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**TURCK**

# RU40...-AP... Ultrasonic Sensors

IO-Link Parameters – IO-Link Version 1.1



# Contents

1	About This Manual .....	5
1.1	Target groups.....	5
1.2	Explanation of symbols used .....	5
1.3	Other documents .....	5
2	Information About the Product .....	6
2.1	Product identification.....	6
2.2	Manufacturer and service .....	6
3	Software-Supported IO-Link parameterization.....	7
4	IO-Link Parameters.....	8
4.1	General parameters .....	8
4.2	Process input data.....	9
4.3	Standard parameters.....	10
4.4	Parameters.....	12
4.5	Events .....	16



# 1 About This Manual

This manual describes the parameterization of devices using IO-Link. The manual contains general information on IO-Link and a list of the available parameters.

## 1.1 Target groups

These instructions are aimed a qualified personal and must be carefully read by anyone mounting, commissioning, operating, maintaining, dismantling or disposing of the device.

## 1.2 Explanation of symbols used

The following symbols are used in these instructions:



**DANGER**

DANGER indicates a dangerous situation with high risk of death or severe injury if not avoided.



**WARNING**

WARNING indicates a dangerous situation with medium risk of death or severe injury if not avoided.



**CAUTION**

CAUTION indicates a dangerous situation of medium risk which may result in minor or moderate injury if not avoided.



**NOTICE**

NOTICE indicates a situation which may lead to property damage if not avoided.



**NOTE**

NOTE indicates tips, recommendations and useful information on specific actions and facts. The notes simplify your work and help you to avoid additional work.



**CALL TO ACTION**

This symbol denotes actions that the user must carry out.



**RESULTS OF ACTION**

This symbol denotes relevant results of actions.

## 1.3 Other documents

Besides this document the following material can be found on the Internet at [www.turck.com](http://www.turck.com):

- Data sheet
- Instructions for use

## 2 Information About the Product

### 2.1 Product identification

These instructions apply to all ultrasonic sensors in the product series

- RU40...-M18...-AP...

### 2.2 Manufacturer and service

Hans Turck GmbH & Co. KG  
Witzlebenstraße 7  
45472 Muelheim an der Ruhr  
Germany

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### 3 Software-Supported IO-Link parameterization

The ports of the IO-Link master can be configured in IO-Link mode (IOL) or in the standard-IO mode (SIO).

If a port is configured in SIO mode, the IO-Link master on this port behaves like a normal digital input. The connected IO-Link device sends the standard switching output to the IO-Link master – there is no communication between the device and the master.

If the port is configured in IOL mode, the IO-Link master tries to "wake" the connected IO-Link device using the "wake-up request." If the master receives a response from the signal processor, both devices start to communicate with each other. First the communication parameters are exchanged, and then the cyclic data exchange of process data (objects) starts.

In the case of active IO-Link communication (IOL mode), both cyclic and acyclic communication services are available.

Parameterization via IO-Link can occur in two different ways:

- via on-request data objects (e.g. IO-Link function block close to the control)
- via tool-based engineering using FDT/DTM (e.g. PACTware™ with the use of DTM or the IODD)

#### Device parameters (on-request data objects)

Device parameters are exchanged in an acyclic manner and upon the request of the IO-Link master. The IO-Link master always sends a request to the device first, and then the device responds. This is the case when the data is both written into the device and read from the device. With the help of on-request data objects (ORDO), the parameters can be written into the device (write) or the device status can be read from the device (read).

#### IO-Link configuration in PROFINET

Using SIDI (Simple IO-Link Device Integration), IO-Link devices can be configured in PROFINET applications directly in the programming environment (e.g. TIA Portal). The Turck IO-Link devices are integrated in the GSDML file of the IO-Link masters in the TBEN, TBPN and FEN20 product series and can be configured in the programming environment as submodules of a modular I/O system. During this process, the user has access to all device properties and parameters.

