SENSOPART

Data sheet

IO-Link

FT 55-RLHM-...-2PNSDL

096-00074 17.02.2020-00
www.sensopart.com

GENERAL INFORMATION

Communication mode IO-Link	COM 2
Min. cycletime	3 ms
SIO mode	Supported
Length process data	16 Bit
Vendor ID	347 (0x01 0x5B)
Device ID	38145 / 37889
Data storage	Supported
Specification IO-Link	1.1

SMART-SENSOR-PROFILE

Process data (PD-IN)

Byte 0								Byte 1							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
SQ MSB	D6	D5	D4	D3	D2	D1	SQ LSB	X	X	X	X	Ready Bit	Signal quality	Q_2	Q_1

Signal quality 0 ... 100 %
"Ready Bit" 1 = active measurement / 0 = starting, teaching
Signal quality bit - adjustable via index 0xC4
Switching output Q_2
Switching output Q_1

PD-OUT

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

0 = Laser on I 1 = Laser off

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-RLHM-...-2PNSDL-L5M
19 / 0x13					Product ID	623-11043 / 623-11044
20 / 0x14					Product text	Device specific
21 / 0x15					Serial number	Ch.Nr. "-" 6-stellige fortlaufende Nr.
23 / 0x17					Firmware revision	1.0

SMARTSENSOR PROFILE PARAMETER

Index dec / hex	Access	Data type	Length	Subindex	Default value	Range	Description	Comment
12 / 0x0C	Read / write	Uint	16 Bit		0x00 0x00	D0, D1, D2, D3	IO-Link lock functions	D0 - Device access lock (not in IODD) D1 - Data Storage Lock D2 - Local parametrization lock (not in IODD) D3 - Local User Interface Lock
24 / 0x18	Read / write	StringT	32 characters		"***...***"	0 ... 32 char.	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 status	
60 / 0x3C							Define switching output Q_1	
	Read / write	Uint	32 Bit	1	(Device specific)		Switchpoint 1	Needed for single-point mode, window mode, two-point mode, Detect All mode and Layer Detection mode in µm, IODD in mm
				2	(Device specific)		Switchpoint 2	Needed for window mode, two-point mode, Detect All mode and Layer Detection mode, in µm, IODD in mm
61 / 0x3D							Set-up switching output Q_1	
	Read / write	Uint	8 Bit	1	0	0, 1	NO / NC	0 = NO, 1 = NC
				2	1	0, 1, 2, 3, 128,129	Switching mode	0 = Disable 1 = Single point mode 2 = Window mode 3 = Two point mode 128 = Detect All mode 129 = Layer Detection mode
				3	2	0, 1, 2, 3	Hysteresis	0 = Small 1 = Medium 2 = Standard 3 = Wide
62 / 0x3E							Define switching output Q_2	
	Read / write	Uint	32 Bit	1	(Device specific)		Switchpoint 1	Needed for single-point mode, window mode, two-point mode, Detect All mode and Layer Detection mode in µm, IODD in mm
				2	(Device specific)		Switchpoint 2	Needed for window mode, two-point mode, Detect All mode and Layer Detection mode, in µm, IODD in mm
63 / 0x3F							Set-up switching output Q_2	
	Read / write	Uint	8 Bit	1	0	0, 1	NO / NC	0 = NO, 1 = NC
				2	1	0, 1, 2, 3, 128,129	Switching mode	0 = Disable 1 = Single point mode 2 = Window mode 3 = Two point mode 128 = Detect All mode 129 = Layer Detection mode
				3	2	0, 1, 2, 3	Hysteresis	0 = Small 1 = Medium 2 = Standard 3 = Wide

