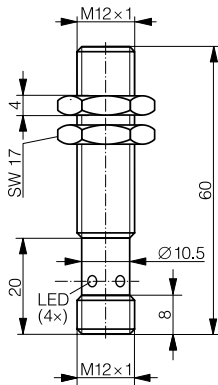
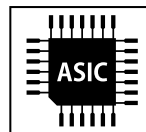
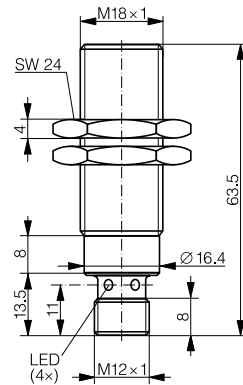


HOUSING	OPERATING DISTANCE	MOUNTING	
M12 ... M18	Up to 10 mm	Embeddable	



IDWE-M12MP-NMS-A0



IDWE-M18MP-NMS-A0

DETECTION DATA		INTERFACE	
Sensing distance	110% $S_d$	Output on pin 4	SIO Selectable / IO-Link
Operating distance ( $S_d$ )	See table "Available types" (p. 2)	Output on pin 2	SIO Selectable
Temperature drift (0 ... 0.8 $S_d$ )	$\leq 10\% S_d$	Output Polarity	PNP
		IO-Link	✓
		MTTF (@40 °C)	322 y

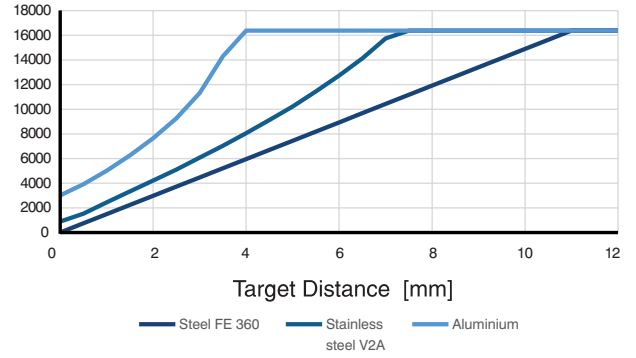
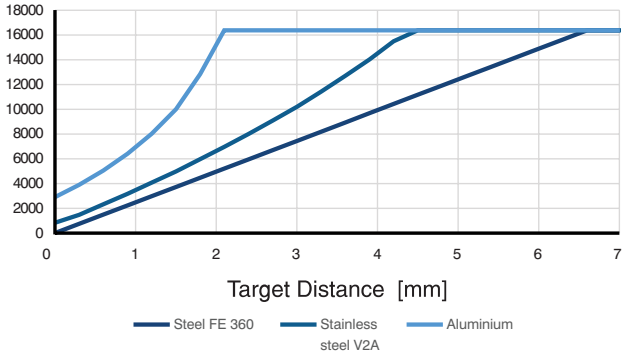
Note:  $0.9 S_n \leq S_s \leq 1.1 S_n$ .

ELECTRICAL DATA		MECHANICAL DATA	
Supply voltage range ( $U_B$ )	18...30 VDC (IO-Link) / 10...30 VDC (SIO)	Mounting	See table "Available types" (p. 2)
Residual ripple	$\leq 20\% U_B$	Housing material	Chrome-plated brass
Output current	$\leq 200$ mA	Sensing face material	PBTP
Output voltage drop	$\leq 2.0$ VDC	Max. tightening torque	See "Installation conditions" (p. 2)
Power consumption (no-load)	$\leq 10$ mA	Ambient operating temperature	$-25 \dots +70^\circ\text{C}^1$
Residual current	$\leq 0.1$ mA	Enclosure rating	IP67
Max. sampling rate & Max. Sw. freq.	1,000 Hz, 125 Hz	Weight (cable/connector)	See table "Available types" (p. 2)
Short-circuit protection	✓	Shock and vibration	IEC 60947-5-2
Voltage reversal protection	✓		
Cable length max.	$\leq 20$ m (IO-Link) / $\leq 300$ m (SIO)		

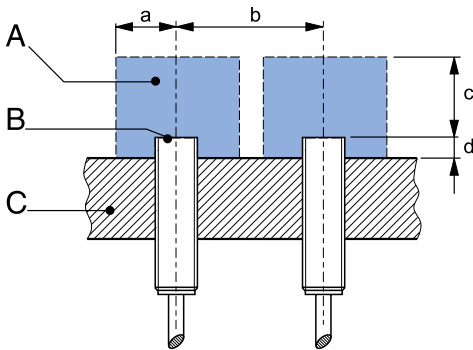
Note: all data measured according to IEC 60947-5-2 standard with  $U_B = 20 \dots 30$  VDC,  $T_A = 23^\circ\text{C} \pm 5^\circ\text{C}$ .

<sup>1</sup> Maximum temperature according to UL:  $70^\circ\text{C}$ .

