# Special Documentation Endress+Hauser IO-Link devices

Endress+Hauser IO-Link Add-On Instructions for Rockwell Automation Studio  $5000^{\ensuremath{\$}}$ 





# **Revision history**

Version	Documentation	Changes			
1.00	SD03386S/04/EN/01.25	First version			

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### 1 About this document

### 1.1 Document function

For each IO-Link device from Endress+Hauser, Endress+Hauser develops an Add-On Instruction for integration into specific Rockwell PLCs. These Add-On Instructions are compiled as a library at regular intervals and made available.

This documentation provides the following information:

- Descriptions of the Add-On Instructions for IO-Link devices from Endress+Hauser
- Notes for integration into Rockwell Automation Studio 5000 Logix Designer<sup>®</sup> design software, from version 35 for specific IO-Link masters

This document applies in addition to the accompanying product documentation for the relevant IO-Link device, such as Operating Instructions, Technical Information and ATEX Safety Instructions. The accompanying product documentation must be observed throughout the entire product life cycle.

### 1.2 Symbols

### 1.2.1 Safety symbols

#### A DANGER

This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.

#### **WARNING**

This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in serious or fatal injury.

#### **A**CAUTION

This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or medium injury.

#### NOTICE

This symbol contains information on procedures and other facts which do not result in personal injury.

#### **1.2.2** Symbols for certain types of information and graphics

### 🚹 Tip

Indicates additional information

### 

Reference to documentation

#### 

Reference to graphic

#### 

Notice or individual step to be observed

#### 1., 2., 3.

Series of steps

#### 

Result of a step

**1, 2, 3, ...** Item numbers

**A, B, C, ...** Views

### 1.3 Documentation

#### **1.3.1** Further applicable documents

An overview of the associated documentation is provided in the following:

- Device Viewer: Enter serial number from nameplate www.endress.com/deviceviewer
- The download area of the Endress+Hauser website www.endress.com/downloads

### 1.3.2 Purpose and content of the document types

#### **Technical Information (TI)**

#### Planning aid

This document contains all the technical data on the product and provides an overview of everything that can be ordered with the product.

#### **Brief Operating Instructions (KA)**

#### Quick guide to obtaining the first measured value

The Brief Operating Instructions contain all the essential information from incoming acceptance to initial commissioning.

#### **Operating Instructions (BA)**

#### Your reference guide

The Operating Instructions contain all the information that is required in various phases of the life cycle of the product: from product identification, incoming acceptance and storage, to mounting, electrical connection, operation and commissioning through to troubleshooting, maintenance and disposal.

#### Safety instructions (XA)

Safety Instructions (XA) are supplied with the product depending on the approval. They are an integral part of the Operating Instructions.



The nameplate indicates the Safety Instructions (XA) that are relevant to the product.

#### Special Documentation (SD)

#### Additional information

Special Documentation provides additional information on the product. Additional information can include graphical representation of commissioning, for example, or information on an app.

### 1.4 List of abbreviations

Abbreviation	Description
AOI	Add-On Instruction

### 1.5 Registered trademarks

IO-Link<sup>®</sup> is a registered trademark of the IO-Link Community c/o PROFIBUS User Organization, (PNO) Karlsruhe/Germany - www.io-link.com

Studio 5000 Logix Designer<sup>®</sup> is a registered trademark of Rockwell Automation Inc., USA

All other brand and product names are trademarks or registered trademarks of the companies and organizations in question.

### 2 Basic safety instructions

### 2.1 Requirements for the personnel

This document is intended for commissioning personnel of control systems who possess the following qualifications:

- Technicians or engineers
- Knowledge of Rockwell Automation Studio 5000 Logix Designer<sup>®</sup> design software
- Knowledge of the components in use, such as the IO-Link masters and IO-Link devices

The personnel responsible for installation, commissioning, diagnostics, and maintenance must meet the following conditions:

- Trained, qualified specialists must have a relevant qualification for this specific function and task.
- They must be authorized by the plant owner/operator.
- They must be familiar with federal/national regulations.
- Before starting work, personnel must read and understand the instructions in the manual and supplementary documentation as well as the certificates (depending on the application).
- They must follow instructions and comply with general policies.

The operating personnel must meet the following conditions:

- Personnel must be instructed and authorized according to the requirements of the task by the facility's owner/operator.
- ▶ Personnel must follow the instructions in this manual.

### 2.2 Intended use

For each IO-Link device from Endress+Hauser, Endress+Hauser develops Add-On Instructions for integration into specific Rockwell PLCs. These Add-On Instructions are compiled as a library at regular intervals and made available.



Supported IO-Link devices:  $\rightarrow \square 8$ 

The Add-On Instructions library was tested with specific PLCs, IO-Link masters and the Studio 5000 Logix Designer<sup>®</sup> design software.

The Add-On Instructions are intended to support the commissioning personnel of control systems using Endress+Hauser IO-Link devices. The Add-On Instructions make no claim to completeness or functionality for every configuration and system. The user of the Add-On Instructions is responsible for correct and safe operation in their system and for implementing any necessary adjustments. The user is also responsible for excluding errors that could lead to material damage and/or personal injury.

#### IT security (cybersecurity)

Each IO-Link device has individually implemented security mechanisms. For details about the implemented security mechanisms, refer to the product documentation of the IO-Link device.

The operator is responsible for protecting their system, system components, and networks against attacks and, in accordance with their requirements (security level), implementing and updating a comprehensive security concept.



Endress+Hauser provides information on cybersecurity at the following website: https://www.endress.com/cybersecurity

## 3 Product description

### 3.1 Function

The Add-On Instructions library support commissioning personnel in the integration into the Rockwell Automation Studio 5000 Logix Designer<sup>®</sup> design software.

Furthermore, the function blocks perform the following tasks:

- Writing acyclic data to an IO-Link device
- Reading acyclic data from an IO-Link device
- Configuring an IO-Link device
- Displaying process values directly at the output parameters of each function block without requiring further decoding

The Add-On Instructions are designed to work with generic input and output modules to provide greater flexibility in selecting the desired hardware.

### 3.2 Supported Endress+Hauser IO-Link devices

The library contains Add-On Instructions for the following Endress+Hauser IO-Link devices.

#### Flow

- Dosimag
- Dosimass
- Promag 10
- Promass 10

#### Level

- Liquiphant FTL43
- Micropilot FMR43

#### Pressure

Cerabar PMP43

### Temperature

iTHEMP TMT36

### 3.3 System requirements

The Add-On Instructions library was tested with specific PLCs, IO-Link masters and Studio 5000 Logix Designer<sup>®</sup>.

### 3.3.1 PLC

Rockwell PLC:

- 1756 controller
- 1769 controller
- 5069 controller

### 3.3.2 IO-Link master

Rockwell Automation 5032-8IOLxxxx FW 2.012 IFM AL1323 8-Port

### 3.3.3 Software

Rockwell Automation Studio 5000 Logix Designer from version 35

# 4 System integration with a Rockwell IO-Link master

### 4.1 Requirements and procedure

### Requirements

Hardware configuration engineered.

- **1.** Download Add-On Instructions library  $\rightarrow \implies 10$ .
- **2.** Integrate IO-Link master into EtherNet/IP network and configure  $\rightarrow \square$  10.
- 3. Import device IODDs into the Studio 5000 driver catalog  $\rightarrow \square$  13.
- 4. Integrate IO-Link devices into the IO-Link master  $\rightarrow$   $\cong$  13.
- **5.** Import communication AOI into a project  $\rightarrow \square$  15.
- **6.** Set up communication AOI  $\rightarrow \square$  16
- **7.** Import device AOI into a project  $\rightarrow \implies$  19.
- 8. Configure device AOI  $\rightarrow$   $\cong$  21

Data exchange between the IO-Link devices and control system is via a IO-Link master. The IO-Link master communicates with the control system via EtherNet/IP.

The IO-Link master is integrated into the Rockwell Automation control system as an EtherNet/IP device. The configuration procedure for the IO-Link master depends on the manufacturer.

### 4.1.1 Communication AOI and device AOI

The device AOI and communication AOI are required for integrating an IO-Link device. The communication AOI always applies only to one IO-Link master and one IO-Link device.

For example, you need the following AOIs to integrate a Promass 10 flowmeter into a system with a "Rockwell Automation 5032-8IOLxxxx" IO-Link master:

- Communication AOI: EH\_RA\_5032\_IOLink\_CommAOI\_8P.L5X Communication AOI for a Promass 10 with a "Rockwell Automation 5032-8IOLxxx" IO-Link master
- Device AOI: EH\_Promass10\_IOL\_AOI.L5X Device AOI for a Promass 10

### 4.2 Download Add-on Instructions library

- 1. Open the www.endress.com page.
- 2. Select the product using the filters and search field.
- 3. Open the product page.
- 4. Select the **Downloads** page.
- 5. Select **Software**.

### 4.3 Rockwell Automation 5032-8IOLxxx IO-Link master

# 4.3.1 Integrating IO-Link master into EtherNet/IP network and configuring IO-Link master

The IO-Link master is integrated into the Rockwell Automation control system as an EtherNet/IP device.

- **1.** Open the project into which the IO-Link master is to be integrated.
- 2. Select the network card to which the IO-Link master is to be connected.
- 3. Select the **New Module** function via the context menu. If you access the controller online via the software, you can also use the **Discover Modules** function.





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5. Click or	n <b>Create</b> .										

← The **New Module** window is displayed.

6. Configure the **Name** and **IP Address** parameters.

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7. In the Module Definition section, click on Change.
The Module Definition window is displayed.

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2	5		Disabled		~					
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	7		Digital Input		~					
4	8		Digital Input, Timestamp	~	~	~				
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- 8. Configure the following settings for all ports that are to be operated as IO-Link: Set "First" channel such as "Channel 0" or "Channel 2" to "IO-Link". Set "Second" channel, for example, "Channel 1" and "Channel 3", to "Disabled".
- 9. Confirm configuration with **OK**. Close the "New Module" window and, if necessary, the "Select Module Type" window.
  - ← The IO-Link master is integrated into the project. The IO-Link master is displayed in the **I/O Configuration** window in the **Controller Organizer** folder.

If you double click on the IO-Link master or open the "Properties" function via the context menu, the properties of the IO-Link master are displayed.

### 4.3.2 Importing device IODDs into the Studio 5000 driver catalog

The device IODDs are required for configuring the Rockwell Automation IO-Link master.

 Use the EDS Hardware Installation Tool tool to import the Endress+Hauser device IODDs into the driver catalog. Path: Tools > EDS Hardware Installation Tool

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				ControlFLASH Plus	

#### 4.3.3 Assigning the IO-Link device to the IO-Link master

1. Select the IO-Link master and select the **New Module** function via the context menu.

2. Select the desired IO-Link device, e.g. Promass10 in this case, in the **Catalog** tab.

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#### 3. Click on **Create**.

