

IO-Link-General

Communication mode IO-Link	COM 2
Min. cycle time	2.7ms
SIO mode	supported
Length process data	24 bit
Vendor ID	780
Device ID	1528065
Data storage	supported
Specification IO Link	1.1

IO-Link Process Data

Smart Sensor Profile																							
Byte 0								Byte 1								Byte 2							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
MSB D7	D6	D5	D4	D3	D2	D1	LSB D0	MSB D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	LSB D0	Signal quality	Switching output Q2	Switching output Q1
Signal quality 0 ... 100%								Process value – distance in mm, characteristic curve not adjustable															
Signal quality bit – adjustable via index 0xC4																							
Switching output 2 – virtual switching output																							
Switching output 1 – corresponds to switching output Q in SIO-mode																							

Measurement output																							
Byte 0								Byte 1								Byte 2							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
MSB D7	D6	D5	D4	D3	D2	D1	LSB D0	MSB D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	LSB D0
Signal quality 0 ... 100%								Process value – distance in mm, characteristic curve not adjustable, averaging rate applicable															

IO-Link Identification Data

Index dec / hex	Access	Data Type	Length	Description	Comment
16 / 0x10	Read	String	Max. 64 Byte	Vendor name	ipf electronic gmbh
17 / 0x11				Vendor text	www.ipf.de
18 / 0x12				Product name	PT230020
19 / 0x13				Product ID	PT230020
20 / 0x14				Product text	Laser distance sensor
23 / 0x17				Firmware revision	1.0

Smart Sensor Profile Parameter

Index dec / hex	Access	Data Type	Length	Subindex	Default value	Range	Description	Comment
12 / 0x0C	Read / write	UInt	16 Bit		0x00 0x00	D1, D3	Lock functions	D1 – data storage 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	Teach channel	0/1 = switching channel 1 2 = switching channel 2
59 / 0x3B	Read	UInt	8 Bit				Teach-in status	
60 / 0x3C	Read / write	UInt	16 Bit	Define switching output Q1				
				1	300	100 ... 5000	Switchpoint 1	Needed for single, window and two-point mode, indicated in mm
				2	3000	100 ... 5000	Switchpoint 2	Needed for window and two-point mode, indicated in mm
61 / 0x3D	Read / write	UInt	8 Bit	Set-up switching output Q1				
				1	0	0,1	NO / NC	0 = NO, 1 = NC
				2	1	0 ... 3	Switching mode	0 – disable 1 – single-point mode 2 – window mode ¹⁾ 3 – two-point-mode ¹⁾
62 / 0x3E	Read / write	UInt	16 Bit	Define switching output Q2 – only virtual via IO-Link				
				1	3000	100 ... 5000	Switchpoint 1	Needed for single, window and two-point mode, indicated in mm
				2	3100	100 ... 5000	Switchpoint 2	Needed for window and two-point mode, indicated in mm
63 / 0x3F	Read / write	UInt	8 Bit	Set-up switching output Q2 – only virtual via IO-Link				
				1	0	0, 1	NO / NC	0 = NO, 1 = NC
				2	1	0 ... 3	Switching mode	0 – disable 1 – single-point mode 2 – window mode ¹⁾ 3 – two-point-mode ¹⁾
			16 Bit	3	0	0	Hysteresis	Not adjustable