## RESPONSE CURVE (NON-FLUSH MOUNTING)



## INSTALLATION CONDITIONS / MAXIMUM TIGHTENING TORQUE

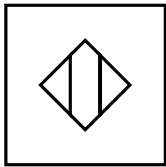


- A : metal free zone
- B : sensing face
- C : support

	a	b	c	d	Max. Tightening Torque
IDWE-M12MP-NMS-A0	8	12	12	0	10 Nm (6 Nm first 10 mm)
IDWE-M18MP-NMS-A0	19	24	30	0	25 Nm

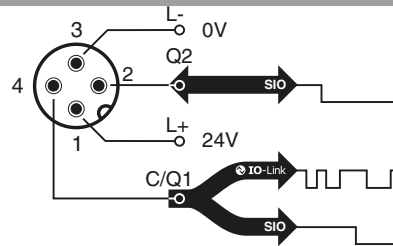
Note: additional installation information can be found in the glossary of the Contrinex General Catalog.

## WIRING DIAGRAM



bn	1	L+
bk	4	C/Q
wh	2	Q2
bu	3	L-

## PIN ASSIGNMENT



IO-LINK CHARACTERISTICS	VALUE FOR IDWx-MxxMP-NMS-A0
Vendor ID	0156 <sub>h</sub>
Device ID	320101 <sub>h</sub>
IO-Link Protocol	1.1.2
SIO-Mode	Supported
Process data	4 bytes input / 1 bytes output
Baudrate	COM2 (38.4 kBaud)
Minimum cycle time	4 ms

IODD files may be downloaded from  
[www.contrinex.com/product-range/inductive-sensors/](http://www.contrinex.com/product-range/inductive-sensors/)  
 Select the product name to display the product page with corresponding downloads.

## AVAILABLE TYPES All the below specifications were obtained with a 3-S<sub>d</sub> × 3-S<sub>d</sub> × 1 mm<sup>2</sup>, FE 360 standard target

Part number	Part reference	S <sub>d</sub>	Mounting	Repeat accuracy	Resolution (@0.67-S <sub>d</sub> )		Linearity	Weight
					Static	Dynamic		
330-020-479	IDWE-M12MP-NMS-A0	0... 6 mm	Embeddable	< 3 μm <sup>(1)</sup> / 13 μm <sup>(2)</sup>	< 2 μm <sup>(3)</sup>	< 5 μm <sup>(3)</sup>	± 50 μm <sup>(4)</sup>	27 g
330-020-481	IDWE-M18MP-NMS-A0	0... 10 mm	Embeddable	< 6 μm <sup>(1)</sup> / 50 μm <sup>(2)</sup>	< 4 μm <sup>(3)</sup>	< 10 μm <sup>(3)</sup>	± 100 μm <sup>(4)</sup>	56 g

<sup>(1)</sup> measured under 3σ confidence level (99.7%) at 0.33 S<sub>d</sub>, constant temperature and constant voltage supply

<sup>(2)</sup> measured under 3σ confidence level (99.7%) at 0.67 S<sub>d</sub>, constant temperature and constant voltage supply

<sup>(3)</sup> measured under σ confidence level (RMS value) at 0.67 S<sub>d</sub>, constant temperature and constant voltage supply

<sup>(4)</sup> measured under a range condition from 5% to 95% S<sub>d</sub>, constant temperature and constant voltage supply

Note: part reference may include additional suffix to indicate a revision version or special version. Further information is available on request.