└ The **New Module** window is displayed.

New Module		×
General	General	
General - Connection - Device Info - Configuration - Parameters - Fault/Program Actions	Type:         Promass 10 (9728513) Promass 10           Vendor:         Endress+Hauser           Parent:         Rockwell_IOL_Master           Name:         1         Channel:         2         0           Description:	v
	Module Definition	
	IO-Link Revision: 1.1	
	Electronic Keying: Compatible Module	
	ADC Enabled: Yes, Data Storage: Backup/Restore	
	Connection: Data Connection Change	
	DANGER: Selected Channel is configured for IO-Link. To prevent unexpected motion, do not attach a discrete out channel that does not support IO-Link.	put device to the
Status: Creating	OK Cancel	Help

- 4. Configure the **Name** and **Channel** parameters.
- 5. Confirm configuration with **OK**.
  - ➡ The IO-Link device is assigned to the IO-Link master. The IO-Link device is displayed in the Controller Organizer window in the I/O Configuration folder under the IO-Link master.

Jogix Designer - IOLink_AOI [1756-L81E 35.11]*		
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Controller Fault Handler	- Configuration	Type: Promass T0 (372013) Promass T0
Power-Up Handler	- Parameters	Vendor: Endress+Hauser
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A 🕲 IO-Link		
C U Promass 10 (9728513) Promass_10_IOL		
	Status: Offine	OK Cancel Apply Help

If you double click on the IO-Link master or open the "Properties" function via the context menu, the properties of the IO-Link master are displayed.

### 4.4 Importing the communication AOI into a project

#### Requirements

The IO-Link devices are added to the project.

- 1. In the **Controller Organizer** window, select the **Add-On Instruction** folder. **Assets** folder > **Add-On Instruction** folder
- 2. Select the **Import Add-On Instruction** ... function via the context menu.
  - ← The Import Add-On Instructions window is displayed.



**3.** Select the communication AOI for the Rockwell Automation IO-Link master and the IO-Link device.



← The **Import Configuration** window is displayed.

1	🖄 Find:	~ <u>A</u> 6 A <u>6</u>	Find/Replace
	Find Within: Final Name		
00	ort Content:	Conformental O	Texture Description
	Add-On Instructions	Import Name:	EH_RA_5032_IOLink_CommAOI_8P_Promass 10
	<ul> <li>Parameters and Local Tags</li> <li>Routines</li> </ul>	Operation:	Create V D
a	References		References will be imported as configured in the References folders
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	, , , , , , , , , , , , , , , , , , ,		
		1	

5. If the communication AOI has not yet been imported, the **Create** option is displayed for the **Operation** field. If the communication AOI has already been imported or the name is already assigned, a warning is displayed. The **Import Configuration** window does **not** require any adjustments.

6. Click OK.

The communication AOI is imported into the project and is available for the routine. The AOI is displayed in the Controller Organizer window in the Add-On Instructions folder and Language Element section under Add-On.



### 4.5 Setting up the communication AOI

To set up the communication AOI, you create and link tags. The first five tags of the communication AOI make up the "IO-Link master data structure". You only need to create these tags once for each IO-Link master within a project. You can then use these tags for all IO-Link devices connected to the same IO-Link master. The remaining tags are device specific. You must generate and link these tags for every IO-Link device.

You are not required to follow any naming conventions for the tags.

EH_RA_5032_IOLink_CommAOI_8	8P_Promass10 🛄		EH_RA_5032_IOL	.ink_CommAOI_8P_Promass10
EH_RA_5032_IOLink_CommAOI_8P_P_0	01		EH_RA_5032_IOL	.ink_CammAOI_8P_P_01
DataToSend	?		DataToSend	RA_DataToSend
CommA OlBusy	?		CommA OlBusy	RA_CommBusy
ActiveComPort	?		ActiveComPort	RA_ActiveComPort
Send_Request	?		Send_Request	RA_SendRequest
CommError	?		CommError	RA_CommError
DeviceData	?		DeviceData	RA_Promass10_Data
Device_Input	?		Device_Input	Promass_10_IOL:I
Device_Output	?		Device_Output	Promass_10_IOL:O
GetDeviceMSG	?		GetDeviceMSG	RA_MSG_IOL_Get_Promass 10
GetDeviceData	?		GetDeviceData	Promass10_get_Data
SetDeviceMSG	?		SetDeviceMSG	RA_MSG_IOL_Set_Promass10
SetDeviceData	?		SetDeviceData	Promass10_set_Data
		1		

- 1. Create the first five tags "DataToSend", "CommAOIBusy", "ActiveComPort", "Send\_Request" and "CommError". You can use these tags for all IO-Link devices that are connected to this IO-Link master.
- 2. Create the "DeviceData" tag.
- 3. Create the "Device\_Input" tag and link to the input tag of the IO-Link device.
- 4. Create the "Device\_Output" tag and link to the output tag of the IO-Link device.
- 5. Generate the "GetDeviceData tag and configure the "GetDeviceMSG tag.  $\rightarrow \square 17$
- 6. Generate the "SetDeviceData tag and configure the "SetDeviceMSG tag.  $\rightarrow \square$  18

#### 4.5.1 Configuring message for GetDeviceMSG

1. Click on ... to the right of the **GetDeviceMSG** tag.

└ The **Message Configuration** window is displayed.

- 2. Select the **Configuration** tab.
- 3. In the **Service Code** field, enter the value **32**.
- 4. Use the **Destination Element** field to select the previously created "GetDeviceData" tag with [0] at the end.
- 5. In the **Source Length** field, select the value **0**.

EH_RA_5032_IOLink_CommAOI_8P_Promass10	Message Configuration - RA_MSG_IOL_Get_Promass10 X
EH_RA_5032_IOLink_CommAOI_8P_P_01	Configuration Communication Tax
DataToSend RA_DataToSend	Coningenerication Tag
CommA OlBusy RA_CommBusy	Message Type: CIP Generic V
ActiveComPort RA_ActiveComPort	
Send_Request RA_SendRequest	Service Custom V Source Element: V
CommError RA_CommError	Type: 2 Source Lengths on (Ruter)
DeviceData RA_Promass10_Data	Service and Havi Classe O (Havi)
Device_Input Placeholder_I	Code: 32 (Hex) Class: 0 (Hex) Destination hass10_get_Data[0] V
Device_Output Placeholder_O 1	Instance: 0 Attribute: 0 (Hex) Clement:
GetDeviceMSG RA_MSG_IOL_Get_Promass10	
GetDeviceData Promass10_get_Data	
SetDeviceMSG RA_MSG_IOL_Set_Promass10	
SetDeviceData Promass10_set_Data	
	Enable
	⊖ Error Code: Extended Error Code: ☐ Timed Out ♥ Error Path: Promass10 Error Text:
	OK Cancel Apply Help

- 6. Select the **Communication** tab.
- 7. Use **Browse** to search for and select the IO-Link device.

- 8. Enable the **Connected** checkbox.
- 9. Press **OK** to confirm your entry.

nfiguration Communication* Tag	Message Path Browser	
Path:	Browse Path: Promass_10_IOL	
Broadcast:		- <u>10 IOI</u>
	OK Cancel	Help

### 4.5.2 Configuring message for SetDeviceMSG

- Click on ... to the right of the SetDeviceMSG tag.
   The Message Configuration window is displayed.
- 2. Select the **Configuration** tab.
- 3. In the **Service Code** field, enter the value **33**.
- 4. Use the **Destination Element** field to select the previously generated "SetDeviceData" tag with [0] at the end.
- 5. In the **Source Length** field, select the value **1**.

EH_RA_5032_IOLink_CommAOI_8P_Promass10 🛛 🛄	Message Configuration - RA_MSG_IOL_Set_Promass10
EH_RA_5032_IOLink_CommAOI_8P_P_01	Configuration Communication Tag
DataToSend RA_DataToSend	Communication Tog
CommA OlBusy RA_CommBusy	Message Type: CIP Generic V
ActiveComPort RA_ActiveComPort	
Send_Request RA_SendRequest	Service Custom V Source Element: Promass10_set_Data V
CommError RA_CommError	Type: 2 3 Source Length: (Bytec)
DeviceData RA_Promass10_Data	Service an Alan) class a Alan
Device_Input Placeholder_I	Code: 33 (nex) Class: 0 (nex) Destination
Device_Output Placeholder_O	Instance: 0 Attribute: 0 (Hex)
GetDeviceMSG RA_MSG_IOL_Get_Promass10	i i i i i i i i i i i i i i i i i i i
GetDeviceData Promass10_get_Data 1	
SetDeviceMSG RA_MSG_IOL_Set_Promass10	
SetDeviceData Promass10 set Data	
	O Eachla O Eachla Walters O Bast O Davas Desas Landha B
	C Enable C Enable Waiting C Start C Done Done Length: U
	O Error Code: Extended Error Code: ☐ Timed Out ♥ Error Path: TMT36 Error Text:
	OK Cancel Apply Help

- 6. Select the **Communication** tab.
- 7. Use **Browse** to search for and select the IO-Link device.
- 8. Enable the **Connected** checkbox.

Message Configuration - RA_MSG_IOL_Set_Promass10 × Configuration Communication* Tag	
Path:     Browse      Browse      Browse      Drowsecast:     Communication Method     @ CIP Wth     Channet:     A' Destination Link:     D     (0 Ctal)     Source ID     Source Link:     D     Destination Node:     D     (0 Ctal)	Message Path Browser ×
Connected Cache Connections • Large Connection	Path:         Promass_10_IOL           Promass_10_IOL
O Enable ○ Enable Waiting ○ Stat ○ Done Done Length: 0     O Error Code: Extended Error Code: □ Timed Out ♥ Error Path: Error Text:	0 Promass 10 (9728513) Promass_10_0L

#### 9. Press **OK** to confirm your entry.

### 4.6 Importing device AOI into a project

In the Controller Organizer window, select the Add-On Instructions folder.
 Select the Import Add-On Instruction ... function via the context menu.



**3.** Select the device AOI to be imported. In this example, the Promass 10 is used in combination with a 5032-8IOL master.

