

IO-Link interface description

ODT3C

Diffuse reflection distance sensor



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1 IO-Link interface

Sensors in the ODT3C.../L6... variant have a dual channel architecture. Available on pin 4 is the IO-Link interface in accordance with specification 1.1.3 (June 2019) with support of Smart Sensor Profile 1.1 (September 2021) with profile type SSP 4.1.1 (Measuring and Switching Sensor, 1 Channel). You can easily, quickly and economically configure the devices via the IO-Link interface. 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	2200/0x000898	ODT3C.3/L6-M8

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 (PDOOut – 1-bit data length)

Bit offset	Data width in bits	Assignment	Meaning
0	1	Deactivation	0: transmitter active 1: transmitter not active

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

Bit offset	Data width in bits	Assignment	Meaning
16	16	Measurement value	Display of the sensor's current measurement value
8	8	Resolution	Display of the multiplier associated with the measurement value as a power of ten
0	1	Switching signal SSC.1	0: not active 1: active
1	1	Switching signal SSC.2	0: not active 1: active
3	1	Sensor operation	Sensor operation off when detection is not possible (e.g if deactivated or during the teach event) 0: off 1: on
4	1	Signal	Signal strength as indicator for object detection 0: insufficient signal 1: sufficient signal
5	1	Warning	Warning output autoControl (object-clocked) 0: no warning 1: warning
6	2	Quality	Strength of the reception signal 0: insufficient 1: low 2: sufficient 3: good

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.
- Changes to the transferred PDOOut information are ignored if they are marked as invalid. On the sensor side, the replacement value 0 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 1.1.3, June 2019
- IO-Link Test Specification Version 1.1.3 January 2021

2 Functions configurable via IO-Link

PC configuration and visualization is performed comfortably with the USB-IO-Link Master SET US2-IL1.1 (part no. 50121098) and the *Sensor Studio* configuration 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	In-dex	Sub-in-dex	Data type, octets	Access	Value range	De-fault	Explanation
System command	2	0	UIntegerT, 1	WO	65, 66, 128, 129, 130, 131, 176, 177, 178		65: Teach SP1 66: Teach SP2 128: Reset device 129: Reset application 130: Reset factory settings 131: Back-to-box 176: activation (has priority over PDout) 177: deactivation (has priority over PDout) 178: reset value 176 or 177 (restore PDout)

General configuration

Parameter	In-dex	Sub-in-dex	Data type, octets	Access	Value range	De-fault	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	StringT, max. 32	RW		***	Application-specific identifier
Function Tag	25	0	StringT, max. 32	RW		***	Function identifier
Location Tag	26	0	StringT, max. 32	RW		***	Location indicator
Teach Select	58	0	UIntegerT, 1	RW	0 ... 225 5	1	0: Default channel (SSC.1) 1: SSC.1 2: SSC.2 255: All channels
SSC.1 Param	60	1	IntegerT, 4	RW	30 ... 16 5	155	Numerical entry of switching points SP1 and SP2 for SSC.1 in mm
		2	IntegerT, 4			70	

Parameter	In-dex	Sub-in-dex	Data type, octets	Access	Value range	Default	Explanation
SSC.1 Config	61	1	UIntegerT, 1	RW	0, 1	0	0: SSC.1 not inverted (high active, light switching) 1: SSC.1 inverted (low active, dark switching)
		2	UIntegerT, 1		0 ... 3	1	Defines the evaluation mode for the switching output: 0: Inactive 1: Single-point mode 2: Window mode 3: Two-point mode
		3	IntegerT, 4		0	0	Defines the hysteresis at the switching point
SSC.2 Param	62	1	IntegerT, 4	RW	30 ... 165 5	155	Numerical entry of switching points SP1 and SP2 for SSC.2 in mm
		2	IntegerT, 4			70	
SSC.2 Config	63	1	UIntegerT, 1	RW	0, 1	0	0: SSC.2 not inverted (high active, light switching) 1: SSC.2 inverted (low active, dark switching)
		2	UIntegerT, 1		0 ... 3	1	Defines the evaluation mode for the switching output. 0: Inactive 1: Single-point mode 2: Window mode 3: Two-point mode
		3	IntegerT, 4		0	0	Defines the hysteresis at the switching point.
SSC.2 Teaching Reserve Factor	82	0	IntegerT, 1	RW	-1, 0, 1, 2	0	Reserve setting for SSC.2: -1: No reserve 0: Minimum reserve 1: Medium reserve (approx. 5%) 2: Large reserve (approx. 10%) This configuration only applies when performing a teach for SP1 in single-point mode.
SSC.1 Teaching Reserve Factor	92	0	IntegerT, 1	RW	-1, 0, 1, 2	0	Reserve setting for SSC.1: -1: No reserve 0: Minimum reserve 1: Medium reserve (approx. 5%) 2: Large reserve (approx. 10%) This configuration only applies when performing a teach for SP1 in single-point mode.
Distance Value Averaging	130	0	UIntegerT, 1	RW	0, 1 ... 100	30	Adjustable value of a sliding average value for stabilizing the distance value. 0: Off