**CONFIGURATION PARAMETER (IO-LINK / SIO MODE)**

Index	Sub Hex	Name	Access	Data Type	Value	Default
<b>SYSTEM</b>						
02 <sub>h</sub>	00 <sub>h</sub>	Standard Command <sup>(1)</sup>	W	uint8	05 <sub>h</sub> = ParamDownloadStore, 40 <sub>h</sub> = Teach Apply, 41 <sub>h</sub> = Single Value Teach SP1, 42 <sub>h</sub> = Single Value Teach SP2, 43 <sub>h</sub> = Two Value Teach for SP1 → TP1, 44 <sub>h</sub> = Two Value Teach for SP1 → TP2, 45 <sub>h</sub> = Two Value Teach for SP2 → TP1, 46 <sub>h</sub> = Two Value Teach for SP2 → TP2, 47 <sub>h</sub> = Dynamic Start SP1, 48 <sub>h</sub> = Dynamic Stop SP1, 49 <sub>h</sub> = Dynamic Start SP2, 4A <sub>h</sub> = Dynamic Stop SP2, 4F <sub>h</sub> = Teach Cancel, 80 <sub>h</sub> = Device Reset, 82 <sub>h</sub> = Restore Factory Settings, A0 <sub>h</sub> = Locate Device, A1 <sub>h</sub> = Clear MHM BIN	N/A
<b>DATA STORAGE</b>						
03 <sub>h</sub>	01 <sub>h</sub>	DS_Command <sup>(1)</sup>	R/W	uint8	00 <sub>h</sub> : Reserved 01 <sub>h</sub> : DS_UploadStart 02 <sub>h</sub> : DS_UploadEnd 03 <sub>h</sub> : DS_DownloadStart 04 <sub>h</sub> : DS_DownloadEnd 05 <sub>h</sub> : DS_Break 06 <sub>h</sub> – FF <sub>h</sub> : Reserved	N/A
	02 <sub>h</sub>	State_Property <sup>(1)</sup>	R	uint8	Bit 0: Reserved Bit 1 and 2: State of Data Storage (00 <sub>h</sub> : Inactive, 01 <sub>h</sub> : Upload, 02 <sub>h</sub> : Download, 03 <sub>h</sub> : Data Storage Locked) Bit 3 to 6: Reserved Bit 7: DS_UPLOAD_FLAG (00 <sub>h</sub> : no DS_UPLOAD_ FLAG, 01 <sub>h</sub> : DS_UPLOAD_REQ pending)	N/A
	03 <sub>h</sub>	Data_Storage_Size	R	uint32	FF <sub>h</sub>	N/A
	04 <sub>h</sub>	Parameter_Checksum	R	uint32	–	N/A
	05 <sub>h</sub>	Index_List	R	array of byte	–	N/A
<b>DEVICE ACCESS LOCKS</b>						
0C <sub>h</sub>	–	Device Access Lock	R/W	uint16	Parameter Access, Data Storage, Local Parametrization and Local User Interface Locks	0000 <sub>h</sub>
<b>PROFILE PARAMETER</b>						
0D <sub>h</sub>	–	Profile Characteristic	R	uint16	<ProfileID1>, <ProfileID2>, <ProfileID3>, <FCID>	–
<b>PD DESCRIPTOR</b>						
0E <sub>h</sub>	–	PD Input Descriptor	R	array	<DataType><TypeLength><BitOffset>	–
0F <sub>h</sub>	–	PD Output Descriptor	R	array	<DataType><TypeLength><BitOffset>	–
<b>FUNCTION CLASS – IDENTIFICATION (8000<sub>h</sub>)</b>						
10 <sub>h</sub>	–	Vendor Name	R	char [16]	“Contrinex”	–
11 <sub>h</sub>	–	Vendor Text	R	char [32]	“www.contrinex.com”	–
12 <sub>h</sub>	–	Product Name	R	char [32]	-	–
13 <sub>h</sub>	–	Product ID	R	char [16]	XXX-XXX-XXX	–
14 <sub>h</sub>	–	Product Text	R	char [32]	-	–
15 <sub>h</sub>	–	Serial Number	R	char [16]	123456	–
16 <sub>h</sub>	–	Hardware Revision	R	char [16]	1.0.0	–
17 <sub>h</sub>	–	Firmware Revision	R	char [16]	1.0.0	–
18 <sub>h</sub>	–	Application Specific Tag	R/W	char [32]	<user string, 32 bytes (variable length)>	<vendor specific>
<b>FUNCTION CLASS – DIAGNOSIS (8003<sub>h</sub>)</b>						
24 <sub>h</sub>	00 <sub>h</sub>	Device Status <sup>(1)</sup>	R	uint8	0 = Device is OK, 1 = Maintenance required, 2 = Out of specification, 3 = Functional check, 4 = Failure, 5...255 Reserved	–
25 <sub>h</sub>	00 <sub>h</sub> – 03 <sub>h</sub>	Detailed Device Status <sup>(1)</sup>	R	uint8 [3]	–	–

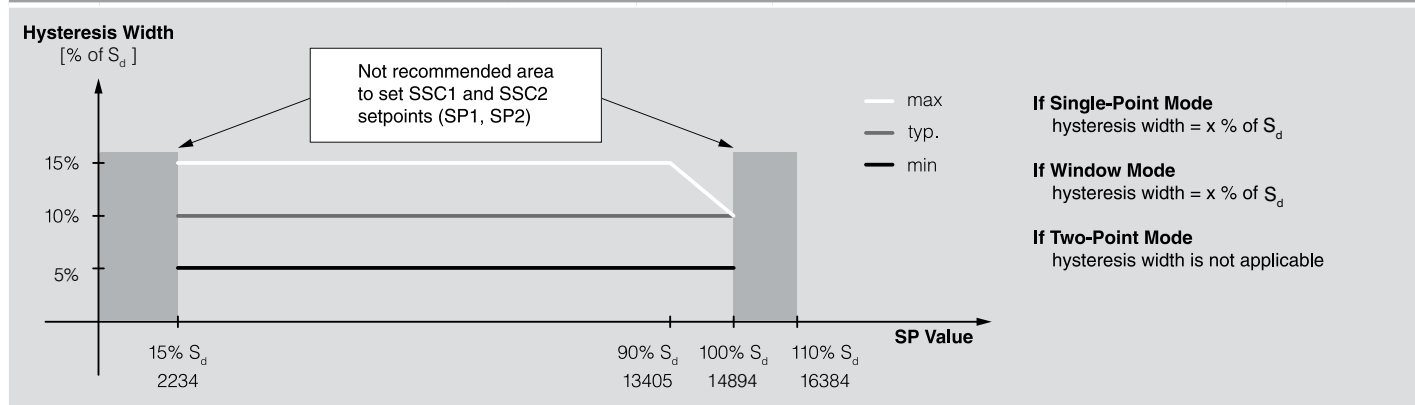
<sup>(1)</sup>This parameter is stored in a volatile memory

