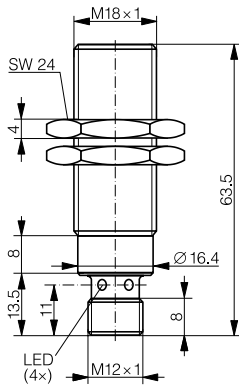
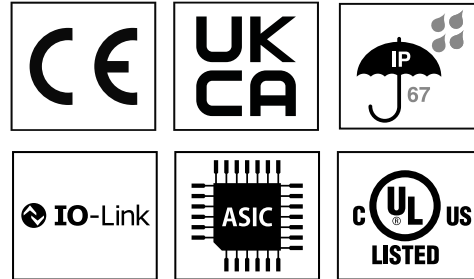


HOUSING	OPERATING DISTANCE	MOUNTING
M18	0 ... 8	Embeddable



ISWE-M18MP-NSS-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	V 1.1, SSP 2.7
		MTTF (@40°C)	315 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)	$\leq 15$ mA	Ambient operating temperature	-25 ... +70°C <sup>1</sup>
Residual current	$\leq 0.1$ mA	Enclosure rating	IP67
Max. sampling rate & Max. Sw. freq.	2,000 Hz, 500Hz	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°C.

## CORRECTION FACTORS FOR TARGET OF

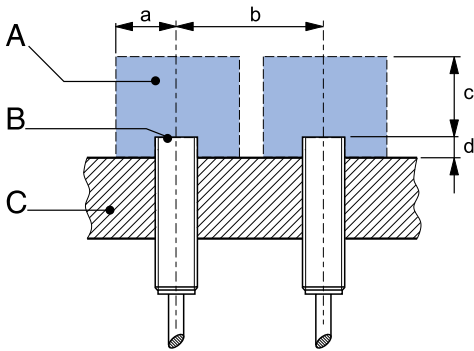
Steel FE 360	1	Copper	0.31	Aluminum	0.37	Brass	0.46	Stainless Steel V2A	0.85
--------------	---	--------	------	----------	------	-------	------	---------------------	------

## CORRECTION FACTORS FOR EMBEDDABLE MOUNTING IN SUPPORT OF

Steel FE 360	1	Aluminum	0.9	Brass	0.9	Stainless Steel V2A	0.98
--------------	---	----------	-----	-------	-----	---------------------	------

Note: the operating distance of the sensor must be multiplied by the correction factor of the material. For example, the operating distance on Aluminum is  $S_{n,Al} = S_n \times CF_{Al}$ . In case of embeddable mounting, the distance is multiplied by the additional correction factor of the support, thus  $S_{n,Al} = S_n \times CF_{Al} \times CF_{emb,Al}$ .

## INSTALLATION CONDITIONS / MAXIMUM TIGHTENING TORQUE



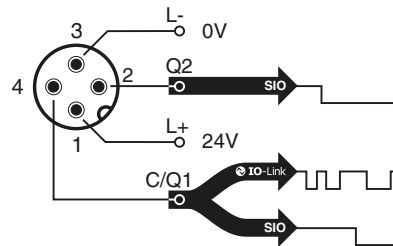
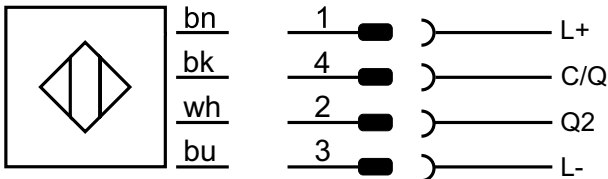
- A : metal free zone
- B : sensing face
- C : support

	a	b	c	d	Max. Tightening Torque
ISWE-M18MP-NSS-A0	24	18	24	0	25 Nm

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

## WIRING DIAGRAM

## PIN ASSIGNMENT



IO-LINK CHARACTERISTICS	VALUE FOR ISWX-MX-MP-NSS-A0
Vendor ID	0156 <sub>h</sub>
Device ID	320101 <sub>h</sub>
IO-Link Protocol	1.1.3
SIO-Mode	Supported
Process data	1 byte Input
Baudrate	COM2 (38.4 kBaud)
Minimum cycle time	2.3 ms
SSP (Smart sensor profile)	2.7

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. Alternatively, the IODD files are available on <https://ioddfinder.io-link.com/>

## AVAILABLE TYPES

All the below specifications were obtained with a  $3 \cdot S_d \times 3 \cdot S_d \times 1 \text{ mm}^3$ , FE 360 standard target

