

GENERAL INFORMATION	
Communication mode IO-Link	COM 2
Min. cycle time	4 ms
SIO mode	supported
Length process data	48 Bit
Vendor ID	347 (0x01 0x5B)
Device ID	11777, 12545, 13057
Data storage	supported
Specification IO-Link	1.1

PROCESS DATA PROFILE 0: SWITCHING OUTPUTS																																																							
Byte 0								Byte 1								Byte 2								Byte 3								Byte 4								Byte 5															
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0								
																Quality MSB D7	D6	D5	D4	D3	D2	D1	Quality LSB D0																	Q quality															
																Signal quality level [0 ... 100 %]																																							
																Q quality, threshold adjustable [0/1]																																							
																Switching outputs [0/1]																																							

PROCESS DATA PROFILE 1: COLOR VALUES																																																	
Byte 0								Byte 1								Byte 2								Byte 3								Byte 4								Byte 5									
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0		
Energy MSB D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	Energy LSB D0	Blue MSB D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	Blue LSB D0	Green MSB D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	Green LSB D0	Red MSB D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	Red LSB D0		
Energy value [0 ... 4095]																																																	
Color value blue [0 ... 4095]																																																	
Color value green [0 ... 4095]																																																	
Color value red [0 ... 4095]																																																	

IDENTIFICATION DATA						
Index dec / hex	Access	Data type	Length	Description	Comment	
16 / 0x10	Read	String	Max. 64 Byte	Vendor name	SensoPart Industriesensorik GmbH	
17 / 0x11				Vendor text	www.sensopart.com	
18 / 0x12				Product name	FT 55-CM-...-PNSDL-L5M	
19 / 0x13				Product ID		
20 / 0x14				Product text	Optical color sensor	
23 / 0x17				Firmware revision	1.0	

PARAMETER								
Index 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		**** ... ****	16 ... 32 characters	Application text	Free text, e.g. item designation
203 / 0xCB	Read / write	UInt	8 Bit		1	0 ... 7	Choose teach-channel	Number of switching output (default value 0 = channel 1)
204 / 0xCC	Read	UInt	8 Bit				Teach-in status	
81 / 0x51	Read / write	UInt	8 Bit			All events allowed	0 ... 0x1F	Events on / off
Read operating data								
88 / 0x58	Read	UInt	32 Bit	1			Counter operating hours	No reset possible
				2			Counter switch cycle	No reset possible
Read sensor characteristics								
95 / 0x5F	Read	String		1			Measurement range	C1 = 18 ... 32 mm C3 = 18 ... 60 mm C4 = 20 ... 150 mm
				2	LED	Type of light		
				3	≤ 60 mA	No-load current		
				4	C1 ≤ 500 Hz C3 / C4 ≤ 3 kHz	Switching frequency		
				5	300 s	Warm-up time		
				6	-20 ... +55 °C	Ambient temperature		