Import Add-On	Instruction				×
Look in:	AOI	~	G 🦻 🖻 🛄 -		
1	Name	^	Date modified	Туре	Size
<b>X</b>	EH_Promas	is10_IOL_AOI.L5X	10.10.2024 10:54	Logix Designer X	118 KB
Quick access Desktop Libraries This PC		2_IOLink_CommAOI_8P_Promass	09.10.2024 14:22	Logix Designer X	60 KB
	File name:	EH_Promass10_IOL_AOI.L5X		~	Open
	Files of type:	Logix Designer XML Files (*.L5X)		~	Cancel
					Help

4. The **Import Configuration** window does **not** require any adjustments. If the device AOI has not yet been imported, the **Create** option is displayed for the **Operation** field.

rt Content:					
Add-On Instructions	Configure Add-0	In Instruction Properties			
EH_Promass10_IOL     Parameters and Local Tags	Import Name:	EH_Promass 10_IOL			
Routines	Operation:	Create	~	D	
References		References will be imported configured in the Reference	as s folders		
Co Errors/Warnings	Final Name:	EH_Promass 10_IOL	~	Properties	
	Description:	Promass 10 Rev 1 IO-Link	^		
			~		
	Revision:	v1.0			
	Revision Note:				
	Venders	Fadares (Marray			
	vendor:	Endress thauser			

### 5. Click **OK**.

└→ The device AOI is imported into the project. The device AOI is displayed in the Controller Organizer window in the Add-On Instructions folder and Language Elemen section under Add-On.



6. Add the device AOI. The device AOI must be added in the same program section of the function block where the Comm AOI is stored. To do this, either click on the **Promass IO-Link** button or drag the device AOI from the **Controller Organizer** window.

### 4.7 Configuring the device AOI (Rockwell 5032-8IOL)

The first six tags are reused by the communication AOI. The three diagnostic tags must be generated for every device AOI.

- **1.** Generate the three diagnostic tags. These tags are the string data type.
- 2. Set up all the remaining tags.
  - └ The color of the device AOI header changes from red to gray. The corresponding IO-Link master and corresponding IO-Link device can communicate.

EH_RA_5032_IOLink_CommAOI_8P_Promas s10				EH_Promass10			EH_Promass10	[]		
CommAOI_8P	P_02			EH_Promass10_01			EH_Promass10_02			
RA	A_DataToSend			DataToSend CommA OBusy	?		DataToSend CommA OBusy	RA_DataToSend RA_CommBusy		
RA	ActiveComPort			ActiveComPort	2		ActiveComPort	RA ActiveComPort		
RA	SendRequest			DeviceAOISendRequest	2		DeviceAOISendRequest	RA SendRequest		
F	A_CommError			CommError	?		CommError	RA_CommError		
RA_Pro	omass10_Data			DeviceData	?		DeviceData	RA_Promass10_Data		
Pror	mass_10_IOL:I	_	0	SetSimulation	qVendar_10		SetSimulation	qVendor_ID	P	
Prom	ass_10_IOL:0			iSimulation Variable	qDevice_ID		iSimulation Variable	qDevice_ID	Þ.	
MSG_IOL_G	et_Promass10			iSimulation Value	qMassFlow	0.0	iSimulation Value	qMassFbw	0.0	
Promas	ss10_get_Data			iSetTotalizerPresetValue	qDensity	0.0	iSetTotalizerPresetValue	qDensity	þ.0.0	
MSG_IOL_S	et_Promass10			iTotalizerPresetValue	qTemperature	0.0	iTotalizerPresetValue	qTemperature	0.0	
Promas	ss10_set_Data		0	iTotalizer_Hold	qTotalizer1		iTotalizer_Hold	qTotalizer1	Þ.0	
				iTotalizer_ResetTotalize	qExtendedDeviceStatus		Totalizer_ResetTotalize	qExtendedDeviceStatus	Þ	
				iTotalizer_ResetHold	qSSC1_1		Totalizer_ResetHold	qSSC1_1		
				iTotalizer_Totalize	qSSC1_2		iTotalizer_Totalize	qSSC1_2	Þ.	
				iDeviceSearch	qSSC2_1	0	DeviceSearch	qSSC2_1	Þ	
			0	iFlowOverride	qSSC2_2	3	FlowOverride	qSSC2_2		
					qSSC3_1	0		qSSC3_1	Þ	
					qSSC3_2	Ð		qSSC3_2	Þ.	
					qSSC4_1	0		qSSC4_1	Þ	
					qSSC4_2	16#0000.0000		qSSC4_2	16#	
					qAOI_Diagnostic	>		qAOI_Disgnostic	D IOW	
			- 1	qAOI_Diagnostic_String	?	0	qAOI_Diagnostic_String	Promass_10_AOI_Diag	0	
			- 1		Actual_Diagnostics_Code	2		qActual_Diagnostics_Code	Ρ.	
				qActual_Diagnostics_Stri	ng ?	0	qActual_Diagnostics_String	Promass_10_A_Diag	0	
					qLast_Diagnostics_Code	D T		qLast_Diagnostics_Code	Ρ.	
			- L	qLast_Diagnostics_String	?	0	qLast_Diagnostics_String	Promass_10_L_Diag	0	
					qCommunicationBusy	> .		qCommunicationBusy	Po	
					qDeviceConnectionError	Ð		qDeviceConnectionError	Þ	

		C C C C S	1941 1941	eh = Sheet 1 ↓ of	1	
Controller IOLink_AOI	A	В				
Controller Tags		0				
Controller Fault Handler	EH RA 5032 10	ink CommAOI 8P Promas s10		EH Promass10 IOL		
Power-Up Handler						
a 🛁 Tasks 1	EH_RA_5032_10	Link_CommAOI_8P_P_02		EH_Promass10_02		
A 🖓 MainTask	DataToSend	RA_DataToSend		DataToSend	RA_DataToSend	
A 5 MainProgram	CommA OlBusy	RA_CommBusy		CommA OlBusy	RA_CommBusy	
Parameters and Local Tags	ActiveComPort	RA_ActiveComPort		ActiveComPort	RA_ActiveComPort	
MainRoutine	Send_Request	RA_SendRequest		DeviceAOISendRequest	RA_SendRequest	
SE AOI	CommError	RA_CommError		CommError	RA_CommError	
Unscheduled	DeviceData	RA_Promass10_Data		DeviceData	RA_Promass10_Data	
Motion Groups	Device_Input	Promass_10_IOL:I		C iSetSimulation	qVendor_ID	
Ungrouped Axes	Device_Output	Promass_10_IOL:O		ISimulationVariable	qDevice_ID	0
Alarm Manager	GetDeviceMSG	RA MSG IOL Get Promass10	-	SimulationValue	gMassFlow D	0.0
Assets	GetDeviceData	Promass10 get Data		ISetTotalizerPresetValue	dDensity	0.0
Add-On Instructions	SetDeviceMSG	RA MSG IOL Set Promass10		TotalzerPresetValue	oTemperature	0.0
Descenter and local Terr	SetDeviceData	Promass10 set Data		Totalzer Hold	oTotalizer1	0.0
V Parameters and Local lags				Gilotalzer ResetTotalze	dExtendedDeviceStatus	0
FT FH RA 5032 IOI ink CommAOI 8P Promass10				Totalzer ResetHold	oSSC1 1	0
A C Data Types				Totalzer Totalize	aSSC1 2	0
A G User-Defined				DavinaSaarch	1 50220	0
III EH CommAOI Data				EleviceSearch	40002 1 p	0
Tim Strings				CIERDWOVEIINE	q3502_2 D	0
Madd-On-Defined					q55C5_1 5	0
Predefined					d22C3_2	0
Module-Defined					qSSC4_1	0
Trends					qSSC4_2	16#00
h. Logical Model					qAOI_Disgnostic D	
G I/O Configuration				qAO[_Diagnostic_String	Promass_10_AOI_Diag	0
▲ 📾 1756 Backplane, 1756-A10				(	Actual_Diagnostics_Code	
[3 [4] 1756-L81E IOLink_AOI				qActual_Diagnostics_String	Promass_10_A_Diag	0
A So Ethernet					qLast_Diagnostics_Code	>
🕼 1756-L81E IOLink_AOI				qLast_Diagnostics_String	Promass_10_L_Diag	0
5032-8I0LM12DR/A I0Link_5032_8I0L					qCommunicationBusy	
A 🚫 IO-Link					qDeviceConnectionError	0
2. 0 Promass 10 (9728513) Promass 10 IOL 4						

Description of device AOIs: • Flow:  $\rightarrow \cong 33$ 

- Level: → 🗎 45
- Pressure:  $\rightarrow \square 50$
- Temperature:  $\rightarrow \square 52$

# 5 System integration with an IFM IO-Link master

### 5.1 Requirements and procedure

#### Requirements

Hardware configuration engineered.

- **1.** Download Add-On Instructions library  $\rightarrow \square$  10.
- **2.** Integrate IO-Link master into EtherNet/IP network and configure  $\rightarrow \bigoplus 24$ .
- **3.** Import communication AOI into a project  $\rightarrow \cong$  30.
- 4. Set up communication AOI  $\rightarrow$  🗎 28
- **5.** Import device AOI into a project  $\rightarrow \cong$  30.
- 6. Configure device AOI  $\rightarrow \cong 31$

Data exchange between the IO-Link devices and control system is via a IO-Link master. The IO-Link master communicates with the control system via EtherNet/IP.

The IO-Link master is integrated into the Rockwell Automation control system as an EtherNet/IP device. The configuration procedure for the IO-Link master depends on the manufacturer.

### 5.1.1 Communication AOI and device AOI

The device AOI and communication AOI are required for integrating an IO-Link device. The communication AOI always applies only to one IO-Link master and one IO-Link device.

For example, you need the following AOIs to integrate a Promass 10 flowmeter into a system with an "IFM AL1323" IO-Link master:

- Communication AOI: EH\_AL1323\_8P\_CommAOI.L5X oder EH\_AL1323\_8P\_CommAOI\_Array.L5x Communication AOI for a Promass 10 with an "IFM AL1323" IO-Link master
- Device AOI: EH\_ Promass10\_IOL\_AOI.L5X Device AOI for a Promass 10
  - The library contains the two communication AOIs

"EH\_AL1323\_8P\_CommAOI\_Array" and "EH\_AL1323\_8P\_CommAOI" for the "IFM AL1323" IO-Link master.

The difference between the two AOIs is the EDS version of the IFM AL1323.

- In the older version "EH\_AL1323\_8P\_CommAOI\_Array", the implicit input data type is defined as "Array of Integer".
- In the latest version "EH\_AL1323\_8P\_CommAOI", the implicit input data type is defined as "Integer".

### 5.2 Download Add-on Instructions library

1. Open the www.endress.com page.

- 2. Select the product using the filters and search field.
- 3. Open the product page.
- 4. Select the**Downloads** page.
- 5. Select **Software**.

### 5.3 IFM AL1323 IO-Link master

# 5.3.1 Integrating IO-Link master into EtherNet/IP network and configuring IO-Link master

The IO-Link master is integrated into the Rockwell Automation control system as an EtherNet/IP device.

#### Requirements

The EDS for the IO-Link master is installed.

- **1.** Open the project into which the IO-Link master is to be integrated.
- 2. Select the network card with which the IO-Link master is to be assigned.
- 3. Select the **New Module** function via the context menu. If you access the controller online via the software, you can also use the **Discover Modules**function.