FUNCTION CLASS – TEACH-IN CHANNEL SELECT (8004 <sub>h</sub> )						
3A <sub>h</sub>	–	Teach Select <sup>(1)</sup>	R/W	uint8	00 <sub>h</sub> : Default (SSC1) 01 <sub>h</sub> : SSC1 02 <sub>h</sub> : SSC2 FF <sub>h</sub> : ALL SSC	00 <sub>h</sub>
FUNCTION CLASS – TEACH STATUS (8007 <sub>h</sub> TO 8009 <sub>h</sub> )						
3B <sub>h</sub>	01 <sub>h</sub>	Teach State <sup>(1)</sup>	R	bool[4]	00 <sub>h</sub> : Idle 01 <sub>h</sub> : SP1 Success 02 <sub>h</sub> : SP2 Success 03 <sub>h</sub> : SP12 Success 04 <sub>h</sub> : Wait for command 05 <sub>h</sub> : Busy 06 <sub>h</sub> : Reserved 07 <sub>h</sub> : Error 08 <sub>h</sub> ...12 <sub>h</sub> : Reserved	00 <sub>h</sub>
	02 <sub>h</sub>	Flag SP1 → TP1 <sup>(1)</sup>	R	bool	00 <sub>h</sub> : Teach point not taught or not successful 01 <sub>h</sub> : Teach point successfully taught	00 <sub>h</sub>
	03 <sub>h</sub>	Flag SP1 → TP2 <sup>(1)</sup>	R	bool	00 <sub>h</sub> : Teach point not taught or not successful 01 <sub>h</sub> : Teach point successfully taught	00 <sub>h</sub>
	04 <sub>h</sub>	Flag SP2 → TP1 <sup>(1)</sup>	R	bool	00 <sub>h</sub> : Teach point not taught or not successful 01 <sub>h</sub> : Teach point successfully taught	00 <sub>h</sub>
	05 <sub>h</sub>	Flag SP2 → TP2 <sup>(1)</sup>	R	bool	00 <sub>h</sub> : Teach point not taught or not successful 01 <sub>h</sub> : Teach point successfully taught	00 <sub>h</sub>
SCU – SENSOR CONFIGURATION UNIT						
40 <sub>h</sub>	01 <sub>h</sub>	Measurement Startup Time	R/W	uint16	0 ... 65535 ms	0000 <sub>h</sub>
	02 <sub>h</sub>	Measurement Value Source	R/W	uint8	00 <sub>h</sub> : Distance (VTARGET) 01 <sub>h</sub> : Counter 02 <sub>h</sub> : Temperature	00 <sub>h</sub>
	03 <sub>h</sub>	Measurement value filter	R/W	uint8	00 <sub>h</sub> : Fast (1 kHz) 02 <sub>h</sub> : Standard (250 Hz) 20 <sub>h</sub> : Fine (14 Hz)	02 <sub>h</sub>
SSC1 PARAMETER						
3C <sub>h</sub>	01 <sub>h</sub>	Setpoint 1	R/W	uint32	Recommended value: (2234 ... 14894 = 15% S <sub>d</sub> to 100% S <sub>d</sub> )	14894 100% S <sub>d</sub>
	02 <sub>h</sub>	Setpoint 2	R/W	uint32	Recommended value: (2234 ... 14894 = 15% S <sub>d</sub> to 100% S <sub>d</sub> ), but must be lower than Setpoint 1. N/A if Single-Point mode is selected.	0 0% S <sub>d</sub>
SSC1 CONFIGURATION						
3D <sub>h</sub>	01 <sub>h</sub>	Logic	R/W	uint8	00 <sub>h</sub> : High active 01 <sub>h</sub> : Low active	00 <sub>h</sub>
	02 <sub>h</sub>	Mode	R/W	uint8	00 <sub>h</sub> : Deactivated 01 <sub>h</sub> : Single Point 02 <sub>h</sub> : Window Mode 03 <sub>h</sub> : Two Points	01 <sub>h</sub>
	03 <sub>h</sub>	Hysteresis Width	R/W	uint32	0 ... 16384 (e.g. If SSC1 Configuration Mode = Single Point, SP1 = 50% S <sub>d</sub> = 7447, Hysteresis Width = 10% of S <sub>d</sub> = 1488)	1488 9.99% of S <sub>d</sub>
SSC2 PARAMETER						
400C <sub>h</sub>	01 <sub>h</sub>	Setpoint 1	R/W	uint32	Recommended value: (2234 ... 14894 = 15% S <sub>d</sub> to 100% S <sub>d</sub> )	11916 80% S <sub>d</sub>
	02 <sub>h</sub>	Setpoint 2	R/W	uint32	Recommended value: (2234 ... 14894 = 15% S <sub>d</sub> to 100% S <sub>d</sub> ), but must be lower than Setpoint 1. N/A if Single-Point mode is selected.	0 0% S <sub>d</sub>