PARAMETER								
Index dec / hex	Access	Data type	Length	Subindex	Default value	Range	Description	Comment
196 / 0xC4	Read / write	Uint	8 Bit		10	10 ... 90	Signal quality level	%
207 / 0xCF	Read	Uint	8 Bit		0 ... 100	Current signal quality	%	
202 / 0xCA	Read / write	Uint	8 Bit		0	0 ... 1	Process data profile	0 = switchig channels 1 = color values
Display								
224 / 0xE0	Read / write	Uint	8 Bit	1	1	0 ... 1	Screensaver	0 = off, 1 = on
	Read / write	Uint	8 Bit	2	1	0 ... 1	Rotate display	
Function Q All								
176 / 0xB0	Read / write	Uint	8 Bit	1	1	0 ... 2	PNP / NPN	0 = NPN 1 = PNP 2 = Auto Detect on Q1
				2	1 = 30 Hz	0 ... 6	Switching frequency	0 = 3 Hz 1 = 30 Hz 2 = 100 Hz 3 = 300 Hz 4 = 500 Hz 5 = 1500 Hz 6 = 3000 Hz
				3	Off	0 ... 1	Binary output	On / off. Enables logical combination of switching outputs
177 / 0xB1	Read / write	Uint	8 Bit		Color mode	0 ... 1	Detection mode	0 = color mode 1 = best fit mode
Q <sub>1</sub> (physical) *								
96 / 0x60	Read / write	Uint	8 Bit	1	3	0 ... 8	Tolerance	0 = finest tolerance level 1 = 2 <sup>nd</sup> tolerance level 2 = 3 <sup>rd</sup> tolerance level ... 8 = roughest tolerance level
				2	N.O.	0 ... 1	N.O. / N.C.	0 = N.O. 1 = N.C.
				3	Output	0 ... 1	Function switching output	0 = disable 1 = output
				4	On	0 ... 1	Energy evaluation off / on	0 = off, 1 = on
			16 Bit	5	0	0 ... 65535	Counter	Switches only every nth cycle
				6	0.	0 ... 65535	On delay	In ms, adjustable in 1 ms
				7	0	0 ... 65535	Off delay	In ms, adjustable in 1 ms
				8	0	0 ... 65535	Impulse	In ms, adjustable in 1 ms
			8 Bit	9	0	0 ... 2	Not connected	0 = not connected 1 = combine with color C4 2 = exclude color C4
Q <sub>2</sub> (physical) *								
97 / 0x61	Read / write	Uint	8 Bit	1	3	0 ... 8	Tolerance	0 = finest tolerance level 1 = 2 <sup>nd</sup> tolerance level 2 = 3 <sup>rd</sup> tolerance level ... 8 = roughest tolerance level
				2	N.O.	0 ... 1	N.O. / N.C.	0 = N.O., 1 = N.C.
				3	Output	0 ... 3	Function switching output	0 = disable 1 = output 3 = input (trigger)
				4	On	0 ... 1	Energy evaluation off / on	0 = off, 1 = on
			16 Bit	5	0	0 ... 65535	Counter	Switches only every nth cycle
				6	0	0 ... 65535	On delay	In ms, adjustable in 1 ms
				7	0	0 ... 65535	Off delay	In ms, adjustable in 1 ms
				8	0	0 ... 65535	Impulse	In ms, adjustable in 1 ms
			8 Bit	9	0	0 ... 2	Not connected	0 = not connected 1 = combine with color C5 2 = exclude color C5
Q <sub>3</sub> (physical) *								
98 / 0x62	Read / write	Uint	8 Bit	1	3	0 ... 8	Tolerance	0 = finest tolerance level 1 = 2 <sup>nd</sup> tolerance level 2 = 3 <sup>rd</sup> tolerance level ... 8 = roughest tolerance level
				2	N.O.	0 ... 1	N.O. / N.C.	0 = N.O., 1 = N.C.
				3	Output	0 ... 2	Function switching output	0 = disable 1 = output 2 = input (keylock)
				4	On	0 ... 1	Energy evaluation off / on	0 = off, 1 = on
			16 Bit	5	0	0 ... 65535	Counter	Switches only every n <sup>th</sup> cycle
				6	0	0 ... 65535	On delay	In ms, adjustable in 1 ms
				7	0	0 ... 65535	Off delay	In ms, adjustable in 1 ms
				8	0	0 ... 65535	Impulse	In ms, adjustable in 1 ms
			8 Bit	9	0	0 ... 2	Not connected	0 = not connected 1 = combine with color C6 2 = exclude color C6