ā 📲										
Controller IOLink_Rockwell										
Controller Tags										
📕 Controller Fault Handler										
Power-Up Handler										
🖌 🖳 Tasks										
Fast (100 ms)										
FastProgram										
Normal (250 ms)										
Slow (500 ms)										
System (1000 ms)										
Unscheduled										
Motion Groups										
👂 💼 Alarm Manager										
Assets										
🔁 Logical Model										
🔺 🚄 I/O Configuration										
🔺 📟 1756 Backplane, 1756-A10										
📴 [4] 1756-L81EP IOLink_Rockwell										
[8] 1756-EN2TR Testnetzt										
Ethern New Module										
▲ Import Module										
Discours Medules										
Deste Ctrl+V										
Print										

4. Select the IO-Link master via the **Select Module Type** window in the **Catalog** tab. A selection is only displayed if the EDS for the IO-Link master was installed beforehand.

Logix Designer - IOL	ink_AOI [1756-L8	IE 35.11]											
File Edit View	Search Logic	Communications	Tools Window Help										
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Controller Organizer			- 1 X										
an pii													
er a													
▲ Controller IOLin	k_AOI												
Controller la	igs			Select	Module Time								
Deuter Ha H	suit Handler			Jelect	module type								
A Tarke	anulei			Cata	Ing Mark In Discourses	Enuder							
A C MainTask					House Discovery	ravolites							
P & MainPro	gram							i.				-	
Unscheduled	d				1323		Clear Filters					Show Filte	rs ¥
4 📹 Motion Groups													
Ungrouped a	Axes				Catalog Number		Description		Vendor	Category			
👂 💼 Alarm Manager					AL1323		IO-Link Master DL EIP 8P IP69	ĸ	fm electronic gm	Communications Adapter			
Assets													
Add-On Inst	ructions												
4 📹 Data Types													
Tim User-Det	ined												
Tat Strings													
Deadefin	-Denneu												
P In Predering	Defined												
Trends	Denned												
h Logical Model													
4 🗐 I/O Configuratio	n												
🖌 📾 1756 Backpla	ane, 1756-A10												
[3 [4] 1756-	L81E IOLink_AO												
🔺 💑 Ethernet					of 850 Module Types Fe	und						Add to Far	vorites
[3 1756-L81	E IOLink_AOI												
					T Church Church					0		Class	Hala
					_ close on create					C	cove	Ciuse	melp
				-								1	
1= Controller Organizer	Logical Or	anizer											

5. Click on **Create**.

- └ The **New Module** window is displayed.
- 6. Configure the **Name** and **IP Address** parameters.

Logix Designer - IOLink, AOI (1755-L31E 35.11) File Edit View Search Logic Communications Tools Window Help C L H H H H H H H H H H H H H H H H H H	5 /
Path crose>     Path cros	Note:     List     List     Farmeries       Adde Derivation     Restandoru     Farmeries       Adde Derivation     Farmeries     Farmeries       Module     X     X       Tipe:     A.11220.0Link Mater DL EIP BP IP69K       Vendor:     fine-dedonic gabh       Peerrie:     Local       Name:     M.1222.0Link Mater DL EIP BP IP69K       Vendor:     fine-dedonic gabh       Peerrie:     Local       Description:     Photoe       Module Derivation     Provide Materia       Module Derivation     Provide Materia       Module Derivation     Provide Materia       Module Derivation     Topic       Derivation     Topic       Derivation     Topic       Derivation     Topic       Derivation     Topic   <
The Second Seco	Creating OK Cancel Heb Close

In the Module Definition section, click on Change.
 The Module Definition window is displayed.

Electronic Keying: Compatible Module						
nections:						
Name	_		Size		Tag Su	ffix
Exclusive Owner		Input:	223	INT V	1	AL_1323_IFM_Master:I1
IU-Acyc-Diag	_	Output:	151			AL_1323_IFM_Master:01
Select a connection	~			SINT INT		
	_					

- 8. Select data type INT for Exclusive Owner IO-Acyc-Diag.
- 9. Confirm configuration with **OK**. Close the "New Module" window and, if necessary, "Select Module Type".
  - └→ The IO-Link master is integrated into the project. The IO-Link master is displayed in the I/O Configuration window in the Controller Organizer folder.

Logix Designer - IOLink_AOI [1756-L81E 35.11]*			- 8 ×
File Edit View Search Logic Communications Tools Windor	w Help		
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RUN     Comparison     Comparis	€ & 0 Its & Redundancy 11	C C O + () 00 0	
2 m	g mobile Properties: Local UKL1525 1.004		
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Controller Organizer     Exceptul Organizer      Totor      O Einen     La V Warreys     O Einen	sager		+•× αh
🔽 Errors 💭 Search Results 💭 Watch			

If you double click on the IO-Link master or open the "Properties" function via the context menu, the properties of the IO-Link master are displayed.

### 5.4 Importing the communication AOI into a project

- In the Controller Organizer window, select the Add-On Instruction folder. Assets folder > Add-On Instruction folder
- 2. Select the **Import Add-On Instruction** ... function via the context menu.
  - ← The **Import Add-On Instructions** window is displayed.

Logix Designer - IOLink_AC	OI [1756-L81E 35.11]*				
File Edit View Search	Logic Communications Tools	Window Help			
🔁 🛳 🖴 😽 🕹 🖉	1 🤊 약 DeviceData.NewState	v 🍫 🍫	🏓 📴 🗽 🕞 💩	<b>G</b> (16) G (2)	
Energy Storage	Path: <none> e</none>	No Edits	Redundancy	Favori     Add-On Proces     Drives	Filter Selec Stati Alarm Bit Timer Comp
Controller Organizer		X Module P	roperties: IOLink 5032 8IOL:	*	×
0 1				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	of 1
Controller floink_ADI     Controller Fault Ha     Power-Up Handler     Tass     Tass     MainTask     MainTask     MainTask     MainTask     More Parameter     Workeduled     More Groups     Unscheduled     More Manager	andler r and Local Tags ne	•	A	Β	C D
Add-On Instructio	New Add-On Instruction	-			
📆 User-Defined	Import Add-On Instruction	-	•		
Find Strings	Lut Cut	Ctrl+X Ctrl+C			
Predefined      Module-Define      Trends	Paste Paste With Configuration	Ctrl+V Ctrl+Shift+V			
be Logical Model	L				

3. Select the communication AOI for the IFM IO-Link master and the IO-Link device.

The library contains the two communication AOIs "EH AL1323 8P CommAOI Array" and "EH AL1323 8P CommAOI" for the "IFM

The difference between the two AOIs is the EDS version of the IFM AL1323.

- In the older version "EH\_AL1323\_8P\_CommAOI\_Array", the implicit input data type is defined as "Array of Integer".
- In the latest version "EH\_AL1323\_8P\_CommAOI", the implicit input data type is defined as "Integer".

#### 4. Click **Open**.

AL1323" IO-Link master.

← The **Import Configuration** window is displayed.

Find Within: Final Name				
port Content:	figure Add-On	Instruction Properties		
EH_RA_5032_IOLink_Comi     Parameters and Local Tags	port Name:	EH_RA_5032_IOLink_CommAOI_8P_Pror	mass 10	
- Routines Or	peration:	Create ~		
Data Types		References will be imported as configured in the References folders		
Errors/Warnings	nal Name:	H_RA_5032_IOLink_CommAOI_8P	Properties	
De	escription:	Comm AOI Promass 10 for the RA A 5032-81OL		
Re	evision:	v1.0		
Re	vision Note:			
Ve	ndor:			

5. If the communication AOI has not yet been imported, the **Create** option is displayed for the **Operation** field. If the communication AOI has already been imported or the name is already assigned, a warning is displayed. The **Import Configuration** window does **not** require any adjustments.



The communication AOI is imported into the project and is available for the routine. The AOI is displayed in the Controller Organizer window in the Add-On Instructions folder and Language Element section under Add-On.



5.5 Setting up the communication AOI

- **1.** Select the **MainProgram** task in the **Controller Organizer** window in the **Tasks** folder.
- 2. Select the **Add > New Routine** function via the context menu.
  - └ The **New Routine** window is displayed.

ntroller Organizer				<b>▼</b> ₽ ×	
Controller IU	LINK_AUI				
	Fault Handler				
Power-Un	Handler				
Tasks					
A 🤁 MainTask					
🔺 🔓 Ma	Add	•		New Poutine	
<b>?</b>	Aud		1.00	New Rodeline	
K 🗈	Cut	Ctrl+X	0	New Local Tag	
Unschi 🗍	Сору	Ctrl+C		New Parameter	
Ungrou	Paste	CtrI+V		Import Poutine	
Alarm Mai	Delete	Delete	-	Import Rodenie	
Assets	Varifi				
Add-O	verily				
🔺 🚄 Data Ty	Cross Reference	Ctrl+E			
📊 Use	Browse Logic	Ctrl+L			
Stri	Find in Logical C	rganizer			
Ad	Opling Edits				
P Int Pre	Online Edits				
Trands	Print	•			
h. Logical M	Export Program				
I/O Confic	portrogramm				
🔺 📟 1756 B	Properties	Alt+Enter			
[0 [4] 175	56-L81E IOLink_AOI				
▲ Xa Ethernet					
🖸 1756-L	.81E IOLink_AOI				
🍋 AL132	3 AL_1323_IFM_Ma	ster			
Controller Organi	zer ha Logical Oro	anizer			

New Routine	2		×
Name:	AOI		ОК
Description:		^	Cancel
		$\sim$	
Type:	입다. Function Block Diagram	~	Help
In Program or Phase:	🔓 MainProgram	~	
	Assignment: <pre></pre>	~	
Open Rou	itine		

- 3. Assign a name.
- 4. For **Type** select the option **Function Block Diagram**.
- 5. Press **OK** to confirm your entry.
- 6. Add the communication AOI. To do this, click on the required AOI in the **Language Element** section.
  - └ The communication AOI is inserted on the sheet (Sheet).



To set up the communication AOI, you create and link tags. The "DataToSend", "CommAOIBusy", "ActiveComPort", "Send\_Request" and "CommError" tags of the communication AOI make up the "IO-Link master data structure". You only need to create these tags once for each IO-Link master within a project. You can then use these tags for all IO-Link devices connected to the same IO-Link master. The remaining tags are device specific. You must generate and link these tags for every IO-Link device.

You are not required to follow any naming conventions for the tags.



- 7. Create the "DataToSend", "CommAOIBusy", "ActiveComPort", "Send\_Request" and "CommError" tags. You can use these tags for all IO-Link devices that are connected to this IO-Link master.
- 8. Create the "DeviceData" tag.
- 9. Create the inputs of the communication AOI "Data Size", "Device Port Number" and "Connection Fault" [bit].