Parameter	In-dex	Sub-in-dex	Data type, octets	Access	Value range	Default	Explanation
Analysis Depth SSC.2	180	0	IntegerT, 1	RW	1 ... 100	2	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: <i>On</i> (255) activates the internal time function.
Function of Timer Unit SSC.2	183	0	UIntegerT, 1	RW	0 ... 3	0	0: Start-up 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 SSC.2	184	0	UIntegerT, 2	RW	1 ... 500 00	200	Definition of the time basis in 100 µs increments, configurable from 100 µs to 5000 ms
Number of Objects SSC.2	185	0	UIntegerT, 4	RW	0 ... 429 4967295	0	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.
Analysis Depth SSC.1	190	0	IntegerT, 1	RW	1 ... 100	2	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: <i>On</i> (255) activates the internal time function.
Function of Timer Unit SSC.1	193	0	UIntegerT, 1	RW	0 ... 3	0	0: Start-up 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 SSC.1	194	0	UIntegerT, 2	RW	1 ... 500 00	200	Definition of the time basis in 100 µs increments, configurable from 100 µs to 5000 ms

Parameter	In- dex	Sub- in- dex	Data type, octets	Ac- cess	Value range	De- fault	Explanation
Number of Objects SSC.1	195	0	UIntegerT, 4	RW	0 ... 429 4967295	0	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.
Tempera- ture	220	0	IntegerT, 2	RO			The device is equipped with an integrated temperature sensor for transmitting the internal temperature in 1/10 °Celsius.
Button function level 1	241	0	IntegerT, 1	RW	0, 2, 3, 4, 5, 6, 7, 19, 20, 21, 22, 23, 24, 31, 32, 33, 34, 35, 36, 43, 44, 45	2	Assignment of teach level 1 (2 ... 7 s) via the teach button: 0: Teach level not assigned 2: Teach SP of SSC.1 (minimum reserve) 3: Teach SP of SSC.2 (minimum reserve) 4: Teach SP of SSC.1 (medium reserve) 5: Teach SP of SSC.2 (medium reserve) 6: Teach SP of SSC.1 (large reserve) 7: Teach SP of SSC.2 (large reserve) 19: SSC.1 not inverted 20: SSC.1 inverted 21: Toggle SSC.1 logic 22: Time module SSC.1 activated 23: Time module SSC.1 deactivated 24: Toggle time module SSC.1 (on/off) 31: SSC.2 not inverted 32: SSC.2 inverted 33: Toggle SSC.2 logic 34: Time module SSC.2 activated 35: Time module SSC.2 deactivated 36: Toggle time module SSC.2 (on/off) 43: SSC.1 and SSC.2 not inverted 44: SSC.1 and SSC.2 inverted 45: Toggle SSC.1 and SSC.2 logic
Button function level 2	242	0	IntegerT, 1	RW	Analog to pa- rameter <i>Button function level 1</i>	3	Assignment of teach level 2 (7 ... 12 s) via the teach button: <i>Analog to parameter <i>Button function level 1</i></i>
Button function level 3	243	0	IntegerT, 1	RW	Analog to pa- rameter <i>Button function level 1</i>	45	Assignment of teach level 3 (> 12 s) via the teach button: <i>Analog to parameter <i>Button function level 1</i></i>
Pin 4 func- tion	251	0	UIntegerT, 1	RW	0 ... 4 7, 8	1	Assignment of pin 4: 0: No function 1: SSC.1 2: SSC.1 inverted 3: SSC.2 4: SSC.2 inverted 7: Warning 8: Warning inverted

Parameter	Index	Sub-index	Data type, octets	Access	Value range	Default	Explanation
Pin 2 function	252	0	UIntegerT, 1	RW	Analog to parameter <i>Pin 4 function</i>	3	Assignment of pin 2: Analog to parameter <i>Pin 4 function</i>