Leuze

IO-Link interface description

ODT5B

Distance diffuse sensor



The Sensor People

We reserve the right to make technical changes
EN • 2026-09-29 • 24-105930

© 2026
Leuze electronic GmbH + Co. KG
In der Braike 1
73277 Owen / Germany
Phone: +49 7021 573-0
Fax: +49 7021 573-199
www.leuze.com
info@leuze.com

1 IO-Link interface 4
1.1 IO-Link identification 4
1.2 IO-Link process data 4
1.3 Device-specific IODD 5
1.4 IO-Link parameters documentation 5
1.5 Device-specific information 5
2 Functions configurable via IO-Link 7

1 IO-Link interface

Sensors in the ODT5B variant have a dual channel architecture. Pin 4 provides the IO-Link interface in accordance with Specification 1.1.4 (June 2024), supporting the Smart Sensor Profile 2nd Ed 1.2 (Jan 2024) with profile type SSP 4.1.1 (Measuring and Switching Sensor, 1 Channel). You can configure the devices via the IO-Link interface quickly, easily and cost-effectively. Furthermore, the sensor transmits the process data via the IO-Link interface and makes diagnostic information available through it.

In parallel with the IO-Link communication, the sensor can output the continuous switching signal for object detection on pin 2 (SSC.2 by default) by means of the dual channel architecture. The IO-Link communication does not interrupt this signal.

1.1 IO-Link identification

VendorID dec/hex	DeviceID dec/hex	Device
338/0x152	2250/0x8ca	ODT5BL1-1000.XV3/L6-M8
	…	…
	2251/0x8cb	ODT5BL1-1500.3/L6-M8
	…	…
	2252/0x8cc	ODT5BIL1-2000.XV3/L6-M8
	2253/0x8cd	ODT5BIL1-2500.3/L6-M8
	…	
	2254/0x8ce	ODT5BL1-1200.XV3/L6-M8.P1
	…	…

Please refer to the respective product data sheet for the identification data of other IO-Link devices.

1.2 IO-Link process data

Device input data (PDOut – 1-bit data length)

Bit offset	Data width in bits	Assignment	Meaning
0	1	CSC – Sensor control	0: Transmitter active 1: Transmitter not active

Byte 0	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**CSC**
	7	6	5	4	3	2	1	0

Device output data (PDIn) – 32-bit data length

Bit offset	Data width in bits	Assignment	Meaning
16	16	MDC - Measurement Value	Current measurement value -32760: Outside of measurement range (-) 32760: Outside of measurement range (+) 32764: No measurement value available 0–1800: Measurement value (DeviceID 2250) 0–2300: Measurement value (DeviceID 2251) 0–2800: Measurement value (DeviceID 2252) 0–3300: Measurement value (DeviceID 2253) 0–2000: Measurement value (DeviceID 2254)
8	8	MDC – Scale	Display of the multiplier associated with the measurement value as a power of ten

Bit offset	Data width in bits	Assignment	Meaning
0	1	SSC.1 – Switching Signal	0: Switching output 1 not active 1: Switching output 1 active
1	1	SSC.2 – Switching Signal	0: Switching output 2 not active 1: Switching output 2 active
2	1	Uncertainty indication	0: Measurement not active 1: Measurement active
3	1	Measure	0: Measurement not active 1: Measurement active
4	1	Signal	0: No valid reception signal 1: Reception signal available

Byte 0	MDC – Measurement Value							
	15	14	13	12	11	10	9	8

Byte 1	MDC – Measurement Value							
	7	6	5	4	3	2	1	0

Byte 2	MDC – Scale							
	7	6	5	4	3	2	1	0

Byte 3	Quality			Signal	Measure	Uncer-tainty	SSC.2	SSC.1
	/	/	/	4	3	2	1	0

1.3 Device-specific IODD

At **www.leuze.com** in the download area for IO-Link sensors you will find the IODD zip file with all data required for the installation.

On the IODDfinder platform (https://ioddfinder.io-link.com/#/), a central cross-manufacturer database, you can also find the description files (IODDs) of the IO-Link sensors.

1.4 IO-Link parameters documentation

The complete description of the IO-Link parameters can be found in the *.html files. Double-click on a language variant in the directory containing the extracted files:

- German: *IODD*-de.html
- English: *IODD*-en.html

If the html file within the ZIP archive is opened, the image files are not displayed.

↳ Extract the ZIP file first.