### 5.6 Importing device AOI into a project

1. In the **Controller Organizer** window, select the **Add-On Instructions** folder.

2. Select the **Import Add-On Instruction** ... function via the context menu.

💰 Logix Designer - Fu	inctionBlocks [1756-L82E 35.11]	
File Edit View	Search Logic Communications	Tools Window
🗄 🐿 🔛 🗎 🖨 🛛 8	🖌 🗊 🏛 🦻 💎 🚺 DeviceData.	NewState
E RUN	Path: <none></none>	
III I/O	Offline 🛛 🗸 No Forces	▶ <sub>↓</sub> No Edit
Controller Organizer		▼ 9 ×
ð •		
Controller T Controller F Power-Up H Carasks Carasks Data MainTask Data	fags ault Handler Handler Sogram ed Axes r	
⊿ ⊆ Data Type	New Add-On Instruction	
User-E	Import Add-On Instruction	
Fitte String	% Cut	Ctrl+X
Add-C	[] Сору	Ctrl+C
Þ 🖬 Modu	D Paste	Ctrl+V
Trends	Paste With Configuration	Ctrl+Shift+V
<ul> <li>Logical Model</li> <li>↓/O Configurati</li> <li>■ 1756 Backpi</li> <li>[□ [0] 1756</li> <li>☆ Ethernet</li> <li>[□ 1756-L8</li> </ul>	ion Iane, 1756-A10 -L82E FunctionBlocks 2E FunctionBlocks	

**3.** Select the device AOI to be imported. In this example, the Promass 10 is used in combination with an AL1323\_8P master.

Import Add-On I	nstruction				×
Look in:	AOI	~	G 👂 📂 🛄 -		
-	Name	^	Date modified	Туре	Size
Owiek access	EH_Proma	ss10_IOL_AOI.L5X	10.10.2024 10:54	Logix Designer X	118 KB
Libraries This PC	12 EH_AL1323	_8P_CommAOI_AOI.L5X	09.10.2024 14:22	Logix Designer X	50 KB
	File name:	EH_Promass10_IOL_AOI.L5X		~	Open
	Files of type:	Logix Designer XML Files (*.L5X)		~	Cancel
					Help

4. The **Import Configuration** window does **not** require any adjustments. If the device AOI has not yet been imported, the **Create** option is displayed for the **Operation** field.

wt Contents					
- Add-On Instructions	Configure Add-0	n Instruction Properties			
EH_Promass10_IOL	Import Name:	EH_Promass 10_IOL			
Routines	Operation:	Create	~		
References		References will be imported configured in the Reference	as s folders		
-Co Errors/Warnings	Final Name:	EH_Promass 10_IOL	~	Properties	
	Description:	Promass 10 Rev 1 IO-Link	< >		
	Revision:	v1.0			
	Revision Note:				
	Vendor:	Endress +Hauser			

#### 5. Click OK.

Let The device AOI is imported into the project. The device AOI is displayed in the **Controller Organizer** window in the **Add-On Instructions** folder and **Language Elemen** section under Add-On.

Logix Designer - IOLink_AOI [1756-L81E 35.11]*	
File Edit View Search Logic Communications Tools Win	Sow Help
🔁 🖕 🔛 🖶 🔺 🖉 🎧 🦻 😤 🕐 DeviceData NewState	> > # b ≤ B 表 値 G G G G G
III RUN	
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	4 4 10 10 10 10 10 10 10 10 10 10 10 10 10
Controller Tuos	A B C D
Controller Fault Handler	
Power-Un Handler	
🖌 🖨 Tasks	
A O MainTask	EH_RA_5032_OLink_CommAOLBP_Promess10
A 5 MainProgram	1 EH BA 5032 ISLink CompACI 82 P 02
Parameters and Local Tags	Confederation Data Data Data Data Data Data Data Dat
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So AOI	A shar software Da Artise software
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A (?) EH Promass10	CetDevice#150 RA MSQ XL Get Promass10
Parameters and Local Tags	2 GetDeviceData Promass10 get_Data
In Logic	SetDeviceMSG RA MSD RL Set Promass10
EH_RA_5032_IOLink_CommAOI_8P_Promass10	SetDeviceCats Promass10_set_Data
🖌 🖳 Data Types	
User-Defined	
20 EH_CommAOI_Data	
The Strings	
Predefined	
Module-Defined	
iii Trends	
Logical Model	3
▲ G VO Configuration	
I756 Backplane, 1756-A10	
[1 [4] 1756-L81E IOLink_AOI	
A 25 Ethernet	
8 1/20-0312 10UNK_A01	
A BIO-Link	
2. 0 Promass 10 (9728513) Promass 10 IOL	
The Controller Organizer St Longel Organizer	
The contrasts on Baussian Distriction	
Errors	

6. Add the device AOI. The device AOI must be added in the same program section of the function block where the Comm AOI is stored. To do this, either click on the **Promass IO-Link** button or drag the device AOI from the **Controller Organizer** window.

### 5.7 Configuring device AOI (IFM AL1323)

The first six tags are reused by the communication AOI. The three diagnostic tags must be generated for every device AOI.

1. Generate the three diagnostic tags. These tags are the string data type.

2. Set up all the remaining tags.

← The color of the device AOI header changes from red to gray. The corresponding IO-Link master and corresponding IO-Link device can communicate.





Description of device AOIs:

- Flow: → 🗎 33
- Level: → 🗎 45
- Pressure:  $\rightarrow \textcircled{50}{50}$
- Temperature:  $\rightarrow$  🗎 52

## 6 Description of "Flow" Add-On Instructions

### 6.1 Dosimag

**Device AOI designation** 

EH\_Dosimag\_IOL

#### **Overview of functions**

- Providing the current values for the main measured variables: volume flow, temperature and totalizer
- Providing the status of switching signals
- Providing the extended diagnostic status
- Starting the zero adjustment
- Control of pulses
- Control of the totalizer

For detailed information on the device, see the product documentation  $\rightarrow \square 5$ .



■ 1 EH\_Dosimag\_IOL device AOI

EH\_Dosimag\_IOL parameters

Name	Р Туре	Data Type	Comment
DataToSend	IN	Int[10]	IO-Link master acyclic sending frame
ComAOIBusy	IN	DInt	IO-Link master communication busy state

Name	Р Туре	Data Type	Comment
ActiveComPort	IN	DInt	Active IO-Link master communication port
DeviceAOISendRequest	IN	DInt	Device request for sending data to IO-Link master
CommError	IN	Int	IO-Link master communication error
DeviceData	IN	EH_ CommAOI _Data	Internal device data model
iSetPulseSimulation	IN	Bool	Trigger to start pulse simulation
iPulseSimulationOnOff	IN	Bool	<ul><li>TRUE: Pulse simulation ON</li><li>FALSE: Pulse simulation OFF</li></ul>
iAmountPulses	IN	Int	Amount of pulses to be executed
iSetTotalizerPresetValue	IN	Bool	Trigger to set totalizer preset value
iTotalizer1PresetValue	IN	Real	Start value for the totalizer. The totalizer starts totalizing with this value.
iTotalizer_Hold	IN	Bool	Totalizer hold
iTotalizer_ResetTotalize	IN	Bool	Reset totalizer and totalize
iTotalizer_ResetHold	IN	Bool	Reset totalizer and hold
iTotalizer_Totalize	IN	Bool	Totalizer totalize
iParameterize	IN	Bool	Trigger to start parameterization
iFlowDamping	IN	Real	Flow damping value
iPressureShockSupression	IN	Real	Pressure shock suppression value
iIntegrationTime	IN	Real	Integration time value
iMeasuringPeriod	IN	Real	Measuring period value
iFlowOverride	IN	Bool	Flow override
iStartZeroPointAdjustment	IN	Bool	Trigger to start zero point adjustment
qVendor_ID	OUT	DInt	Vendor ID
qDevice_ID	OUT	DInt	Device ID
qVolumeFlow	OUT	Real	Process value volume flow
qTemperature	OUT	Real	Process value temperature
qTotalizer1	OUT	Real	Process value totalizer
qExtendedDeviceStatus	OUT	USInt	<ul> <li>0: Not specified</li> <li>36: Failure</li> <li>37: Failure - simulation</li> <li>60: Functional check</li> <li>61: Functional check - simulation</li> <li>120: Out of specification</li> <li>121: Out of specification - simulation</li> <li>128: Good</li> <li>129: Good - simulation</li> <li>164: Maintenance required</li> <li>165: Maintenance required - simulation</li> </ul>
qZeroPointStatus	OUT	SInt	Status of the zero point adjustment • 2: Failed • 5: Done • 8: Busy
qReadProgress	OUT	SInt	Progress of the zero point adjustment 0 to 100 %
qSSC1_1	OUT	Bool	Status switching signal 1.1
qSSC1_2	OUT	Bool	Status switching signal 1.2
qSSC2_1	OUT	Bool	Status switching signal 2.1

Name	Р Туре	Data Type	Comment
qSSC2_2	OUT	Bool	Status switching signal 2.2
qSSC3_1	OUT	Bool	Status switching signal 3.1
qSSC3_2	OUT	Bool	Status switching signal 3.2
qSSC4_1	OUT	Bool	Status switching signal 4.1
qSSC4_2	OUT	Bool	Status switching signal 4.2
qAOI_Diagnostic	OUT	DInt	Diagnostic for device AOI state machine steps 1: qAOI_Diagnostic.1: Device port is zero 0: qAOI_Diagnostic.1: No error 1: qAOI_Diagnostic.2: Wrong device ID 0: qAOI_Diagnostic.2: No error 1: qAOI_Diagnostic.8: Error Step 0: qAOI_Diagnostic.8: No error 1: qAOI_Diagnostic.8+n: Error Step n 0: qAOI_Diagnostic.8+n: No error
qAOI_Diagnostic_String	OUT	String	Diagnostic for device AOI state machine steps
qActual_Diagnostics_Code	OUT	DInt	Current diagnostic code See product documentation
qActual_Diagnostics_String	OUT	String	Current diagnostic text See product documentation
qLast_Diagnostics_Code	OUT	DInt	Previous diagnostic code See product documentation
qLast_Diagnostics_String	OUT	String	Previous diagnostic text See product documentation
qCommunicationBusy	OUT	DInt	IO-Link master communication busy state
qDeviceConnectionError	OUT	Bool	<ul><li>TRUE: Device disconnected</li><li>FALSE: Device connected</li></ul>

### 6.2 Dosimass

#### **Device AOI designation** EH\_Dosimass\_IOL

#### **Overview of functions**

- Providing the current values for the main measured variables: mass flow, density, temperature and totalizer
- Providing the status of switching signals
- Providing the extended diagnostic status
- Starting the zero adjustment
- Control of pulses
- Control of the totalizer

For detailed information on the device, see the product documentation  $\rightarrow \triangleq 5$ .



