BALLUFF

Data sheet

IO-Link

BOD 23K-LI03-S4

940004 F18 EN

www.balluff.com

GENERAL INFORMATION	
Communication mode IO-Link	COM 2
Min. cycle time	3 ms
SIO mode	supported
Length process data	16 Bit
Vendor ID	888 (0x0378)
Device ID	200705 (0x03 0x10 0x01)
Data storage	supported
Specification IO-Link	1.1

PROCESS DATA (PD-IN)

SMART SENSOR FORMAT

Byte 0								Byte 1							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
PDV MSB	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	PDV LSB	Signal quality	Switching output 2	Switching output 1

Process value - distance in mm, characteristic curve not adjustable

Signal quality - adjustable via index 0xC4

Switching output 2 - only in IO-Link mode

Switching output 1 - corresponds to switching output Q in SIO-Mode

PD-OUT

Byte 0								Byte 1							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
															Transduser disable

Laser off, if Bit 0 = 1

Measurement FORMAT (PD-IN)

Byte 0								Byte 1							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
PDV MSB	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	PDV LSB

Process value - distance in mm, characteristic curve adjustable

IDENTIFICATION DATA

Index dec / hex	Access	Data type	Length		Description	Comment
16 / 0x10	Read	String	Max. 64 Byte		Vendor name	BALLUFF
17 / 0x11					Vendor text	www.balluff.com
18 / 0x12					Product name	BOD 23K-LI03-S4
19 / 0x32					Product ID	BOD002K
20 / 0x11					Product text	BOD - Optical Distance Sensor
23 / 0x17					Firmware revision	1.0

SMART SENSOR PROFILE PARAMETER

Index in dec / hex	Access	Data type	Length	Subindex	Default value	Range	Description	Comment
12 / 0x0C	Read / write	Uint	16 Bit		0x00 0x00	D1, D2, D3	Lock functions	D1 - data storage lock D2 - local parametrization lock D3 - local user interface lock
24 / 0x18	Read / write	StringT	32 characters		"***...***"		Application text	Free text, e.g. item designation
58 / 0x3A	Read / write	Uint	8 Bit		0	0, 1, 2	Switching channel teach-in	0/1 = switching channel 1 2 = switching channel 2
59 / 0x3B	Read	Uint	8 Bit				Teach-in status	
							Define switching channel 1	
60 / 0x3C	Read / write	Uint	16 Bit	1	3000	60 ... 5000	Switching point 1	Needed for single, window and two-point mode, indicated in mm
				2	3100	60 ... 5000	Switching point 2	Needed for window and two-point mode, indicated in mm
							Set-up switching channel 1	
61 / 0x3D	Read / write	Uint	8 Bit	1	0	0, 1	NO / NC	0 = NO, 1 = NC
				2	1	0, 1, 2, 3	Switching mode	0 - off, 1 - single-point mode 2 - window mode 3 - two-point mode
			16 Bit	3	0	0	Hysteresis	Not adjustable
							Define switching channel 2	
62 / 0x3E	Read / write	Uint	16 Bit	1	3000	60 ... 5000	Switching point 1	Needed for single, window and two-point mode, indicated in mm
				2	3100	60 ... 5000	Switching point 2	Needed for window and two-point mode, indicated in mm
							Set-up switching channel 2	
63 / 0x3F	Read / write	Uint	8 Bit	1	0	0, 1	NO / NC	0 = NO, 1 = NC
				2	0	0, 1, 2, 3	Switching mode	0 - off 1 - single-point mode 2 - window mode 3 - two-point mode
			16 Bit	3	0	0	Hysteresis	Not adjustable

