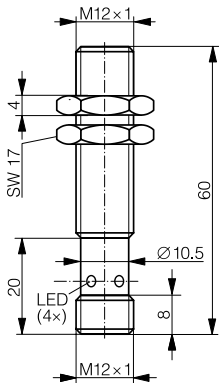
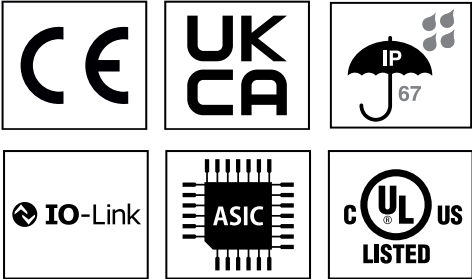




INDUCTIVE SENSOR
BASIC SMART
ISWE-M12MP-NSS-A0

HOUSING	OPERATING DISTANCE	MOUNTING	
M12	0 ... 4	Embeddable	



ISWE-M12MP-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)	≤ 10 % S _d	Output Polarity	PNP
		IO-Link	V 1.1, SSP 2.7
		MTTF (@40 °C)	315 y

Note: 0.9 S_n ≤ S_d ≤ 1.1S_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	≤ 20% U _B	Housing material	Chrome-plated brass
Output current	≤ 200 mA	Sensing face material	PBTP
Output voltage drop	≤ 2.0 VDC	Max. tightening torque	See "Installation conditions" (p. 2)
Power consumption (no-load)	≤ 15 mA	Ambient operating temperature	-25 ... +70°C¹
Residual current	≤ 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.	≤ 20 m (IO-Link) / ≤ 300 m (SIO)		

Note: all data measured according to IEC 60947-5-2 standard with U_B = 20 ... 30 VDC, T_A = 23°C ± 5°C.

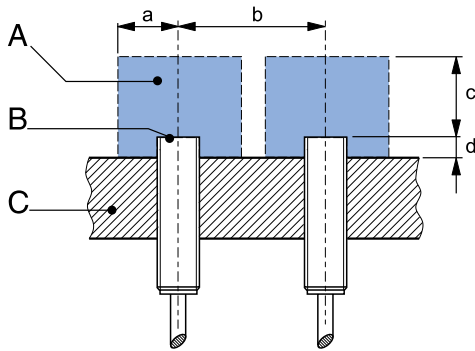
¹ Maximum temperature according to UL: 70°C.

CORRECTION FACTORS FOR TARGET OF									
Steel FE 360	1	Copper	0.32	Aluminum	0.78	Brass	0.46	Stainless Steel V2A	0.73

CORRECTION FACTORS FOR EMBEDDABLE MOUNTING IN SUPPORT OF									
Steel FE 360	1	Aluminum	0.9	Brass	0.91	Stainless Steel V2A	0.95		

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

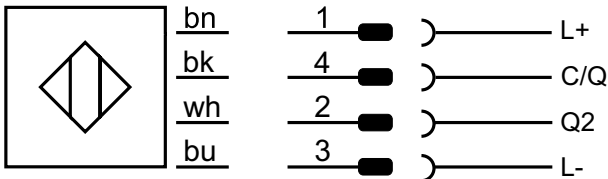


A : metal free zone
B : sensing face
C : support

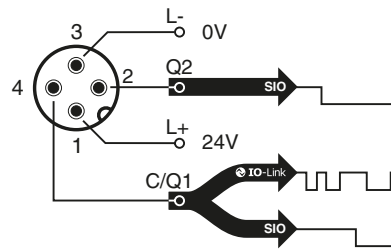
	a	b	c	d	Max. Tightening Torque
ISWE-M12MP-NSS-A0	12	12	12	0	10 Nm (6 Nm first 10 mm)

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 _h
Device ID	320101 _h
IO-Link Protocol	1.1.3
SIO-Mode	Supported
Process data	1 bytes 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/
 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-S_d × 3-S_d × 1 mm³, FE 360 standard target

Part number	Part reference	S _d	Mounting	Repeat accuracy	Weight
330-020-535	ISWE-M12MP-NSS-A0	0...4 mm	Embeddable	< 3 μm ⁽¹⁾ /13 μm ⁽²⁾	27 g

⁽¹⁾ measured under 3σ confidence level (99.7%) at 0.33 S_d, constant temperature, and constant voltage supply

⁽²⁾ measured under 3σ confidence level (99.7%) at 0.67 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.