## 4 IO-Link Parameters

### 4.1 General parameters

Parameter	Content
Vendor ID	317 (0x13D)
Device ID	263170 (0x40402)
IO-Link version	1.1
Bitrate	COM2 (38.4 kbit/s)
Minimum cycle time	2 ms
SIO supported	True
M-Sequence Capability	PREOPERATE = TYPE_0 with 1 byte on-request data OPERATE = TYPE_0 with 1 byte on-request data ISDU supported
Block Parameter	True
Data Storage	True
ProfileCharacteristic	



## 4.2 Process input data

Name	Byte.Bit-offset	Bit Length	Subindex access supported	Data Type	Value	Description
Process Value	0.1	15	True	UInteger	0...32767	
					0	no target
					1	muted
					2	filtered
Switch state output 1	1.0	1	True	Boolean	false/true	
					false	open
					true	closed

4.3 Standard parameters

Name	Index (dec.)	Index (hex.)	Sub-index (dec.)	Sub-index (hex.)	Subindex access supported	Access	Byte. Bit-offset	Bit Length	Data Type	Value	Default	Description
Min Cycle Time	0	0x0	3	0x3	True	read	2.0	8	UInteger			
IO-Link Version ID	0	0x0	5	0x5	True	read	4.0	8	UInteger		17	
Vendor ID 1	0	0x0	8	0x8	True	read	7.0	8	UInteger			
Vendor ID 2	0	0x0	9	0x9	True	read	8.0	8	UInteger			
Device ID 1	0	0x0	10	0xA	True	read	9.0	8	UInteger			
Device ID 2	0	0x0	11	0xB	True	read	10.0	8	UInteger			
Device ID 3	0	0x0	12	0xC	True	read	11.0	8	UInteger			
Standard Command	2	0x2	0	0x0	True	write	0.0	8	UInteger	0...177		System command
										75		Far Switchpoint Teach
										76		Near Switchpoint Teach
										79		Cancel Teach
										128		Device Reset
										129		Application Reset
										130		Restore Factory Settings
										160		-
										161		-
										176		mute sensor
177		unmute sensor										
Parameter (write) Access Lock	12	0xC	1	0x1	False	read/write	0.0	1	Boolean	false/true		Device access locks
Data Storage Lock	12	0xC	2	0x2	False	read/write	0.1	1	Boolean	false/true		Device access locks
Local Parameterization Lock	12	0xC	3	0x3	False	read/write	0.2	1	Boolean	false/true		Device access locks
Local User Interface Lock	12	0xC	4	0x4	False	read/write	0.3	1	Boolean	false/true		Device access locks
Vendor Name	16	0x10	0	0x0	True	read	0.0	512	String			Vendor name
Vendor Text	17	0x11	0	0x0	True	read	0.0	512	String			Additional manufacturer information
Product Name	18	0x12	0	0x0	True	read	0.0	512	String			Manufacturer's device designation

Name	Index (dec.)	Index (hex.)	Sub-index (dec.)	Sub-index (hex.)	Subindex access supported	Access	Byte. Bit-offset	Bit Length	Data Type	Value	Default	Description
Product ID	19	0x13	0	0x0	True	read	0.0	512	String			Ident-No.
Product Text	20	0x14	0	0x0	True	read	0.0	512	String			Device category
Serial Number	21	0x15	0	0x0	True	read	0.0	128	String			Device serial number
Firmware Version	23	0x17	0	0x0	True	read	0.0	512	String			Firmware revision
Application Specific Tag	24	0x18	0	0x0	True	read/write	0.0	32	String			Any user generated content
Device Status	36	0x24	0	0x0	True	read	0.0	8	UInteger	0...255		
										0		Device is OK
										1		Maintenance required
										2		Out of specification
										3		Functional check
										4		Failure
Detailed Device Status	37	0x25	0	0x0	False	read	0.0	5	Array			
Process Data Input	40	0x28	0	0x0	True	read	0.0	0	Process-DataIn-Union			