<sup>(1)</sup> This parameter is stored in a volatile memory

SSC2 CONFIGURATION						
400D <sub>h</sub>	01 <sub>h</sub>	Logic	R/W	uint8	00 <sub>h</sub> : High active 01 <sub>h</sub> : Low active	00 <sub>h</sub>
	07 <sub>h</sub>	Mode	R/W	uint8	00 <sub>h</sub> : Deactivated 01 <sub>h</sub> : Single Point 02 <sub>h</sub> : Window Mode 03 <sub>h</sub> : Two Points	01 <sub>h</sub>
	08 <sub>h</sub>	Hysteresis Width	R/W	uint32	0 ... 16384 (e.g. If SSC2 Configuration Mode = Single Point, SP1 = 50% S <sub>d</sub> = 7447, Hysteresis Width = 10% of S <sub>d</sub> = 1488)	1488 9.99% of S <sub>d</sub>

#### HYSTERESIS WIDTH RECOMMENDED BY CONTRINEX



#### OSS CONFIGURATION

42 <sub>h</sub>	01 <sub>h</sub>	OSS1 Logic – Sensor Physical Output 1 Logic (PIN4) when used in SIO mode	R/W	uint8	0 = OUTPUT: High active (NO) 1 = OUTPUT: Low active (NC) 2 = OUTPUT: ON 3 = OUTPUT: OFF	00 <sub>h</sub>
	02 <sub>h</sub>	OSS2 Logic – Sensor Physical Output 2 Logic (PIN2) when used in SIO mode	R/W	uint8	0 = OUTPUT: High active (NO) 1 = OUTPUT: Low active (NC) 2 = OUTPUT: ON 3 = OUTPUT: OFF 4 = INPUT 5 = INPUT-TRIGGER Single Value Teach	00 <sub>h</sub>
	03 <sub>h</sub>	OSS1 Condition – Sensor Physical Output 1 Condition (PIN4) when used in SIO mode	R/W	uint8	0 = OSS1_A1 1 = OSS1_A1 AND OSS1_A2 2 = OSS1_A1 OR OSS1_A2 3 = OSS1_A1 XOR OSS1_A2	00 <sub>h</sub>
	04 <sub>h</sub>	OSS2 Condition – Sensor Physical Output 2 Condition (PIN2) when used in SIO mode	R/W	uint8	0 = OSS2_A1 1 = OSS2_A1 AND OSS2_A2 2 = OSS2_A1 OR OSS2_A2 3 = OSS2_A1 XOR OSS2_A2	00 <sub>h</sub>
	05 <sub>h</sub>	OSS1 Source A1 – Sensor Physical Output 1 Source A1 (PIN4) when used in SIO mode	R/W	uint8	0 = SSC1 1 = SSC2 2 = TSSP 3 = ALR1 4 = ALR2 5 = ALR3 6 = INPUT <sup>(1)</sup> 7 = Not INPUT <sup>(1)</sup>	00 <sub>h</sub>
	06 <sub>h</sub>	OSS1 Source A2 – Sensor Physical Output 1 Source A2 (PIN4) when used in SIO mode	R/W	uint8	0 = SSC1 1 = SSC2 2 = TSSP 3 = ALR1 4 = ALR2 5 = ALR3 6 = INPUT <sup>(1)</sup> 7 = Not INPUT <sup>(1)</sup>	00 <sub>h</sub>