Parameter

Index dec / hex	Access	Data Type	Length	Subindex	Default value	Range	Description	Comment
88 / 0x58	Read	Uint	32 Bit	1			Read operating data	
							Counter operating hours	No reset possible
				2			Counter switch cycle	No reset possible
95 / 0x5F	Read	String		1	100 ... 5000mm		Read sensor characteristics	
				2	< 5mm		Measurement range	
				3	± 30mm		Resolution Q _A	
				4	20mm		Linearity Q _A	
				5	Laser, red 655nm, class 1		Hysteresis Q _A / Q	
				6	≤ 60mA		Type of light	
				7	≤ 250Hz		No-load current	
				8	20min		Switching frequency	
				9	-40 ... + 60°C		Warm-up time	
				10	0...10V, 4...20mA		Ambient temperature	
			10	0...10V, 4...20mA		Output signal		
			11	1,2mm		Repeatability 1σ		
189 / 0xBD	Read / write	Uint	8 Bit		0	0 ... 10		0 = off 10 = max.
193 / 0xC1	Read / write	Int	16 Bit		0	-5000 ... 5000		Mm
185 / 0xC3	Read / write	Uint	8 Bit		1	0, 1		0 = negative 1 = positive
202 / 0xCA	Read / write	Uint	8 Bit		1	0, 1		0 = measurement output 1 = smart sensor profile
196 / 0xC4	Read / write	Uint	8 Bit		10	10 ... 90	Signal quality level	%
207 / 0xCF	Read	Uint	8 Bit			0 ... 100	Current signal quality	%
							Analogue output	
194 / 0xC2	Read / write	Uint		1	1	0, 1	Output signal	0 = 0 ... 10V 1 = 4 ... 20mA
			32 Bit	2	300	100 ... 3000	Start measurement range	In mm
			32 Bit	3	3000	100 ... 3000	End measurement range	
							Smart functions Q1	
208 / 0xD0	Read / write	Uint	16 Bit	1	0	0 ... 65535	Counter	
				2	0	0 ... 65535	On delay	in ms, adjustable in 1ms
				3	0	0 ... 65535	Off delay	in ms, adjustable in 1ms
				4	0	0 ... 65535	Impulse	in ms, adjustable in 1ms
				5	0	0 ... 50	Monitoring frequency	in Hz, adjustable in 0.1Hz steps ²⁾
							Smart functions Q2 – on virtual switching output Q2	
209 / 0xD1	Read / write	Uint	16 Bit	1	0	0 ... 65535	Counter	
				2	0	0 ... 65535	On delay	in ms, adjustable in 1ms
				3	0	0 ... 65535	Off delay	in ms, adjustable in 1ms
				4	0	0 ... 65535	Impulse	in ms, adjustable in 1ms
				5	0	0 ... 50	Monitoring frequency	in Hz, adjustable in 0.1Hz steps ²⁾
							Function switching output Q1	
213 / 0xD5	Read / write	Uint	8 Bit	1	2	0 ... 2	PNP / NPN	0 = NPN 1 = PNP 2 = auto-detect
							Control input	
221 / 0xDD	Read / write	Uint	16 Bit	1	1	0, 1	Activation control input	0 = PIN 2 disable 1 = PIN 2 active

System Commands

Index dec / hex	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-switchpoint 1	The switchpoint is on the teach value
					66 / 0x42		Single value teach-switchpoint 2	
					67 / 0x43		Two value teach- teachpoint 1 for switchpoint 1	The switchpoint is in the middle of both teachpoints
					68 / 0x44		Two value teach- teachpoint 2 for switchpoint 1	
					69 / 0x45		Two value teach- teachpoint 1 for switchpoint 2	
					70 / 0x46		Two value teach- teachpoint 2 for switchpoint 1	
					71 / 0x47		Dynamic teach - switchpoint 1 - start	The switchpoint is between the min. / max. value
					72 / 0x48		Dynamic teach - switchpoint 1 - stop	
					73 / 0x49		Dynamic teach - switchpoint 2 - start	
					74 / 0x4A		Dynamic teach - switchpoint 2 - stop	
					79 / 0x4F		Teach cancel	
					160 / 0xA0		Emitter off	
					161 / 0xA1		Emitter on	
					162 / 0xA2		Reset switching channel	Reset of current switching channel
					0xAC		Start measurement range	
					0xAD		End measurement range	
					224 / 0xE0		Offset teach	
					175 / 0xAF		Detect sensor	1x activated - sensor flashes 60s 2x activated - permanent flashing 3x activated - stop permanent flashing
					128 / 0x80		Reset sensor	
					130 / 0x82		Factory settings	

Events

Event	Status value	Warning		
20480 / 0x5000	4	Error	Device hardware fault	
20497 / 0x5011	4	Error	Non-volatile memory loss	
65425 / 0xFF91	0	Notice	Data storage – upload request	
16384 / 0x4000	4	Error	Temperature fault	Temperature range exceeded

¹⁾ Min. difference between both switchpoints 60mm

²⁾ Differs to real frequency $\pm 10\%$