4.4 Parameters

Name	Index (dec.)	Index (hex.)	Sub-index (dec.)	Sub-index (hex.)	Subindex access supported	Access	Byte. Bit Offset	Bit Len-gth	Data Type	Value	Default	Description
Near Switchpoint Value Teach Flag	59	0x3B	1	0x1	True	read	0.6	1	Boolean	false/true		
										false		Not taught or not successful
										true		Successfully taught
Far Switchpoint Value Teach Flag	59	0x3B	2	0x2	True	read	0.4	1	Boolean	false/true		
										false		Not taught or not successful
										true		Successfully taught
Teach State	59	0x3B	3	0x3	True	read	0.0	4	UInteger	0...7		
										0		Idle
										1		Far switchpoint successfully taught
										2		Near switchpoint successfully taught
										7		Error
Far Switchpoint	60	0x3C	1	0x1	True	read/write	0.0	16	UInteger	300...4000	000	
Near Switchpoint	60	0x3C	2	0x2	True	read/write	2.0	16	UInteger	250...3950	250	
Logic	61	0x3D	1	0x1	True	read/write	0.0	8	UInteger	0...1		
										0		Not Inverted Switching
										1		Inverted Switching
Mode	61	0x3D	2	0x2	True	read/write	1.0	8	UInteger	3...128	128	
										3		Two Point Mode
										128		Window Mode

Name	Index (dec.)	Index (hex.)	Sub-index (dec.)	Sub-index (hex.)	Subindex access supported	Access	Byte. Bit Offset	Bit Length	Data Type	Value	Default	Description	
Operating Mode	80	0x50	0	0x0	True	read/write	0.0	8	UInteger	0...4	0	Standard mode: The sensor operates as diffuse	
												Multiplex mode: Allocation of an address to run with additional sensors	
												Synchronization mode: Synchronized sensor network	
												Enable mode: Sensor remote enabling	
												Opposed mode: Sensor is emitter or receiver	
0	Standard Mode												
1	Multiplex Mode												
2	Synchronization Mode												
3	Enable Mode												
4	Opposed Mode												
PNP/NPN Switch Selection	83	0x53	0	0x0	True	read/write	0.0	8	UInteger	0...1	0	Selection of switching behaviour in p or n type	
												0	PNP
												1	NPN
Error Behavior	86	0x56	0	0x0	True	read/write	0.0	8	UInteger	0...1	0	In case of failure the switching output can be set to open or closed	
												0	Open
												1	Closed

Name	Index (dec.)	Index (hex.)	Sub-index (dec.)	Sub-index (hex.)	Subindex access supported	Access	Byte. Bit Offset	Bit Length	Data Type	Value	Default	Description
Teach Time Lock 300s	88	0x58	0	0x0	True	read/write	0.0	8	UInteger	0...1	0	Automatically 300 s teach lock can be disabled or enabled
											1	On
											1	Off
Temperature Compensation	112	0x70	0	0x0	True	read/write	0.0	8	UInteger	0...1	0	Temperature compensation via internally measured temperature or externally defined temperature
											1	Internal
											1	External
Temperature Value For External Temperature Compensation	113	0x71	0	0x0	True	read/write	0.0	16	Integer	-300... 850	250	Value of externally defined temperature that is used for compensation if external temperature compensation is selected
Unit For Temperature Value	114	0x72	0	0x0	True	read/write	0.0	8	UInteger	0...1	0	The unit of temperature can be changed between °C and °F
											1	°C
											1	°F
Multiplex Mode Address	116	0x74	0	0x0	True	read/write	0.0	8	UInteger	0...9	0	In Multiplex Mode every connected sensor is assigned to an own adress to activate it in a time slice
moving Average Filter	118	0x76	0	0x0	True	read/write	0.0	8	UInteger	0...5	0	Defines how much samples should be taken for an moving average filter.

Name	Index (dec.)	Index (hex.)	Sub-index (dec.)	Sub-index (hex.)	Subindex access supported	Access	Byte. Bit Offset	Bit Length	Data Type	Value	Default	Description
										0	1	
										1	2	
										2	4	
										3	8	
										4	16	
										5	32	
Internal Temperature Value	120	0x78	0	0x0	True	read	0.0	16	Integer	-300...850		Internally measured value of ambient temperature that is used for compensation if internal temperature compensation is selected
Signal Strength Indication via LED	121	0x79	0	0x0	True	read/write	0.0	8	UInteger	0...1	0	The LED shows the received signal strength
										0	Off	
										1	On	
Signal Strength Indication Value	122	0x7A	0	0x0	True	read	0.0	8	UInteger	0...255		Value of signal strength

## 4.5 Events

<b>Code</b>	<b>Type</b>	<b>Name</b>	<b>Description</b>
30480	Error	Short circuit	Check installation
35856	Warning	Process variable range over-run	Process data uncertain
36010	Error	Storage Error	EEPROM uninitialized, erroneous or maximum number of write cycles reached



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