

GENERAL INFORMATION	
Communication mode IO-Link	COM 2
Min. cycle time	2.7 ms
SIO mode	supported
Length process data	24 Bit
Vendor ID	347 (0x01 0x5B)
Device ID	5121
Data storage	supported
Specification IO-Link	1.1

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 Q <sub>2</sub>	Switching output Q <sub>1</sub>
Signal quality 0 ... 100 %								Process value - distance in mm, characteristic curve not adjustable															
Signal quality score - 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 adjustable, average filter applicable															

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 25-RA-170-PNSUL-M4M	
19 / 0x13				Product ID	604-41009	
20 / 0x11				Product text	30 ... 200 mm, Q <sub>1</sub> , Q <sub>2</sub> , Auto / PNP / NPN, metal plug, M8, 4-pin	
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	D0, D1, D3	Lock functions	D0 - parameter write access 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	
Define switching output Q <sub>1</sub> (physical pin)								
60 / 0x3C	Read / write	Uint	16 Bit	1	300	300 ... 2000	Switching point 1	Needed for single, window and two-point mode, in 1/10 mm (e.g. 30 mm = 300 1/10 mm)
				2	2000	300 ... 2000	Switching point 2	Needed for window and two-point mode, in 1/10 mm (e.g. 30 mm = 300 1/10 mm)
Set-Up switching output Q <sub>1</sub> (physical pin)								
61 / 0x3D	Read / write	Uint	8 Bit	1	0	0, 1	NO / NC	0 = NO, 1 = NC
				2	2	0, 1, 2, 3	Switching mode	0 - disable 1 - single-point mode 2 - window mode <sup>1)</sup> 3 - two-point mode <sup>1)</sup>
Define switching output Q <sub>2</sub> (only virtual via IO-Link)								
62 / 0x3E	Read / write	Uint	16 Bit	1	300	300 ... 2000	Switching point 1	Needed for single, window and two-point mode, in 1/10 mm (e.g. 30 mm = 300 1/10 mm)
				2	2000	300 ... 2000	Switching point 2	Needed for window and two-point mode, in 1/10 mm (e.g. 30 mm = 300 1/10 mm)
Set-Up switching output Q <sub>2</sub> (only virtual via IO-Link)								
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 - disable 1 - single-point mode 2 - window mode <sup>1)</sup> 3 - two-point mode <sup>1)</sup>

<sup>1)</sup> Min. difference between both switchpoints 3 mm

PARAMETER									
Index dec / hex	Access	Data type	Length	Subindex	Default value	Range	Description	Comment	
88 / 0x58	Read	Uint	32 Bit	1			Read operating data		
				2			Counter operating hours	No reset possible	
							Counter switch cycle	No reset possible	
95 / 0x5F	Read	String		1			Type label		
				2			30 ... 200 mm	Measurement range	
				3			0.68 mm	Resolution Q <sub>A</sub>	
				5			± 2 mm	Linearity Q <sub>A</sub>	
				6			LED	Type of light	
				7			≤ 30 mA	No-load current	
				8			≤ 1000 Hz	Switching frequency	
				9			10 min	Warm-up time	
				10			-20 ... 60 °C	Ambient temperature	
				11			1 ... 10 V	Output signal	
								< 1 mm	Repeatability
189 / 0xBD	Read / write	Uint	8 Bit		0	0 ... 10	Intensity average filter	0 = No averaging response time 3.4 ms 1 = 10x response time 2 = 20x response time ... 10 = max.	
193 / 0xC1	Read / write	Int	16 Bit		0	-2000 ... 2000	Offset	In 1/10 mm	
185 / 0xC3	Read / write	Uint	8 Bit		1	0, 1	Invert characteristic curve	Rise: 0 = negative 1 = positive	
202 / 0xCA	Read / write	Uint	8 Bit		1	0, 1	Process data output	0 = measurement output 1 = smart sensor profile	
196 / 0xC4	Read / write	Uint	8 Bit		10	10 ... 90	Signal quality level	%	
194 / 0xC2	Read / write	Uint	16 Bit		300	300 ... 2000	Analog - low level	In 1/10 mm	
					2000	300 ... 2000	Analog - high level	In 1/10 mm	
208 / 0xD0	Read / write	Uint	16 Bit	1	0	0 ... 65535	Smart functions switching output Q <sub>1</sub>		
				2	0	0 ... 65535	Counter		
				3	0	0 ... 65535	On delay	In ms, adjustable in 1 ms	
				4	0	0 ... 65535	Off delay	In ms, adjustable in 1 ms	
				5	0	0 ... 65535	Impulse	In ms, adjustable in 1 ms	
					0	0 ... 500	Monitoring frequency	In 1/10 Hz, adjustable in 0.1 Hz steps <sup>2)</sup>	
209 / 0xD1	Read / write	Uint	16 Bit	1	0	0 ... 65535	Smart functions on virtual switching output Q <sub>2</sub>		
				2	0	0 ... 65535	Counter		
				3	0	0 ... 65535	On delay	In ms, adjustable in 1 ms	
				4	0	0 ... 65535	Off delay	In ms, adjustable in 1 ms	
				5	0	0 ... 65535	Impulse	In ms, adjustable in 1 ms	
					0	0 ... 500	Monitoring frequency	In 1/10 Hz, adjustable in 0.1 Hz steps <sup>2)</sup>	
213 / 0xD5	Read / write	Uint	8 Bit		2	0, 1, 2	Function switching output Q <sub>1</sub>		
							PNP / NPN	0 = NPN 1 = PNP 2 = auto-detect	

<sup>2)</sup> Differs to real frequency ± 10 %

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 - 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 in the middle of 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	
				160 / 0xA0		Emitter off	
				161 / 0xA1		Emitter on	
				162 / 0xA2		Reset switching channel	Reset of current switching channel
				172 / 0xAC		Analog-start measurement range	
				173 / 0xAD		Analog-end measurement range	
				174 / 0xAE		Teach offset	
175 / 0xAF		Detect sensor	1x activated - sensor flashes 60 s 2x activated - permanent flashing 3x activated - stop permanent flashing				
128 / 0x80		Device reset					
130 / 0x82		Restore factory settings					

EVENTS				
Event	Status value	Warning		
20480 / 0x5000	4	Error	Device hardware fault	Default: deactivated <sup>3)</sup>
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; default: deactivated <sup>3)</sup>

<sup>3)</sup> For activation use function 0x51