☑ 2 EH\_Dosimass\_IOL device AOI

*EH\_Dosimass\_IOL parameters* 

Name	Р Туре	Data Type	Comment
DataToSend	IN	Int[10]	IO-Link master acyclic sending frame
ComAOIBusy	IN	DInt	IO-Link master communication busy state
ActiveComPort	IN	DInt	Active IO-Link master communication port

Name	Р Туре	Data Type	Comment	
DeviceAOISendRequest	IN	DInt	Device request for sending data to IO-Link master	
CommError	IN	Int	IO-Link master communication error	
DeviceData	IN	EH_ CommAOI _Data	Internal device data model	
iSetPulseSimulation	IN	Bool	Trigger to start pulse simulation	
iPulseSimulationOnOff	IN	Bool	<ul><li>TRUE: Pulse simulation ON</li><li>FALSE: Pulse simulation OFF</li></ul>	
iAmountPulses	IN	Int	Amount of pulses to be executed	
iSetTotalizerPresetValue	IN	Bool	Trigger to set totalizer preset value	
iTotalizer1PresetValue	IN	Real	Start value for the totalizer. The totalizer starts tot	taliz
iTotalizer_Hold	IN	Bool	Totalizer hold	
iTotalizer_ResetTotalize	IN	Bool	Reset totalizer and totalize	
iTotalizer_ResetHold	IN	Bool	Reset totalizer and hold	
iTotalizer_Totalize	IN	Bool	Totalizer totalize	
iParameterize	IN	Bool	Trigger to start parameterization	
iFlowDamping	IN	Real	Flow damping value	
iPressureShockSupression	IN	Real	Pressure shock suppression value	
iStartZeroPointAdjustment	IN	Bool	Trigger to start zero point adjustment	
qVendor_ID	OUT	DInt	Vendor ID	
qDevice_ID	OUT	DInt	Device ID	
qMassFlow	OUT	Real	Process value mass flow	
qDensity	OUT	Real	Process value density	
qTemperature	OUT	Real	Process value temperature	
qTotalizer1	OUT	Real	Process value totalizer	
qExtendedDeviceStatus	OUT	USInt	<ul> <li>0: Not specified</li> <li>36: Failure</li> <li>37: Failure - simulation</li> <li>60: Functional check</li> <li>61: Functional check - simulation</li> <li>120: Out of specification</li> <li>121: Out of specification - simulation</li> <li>128: Good</li> <li>129: Good - simulation</li> <li>164: Maintenance required</li> <li>165: Maintenance required - simulation</li> </ul>	
qZeroPointStatus	OUT	Int	<ul><li>Status of the zero point adjustment</li><li>2: Failed</li><li>5: Done</li><li>8: Busy</li></ul>	
qReadProgress	OUT	SInt	Progress of the zero point adjustment 0 to 100 %	
qSSC1_1	OUT	Bool	Status switching signal 1.1	
qSSC1_2	OUT	Bool	Status switching signal 1.2	
qSSC2_1	OUT	Bool	Status switching signal 2.1	
qSSC2_2	OUT	Bool	Status switching signal 2.2	
qSSC3_1	OUT	Bool	Status switching signal 3.1	
qSSC3_2	OUT	Bool	Status switching signal 3.2	

Name	Р Туре	Data Type	Comment
qSSC4_1	OUT	Bool	Status switching signal 4.1
qSSC4_2	OUT	Bool	Status switching signal 4.2
qAOI_Diagnostic	OUT	DInt	Diagnostic for device AOI state machine steps 1: qAOI_Diagnostic.1: Device port is zero 0: qAOI_Diagnostic.1: No error 1: qAOI_Diagnostic.2: Wrong device ID 0: qAOI_Diagnostic.2: No error 1: qAOI_Diagnostic.8: Error Step 0: qAOI_Diagnostic.8: No error 1: qAOI_Diagnostic.8+n: Error Step n 0: qAOI_Diagnostic.8+n: No error
qAOI_Diagnostic_String	OUT	String	Diagnostic for device AOI state machine steps
qActual_Diagnostics_Code	OUT	DInt	Current diagnostic code See product documentation
qActual_Diagnostics_String	OUT	String	Current diagnostic text See product documentation
qLast_Diagnostics_Code	OUT	DInt	Previous diagnostic code See product documentation
qLast_Diagnostics_String	OUT	String	Previous diagnostic text See product documentation
qCommunicationBusy	OUT	DInt	IO-Link master communication busy state
qDeviceConnectionError	OUT	Bool	<ul><li>TRUE: Device disconnected</li><li>FALSE: Device connected</li></ul>

### 6.3 Promag 10

Device AOI designation

EH\_Promag10\_IOL

#### Overview of functions

- Providing the current values for the main measured variables: volume flow, conductivity, temperature and totalizer
- Providing the status of switching signals
- Providing the extended diagnostic status
- Simulating the main measured variables and other measured variables
- Control of the totalizer
- Additional functions such as device search and positive zero return

For detailed information on the device, see the product documentation  $\rightarrow \square 5$ .



EH\_Promag10\_IOL device AOI

EH\_Promag10\_IOL parameters

Name	Р Туре	Data Type	Comment
DataToSend	IN	Int[10]	IO-Link master acyclic sending frame
ComAOIBusy	IN	DInt	IO-Link master communication busy state
ActiveComPort	IN	DInt	Active IO-Link master communication port

Name	Р Туре	Data Type	Comment
DeviceAOISendRequest	IN	DInt	Device request for sending data to IO-Link master
CommError	IN	Int	IO-Link master communication error
DeviceData	IN	EH_ CommAOI _Data	Internal device data model
iSetSimulation	IN	Bool	Signal to set device into simulation mode • TRUE: Simulation ON • FALSE: Simulation OFF
iSimulationVariable	IN	Int	Variable for simulation mode • 0: Off • 1: Volume flow • 4: Conductivity • 7: Temperature • 11: Mass flow • 13: Corrected conductivity
iSimulationValue	IN	Int	Value to be simulated
iSetTotalizerPresetValue	IN	Bool	Trigger to set totalizer preset value
iTotalizerPresetValue	IN	Real	Start value for the totalizer. The totalizer starts totalizing with this value.
iTotalizer_Hold	IN	Bool	Totalizer hold
iTotalizer_ResetTotalize	IN	Bool	Reset totalizer and totalize
iTotalizer_ResetHold	IN	Bool	Reset totalizer and hold
iTotalizer_Totalize	IN	Bool	Totalizer totalize
iDeviceSearch	IN	Bool	Device search. Display is flashing. Activate the device search to locate the device in the application. When the function is activated, the device emits visual signals e.g. a flashing LED or local display.
iFlowOverride	IN	Bool	Flow override
qVendor_ID	OUT	DInt	Vendor ID
qDevice_ID	OUT	DInt	Device ID
qVolumeFlow	OUT	Real	Process value volume flow
qConductivity	OUT	Real	Process value conductivity
qTemperature	OUT	Real	Process value temperature
qTotalizer1	OUT	Real	Process value totalizer
qExtendedDeviceStatus	OUT	USInt	<ul> <li>0: Not specified</li> <li>36: Failure</li> <li>37: Failure - simulation</li> <li>60: Functional check</li> <li>61: Functional check - simulation</li> <li>120: Out of specification</li> <li>121: Out of specification - simulation</li> <li>128: Good</li> <li>129: Good - simulation</li> <li>164: Maintenance required</li> <li>165: Maintenance required - simulation</li> </ul>
qSSC1_1	OUT	Bool	Status switching signal 1.1
qSSC1_2	OUT	Bool	Status switching signal 1.2
qSSC2_1	OUT	Bool	Status switching signal 2.1
qSSC2_2	OUT	Bool	Status switching signal 2.2
qSSC3_1	OUT	Bool	Status switching signal 3.1
qSSC3_2	OUT	Bool	Status switching signal 3.2

Name	Р Туре	Data Type	Comment
qSSC4_1	OUT	Bool	Status switching signal 4.1
qSSC4_2	OUT	Bool	Status switching signal 4.2
qAOI_Diagnostic	OUT	DInt	Diagnostic for device AOI state machine steps 1: qAOI_Diagnostic.1: Device port is zero 0: qAOI_Diagnostic.1: No error 1: qAOI_Diagnostic.2: Wrong device ID 0: qAOI_Diagnostic.2: No error 1: qAOI_Diagnostic.8: Error Step 0: qAOI_Diagnostic.8: No error 1: qAOI_Diagnostic.8+n: Error Step n 0: qAOI_Diagnostic.8+n: No error
qAOI_Diagnostic_String	OUT	String	Diagnostic for device AOI state machine steps
qActual_Diagnostics_Code	OUT	DInt	Current diagnostic code See product documentation
qActual_Diagnostics_String	OUT	String	Current diagnostic text See product documentation
qLast_Diagnosticcs_Code	OUT	DInt	Previous diagnostic code See product documentation
qLast_Diagnostics_String	OUT	String	Previous diagnostic text See product documentation
qCommunicationBusy	OUT	DInt	IO-Link master communication busy state
qDeviceConnectionError	OUT	Bool	<ul><li>TRUE: Device disconnected</li><li>FALSE: Device connected</li></ul>

### 6.4 Promass 10

### Device AOI designation

# EH\_Promass10\_IOL

### Overview of functions

- Providing the current values for the main measured variables: mass flow, density, temperature and totalizer
- Providing the status of switching signals
- Providing the extended diagnostic status
- Simulating the main measured variables and other measured variables
- Control of the totalizer
- Additional functions such as device search and positive zero return

For detailed information on the device, see the product documentation  $\rightarrow \square 5$ .