PARAMETER								
Index dec / hex	**Access**	**Data type**	**Length**	**Subindex**	**Default value**	**Range**	**Description**	**Comment**
81 / 0x51	Read / write	Uint	8 Bit		All events allowed	0 … 0x1F	Events on / off	See table events
82 / 0x52	Read	Int	8 Bit				Read temperature sensor	
				1			Operating temperature	Current temperature in device in °C
				2			Max. operating temperature since restart	Reset after interruption of voltage supply, in °C
				3			Min. operating temperature since restart	
				4			Max. lifetime temperature	No reset possible, in °C
				5			Min. lifetime temperature	
83 / 0x53	Read / write	Int	8 Bit				Define limit temperature	
				1	- 20	- 40 ... 100	Temperature min.	Definition of temperature level for event 16928/4220, in °C
				2	80	- 40 ... 100	Temperature max.	Definition of temperature level for event 16912/4210, in °C
88 / 0x58	Read	Uint	32 Bit				Read operating data	
				1			Counter power-on hours	No reset possible
				2			Counter switch cycle	No reset possible
95 / 0x5F	Read	String					Read sensor characteristics	
				1	0.06 ... 5m		Measurement range	
				2	< 5 mm		Resolution	
				3	± 30 mm		Linearity	
				4	20 mm		Hysteresis	
				5	Laser, red 655 nm class 1		Type of light	
				6	≤ 60 mA		No-load current	
				7	≤ 250 Hz		Switching frequency	
				8	20 min.		Warm-up time	
				9	-40 … +60 °C		Ambient temperature	
189 / 0xBD	Read / write	Uint	8 Bit		0	0 …10	Intensity process data average filter	0 = off to 10 = max
193 / 0xC1	Read / write	Int	16 Bit		0	-5000 … 5000	Offset	mm
185 / 0xC3	Read / write	Uint	8 Bit		1	0,1	Invert characteristic curve	0 = negative, 1 = positive
202 / 0xCA	Read / write	Uint	8 Bit		0	0,1	Process data output	0 = measurement output 1 = measurement format with switching channel
196 / 0xC4	Read / write	Uint	8 Bit		10	10 … 90	Signal quality level	%
207 / 0xCF	Read	Uint	8 Bit			0 … 100	Current signal quality	%
213 / 0xD5	Read / write	Uint	8 Bit		2 = auto-detect	0, 1, 2	Function switching output Q_1	0 = NPN, 1 = PNP, 2 = auto-detect
221 / 0xDD	Read / write	Uint	8 Bit		1 = PIN 2 active	0, 1	Control input PIN 2	0 = PIN 2 inactive, 1 = PIN 2 active

SYSTEM COMMANDS								
Index dec / hec	**Access**	**Data type**	**Length**	**Subindex**	**Function dec / hex**	**Range**	**Description**	**Comment**
2 / 0x02	Read / write	Uint	8 Bit		64 / 0x40		Teach apply	Adopt teach values on sensor
					65 / 0x41		Single value teach - switching point 1	The switching point is on the teach value
					66 / 0x42		Single value teach - switching point 2	
					67 / 0x43		Two value teach - teachpoint 1 for switching point 1	The switching point is in the middle of both teachpoints
					68 / 0x44		Two value teach - teachpoint 2 for switching point 1	
					69 / 0x45		Two value teach - teachpoint 1 for switching point 2	
					70 / 0x46		Two value teach - teachpoint 2 for switching point 2	
					71 / 0x47		Dynamic teach - switching point 1 - start	The switching point is between the min. / max. value
					72 / 0x48		Dynamic teach - switching point 1 - stop	
					73 / 0x49		Dynamic teach - switching point 2 - start	
					74 / 0x4A		Dynamic teach - switching point 2 - stop	
					79 / 0x4F		Teach cancel	
					162 / 0xA2		Reset switching channel	Reset of current switching channel
					224 / 0xE0		Offset teach	
					175 / 0xAF		Detect sensor	1x activated - sensor flashes 60 s 2x activated - permanent flashing 3x activated - stop permanent flashing
					128 / 0x80		Reset sensor	
					130 / 0x82		Factory settings	

EVENTS						
Event	**Events ON/OFF**	**Status value**	**Warning**			
1024 / 0x4000	0	4	Error		Operation temperature fault	
16912 / 0x4210	1	2	Warning		Limit temperature max. overrun	Self defined values at Index 83/0x53-2 overrun
16928 / 0x4220	2	2	Warning		Limit temperature min. underrun	Self defined values at Index 83/0x53-1 underrun
20480 / 0x5000	3	4	Error		Device hardware fault	
20497 / 0x5011	4	4	Error		Non-volatile memory loss	
65425 / 0xFF91		0	Notice		Data storage - upload request	