1.5 Device-specific information

- This is a device of data storage class 1 (automatic DS), i.e., device exchange is possible without additional measures (such as teaching).
- In the PREOPERATE state, this device uses TYPE_0.
- Because this device is not an actuator, no special failsafe behavior in the event of failure of PDOut is necessary. In the context of deactivation, there are, however, the following special situations:

- Changes to the transferred PDOut information are ignored if they are marked as invalid. On the sensor side, the replacement value 0 (= activation) is assumed: If the device was previously activated, it thus remains activated. If the device was previously deactivated, it changes to the activated state.
- If there is a lack of communication, the last setting (activation or deactivation) remains unchanged.

Fundamentals:

- IO-Link Interface and System Specification Version 1.1.4 June 2024
- IO-Link Test Specification Version 1.1.4 June 2024

2 Functions configurable via IO-Link

PC configuration and visualization is performed conveniently with the USB-IO-Link Master SET MD12-US2-IL1.1 (part no. 50121098) and the *Sensor Studio* configuration and diagnosis software (in the download area of the sensor at **www.leuze.com**).

System commands

NOTICE
The system commands trigger an action in the device.

Parameter	Index	Sub-index	Data type, octets	Access	Value range	Default	Explanation
System command	2	0	UIntegerT, 1	WO	65, 66, 128, 129, 130 131, 176, 177, 178, 180		65: Teach SP1 66: Teach SP2 128: Reset device 129: Reset application 130: Reset to factory settings 131: Back-to-box 176: Activate transmitter (has priority over PDout) 177: Deactivate transmitter (has priority over PDout) 178: Priority reset (PDout has priority) 180: Start/finish object test

General configuration

Parameter	Index	Sub-index	Data type, octets	Access	Value range	Default	Explanation
Device Access Locks	12	0	UIntegerT, 2	RW	0, 8	0	0: Teach button not locked 8: Teach button locked
Application Specific Tag	24	0	String, max. 32	RW		***	Application-specific marking
Function Tag	25	0	String, max. 32	RW		***	Function identifier
Location Tag	26	0	String, max. 32	RW		***	Location indicator
Teach Select	58	0	UIntegerT, 1	RW	1, 2, 255	1	1: SSC.1 2: SSC.2 255: All channels

Parameter	Index	Sub-index	Data type, octets	Access	Value range	Default	Explanation
Teach Result	59	1	UintegerT, 4 bits	RO	0, 1, 2, 3, 4, 5, 7		Status of teach event: 0: deactivated 1: Successful SP1 2: Successful SP2 3: Successful SP1, SP2 4: Waiting for command 5: Working 7: Error
		2	Boolean	RO	0, 1		SP1 signal teach-in ok: 0: Teach point 1 not OK 1: Teach point 1 OK
		3	Boolean	RO	0, 1		SP1 signal teach-in ok: 0: Teach point 2 not OK 1: Teach point 2 OK
		4	Boolean	RO	0, 1		SP2 signal teach-in ok: 0: Teach point 1 not OK 1: Teach point 1 OK
		5	Boolean	RO	0, 1		SP2 signal teach-in ok: 0: Teach point 2 not OK 1: Teach point 2 OK
SSC.1 parameter	60	1	IntegerT, 4	RW	20 – 1500 (DeviceID 2250) 20 – 2000 (DeviceID 2251) 20 – 2500 (DeviceID 2252) 20 – 3000 (DeviceID 2253) 20 – 1700 (DeviceID 2254)	1000	Numerical input of switching point SP1
		2	IntegerT, 4	RW	20 – 1500 (DeviceID 2250) 20 – 2000 (DeviceID 2251) 20 – 2500 (DeviceID 2252) 20 – 3000 (DeviceID 2253) 20 – 1700 (DeviceID 2254)	500	Numerical input of switching point SP2
SSC.1 Configuration	61	1	UIntegerT, 1	RW	0, 1	0	Logic: 0: High active 1: Low active
		2	UIntegerT, 1	RW	0 – 3	1	Evaluation mode: 0: Deactivated 1: Single-point mode 2: Window mode 3: Two-point mode
		3	IntegerT, 4	RW	0, 1 … 200	0	Determines the hysteresis at the switching point. A higher hysteresis can help increase the stability in critical applications. 0: Automatic 1 – 200: Numeric entry of the hysteresis in mm