 <sup>4</sup> EH\_Promass10\_IOL device AOI

*EH\_Promass10\_IOL parameters* 

Name	Usagepe	Data Type	Comment
DataToSend	IN	Int[10]	IO-Link master acyclic sending frame
ComAOIBusy	IN	DInt	IO-Link master communication busy state
ActiveComPort	IN	DInt	Active IO-Link master communication port

Name	Usagepe	Data Type	Comment
DeviceAOISendRequest	IN	DInt	Device request for sending data to IO-Link master
CommError	IN	Int	IO-Link master communication error
DeviceData	IN	EH_ CommAOI _Data	Internal device data model
iSetSimulation	IN	Bool	Signal to set device into simulation mode • TRUE: Simulation ON • FALSE: Simulation OFF
iSimulationVariable	IN	Int	Variable for simulation mode • 0: Off • 1: Mass flow • 2: Volume flow • 3: Corrected volume flow • 4: Density • 7: Temperature
iSimulationValue	IN	Real	Value to be simulated
iSetTotalizerPresetValue	IN	Bool	Trigger to set totalizer preset value
iTotalizerPresetValue	IN	Real	Start value for the totalizer. The totalizer starts totalizing with this value.
iTotalizer_Hold	IN	Bool	Totalizer hold
iTotalizer_ResetTotalize	IN	Bool	Reset totalizer and totalize
iTotalizer_ResetHold	IN	Bool	Reset totalizer and hold
iTotalizer_Totalize	IN	Bool	Totalizer totalize
iDeviceSearch	IN	Bool	Device search. Display is flashing. Activate the device search to locate the device in the application. When the function is activated, the device emits visual signals e.g. a flashing LED or local display.
iFlowOverride	IN	Bool	Flow override
qVendor_ID	OUT	DInt	Vendor ID
qDevice_ID	OUT	DInt	Device ID
qMassFlow	OUT	Real	Process value mass flow
qDensity	OUT	Real	Process value density
qTemperature	OUT	Real	Process value temperature
qTotalizer1	OUT	Real	Process value totalizer
qExtendedDeviceStatus	OUT	USInt	<ul> <li>0: Not specified</li> <li>36: Failure</li> <li>37: Failure - simulation</li> <li>60: Functional check</li> <li>61: Functional check - simulation</li> <li>120: Out of specification</li> <li>121: Out of specification - simulation</li> <li>128: Good</li> <li>129: Good - simulation</li> <li>164: Maintenance required</li> <li>165: Maintenance required - simulation</li> </ul>
qSSC1_1	OUT	Bool	Status switching signal 1.1
qSSC1_2	OUT	Bool	Status switching signal 1.2
qSSC2_1	OUT	Bool	Status switching signal 2.1
qSSC2_2	OUT	Bool	Status switching signal 2.2
qSSC3_1	OUT	Bool	Status switching signal 3.1
qSSC3_2	OUT	Bool	Status switching signal 3.2

Name	Usagepe	Data Type	Comment
qSSC4_1	OUT	Bool	Status switching signal 4.1
qSSC4_2	OUT	Bool	Status switching signal 4.2
qAOI_Diagnostic	OUT	DInt	Diagnostic for device AOI state machine steps 1: qAOI_Diagnostic.1: Device port is zero 0: qAOI_Diagnostic.1: No error 1: qAOI_Diagnostic.2: Wrong device ID 0: qAOI_Diagnostic.2: No error 1: qAOI_Diagnostic.8: Error Step 0: qAOI_Diagnostic.8: No error 1: qAOI_Diagnostic.8+n: Error Step n 0: qAOI_Diagnostic.8+n: No error
qAOI_Diagnostic_String	OUT	String	Diagnostic for device AOI state machine steps
qActual_Diagnostics_Code	OUT	DInt	Current diagnostic code See product documentation
qActual_Diagnostics_String	OUT	String	Current diagnostic text See product documentation
qLast_Diagnosticcs_Code	OUT	DInt	Previous diagnostic code See product documentation
qLast_Diagnostics_String	OUT	String	Previous diagnostic text See product documentation
qCommunicationBusy	OUT	DInt	IO-Link master communication busy state
qDeviceConnection Error	OUT	Bool	<ul><li>TRUE: Device disconnected</li><li>FALSE: Device connected</li></ul>

## 7 Description of "Level" Add-On Instructions

### 7.1 Liquiphant FTL43

#### **Device AOI designation**

EH\_Liquiphant\_FTL43\_IOL

#### **Overview of functions**

- Providing the current value for the main measured variable: frequency of the vibrating fork
- Providing the status of switching signals
- Providing the extended diagnostic status
- Providing the strength of the received signal from the vibrating fork
- Simulating the main measured variable

For detailed information on the device, see the product documentation  $\rightarrow \cong 5$ .



<sup>☑ 5</sup> EH\_Liquiphant\_FTL43\_IOL device AOI

EH\_Liquiphant\_FTL43\_IOL parameters

Name	Р Туре	Data Type	Comment
DataToSend	IN	Int[10]	IO-Link master acyclic sending frame
ComAOIBusy	IN	DInt	IO-Link master communication busy state
ActiveComPort	IN	DInt	Active IO-Link master communication port
DeviceAOISendRequest	IN	DInt	Device request for sending data to IO-Link master
CommError	IN	Int	IO-Link master communication error

Name	Р Туре	Data Type	Comment
DeviceData	IN	EH_ CommAOI _Data	Internal device data model
iSetSimulation	IN	Bool	Signal to set device into simulation mode • TRUE: Simulation ON • FALSE: Simulation OFF
iSimulation_Variable	IN	Byte	<ul><li>Variable for simulation mode</li><li>0: Off</li><li>1: Sensor frequency</li></ul>
iSimulationValue_Freqeuency	IN	Real	Frequency value to be simulated
iRead_ReceivingSignal StrengthOfFork	IN	Bool	Trigger to read the receiving signal strength of the fork
qSensorFrequency	OUT	Real	Process value sensor frequency
qExtendedDeviceStatus	OUT	Byte	<ul> <li>0: Not specified</li> <li>36: Failure</li> <li>37: Failure - simulation</li> <li>60: Functional check</li> <li>61: Functional check - simulation</li> <li>120: Out of specification</li> <li>121: Out of specification - simulation</li> <li>128: Good</li> <li>129: Good - simulation</li> <li>164: Maintenance required</li> <li>165: Maintenance required - simulation</li> </ul>
qAOI_Diagnostic	OUT	DInt	Diagnostic for device AOI state machine steps 1: qAOI_Diagnostic.1: Device port is zero 0: qAOI_Diagnostic.1: No error 1: qAOI_Diagnostic.2: Wrong device ID 0: qAOI_Diagnostic.2: No error 1: qAOI_Diagnostic.8: Error Step 0: qAOI_Diagnostic.8: No error 1: qAOI_Diagnostic.8+n: Error Step n 0: qAOI_Diagnostic.8+n: No error
qAOI_Diagnostic_String	OUT	String	Diagnostic for device AOI state machine steps
qBusy	OUT	Bool	<ul><li>Busy signal of the function block</li><li>TRUE: parametrization and acyclic communication ongoing</li><li>FALSE: No action</li></ul>
qSSC1_1	OUT	Bool	Status switching signal 1.1
qSSC1_2	OUT	Bool	Status switching signal 1.2
qReceivingSignal- StrengthOfFork	OUT	Real	Receiving signal strength of fork
qAOI_Diagnostic	OUT	DInt	Diagnostic code of the communication AOI
qAOI_Diagnostic_String	OUT	String	Diagnostic text of the communication AOI
qActual_Diagnostics_Code	OUT	DInt	Current diagnostic code See product documentation
qActual_Diagnostics_String	OUT	String	Current diagnostic text See product documentation
qLast_Diagnostics_Code	OUT	DInt	Previous diagnostic code See product documentation
qLast_Diagnostics_String	OUT	String	Previous diagnostic text See product documentation
qCommunicationBusy	OUT	DInt	IO-Link master communication busy state
qDeviceConnectionError	OUT	Bool	<ul><li>TRUE: Device disconnected</li><li>FALSE: Device connected</li></ul>

### 7.2 Micropilot FMR43

**Device AOI designation** EH Micropilot FMR43 IOL

#### **Overview of functions**

- Providing the current values for the main measured variables: linearized level and distance
- Providing the status of switching signals
- Providing the extended diagnostic status
- Selection of the unit for the distance value
- Simulating the main measured variables
- Providing Heartbeat Diagnostics Data such as buildup on sensor (buildup detected), buildup index, foam index and foam formation detected (foam detected)

For detailed information on the device, see the product documentation  $\rightarrow \square 5$ .



EH\_Micropilot\_FMR43\_IOL device AOI

EH\_Micropilot\_FMR43\_IOL parameters

Name	Р Туре	Data Type	Comment
DataToSend	IN	Int[10]	IO-Link master acyclic sending frame
ComAOIBusy	IN	DInt	IO-Link master communication busy state
ActiveComPort	IN	DInt	Active IO-Link master communication port
DeviceAOISendRequest	IN	DInt	Device request for sending data to IO-Link master

Name	Р Туре	Data Type	Comment
CommError	IN	Int	IO-Link master communication error
DeviceData	IN	EH_ CommAOI _Data	Internal device data model
iSetSimulation	IN	Bool	Trigger to start simulation of the device
iSetSimulation_Variable	IN	Int	Variable for simulation mode • 1: Level • 3: Distance
iSimulationValue_Level	IN	Real	Level value to be simulated
iSimulationValue_Distance	IN	Real	Distance value to be simulated
iSetUnit	IN	Bool	Trigger to set the unit for the distance value
iUnit	IN	Int	Unit for distance value 45: m 47: inch 49: mm
qVendor_ID	OUT	DInt	Vendor ID
qDevice_ID	OUT	DInt	Device ID
qLevelLinearized	OUT	Real	Process value level linearized
qDistance	OUT	Real	Process value distance
qExtendedDeviceStatus	OUT	USInt	<ul> <li>0: Not specified</li> <li>36: Failure</li> <li>37: Failure - simulation</li> <li>60: Functional check</li> <li>61: Functional check - simulation</li> <li>120: Out of specification</li> <li>121: Out of specification - simulation</li> <li>128: Good</li> <li>129: Good - simulation</li> <li>164: Maintenance required</li> <li>165: Maintenance required - simulation</li> </ul>
qUnit	OUT	Int	Selected unit for distance • 45: m • 47: inch • 49: mm
qFoamIndex	OUT	Real	Foam index
qFoamDetected	OUT	Bool	Foam detection • TRUE: Foam detected • FALSE: No foam detected
qBuildupIndex	OUT	Real	Buildup index
qBuildupDetected	OUT	Bool	Buildup detection • TRUE: Buildup detected • FALSE: No buildup detected
qSSC1_1	OUT	Bool	Status switching signal 1.1
qSSC1_2	OUT	Bool	Status switching signal 1.2
qSSC2_1	OUT	Bool	Status switching signal 2.1
qSSC2_2	OUT	Bool	Status switching signal 2.2
qAOI_Diagnostic	OUT	DInt	Diagnostic for device AOI state machine steps 1: qAOI_Diagnostic.1: Device port is zero 0: qAOI_Diagnostic.1: No error 1: qAOI_Diagnostic.2: Wrong device ID 0: qAOI_Diagnostic.2: No error 1: qAOI_Diagnostic.8: Error Step 0: qAOI_Diagnostic.8: No error 1: qAOI_Diagnostic.8+n: Error Step n 0: qAOI_Diagnostic.8+n: No error

Name	Р Туре	Data Type	Comment
qAOI_Diagnostic_String	OUT	String	Diagnostic for device AOI state machine steps
qActual_Diagnostics_Code	OUT	DInt	Current diagnostic code See product documentation
qActual_Diagnostics_String	OUT	String	Current diagnostic text See product documentation
qLast_Diagnostics_Code	OUT	DInt	Previous diagnostic code See product documentation
qLast_Diagnostics_String	OUT	String	Previous diagnostic text See product documentation
qCommunicationBusy	OUT	DInt	IO-Link master communication busy state
qDeviceConnectionError	OUT	Bool	<ul><li>TRUE: Device disconnected</li><li>FALSE: Device connected</li></ul>

# 8 Description of "Pressure" Add-On Instructions

### 8.1 Cerabar PMP43

#### **Device AOI designation**

EH\_Cerabar\_PMP43\_IOL

#### **Overview of functions**

- Providing the current value for the main measured variable: pressure
- Providing the status of switching signals
- Providing the extended diagnostic status
- Selection of the unit for the pressure value
- Simulating the main measured variable

For detailed information on the product, see the product documentation  $\rightarrow \triangleq 5$ .



