Leuze

IO-Link interface description

HT3C

Diffuse reflection sensor

The Sensor People

We reserve the right to make technical changes
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1 IO-Link interface

Sensors in the HT3C…/L… variant have a dual channel architecture. Available on pin 4 is the IO-Link interface in accordance with specification 1.1.2 (July 2013) with support of Smart Sensor Profile 1.0 (March 2017) with profile type SSP 2.4. 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 (SSC2 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	2150/0x000866	HT3C.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 (PDin)

Data bit	Assignment	Meaning
0	Deactivation	0: transmitter active 1: transmitter not active
1	Not assigned	Free
2	Not assigned	Free
3	Not assigned	Free
4	Not assigned	Free
5	Not assigned	Free
6	Not assigned	Free
7	Not assigned	Free

Device output data (PDout)

Data bit	Assignment	Meaning
0	Switching signal SSC1	0: not active 1: active
1	Switching signal SSC2	0: not active 1: active
2	Not assigned	Free
3	Sensor operation	Sensor operation off when detection is not possible (e.g if deactivated or during the teach event) 0: off 1: on
4	Signal	Signal strength as indicator for object detection 0: insufficient signal 1: sufficient signal
5	Warning	Warning output autoControl (object-clocked) 0: no warning 1: warning
6	Quality	Strength of the reception signal 0: insufficient 1: low 2: sufficient 3: good
7		

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:

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

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	Index	Sub-index	Data type, octets	Access	Value range	Default	Explanation
System command	2	0	UIntegerT, 1	WO	65, 128, 130, 176, 177, 178		65: execute SP teach 128: reset device 130: reset factory settings 176: activation (has priority over PDout) 177: deactivation (has priority over PDout) 178: reset value 176 or 177 (restore PDout)

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
SSC Param - SP	56	0	IntegerT, 2	RW	30 … 165	155	Numeric input of switching point SP for SSC1 in mm
SSC Config - Logic	57	0	UIntegerT, 1	RW	0, 1	0	0: SSC1 not inverted (high active, light switching) 1: SSC1 inverted (low active, dark switching) In the factory setting, output SSC1 is configured as light switching.
Teach-In Select	58	0	UIntegerT, 1	RW	0 … 2 255		0: default teach, SP of SSC1 1: teach SP of SSC1 2: teach SP of SSC2 255: teach SPs of SSC1 and SSC2
SSC2 Reserve Factor	82	0	UIntegerT, 1	RW	0, 1, 2	0	Reserve setting for SSC2: 0: minimum reserve 1: medium reserve (approx. 5%) 2: large reserve (approx. 10%)
SSC1 Reserve Factor	92	0	UIntegerT, 1	RW	0, 1, 2	0	Reserve setting for SSC1: 0: minimum reserve 1: medium reserve (approx. 5%) 2: large reserve (approx. 10%)

Parameter	Index	Sub-index	Data type, octets	Access	Value range	Default	Explanation
Analysis depth SSC2	180	0	UIntegerT, 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 SSC2	182	0	BooleanT, 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 SSC2	183	0	UIntegerT, 1	RW	0 … 3	0	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 SSC2	184	0	UIntegerT, 2	RW	1 … 50000	200	Definition of the time basis in 100 µs increments, configurable from 100 µs to 5000 ms
number of objects SSC2	185	0	UIntegerT, 4	RW	0 … 4294967295	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.
SSC2 Param - SP	186	0	IntegerT, 2	RW	30 … 165	155	Numeric input of switching point SP for SSC2 in mm
SSC2 Config - Logic	187	0	UIntegerT, 1	RW	0, 1	0	0: SSC2 not inverted (high active, light switching) 1: SSC2 inverted (low active, dark switching) In the factory setting, output SSC2 is configured as light switching.
analysis depth SSC1	190	0	UIntegerT, 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 SSC1	192	0	BooleanT, 1	RW	0, 255	0	0: time module not active 255: time module active Time module: *On* (255) activates the internal time function.

Parameter	Index	Sub-index	Data type, octets	Access	Value range	Default	Explanation
function of timer unit SSC1	193	0	UIntegerT, 1	RW	0 … 3	0	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 SSC1	194	0	UIntegerT, 2	RW	1 … 50000	200	Definition of the time basis in 100 µs increments, configurable from 100 µs to 5000 ms
number of objects SSC1	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.
Temperature	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 SSC1 (minimum reserve) 3: Teach SP of SSC2 (minimum reserve) 4: Teach SP of SSC1 (medium reserve) 5: Teach SP of SSC2 (medium reserve) 6: Teach SP of SSC1 (large reserve) 7: Teach SP of SSC2 (large reserve) 19: SSC1 not inverted 20: SSC1 inverted 21: SSC1 logic toggle 22: Time module SSC1 activated 23: Time module SSC1 deactivated 24: Time module SSC1 toggle (on/off) 31: SSC2 not inverted 32: SSC2 inverted 33: SSC2 logic toggle 34: Time module SSC2 activated 35: Time module SSC2 deactivated 36: Time module SSC2 toggle (on/off) 43: SSC1 and SSC2 not inverted 44: SSC1 and SSC2 inverted 45: SSC1 and SSC2 logic toggle
Button function level 2	242	0	IntegerT, 1	RW	Analog to parameter *Button function level 1*	3	Assignment of teach level 2 (7 … 12 s) via the teach button: Analog to parameter *Button function level 1*

Parameter	Index	Sub-index	Data type, octets	Access	Value range	Default	Explanation
Button function level 3	243	0	IntegerT, 1	RW	Analog to parameter *Button function level 1*	45	Assignment of teach level 3 (> 12 s) via the teach button: Analog to parameter *Button function level 1*
Pin 4 function	251	0	UIntegerT, 1	RW	0 … 4 7, 8	1	Assignment of pin 4: 0: no function 1: SSC1 2: SSC1 inverted 3: SSC2 4: SSC2 inverted 7: warning 8: warning inverted
Pin 2 function	252	0	UIntegerT, 1	RW	Analog to parameter *Pin 4 function*	3	Assignment of pin 2: Analog to parameter *Pin 4 function*