Part number	Part reference	$S_d$	Mounting	Linearity	Weight
330-020-536	ISWE-M18MP-NSS-A0	0 ... 8 mm	Embeddable	$\pm 80 \mu\text{m}^{(1)}$	56 g

<sup>(1)</sup> measured under a range condition from 5% to 95%  $S_d$ , 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)**

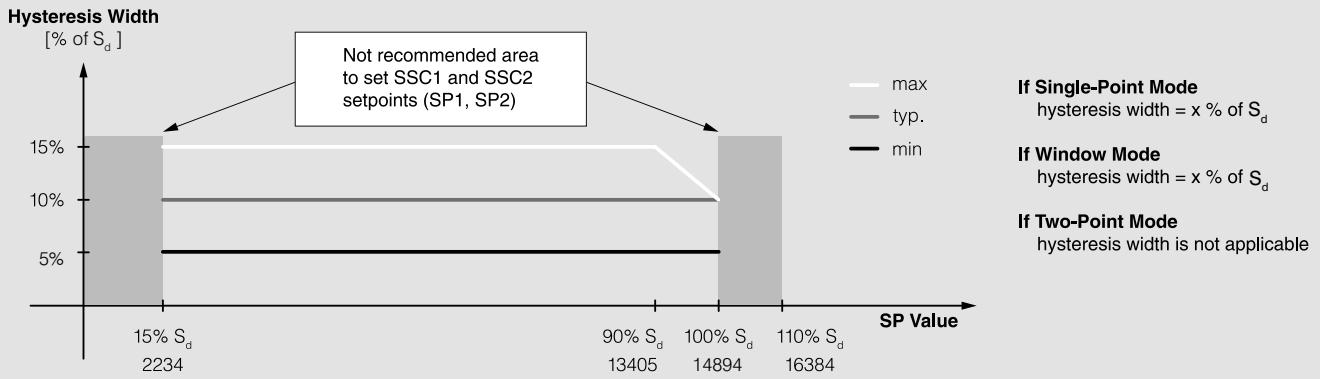
Index	Sub Hex	Name	Access	Data Type	Value	Default
<b>SYSTEM</b>						
02 <sub>h</sub>	00 <sub>h</sub>	Standard Command <sup>(1)</sup>	W	uint8	05 <sub>h</sub> = ParamDownloadStore, 07E <sub>h</sub> = Locator Start, 07F <sub>h</sub> = Locator Stop, 40 <sub>h</sub> = Teach Apply, 41 <sub>h</sub> = Single 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, 81 <sub>h</sub> = Application Reset, 83 <sub>h</sub> = Back-To-Box	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	AF <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>PROFILE PARAMETER</b>						
0D <sub>h</sub>	–	Profile Characteristic	R	array	<ProfileID1>, <ProfileID2>, <ProfileID3>, <FCID> [000E] <sub>h</sub> , [4000] <sub>h</sub> , [8011] <sub>h</sub> , [8012] <sub>h</sub> , [8101] <sub>h</sub> (Type 2.7) (AdSS)	–
<b>PD DESCRIPTOR</b>						
0E <sub>h</sub>	–	PD Input Descriptor	R	array	<DataType><TypeLength><BitOffset> – [1] <sub>h</sub> [8] <sub>h</sub> [0] <sub>h</sub>	–
<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]	“ISWX-MX-MP-NSS-A0”	–
13 <sub>h</sub>	–	Product ID	R	char [16]	330-020-5xx	–
14 <sub>h</sub>	–	Product Text	R	char [32]	ADSS series inductive sensor	–
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 AND LOCATION TAG</b>						
19 <sub>h</sub>	-	Function Tag	R/W	char [32]	<user string, 32 bytes (variable length)>	“***”
1A <sub>h</sub>	-	Location Tag	R/W	char [32]	<user string, 32 bytes (variable length)>	“***”
<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>	-	Detailed Device Status <sup>(1)</sup>	R	array	–	–

<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	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>
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% 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 ... 16383 (e.g. If SSC1 Configuration Mode = Single Point, SP1 = 50% S <sub>d</sub> = 7447, Hysteresis Width = 10% of S <sub>d</sub> = 1489)	1488 9.99% of S <sub>d</sub>
SSC2 PARAMETER						
3E <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>
SSC2 CONFIGURATION						
3F <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 ... 16383 (e.g. If SSC1 Configuration Mode = Single Point, SP1 = 50% S <sub>d</sub> = 7447, Hysteresis Width = 10% of S <sub>d</sub> = 1489)	1488 9.99% of S <sub>d</sub>