<sup>(1)</sup> Only available if OSS2 Logic = 4 = INPUT

	07 <sub>h</sub>	OSS2 Source A1 – Sensor Physical Output 2 Source A2 (PIN2) when used in SIO mode	R/W	uint8	0 = SSC1 1 = SSC2 2 = TSSP 3 = ALR1 4 = ALR2 5 = ALR3	00 <sub>h</sub>
	08 <sub>h</sub>	OSS2 Source A2 – Sensor Physical Output 2 Source A2 (PIN2) when used in SIO mode	R/W	uint8	0 = SSC1 1 = SSC2 2 = TSSP 3 = ALR1 4 = ALR2 5 = ALR3	00 <sub>h</sub>
<b>TMU – SENSOR TIMER UNIT</b>						
43 <sub>h</sub>	01 <sub>h</sub>	Timer Mode	R/W	uint8	0 = No Timer 1 = Stretch ON 2 = Delay ON 3 = Delay and Stretch ON 4 = One Shot	00 <sub>h</sub>
	02 <sub>h</sub>	Timer Value	R/W	uint16	0... 65535 ms	0000 <sub>h</sub>
	03 <sub>h</sub>	Timer Source	R/W	uint8	0 = SSC1 1 = SSC2 2 = ALR1 3 = ALR2 4 = ALR3	00 <sub>h</sub>
<b>CTU – SENSOR COUNTER UNIT</b>						
44 <sub>h</sub>	01 <sub>h</sub>	Counter Mode	R/W	uint8	0 = Falling Edge 1 = Rising Edge 2 = Both	00 <sub>h</sub>
	02 <sub>h</sub>	Counter Value <sup>(1)</sup>	R/W	uint16	0... 65535	0000 <sub>h</sub>
	03 <sub>h</sub>	Counter Source	R/W	uint8	0 = SSC1 1 = SSC2 2 = TSSP 3 = ALR1 4 = ALR2 5 = ALR3	00 <sub>h</sub>
	04 <sub>h</sub>	Counter Reset Source	R/W	uint8	0 = ALR1 1 = ALR2 2 = ALR3	01 <sub>h</sub>
<b>SMU – SENSOR MONITOR UNIT</b>						
46 <sub>h</sub>	01 <sub>h</sub>	Current Temperature <sup>(1)</sup>	R	uint16	–	0000 <sub>h</sub>
	02 <sub>h</sub>	Max. Lifetime Temperature	R	uint16	–	0000 <sub>h</sub>
	03 <sub>h</sub>	Min. Lifetime Temperature	R	uint16	–	0000 <sub>h</sub>
	04 <sub>h</sub>	Lifetime Temperature Cycle Count	R	uint8	–	00 <sub>h</sub>
	05 <sub>h</sub>	Lifetime Operating Hours	R	uint32	–	00000000 <sub>h</sub>
	06 <sub>h</sub>	Lifetime Power-On Cycles	R	uint32	–	00000000 <sub>h</sub>
	07 <sub>h</sub>	Lifetime EMC Disturbances	R	uint32	–	00000000 <sub>h</sub>
	08 <sub>h</sub>	EVENT FLAG <sup>(1)(2)</sup>	R	uint8	0 = B0 (Coil failure) 1 = B1 (Short circuit on output) 2 = B2 (EMC disturbances) 3 = B3 (Collision on output) 4 = B4 (Over temperature) 5 = B5 (Under voltage)	00 <sub>h</sub>
<b>SMAU – SENSOR MEASUREMENT ALARM UNIT</b>						
47 <sub>h</sub>	01 <sub>h</sub>	Sensor Alarm 1 Threshold	R/W	uint16	0... 110% S <sub>d</sub>	10% S <sub>d</sub>
	02 <sub>h</sub>	Sensor Alarm 1 Hysteresis	R/W	uint16	–	5%
	03 <sub>h</sub>	Sensor Alarm 1 Configuration	R/W	uint8	0 = Always OFF 1 = Active 2 = Active / IO-Link Event Generation	01 <sub>h</sub>

<sup>(1)</sup> This parameter is stored in a volatile memory

<sup>(2)</sup> A read on this subindex clear all flags

	04 <sub>h</sub>	Sensor Alarm 1 Source	R/W	uint8	0 = Distance (VTARGET) 1 = Counter 2 = Temperature 3 = MHM Median 4 = MHM Deviation 50% 5 = MHM Deviation To Target Value	00 <sub>h</sub>
	05 <sub>h</sub>	Sensor Alarm 2 Threshold	R/W	uint16	0 ... 65535	0000 <sub>h</sub>
	06 <sub>h</sub>	Sensor Alarm 2 Hysteresis	R/W	uint16	–	0000 <sub>h</sub>
	07 <sub>h</sub>	Sensor Alarm 2 Configuration	R/W	uint8	0 = Always OFF 1 = Active 2 = Active / IO-Link Event Generation	01 <sub>h</sub>
	08 <sub>h</sub>	Sensor Alarm 2 Source	R/W	uint8	0 = Distance (VTARGET) 1 = Counter 2 = Temperature 3 = MHM Median 4 = MHM Deviation 50% 5 = MHM Deviation To Target Value	01 <sub>h</sub>
	09 <sub>h</sub>	Sensor Alarm 3 Threshold	R/W	uint16	–25 ... 70°C	70°C
	10 <sub>h</sub>	Sensor Alarm 3 Hysteresis	R/W	uint16	–	0000 <sub>h</sub>
	11 <sub>h</sub>	Sensor Alarm 3 Configuration	R/W	uint8	0 = Always OFF 1 = Active 2 = Active / IO-Link Event Generation	01 <sub>h</sub>
	12 <sub>h</sub>	Sensor Alarm 3 Source	R/W	uint8	0 = Distance (VTARGET) 1 = Counter 2 = Temperature 3 = MHM Median 4 = MHM Deviation 50% 5 = MHM Deviation To Target Value	02 <sub>h</sub>

#### FUNCTION AND LOCATION TAG

48 <sub>h</sub>	01 <sub>h</sub>	Function Tag	R/W	char []	<user string, 32 bytes (variable length)>	“***”
	02 <sub>h</sub>	Location Tag	R/W	char []	<user string, 32 bytes (variable length)>	“***”

#### DEVICE CHARACTERISTIC

49 <sub>h</sub>	01 <sub>h</sub>	Profile Compatibility	R	char []	“SSP x.x.x”	–
	02 <sub>h</sub>	Detection Range Max.	R	char []	Depends on sensor type	–
	03 <sub>h</sub>	Supply Voltage Range (U <sub>b</sub> )	R	char []	Depends on sensor type	–
	04 <sub>h</sub>	Max. Output Current	R	char []	Depends on sensor type	–
	05 <sub>h</sub>	Ambient Temperature Range (T <sub>A</sub> )	R	char []	Depends on sensor type	–
	06 <sub>h</sub>	Storage Temperature Range (T <sub>S</sub> )	R	char []	Depends on sensor type	–
	07 <sub>h</sub>	Enclosure Rating	R	char []	Depends on sensor type	–

