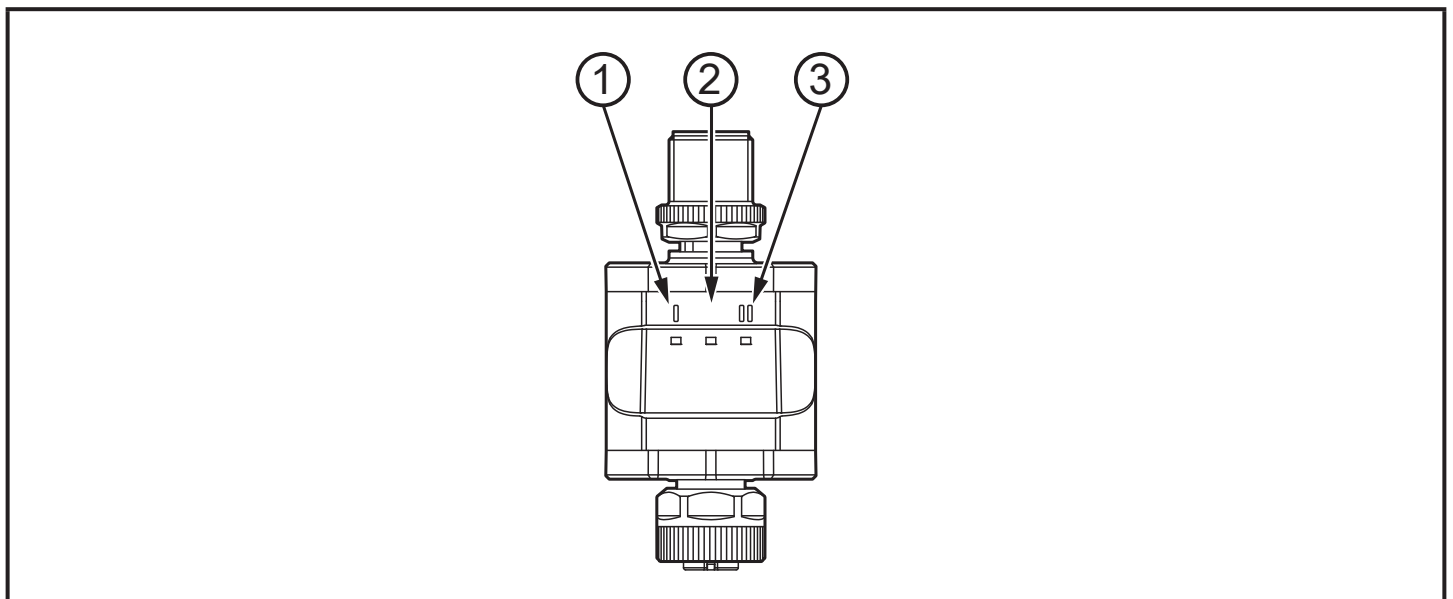


Fig. 7.1

- 1: LED 1 (yellow); indication of the switching status OUT1, if available
- 2: LED 2 (green); operation display / fault
- 3: LED 3 (yellow); indication of the IO-Link communication (→ 9.1)

8 Parameter setting



To set the device parameters an IO-Link (IO Device Description) is needed. More information: (→ 4.3)



For many applications the data splitter is ready for operation on delivery (plug & play).

For connected IO-Link devices that support the automatic output configuration (e.g. devices to the IO-Link smart sensor profile, switching type) the data splitter does not need to be configured.



For operation on an IO-Link device that does not support the automatic output configuration (→ 9.1) or if for example write protection is to be removed the device must first be configured. To do so, the device has to be connected according to fig. 8.1.