Parameter	Index	Sub-index	Data type, octets	Access	Value range	Default	Explanation
SSC.2 parameter	62	1	IntegerT, 4	RW	20 – 1500 (DeviceID 2250) 20 – 2000 (DeviceID 2251) 20 – 2500 (DeviceID 2252) 20 – 3000 (DeviceID 2253) 20 – 1700 (DeviceID 2254)	1000	Numerical input of switching point SP1
		2	IntegerT, 4	RW	20 – 1500 (DeviceID 2250) 20 – 2000 (DeviceID 2251) 20 – 2500 (DeviceID 2252) 20 – 3000 (DeviceID 2253) 20 – 1700 (DeviceID 2254)	500	Numerical input of switching point SP2
SSC.2 Configuration	63	1	UIntgerT, 1	RW	0, 1	0	Logic: 0: High active 1: Low active
		2	UIntegerT, 1	RW	0 – 3	1	Evaluation mode: 0: Deactivated 1: Single-point mode 2: Window mode 3: Two-point mode
		3	IntegerT, 4	RW	0, 1 … 200	0	Determines the hysteresis at the switching point. A higher hysteresis can help increase the stability in critical applications. 0: Automatic 1 – 200: Numeric entry of the hysteresis in mm
Replacement behavior of switching outputs	82	0	UIntegerT, 1	RW	0, 1, 2	0	General behavior of all switching outputs when no measurement value is available.
Number of measurements	131	0	UIntegerT, 2	RW	1 – 65535	1	Average calculation: The distance signal is averaged over this number of measurement values as a switching signal before evaluation. The default setting in the factory settings refers to the specified response time in the device data sheet.

Parameter	Index	Sub-index	Data type, octets	Access	Value range	Default	Explanation
Analysis Depth SSC.2	180	0	UIntegerT, 1	RW	1 – 100	1	Analysis depth: To suppress interference, changing of the switching output is delayed by this number of identical measurement results. The default setting in the factory settings refers to the specified response time in the device data sheet.
Timer Unit SSC.2	182	0	UIntegerT, 1	RW	0, 255	0	0: Time module not active 255: Time module active Time module: On (255) activates the internal time function.
Function of Timer Unit SSC.2	183	0	UIntegerT, 1	RW	0 – 3	0	Function selection of switching delay SSC.2: 0: Switch-on delay 1: Switch-off delay 2: Pulse stretching 3: Pulse suppression Function selection of the switching delay: activation of a suitable switching delay is possible. It is not possible to combine switching delays.
Time Value SSC.2	184	0	UIntegerT, 2	RW	1 – 50000	200	Set the time base as a multiple of the sensor's reaction time specified in the data sheet
Number of Detected Objects SSC.2	185	0	UIntegerT, 4	RW	0 – 4294967295		Object counter: The device has an internal, volatile object counter. This counts the switching events and can be freely read out, edited and reset. This function enables a simple validation of the process. As soon as the object counter has reached the maximum end value, the count process starts over again at 0.
Teach Offset SSC.2	186	0	IntegerT, 2	RW	-200 – 200	20	Adds a certain distance in mm to the teach point to ensure an active SSC.2. This only applies when performing a teach for SP1 in single-point mode.

Parameter	Index	Sub-index	Data type, octets	Access	Value range	Default	Explanation
Sampling Depth SSC.1	190	0	UIntegerT, 1	RW	1 – 100	1	Analysis depth: To suppress interference, changing of the switching output is delayed by this number of identical measurement results. The default setting in the factory settings refers to the specified response time in the device data sheet.
Timer Unit SSC.1	192	0	UIntegerT, 1	RW	0, 255	0	0: Time module not active 255: Time module active Time module: On (255) activates the internal time function.
Function of Timer Unit SSC.1	193	0	UIntegerT, 1	RW	0 – 3	0	Function selection of switching delay SSC.1: 0: Switch-on delay 1: Switch-off delay 2: Pulse stretching 3: Pulse suppression Function selection of the switching delay: activation of a suitable switching delay is possible. It is not possible to combine switching delays.
Time Value SSC.1	194	0	UIntegerT, 2	RW	1 – 50000	200	Set the time base as a multiple of the sensor's reaction time specified in the data sheet
Number of Detected Objects SSC.1	195	0	UIntegerT, 4	RW	0 – 4294967295		Object counter: The device has an internal, volatile object counter. This counts the switching events and can be freely read out, edited and reset. This function enables a simple validation of the process. As soon as the object counter has reached the maximum end value, the count process starts over again at 0.
Teach Offset SSC.1	196	0	IntegerT, 2	RW	-200 – 200	20	Adds a certain distance in mm to the teach point to ensure an active SSC.1. This only applies when performing a teach for SP1 in single-point mode.