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

## HYSTERESIS WIDTH RECOMMENDED BY CONTRINEX



### TEACH OFFSET

41 <sub>h</sub>	01 <sub>h</sub>	Teach offset	R/W	int16	from -x to +x	00 <sub>h</sub>
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### 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	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	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	00 <sub>h</sub>
	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	01 <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	01 <sub>h</sub>

### TMU – SENSOR TIMER UNIT

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	00 <sub>h</sub>

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

### CTU – SENSOR COUNTER UNIT

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	R/W	uint16	0 ... 65535	0000 <sub>h</sub>
	03 <sub>h</sub>	Counter Source	R/W	uint8	0 = SSC1 1 = SSC2 2 = TSSP	00 <sub>h</sub>
	04 <sub>h</sub>	Counter Reset Source	R/W	uint8	0 = ALR1 1 = TSSP	01 <sub>h</sub>

### SMU – SENSOR MONITOR UNIT

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	Set at 70°C durring manufacturing	0091 <sub>h</sub>
	03 <sub>h</sub>	Min. Lifetime Temperature	R	uint16	Set at -25°C durring manufacturing	0032 <sub>h</sub>
	04 <sub>h</sub>	Lifetime Power-On Cycles	R	uint32	–	00000000 <sub>h</sub>
	05 <sub>h</sub>	Lifetime EMC Disturbances	R	uint32	–	00000000 <sub>h</sub>
	06 <sub>h</sub>	EVENT FLAG <sup>(1)(2)</sup>	R	uint8	B0 (Coil failure) B1 (Short circuit on output) B2 (EMC disturbances) B3 (Collision on output) B4 (Under voltage) B5 (Over temperature)	00 <sub>h</sub>

### SMAU – SENSOR MEASUREMENT ALARM UNIT

47 <sub>h</sub>	01 <sub>h</sub>	Sensor Alarm 1 Threshold	R/W	uint16	value of temperature or counter	00 <sub>h</sub>
	02 <sub>h</sub>	Sensor Alarm 1 Hysteresis	R/W	uint16	value of temperature or counter	00 <sub>h</sub>
	03 <sub>h</sub>	Sensor Alarm 1 Configuration	R/W	uint8	0 = Always OFF 1 = Active 2 = Active / IO-Link Event Generation 3 = Low Active 4 = Low Active / IO-Link Event generation	00 <sub>h</sub>
	04 <sub>h</sub>	Sensor Alarm 1 Source	R/W	uint8	0 = Counter value 1 = Temperature value 2 = SSC1 3 = SSC2 4 = TSSP 5 = Warnings Events 6 = Error Events	00 <sub>h</sub>

### DEVICE CHARACTERISTIC

49 <sub>h</sub>	01 <sub>h</sub>	Profile Compatibility	R	char []	“SSP 2.7”	–
	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 []	“10...30 VDC”	–
	04 <sub>h</sub>	Max. Output Current	R	char []	“≤ 200 mA”	–
	05 <sub>h</sub>	Ambient Temperature Range (T <sub>A</sub> )	R	char []	“-25 ... 70°C”	–
	06 <sub>h</sub>	Storage Temperature Range (T <sub>S</sub> )	R	char []	“-25 ... 70°C”	–
	07 <sub>h</sub>	Enclosure Rating	R	char []	“IP67”	–

### LEDC - LED CONFIGURATION

4B <sub>h</sub>	01 <sub>h</sub>	Yellow ON - SIO	R/W	uint8	0 = OSS1 1 = OSS2 2 = OSS1 or OSS2 3 = OFF	0
	02 <sub>h</sub>	Green ON - SIO	R/W	uint8	0 = POWER 1 = OFF	0
	03 <sub>h</sub>	Blinking Alarm - SIO	R/W	uint8	0 = ALR1 1 = OFF	0
	04 <sub>h</sub>	LED IO-Link	R/W	uint8	0 = Green STD IO-Link 1Hz 1 = Id mode Green 5Hz 2 = Same as SIO	0

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

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

## PROCESS DATA REPRESENTATION

### PROCESS DATA STRUCTURE

#### PROCESS DATA INPUT

Bitoffset

Byte	7	6	5	4	3	2	1	0
0			ALR1	OSS2	OSS1	TSSP	SSC2	SSC1

Name	Value	Description
-	0	
	1	
-	0	
	1	
ALR1	0	Alarm 1 is OFF
	1	Alarm 1 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
TSSP	0	Timered selected signal is OFF
	1	Timered selected signal 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

### 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>	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>	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

### 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
1803 <sub>h</sub>	Warning	Short Circuit	Short Circuit detected by sensor
1804 <sub>h</sub>	Error	Under Voltage	Under Voltage 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