#### MHM – MEASUREMENT HISTOGRAM MODULE

4A <sub>h</sub>	01 <sub>h</sub>	MHM Source	R/W	uint8	0 = Distance 1 = Temperature	00 <sub>h</sub>
	02 <sub>h</sub>	MHM Trigger	R/W	uint8	0 = OFF      2(2) = When Input = 1 1 = ON      3 = When TSSP = 1	00 <sub>h</sub>
	03 <sub>h</sub>	Range Start	R/W	uint16	0 ... 110% S <sub>d</sub>	0% S <sub>d</sub>
	04 <sub>h</sub>	Range End	R/W	uint16	0 ... 110% S <sub>d</sub>	100% S <sub>d</sub>
	05 <sub>h</sub>	BIN 1 <sup>(1)</sup>	R	uint32	First bin of value defined by ("Range End" – "Range Start")/16	4 × 00 <sub>h</sub>
	06 <sub>h</sub>	BIN 2 <sup>(1)</sup>	R	uint32	...	4 × 00 <sub>h</sub>
	07 <sub>h</sub>	BIN 3 <sup>(1)</sup>	R	uint32	...	4 × 00 <sub>h</sub>
	08 <sub>h</sub>	BIN 4 <sup>(1)</sup>	R	uint32	...	4 × 00 <sub>h</sub>
	09 <sub>h</sub>	BIN 5 <sup>(1)</sup>	R	uint32	...	4 × 00 <sub>h</sub>
	10 <sub>h</sub>	BIN 6 <sup>(1)</sup>	R	uint32	...	4 × 00 <sub>h</sub>
	11 <sub>h</sub>	BIN 7 <sup>(1)</sup>	R	uint32	...	4 × 00 <sub>h</sub>
	12 <sub>h</sub>	BIN 8 <sup>(1)</sup>	R	uint32	...	4 × 00 <sub>h</sub>
	13 <sub>h</sub>	BIN 9 <sup>(1)</sup>	R	uint32	...	4 × 00 <sub>h</sub>
	14 <sub>h</sub>	BIN 10 <sup>(1)</sup>	R	uint32	...	4 × 00 <sub>h</sub>
	15 <sub>h</sub>	BIN 11 <sup>(1)</sup>	R	uint32	...	4 × 00 <sub>h</sub>
	16 <sub>h</sub>	BIN 12 <sup>(1)</sup>	R	uint32	...	4 × 00 <sub>h</sub>
	17 <sub>h</sub>	BIN 13 <sup>(1)</sup>	R	uint32	...	4 × 00 <sub>h</sub>

<sup>(1)</sup> This parameter is stored in a volatile memory

<sup>(2)</sup> Option 0 only available if OSS2 Logic = 4 = INPUT

18 <sub>h</sub>	BIN 14 <sup>(1)</sup>	R	uint32	...	4 × 00 <sub>h</sub>
19 <sub>h</sub>	BIN 15 <sup>(1)</sup>	R	uint32	...	4 × 00 <sub>h</sub>
20 <sub>h</sub>	BIN 16 <sup>(1)</sup>	R	uint32	Last bin of value defined by ("Range End" – "Range Start")/16	4 × 00 <sub>h</sub>
21 <sub>h</sub>	Median <sup>(1)</sup>	R	uint16	–	2 × 00 <sub>h</sub>
22 <sub>h</sub>	Deviation 50% <sup>(1)</sup>	R	uint16	–	2 × 00 <sub>h</sub>
23 <sub>h</sub>	Target Value	R/W	uint16	–	2 × 00 <sub>h</sub>
24 <sub>h</sub>	Deviation <sup>(1)</sup>	R	uint16	Deviation = Median – Target Value	2 × 00 <sub>h</sub>

#### FUNCTION CLASS – MDC DESCRIPTION PARAMETER (8005<sub>h</sub>)

4080 <sub>h</sub>	01 <sub>h</sub>	Lower Limit	R	int32	Lower value measurement range, see range definition in table A.5. According to SSP <sup>(2)</sup> , table C.8 page 39.	0
	02 <sub>h</sub>	Upper Limit	R	int32	Upper value measurement range, see range definition in table A.5. According to SSP <sup>(2)</sup> , table C.8 page 39.	0
	03 <sub>h</sub>	Unit Code	R	uint16	See Unit table defined in table A.7. According to SSP <sup>(2)</sup> , table C.8 page 39.	0
	04 <sub>h</sub>	Scale	R	int8	See Table B.2. According to SSP <sup>(2)</sup> , table C.8 page 39.	0

<sup>(1)</sup> This parameter is stored in a volatile memory

<sup>(2)</sup> [https://io-link.com/share/Downloads/Smart-Sensor-Profile/IOL-Smart-Sensor-Profile-2ndEd\\_V10\\_Mar2017.pdf](https://io-link.com/share/Downloads/Smart-Sensor-Profile/IOL-Smart-Sensor-Profile-2ndEd_V10_Mar2017.pdf)