PARAMETER								
Index dec / hex	Access	Data type	Length	Subindex	Default value	Range	Description	Comment
Q <sub>4</sub> (virtual) *								
99 / 0x63	Read / write	Uint	8 Bit	1	3	0 ... 8	Tolerance	0 = finest tolerance level 1 = 2 <sup>nd</sup> tolerance level 2 = 3 <sup>rd</sup> tolerance level ... 8 = roughest tolerance level
				2	N.O.	0 ... 1	N.O. / N.C.	0 = N.O., 1 = N.C.
				3	Output	0 ... 2	Function switching output	0 = disable 1 = output
				4	On	0 ... 1	Energy evaluation off / on	0 = off, 1 = on
Q <sub>5</sub> (virtual) *								
100 / 0x64	Read / write	Uint	8 Bit	1	3	0 ... 8	Tolerance	0 = finest tolerance level 1 = 2 <sup>nd</sup> tolerance level 2 = 3 <sup>rd</sup> tolerance level ... 8 = roughest tolerance level
				2	N.O.	0 ... 1	N.O. / N.C.	0 = N.O., 1 = N.C.
				3	Output	0 ... 1	Function switching output	0 = disable 1 = output
				4	On	0 ... 1	Energy evaluation off / on	0 = off, 1 = on
Q <sub>6</sub> (virtual)								
101 / 0x65	Read / write	Uint	8 Bit	1	3	0 ... 8	Tolerance	0 = finest tolerance level 1 = 2 <sup>nd</sup> tolerance level 2 = 3 <sup>rd</sup> tolerance level ... 8 = roughest tolerance level
				2	N.O.	0 ... 1	N.O. / N.C.	0 = N.O., 1 = N.C.
				3	Output	0 ... 1	Function switching output	0 = disable 1 = output
				4	On	0 ... 1	Energy evaluation off / on	0 = off, 1 = on
Q <sub>7</sub> (virtual)								
102 / 0x66	Read / write	Uint	8 Bit	1	3	0 ... 8	Tolerance	0 = finest tolerance level 1 = 2 <sup>nd</sup> tolerance level 2 = 3 <sup>rd</sup> tolerance level ... 8 = roughest tolerance level
				2	N.O.	0 ... 1	N.O. / N.C.	0 = N.O., 1 = N.C.
				3	Output	0 ... 1	Function switching output	0 = disable 1 = output
				4	On	0 ... 1	Energy evaluation off / on	0 = off, 1 = on
Q <sub>1</sub> color settings								
128 / 0x80	Read / write	Uint	16 Bit	1	1365 (33.33 %)	0 ... 4095	Ratio red	Ratio blue = 4095 - red - green.
				2	1365 (33.33 %)	0 ... 4095	Ratio green	Ratio blue = 4095 - red - green.
				3	4095 (100 %)	0 ... 4095	Energy	
				4		0 ... 4095	Red tolerance	
				5		0 ... 4095	Green tolerance	
				6		0 ... 4095	Energy tolerance	
Q <sub>2</sub> color settings								
129 / 0x81	Read / write	Uint	16 Bit	1	1365 (33.33 %)	0 ... 4095	Ratio red	Ratio blue = 4095 - red - green.
				2	1365 (33.33 %)	0 ... 4095	Ratio green	Ratio blue = 4095 - red - green.
				3	4095 (100 %)	0 ... 4095	Energy	
				4		0 ... 4095	Red tolerance	
				5		0 ... 4095	Green tolerance	
				6		0 ... 4095	Energy tolerance	
Q <sub>3</sub> color settings								
130 / 0x82	Read / write	Uint	16 Bit	1	1365 (33.33 %)	0 ... 4095	Ratio red	Ratio blue = 4095 - red - green.
				2	1365 (33.33 %)	0 ... 4095	Ratio green	Ratio blue = 4095 - red - green.
				3	4095 (100 %)	0 ... 4095	Energy	
				4		0 ... 4095	Red tolerance	
				5		0 ... 4095	Green tolerance	
				6		0 ... 4095	Energy tolerance	
Q <sub>4</sub> color settings								
131 / 0x83	Read / write	Uint	16 Bit	1	1365 (33.33 %)	0 ... 4095	Ratio red	Ratio blue = 4095 - red - green.
				2	1365 (33.33 %)	0 ... 4095	Ratio green	Ratio blue = 4095 - red - green.
				3	4095 (100 %)	0 ... 4095	Energy	
				4		0 ... 4095	Red tolerance	
				5		0 ... 4095	Green tolerance	
				6		0 ... 4095	Energy tolerance	
Q <sub>5</sub> color settings								
132 / 0x84	Read / write	Uint	16 Bit	1	1365 (33.33 %)	0 ... 4095	Ratio red	Ratio blue = 4095 - red - green.
				2	1365 (33.33 %)	0 ... 4095	Ratio green	Ratio blue = 4095 - red - green.
				3	4095 (100 %)	0 ... 4095	Energy	
				4		0 ... 4095	Red tolerance	
				5		0 ... 4095	Green tolerance	
				6		0 ... 4095	Energy tolerance	

PARAMETER								
Index dec / hex	Access	Data type	Length	Subindex	Default value	Range	Description	Comment
Q <sub>6</sub> color settings								
133 / 0x85	Read / write	Uint	16 Bit	1	1365 (33.33 %)	0 ... 4095	Ratio red	Ratio blue = 4095 - red - green.
				2	1365 (33.33 %)	0 ... 4095	Ratio green	Ratio blue = 4095 - red - green.
				3	4095 (100 %)	0 ... 4095	Energy	
				4		0 ... 4095	Red tolerance	
				5		0 ... 4095	Green tolerance	
				6		0 ... 4095	Energy tolerance	
Q <sub>7</sub> color settings								
134 / 0x86	Read / write	Uint	16 Bit	1	1365 (33.33 %)	0 ... 4095	Ratio red	Ratio blue = 4095 - red - green.
				2	1365 (33.33 %)	0 ... 4095	Ratio green	Ratio blue = 4095 - red - green.
				3	4095 (100 %)	0 ... 4095	Energy	
				4		0 ... 4095	Red tolerance	
				5		0 ... 4095	Green tolerance	
				6		0 ... 4095	Energy tolerance	
* Smart functions (counter, delays, impulse) only work in the color mode (CM) while having no effect in best-fit mode (BF)								

SYSTEM COMMANDS								
Index dec / hex	Access	Data type	Length	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	Teaches the color seen at this moment	
				71 / 0x47		Color scan - start	Detects all colors taught during the scan	
				72 / 0x48		Color scan - stop		
				79 / 0x4F		Teach cancel		
				160 / 0xA0		Emitter off		
				161 / 0xA1		Emitter on		
				162 / 0xA2		Reset switching channel	Reset of current switching channel	
				169 / 0xA9		Trigger Q <sub>2</sub> Input	To test function set Q <sub>2</sub> as trigger input	
				170 / 0xAA		Trigger Q <sub>2</sub> high		
				171 / 0xAB		Trigger Q <sub>2</sub> low		
				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 setting						

EVENTS						
Event	Events ON/OFF	Status value	Warning		Description	Comment
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	
16384 / 0x4000	0	4	Error		Temperature fault	