Parameter	Index	Sub-index	Data type, octets	Access	Value range	Default	Explanation
Temperature	220	0	UIntegerT, 2	RO			The device is equipped with an integrated temperature sensor for transmitting the internal temperature in 1/10°C.
Operation hour counter	234	0	UIntegerT, 4	RO			The device has an integrated operating hours counter for transmitting the operating hours.
Button actuation (2–6 s)	241	0	UIntegerT, 1	RW	0, 2, 3, 4, 5, 21, 24, 33, 36, 45	2	Selection of the function to be executed after pressing the button for 2 to 6 seconds. 0: No button function 2: Teach SP1 of SSC.1 with defined offset 3: Teach SP1 of SSC.2 with defined offset 4: Teach SP2 of SSC.1 with defined offset 5: Teach SP2 of SSC.2 with defined offset 21: SSC.1 logic toggle 24: Toggle time module SSC.1 (on/off) 33: SSC.2 logic toggle 36: Toggle time module SSC.2 (on/off) 45: SSC.1 and SSC.2 logic toggle
Button actuation (7-11 s)	242	0	UIntegerT, 1	RW	0, 2, 3, 4, 5, 21, 24, 33, 36, 45	3	Selection of the function to be executed after pressing the button for 7 to 11 seconds. 0: No button function 2: Teach SP1 of SSC.1 with defined offset 3: Teach SP1 of SSC.2 with defined offset 4: Teach SP2 of SSC.1 with defined offset 5: Teach SP2 of SSC.2 with defined offset 21: SSC.1 logic toggle 24: Toggle time module SSC.1 (on/off) 33: SSC.2 logic toggle 36: Toggle time module SSC.2 (on/off) 45: SSC.1 and SSC.2 logic toggle

Parameter	Index	Sub-index	Data type, octets	Access	Value range	Default	Explanation
Button actuation (12-16 s)	243	0	UIntegerT, 1	RW	0, 2, 3, 4, 5, 21, 24, 33, 36, 45	45	Selection of the function to be executed after pressing the button for 12 to 16 seconds. 0: No button function 2: Teach SP1 of SSC.1 with defined offset 3: Teach SP1 of SSC.2 with defined offset 4: Teach SP2 of SSC.1 with defined offset 5: Teach SP2 of SSC.2 with defined offset 21: SSC.1 logic toggle 24: Toggle time module SSC.1 (on/off) 33: SSC.2 logic toggle 36: Toggle time module SSC.2 (on/off) 45: SSC.1 and SSC.2 logic toggle
Pin 4 configuration	251	0	UIntegerT, 1	RW	0, 1, 2, 3, 4, 7, 8	1	Setting the functionality on pin 4: 0: Pin without function 1: Pin as SSC.1 2: Pin as SSC.1 inverted 3: Pin as SSC.2 4: Pin as SSC.2 inverted 7: Pin as uncertainty output 8: Pin as inverted uncertainty output
Pin 2 configuration	252	0	UIntegerT, 1	RW	0, 1, 2, 3, 4, 7, 8	3	Setting the functionality on pin 2. 0: Pin without function 1: Pin as SSC.1 2: Pin as SSC.1 inverted 3: Pin as SSC.2 4: Pin as SSC.2 inverted 7: Pin as uncertainty output 8: Pin as inverted uncertainty output
Object Selection	628	0	UIntegerT, 2	RW	1 … 3	1	Select which object in the sensor's field of view should be evaluated with priority. 1: Next object 2: Farthest object 3: Clearest object

Parameter	Index	Sub-index	Data type, octets	Access	Value range	Default	Explanation
Heating control	660	0	Boolean	RW	0, 1	1	Activation or deactivation of the heating control. 0: Deactivated 1: Activated
Response time	913	0	UIntegerT, 2	RW	25 – 2000	25 (DeviceID 2250, 2252, 2254) 50 (DeviceID 2251, 2253)	Setting the switching speed of the sensor output in ms.
Hysteresis preset	914	0	UIntegerT, 2	RW	0 – 2	2	Setting of the distance-dependent hysteresis curves based on ambient light. As ambient light increases, a greater hysteresis is required. 0: No ambient light 1: 10 kLux 2: 100 kLux
Signal strength	915	0	UIntegerT, 2	RO			Factor by which the received signal exceeds the switch-on threshold (function reserve).
Current hysteresis SSC.1 SP1	916	0	UIntegerT, 2	RO			The current hysteresis is recalculated during the teach-in process based on the distance.
Current hysteresis SSC.1 SP2	917	0	UIntegerT, 2	RO			The current hysteresis is recalculated during the teach-in process based on the distance.
Current hysteresis SSC.2 SP1	918	0	UIntegerT, 2	RO			The current hysteresis is recalculated during the teach-in process based on the distance.
Current hysteresis SSC.2 SP2	919	0	UIntegerT, 2	RO			The current hysteresis is recalculated during the teach-in process based on the distance.