PARAMETER								
Index dec / hex	**Access**	**Data type**	**Length**	**Subindex**	**Default value**	**Range**	**Description**	**Comment**
							Operating data	
88 / 0x58	Read	Uint	32 Bit	1			Counter operating hours	No reset possible
				2			Counter switch cycle	No reset possible
							Typelabel	
95 / 0x5F	Read	String		1	(Device specific)		Working range	
				4	(Device specific)		Hysteresis	
				5	Laser, red 655 nm class 1		Type of light and laser class	
				6	<= 50 mA		No-load current	
				7	<= 1000 Hz		Switching frequency	
				9	-20…50 °C		Ambient temperature	
							Signal quality level	
196 / 0xC4	Read / write	Uint	8 Bit	1	10	10 … 90	Signal quality level	In %, minimum = 10 %
							SmartFunctions switching output Q_1	
208 / 0xD0	Read / write	Uint	16 Bit	1	0, disable	0…65535	Counter	
				2	0, disable	0…65535	On delay	In ms, adjustable in 1 ms
				3	0, disable	0…65535	Off delay	In ms, adjustable in 1 ms
				4	0, disable	0…65535	Impulse (One-Shot)	In ms, adjustable in 1 ms
							SmartFunctions switching output Q_2	
209 / 0xD1	Read / write	Uint	16 Bit	1	0, disable	0…65535	Counter	
				2	0, disable	0…65535	On delay	In ms, adjustable in 1 ms
				3	0, disable	0…65535	Off delay	In ms, adjustable in 1 ms
				4	0, disable	0…65535	Impulse (One-Shot)	In ms, adjustable in 1 ms
							Function switching output Q_1	
213 / 0xD5	Read / write	Uint	8 Bit	1	2	0, 1, 2, 3	PNP / NPN	0 = NPN 1 = PNP 2 = Auto-detect 3 = Push-Pull IO-Link only specified for PNP
				2	0	0, 1	Switching behaviour Q_1	0 = Switching output 1 = Good Target
							Function switching output Q_2	
214 / 0xD6	Read / write	Uint	8 Bit	1	2	0, 1, 2, 3	PNP / NPN	0 = NPN 1 = PNP 2 = Auto-detect 3 = Push-Pull IO-Link only specified for PNP
				2	0	0, 2	Switching behaviour Q_2	0 = Switching output 2 = Antivalent
							Function input pin	
221/ 0xDD	Read / write	Uint	8 Bit	1	3	0, 1, 2, 3	Function pin 5	0 = Disable 1 = Laser ON/OFF 2 = Key lock 3 = Teach
							Display	
224 / 0xE0	Read / write	Uint	8 Bit	1	0	0, 1	Screensaver	0 = Screensaver OFF 1 = Screensaver ON
				2	0	0, 1	Turn display	0 = Read from back 1 = Read from front
				4	0	0, 1	LED scheme	0 = Q output 1 = Layer
							Signal quality	
207 / 0xCF	Read	Uint	8 Bit	1	100	0 ... 100	Current signal quality	
							Layer Detection mode	
217 / 0xD9	Read / write	Uint	32 Bit	1	(Device specific)		Zero value Layer Detection mode	In µm, IODD in mm
			8 Bit	2	0	0, 1	Display value Layer Detection mode	0 = Real distance 1 = Offset
							Function switching output	
190 / 0xBE	Read / write	Uint	8 Bit	1	0	0, 1, 2, 3, 4, 5	Switching frequency Q	0 = 1000 Hz 1 = 200 Hz 2 = 100 Hz 3 = 40 Hz 4 = 20 Hz 5 = 10 Hz
							Dual Mode	
218 / 0xDA	Read / write	Uint	8 Bit	1	0	0, 1	Distance + Intensity Q_1	0 = Distance 1 = Distance + Intensity
				2	0	0, 1	Distance + Intensity Q_2	0 = Distance 1 = Distance + Intensity
							Tolerance Detect All mode	
219 / 0xDB	Read / write	Uint	8 Bit	1	1	0 ... 10	Tolerance Detect All mode	0 = 0x Hysteresis 1 = 1x Hysteresis 10 = 10x Hysteresis only at Detect All mode

SYSTEM COMMANDS							
Index dec / hex	**Access**	**Data type**	**Length**	**Subindex**	**Function dec / hex**	**Description**	**Comment**
2 / 0x02	Write	Uint	8 Bit	1	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	
					68 / 0x44	Two value teach - teachpoint 2 for switchpoint 1	
					71 / 0x47	Dynamic teach - switchpoint 1 - start	The switchpoint is in the middle of the min. / max. value
					72 / 0x48	Dynamic teach - switchpoint 1 - stop	
					79 / 0x4F	Teach cancel	
					162 / 0xA2	Reset switching channel	Reset of current switching channel
					175 / 0xAF	Detect sensor	1x Activated - sensor flashes 60 s 2x Activated - permanent flashing 3x Activated - stop permanent flashing
					176 / 0xB0	Layer Detection - teach close distance	
					177 / 0xB1	Detect All - start dynamic teach	
					178 / 0xB2	Layer Detection - teach far distance	
					179 / 0xB3	Detect All - stop dynamic teach	
					180 / 0xB4	Layer Detection - teach offset	
					128 / 0x80	Device reset	
					130 / 0x82	Restore factory settings	