## PROCESS DATA REPRESENTATION

### PROCESS DATA STRUCTURE – DISTANCE, COUNTER, TEMPERATURE SENSING MODE

#### PROCESS DATA INPUT

##### Bitoffset

Byte	7	6	5	4	3	2	1	0
3	ALR3	ALR2	ALR1	SSC2	SSC1	TSSP	OSS2	OSS1
2	Scale Value							
1	Measurement value (LSB) <sup>(1)</sup>							
0	Measurement value (MSB) <sup>(1)</sup>							

<sup>(1)</sup> Measurement value raw data: 0..16384

Scaled value in IODD:

Distance (VTARGET) : 0..110%

Counter value: 0..16384 (no scaling)

Temperature (8 bit): -75°C..180°C (1 LSB = 1°C, offset = -75)

Name	Value	Description
ALR3	0	Alarm 3 is OFF
	1	Alarm 3 is ON
ALR2	0	Alarm 2 is OFF
	1	Alarm 2 is ON
ALR1	0	Alarm 1 is OFF
	1	Alarm 1 is ON
SSC2	0	Switching signal 2 is OFF
	1	Switching signal 2 is ON
SSC1	0	Switching signal 1 is OFF
	1	Switching signal 1 is ON
TSSP	0	Timered selected signal is OFF
	1	Timered selected signal is ON
OSS2	0	Output switching signal 2 is OFF
	1	Output switching signal 2 is ON
OSS1	0	Output switching signal 1 is OFF
	1	Output switching signal 1 is ON

#### PROCESS DATA OUTPUT

##### Bitoffset

Byte	7	6	5	4	3	2	1	0
0	RFU							DIS

Name	Value	Description
DIS	0	Sensor is enabled
	1	Sensor is disabled



## ERROR TYPES

Code	Additional code	Name	Description
80 <sub>h</sub>	11 <sub>h</sub>	Index Not Available	Access occurs to a not existing index
80 <sub>h</sub>	12 <sub>h</sub>	Subindex Not Available	Access occurs to a not existing subindex
80 <sub>h</sub>	20 <sub>h</sub>	Service Temporarily Not Available	Parameter is not accessible due to the current state of the device application
80 <sub>h</sub>	21 <sub>h</sub>	Service Temporarily Not Available – Local Control	Parameter is not accessible due to an ongoing local operation at the device
80 <sub>h</sub>	22 <sub>h</sub>	Service Temporarily Not Available – Device Control	Parameter is not accessible due to a remote triggered state of the device application
80 <sub>h</sub>	23 <sub>h</sub>	Access Denied	Write access on a read-only parameter
80 <sub>h</sub>	30 <sub>h</sub>	Parameter Value Out Of Range	Written parameter value is outside its permitted value range
80 <sub>h</sub>	31 <sub>h</sub>	Parameter Value Above Limit	Written parameter value is above its specified value range
80 <sub>h</sub>	32 <sub>h</sub>	Parameter Value Below Limit	Written parameter value is below its specified value range
80 <sub>h</sub>	33 <sub>h</sub>	Parameter Length Overrun	Written parameter length is above its predefined length
80 <sub>h</sub>	34 <sub>h</sub>	Parameter Length Underrun	Written parameter length is below its predefined length
80 <sub>h</sub>	35 <sub>h</sub>	Function Not Available	Written command is not supported by the device application
80 <sub>h</sub>	36 <sub>h</sub>	Function temporarily Not Available	Written command is not available due to the current state of the device
80 <sub>h</sub>	40 <sub>h</sub>	Invalid Parameter Set	Written single parameter collides with other actual parameter settings
80 <sub>h</sub>	41 <sub>h</sub>	Inconsistent Parameter Set	Parameter inconsistencies were found at the end of the block parameter transfer, device plausibility check failed
81 <sub>h</sub>	01 <sub>h</sub>	MHM Trigger not available	First select OSS2 Logic = INPUT

## EVENTS

Code	Type	Name	Description
1800 <sub>h</sub>	Warning	EMC Disturbances	EMC Disturbances detected by sensor
1801 <sub>h</sub>	Warning	Under IOL Voltage	Under IOL Voltage detected by sensor
1802 <sub>h</sub>	Error	Emitter Failure	Emitter Failure detected by sensor
1803 <sub>h</sub>	Warning	Short Circuit	Short Circuit detected by sensor
1804 <sub>h</sub>	Error	Under Voltage	Under Voltage detected by sensor
1805 <sub>h</sub>	Warning	Disturbances on Receiver	Disturbances on Receiver detected by sensor
1806 <sub>h</sub>	Warning	LED Regulation Limit	LED Regulation Limit detected by sensor
1807 <sub>h</sub>	Error	Ferrite, Coil, PCB Failure	Ferrite, Coil, PCB Failure detected by sensor
1808 <sub>h</sub>	Notification	Alarm 1	Alarm 1 Threshold reached
1809 <sub>h</sub>	Notification	Alarm 2	Alarm 2 Threshold reached
180A <sub>h</sub>	Notification	Alarm 3	Alarm 3 Threshold reached
180B <sub>h</sub>	Notification	Trigger Teach	New SSC value is taught
5010 <sub>h</sub>	Error	Component malfunction	Repair or exchange
7710 <sub>h</sub>	Error	Short circuit	Check installation