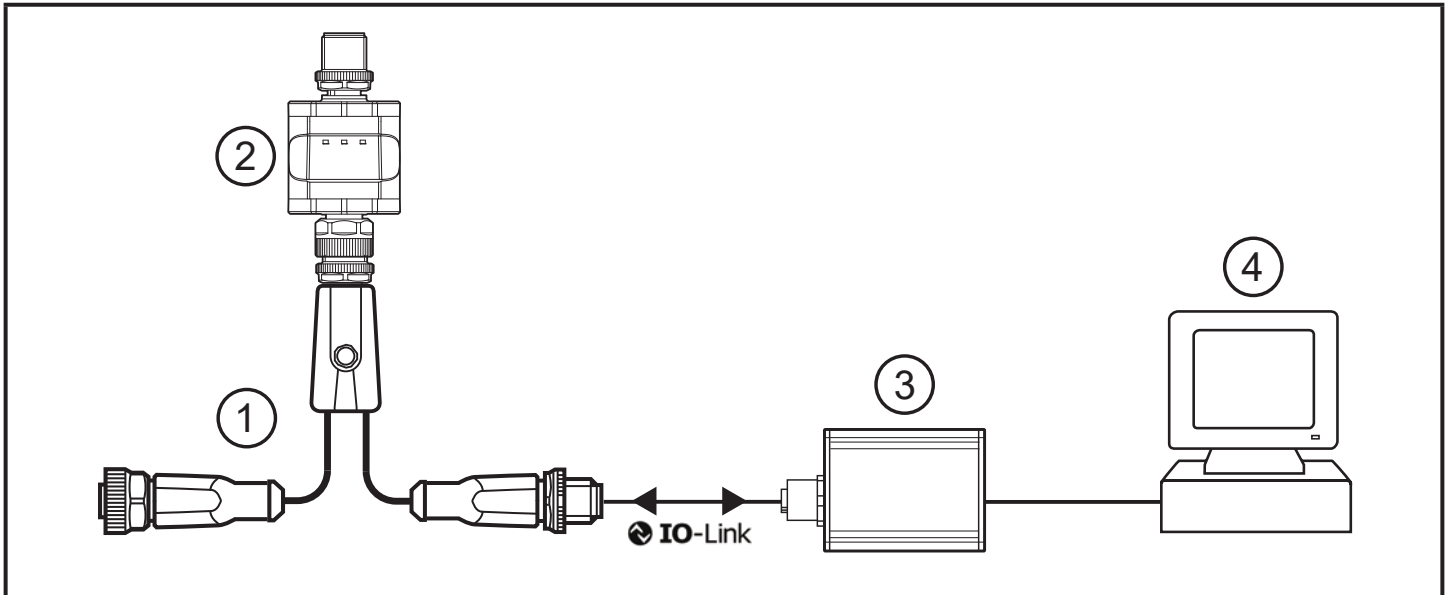


Fig. 8.1: Connection for parameter setting

1: Y cable (EVC843)

3: IO-Link master (e.g. USB version, E30390)

2: data splitter E434xx



4: PC / notebook



During parameter setting no IO-Link device must be connected to the Y cable (1).


- ▶ Connect the data splitter (2) to an IO-Link master (3) via the Y cable (1).
- ▶ Connect the IO-Link master (3) to a PC (4).
- ▶ For parameter setting use an IO-Link capable software (→ Accessories).
- ▶ If necessary, download the IO-Link of the data splitter and integrate it in the parameter setting tool used.

8.1 Parameters

Name	Description	(1)
OutputConfiguration	Selection between the automatic output configuration (default) and the manual output configuration.	auto
Restore factory settings	Default command to restore factory settings.	---
WriteProtect	Write protection for the connected IO-Link device. If write protection is active (parameter to 'on') write access of the master is rejected by the data splitter. Due to the system no feedback is given about rejected write access to DPP (Direct Parameter Page → IO-Link specification) nor about compatibility and validity requests of actuator data by the master.	On
	 Removing write protection may jeopardise the integrity of the application. Remove write protection only after a thorough check of the possible risks and effects.	
SwitchingBit	Bit in the IO-Link process data flow representing the switching output OUT1. The parameter is only available if OutputConfiguration is set to 'manual'.	0
	 ► For the position of the corresponding bit see the IODD description (PDF) of the connected IO-Link device.	
FOU1	Response of OUT1 in case of a fault. The parameter is only available if OutputConfiguration is set to 'manual'.	Off

(1) Factory settings / on delivery

► After parameter setting connect the device again according to fig. 4.2 (→ 4.1).

 After removal of the write protection and correct integration of the IODD (of the IO-Link device) the connected IO-Link device can be read and configured by the IO-Link master.

9 Operation

► Check whether the unit operates correctly.

9.1 Operation and diagnostics display

Description	LED 1	LED 2	LED 3
Supply voltage too low	OFF	OFF	OFF
Device fault	OFF	flashes at 1 Hz	OFF
Normal operation	X	ON	X
IO-Link master connected	X	ON	ON
No IO-Link master connected or IO-Link master not detected	X	ON	flashes at 1 Hz
No IO-Link device connected or IO-Link device not detected IO-Link device provides no switching output on pin 4	flashes at 1 Hz	ON	X
Short circuit on OUT1	flashes at 4 Hz	ON	X
Error with automatic output configuration (→ 8.1)	flashes at 1 Hz	ON	X
Switching status OUT1	ON / OFF	ON	X
Parameter setting mode	ON	ON	OFF

X: not defined

9.2 Delay times

Because of the data splitter the response time for the switching output OUT1 slightly increases by the IO-Link process cycle time.

Example:

A sensor has a response time of e.g. approx. 100 ms. By switching to the IO-Link mode this time is increased by the IO-Link process cycle time of e.g. 2.3 ms (depends on the device, → Technical data of the connected IO-Link components). So the total response time is approx. 102.3 ms.

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10 Technical data and scale drawing

Technical data and scale drawing at www.ifm.com.

11 Maintenance, repair and disposal

- ▶ It is not possible to repair the unit.
- ▶ After use dispose of the unit in an environmentally friendly way in accordance with the applicable national regulations.
- ▶ In case of returns ensure that the unit is free from dangerous and toxic substances.

More information at www.ifm.com