☑ 7 EH\_Cerabar\_PMP43\_IOL device AOI

Name	Р Туре	Data Type	Comment
DataToSend	IN	Int[10]	IO-Link master acyclic sending frame
ComAOIBusy	IN	DInt	IO-Link master communication busy state
ActiveComPort	IN	DInt	Active IO-Link master communication port
DeviceAOISendRequest	IN	DInt	Device request for sending data to IO-Link master
CommError	IN	Int	IO-Link master communication error
DeviceData	IN	EH_ CommAOI _Data	Internal device data model

EH\_EH\_Cerabar\_PMP43\_IOL parameters

Name	Р Туре	Data Type	Comment
iSetSimulation	IN	Bool	Signal to set device into simulation mode • TRUE: Simulation ON • FALSE: Simulation OFF
iSimulation_Variable	IN	Int	Variable for simulation mode • 0: Off • 1: Pressure
iSetSimulationPressure	IN	Real	Pressure value to be simulated
iSetUnit	IN	Bool	Trigger to set the unit for the pressure value
iUnit	IN	Byte	Unit for pressure value • 0: bar • 6: psi • 8: mbar • 11: Pa • 12: kPa • 237: MPa
qPressure	OUT	Real	Process value pressure
qExtendedDeviceStatus	OUT	USInt	<ul> <li>0: Not specified</li> <li>36: Failure</li> <li>37: Failure - simulation</li> <li>60: Functional check</li> <li>61: Functional check - simulation</li> <li>120: Out of specification</li> <li>121: Out of specification - simulation</li> <li>128: Good</li> <li>129: Good - simulation</li> <li>164: Maintenance required</li> <li>165: Maintenance required - simulation</li> </ul>
qUnit	OUT	Int	Selected unit for distance • 0: bar • 6: psi • 8: mbar • 11: Pa • 12: kPa • 237: MPa
qSSC1_1	OUT	Bool	Status switching signal 1.1
qSSC1_2	OUT	Bool	Status switching signal 1.2
qAOI_Diagnostic	OUT	DInt	Diagnostic for device AOI state machine steps 1: qAOI_Diagnostic.1: Device port is zero 0: qAOI_Diagnostic.1: No error 1: qAOI_Diagnostic.2: Wrong device ID 0: qAOI_Diagnostic.2: No error 1: qAOI_Diagnostic.8: Error Step 0: qAOI_Diagnostic.8: No error 1: qAOI_Diagnostic.8+n: Error Step n 0: qAOI_Diagnostic.8+n: No error
qAOI_Diagnostic_String	OUT	String	Diagnostic for device AOI state machine steps
qActual_Diagnostics_Code	OUT	DInt	Current diagnostic code See product documentation
qActual_Diagnostics_String	OUT	String	Current diagnostic text See product documentation
qLast_Diagnostics_Code	OUT	DInt	Previous diagnostic code See product documentation
qLast_Diagnostics_String	OUT	String	Previous diagnostic text See product documentation
qCommunicationBusy	OUT	DInt	IO-Link master communication busy state
qDeviceConnectionError	OUT	Bool	<ul><li>TRUE: Device disconnected</li><li>FALSE: Device connected</li></ul>

### 9 Description of "Temperature" Add-On Instructions

### 9.1 iTHEMP TMT36

Device AOI designation

EH\_iTHEMP\_TMT36\_IOL

#### **Overview of functions**

- Providing the current value for the main measured variable: temperature
- Providing the status of switching signals
- Providing the extended diagnostic status
- Selection of the unit for the temperature value
- Simulating the main measured variable
- Programming the switch points via the inputs iTeachSSC1 and iTeachSSC2
- Starting the configuration of the switch points via the input iParameterizeSetpoints

For detailed information on the product, see the product documentation  $\rightarrow \square 5$ .

	EH_iTemp_TMT36_	_IOL	
	EH_iTemp_TMT36_IOL_0	1	
a	DataToSend	?	
į	CommAOIBusy	?	
ł	ActiveComPort	?	
İ	DeviceAOISendRequest	?	CommAUI data inputs
i	CommError	?	
ł	DeviceData	?	
0	iSetSimulation	qVendor_ID	
C	iSimulationVariable	qDevice_ID	
C	iSimulationValue	qTemperature	
0	iSetUnit	qExtendedDeviceStatus	
C	iUnit	qSSC_1	
0	iParameterizeSetpoints	qSSC1_SetPoint1	0.0
C	iSSC1_SetPoint1	qSSC1_SetPoint2	
<	iSSC1_SetPoint2	qSSC_2	
¢	iSSC1_Logic	qSSC2_SetPoint1	
¢	iSSC1_Mode	qSSC2_SetPoint2	
C	iSSC1_Hysteresis	qUnit	15#000.0000
C	iSSC2_SetPoint1	qAOI_Dagnostic	
C	iSSC2_SetPoint2		
¢	iSSC2_Logic		
C	iSSC2_Mode		
0	iSSC2_Hysteresis		
0	iTeachSSC1		
¢	iSelectSP_SSC1		
0	iTeachSSC2		
0	iSelectSP_SSC2		
1	qAOI_Diagnostic_String	?	
		qActual_Diagnostics_Code	P °
ł	qActual_Diagnostics_Str	ring ?	Device Diagnostics variables
		qLast_Diagnostics_Code	
1	qLast_Diagnostics_Strin	g ?	0
• •		qCommunicationBusy	0
		qDeviceConnectionError	2

■ 8 EH\_iTHEMP\_TMT36\_IOL device AOI

Name	Р Туре	Data Type	Comment
DataToSend	IN	Int[10]	IO-Link master acyclic sending frame
ComAOIBusy	IN	DInt	IO-Link master communication busy state
ActiveComPort	IN	DInt	Active IO-Link master communication port
DeviceAOISendRequest	IN	DInt	Device request for sending data to IO-Link master
CommError	IN	Int	IO-Link master communication error
DeviceData	IN	EH_ CommAOI _Data	Internal device data model
iSetSimulation	IN	Bool	Signal to set device into simulation mode TRUE: Simulation ON FALSE: Simulation OFF
iSimulationVariable	IN	Int	Variable for simulation mode • 0: Off • 1: Temperature
iSimulationValue	IN	Real	Value to be simulated
iSetUnit	IN	Bool	TRUE: Trigger to set the unit for the temperature value
iUnit	IN	SInt	Unit for temperature value • 32: °Celsius • 33: °Fahrenheit • 35: Kelvin
iParameterizeSetpoints	IN	Bool	Trigger to start switch point configuration
iSSC1_SetPoint1	IN	Real	Set point 1 of SSC1
iSSC1_SetPoint2	IN	Real	Set point 2 of SSC1
iSSC1_Logic	IN	SInt	Logic of the switching signal 1 • 0: High active • 1: Low active
iSSC1_Mode	IN	SInt	Mode of the switching signal 1 • 0: Deactivated • 1: Single point • 2: Window • 3: Two point
iSSC1_Hysteresis	IN	Real	Hysteresis of the switching signal 1
iSSC2_SetPoint1	IN	Real	Set point 1 of SSC2
iSSC2_SetPoint2	IN	Real	Set point 2 of SSC2
iSSC2_Logic	IN	SInt	Logic of the switching signal 2 • 0: High active • 1: Low active
iSSC2_Mode	IN	SInt	Mode of the switching signal 2 • O: Deactivated • 1: Single point • 2: Window • 3: Two point
iSSC2_Hysteresis	IN	SInt	Hysteresis of the switching signal 2
iTeachSSC1	IN	Bool	Trigger to teach SSC1
iSelectSP_SSC1	IN	SInt	Selection of the set point of SSC1 1: Set point 1 2: Set point 2
iTeachSSC2	IN	Bool	Trigger to teach SSC2

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		1101120	TO D	parameters

Name	Р Туре	Data Type	Comment
iSelectSP_SSC2	IN	SInt	Selection of the set point of SSC2 • 1: Set point 1 • 2: Set point 2
qVendor_ID	OUT	DInt	Vendor ID
qDevice_ID	OUT	DInt	Device ID
qTemperature	OUT	Real	Process value temperature
qExtendedDeviceStatus	OUT	USInt	<ul> <li>0: Not specified</li> <li>36: Failure</li> <li>37: Failure - simulation</li> <li>60: Functional check</li> <li>61: Functional check - simulation</li> <li>120: Out of specification</li> <li>121: Out of specification - simulation</li> <li>128: Good</li> <li>129: Good - simulation</li> <li>164: Maintenance required</li> <li>165: Maintenance required - simulation</li> </ul>
qSSC1	OUT	Bool	Status switching signal 1
qSSC1_SetPoint1	OUT	Real	Set point 1 of SSC1
qSSC1_SetPoint2	OUT	Real	Set point 2 of SSC1
qSSC2	OUT	Bool	Status switching signal 2
qSSC2_SetPoint1	OUT	Real	Set point 1 of SSC2
qSSC2_SetPoint2	OUT	Real	Set point 2 of SSC2
qAOI_Diagnostic	OUT	DInt	Diagnostic for device AOI state machine steps 1: qAOI_Diagnostic.1: Device port is zero 0: qAOI_Diagnostic.1: No error 1: qAOI_Diagnostic.2: Wrong device ID 0: qAOI_Diagnostic.2: No error 1: qAOI_Diagnostic.8: Error Step 0: qAOI_Diagnostic.8: No error 1: qAOI_Diagnostic.8+n: Error Step n 0: qAOI_Diagnostic.8+n: No error
qAOI_Diagnostic_String	OUT	String	Diagnostic for device AOI state machine steps
qActual_Diagnostics_Code	OUT	DInt	Current diagnostic code See product documentation
qActual_Diagnostics_String	OUT	String	Current diagnostic text See product documentation
qLast_Diagnostics_Code	OUT	DInt	Previous diagnostic code See product documentation
qLast_Diagnostics_String	OUT	String	Previous diagnostic text See product documentation
qCommunicationBusy	OUT	DInt	IO-Link master communication busy state
qDeviceConnectionError	OUT	Bool	<ul><li>TRUE: Device disconnected</li><li>FALSE: Device connected</li></ul>



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