EVENTS					
Event	**Events On/Off**	**Status value**	**Warning**		
16384 / 0x4000	0x00	4	Error	Temperature fault	Temperature range exceeded; default: deactivated
20480 / 0x5000	0x08	4	Error	Device hardware fault	Default: deactivated [1]
20497 / 0x5011	0x10	4	Error	Non volatile memory loss	
65425 / 0xFF91		0	Notice	Data storage - upload request	Not blockable via 0x51

1) For activation use 0x51

Below are a few examples for the teach process with the FT 55-RLHM

TEACH PROCESS				
Single Point mode: Teach on object				
Step	**Index dec / hex**	**Subindex**	**Description**	**Range**
1.	58 / 0x3A	1	Choose „Teach channel“	1 = Q_1 2 = Q_2
2.	61 / 0x3D	2	Choose „Switching mode“ for Q_1	1 = Single point mode
3.	2 / 0x02	1	Single value teach - switchpoint 1	65 / 0x41
4.	2 / 0x02	1	Teach apply	64 / 0x40
Single Point mode: Object background teach				
Step	**Index dec / hex**	**Subindex**	**Description**	**Range**
1.	58 / 0x3A	1	Choose "Teach channel"	1= Q_1 2= Q_2
2.	61 / 0x3D	2	Choose "Switching mode" for Q_1	1 = Single point mode
3.	2 / 0x02	1	Two value teach - teachpoint 1 for switchpoint 1	67 / 0x43
4.	2 / 0x02	1	Two value teach - teachpoint 2 for switchpoint 1	68 / 0x44
5.	2 / 0x02	1	Teach apply	64 / 0x40
Single Point mode: Dynamic teach				
Step	**Index dec / hex**	**Subindex**	**Description**	**Range**
1.	58 / 0x3A	1	Choose "Teach channel"	1 = Q_1 2 = Q_2
2.	61 / 0x3D	2	Choose "Switching mode" for Q_1	1 = Single point mode
3.	2 / 0x02	1	Dynamic teach - switchpoint 1 - start	71 / 0x47
4.	2 / 0x02	1	Dynamic teach - switchpoint 1 - stop	72 / 0x48
5.	2 / 0x02	1	Teach apply	64 / 0x40
Window mode				
Step	**Index dec / hex**	**Subindex**	**Description**	**Range**
1.	58 / 0x3A	1	Choose "Teach channel"	1 = Q_1 2 = Q_2
2.	61 / 0x3D	2	Choose "Switching mode" for Q_1	2 = Window mode
3.	2 / 0x02	1	Single value teach - switchpoint 1	65 / 0x41
4.	2 / 0x02	1	Single value teach - switchpoint 2	66 / 0x42
5.	2 / 0x02	1	Teach apply	64 / 0x40
Two point mode (hysteresis mode)				
Step	**Index dec / hex**	**Subindex**	**Description**	**Range**
1.	58 / 0x3A	1	Choose "Teach channel"	1 = Q_1 2 = Q_2
2.	61 / 0x3D	2	Choose "Switching mode" for Q1	3 = Two point mode
3.	2 / 0x02	1	Single value teach - switchpoint 1	65 / 0x41
4.	2 / 0x02	1	Single value teach - switchpoint 2	66 / 0x42
5.	2 / 0x02	1	Teach apply	64 / 0x40

TEACH PROCESS				
Detect All mode				
Step	**Index dec / hex**	**Subindex**	**Description**	**Range**
1.	58 / 0x3A	1	Choose "Teach channel"	1 = Q_1 2 = Q_2
2.	61 / 0x3D	2	Choose "Switching mode" for Q_1	128 / 0x80 = Detect All mode
3.	2 / 0x02	1	Detect All - start dynamic teach	177 / 0xB1
4.	2 / 0x02	1	Detect All - stop dynamic teach	179 / 0xB3
5.	2 / 0x02	1	Teach apply	64 / 0x40
Layer Detection mode				
Step	**Index dec / hex**	**Subindex**	**Description**	**Range**
1.	58 / 0x3A		Choose "Teach channel"	1 = Q_1 2 = Q_2
2.	61 / 0x3D	2	Choose "Switching mode" for Q_1	129 / 0x81 = Layer Detection mode
3.	2 / 0x02	1	Layer Detection - teach offset	180 / 0xB4
4.	2 / 0x02	1	Layer Detection - teach close distance	176 / 0xB0
5.	2 / 0x02	1	Layer Detection - teach far distance	178 / 0xB2
6.	2 / 0x02	1	Teach apply	64 / 0x40