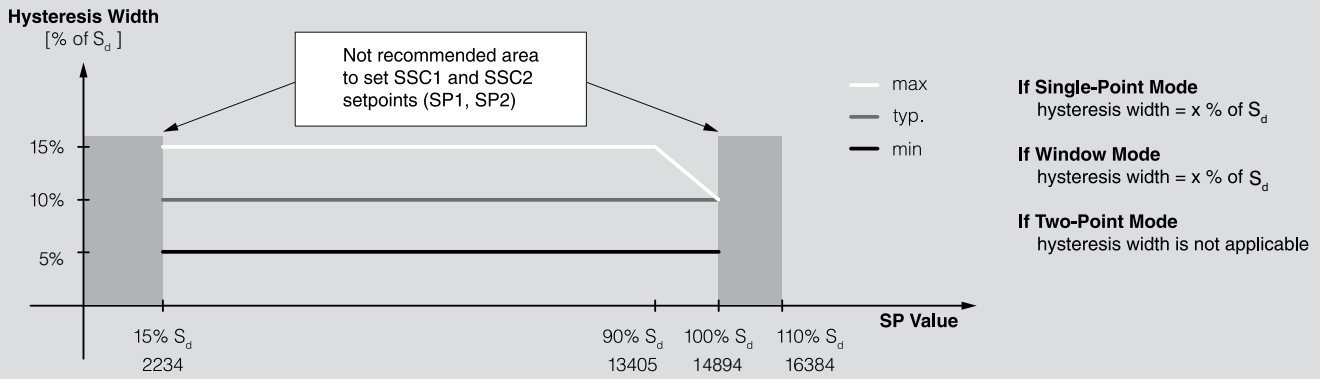
CONFIGURATION PARAMETER (IO-LINK / SIO MODE)						
Index	Sub Hex	Name	Access	Data Type	Value	Default
SYSTEM						
02 _h	00 _h	Standard Command ⁽¹⁾	W	uint8	05 _h = ParamDownloadStore, 07E _h = Locator Start, 07F _h = Locator Stop, 40 _h = Teach Apply, 41 _h = Single Value Teach SP1, 42 _h = Single Value Teach SP2, 43 _h = Two Value Teach for SP1 → TP1, 44 _h = Two Value Teach for SP1 → TP2, 45 _h = Two Value Teach for SP2 → TP1, 46 _h = Two Value Teach for SP2 → TP2, 47 _h = Dynamic Start SP1, 48 _h = Dynamic Stop SP1, 49 _h = Dynamic Start SP2, 4A _h = Dynamic Stop SP2, 4F _h = Teach Cancel, 80 _h = Device Reset, 81 _h = Application Reset, 83 _h = Back-To-Box	N/A
DATA STORAGE						
03 _h	01 _h	DS_Command ⁽¹⁾	R/W	uint8	00 _h : Reserved 01 _h : DS_UploadStart 02 _h : DS_UploadEnd 03 _h : DS_DownloadStart 04 _h : DS_DownloadEnd 05 _h : DS_Break 06 _h – FF _h : Reserved	N/A
	02 _h	State_Property ⁽¹⁾	R	uint8	Bit 0: Reserved Bit 1 and 2: State of Data Storage (00 _h : Inactive, 01 _h : Upload, 02 _h : Download, 03 _h : Data Storage Locked) Bit 3 to 6: Reserved Bit 7: DS_UPLOAD_FLAG (00 _h : no DS_UPLOAD_FLAG, 01 _h : DS_UPLOAD_REQ pending)	N/A
	03 _h	Data_Storage_Size	R	uint32	AF _h	N/A
	04 _h	Parameter_Checksum	R	uint32	–	N/A
	05 _h	Index_List	R	array of byte	–	N/A
PROFILE PARAMETER						
0D _h	–	Profile Characteristic	R	array	<ProfileID1>, <ProfileID2>, <ProfileID3>, <FCID> [000E] _h , [4000] _h , [8011] _h , [8012] _h , [8101] _h (Type 2.7) (AdSS)	–
PD DESCRIPTOR						
0E _h	–	PD Input Descriptor	R	array	<DataType> <TypeLength> <BitOffset> – [1] _h [8] _h [0] _h	–
FUNCTION CLASS – IDENTIFICATION (8000 _h)						
10 _h	–	Vendor Name	R	char [16]	“Contrinex”	–
11 _h	–	Vendor Text	R	char [32]	“www.contrinex.com”	–
12 _h	–	Product Name	R	char [32]	“ISWX-MX-MP-NSS-A0”	–
13 _h	–	Product ID	R	char [16]	330-020-5xx	–
14 _h	–	Product Text	R	char [32]	ADSS series inductive sensor	–
15 _h	–	Serial Number	R	char [16]	123456	–
16 _h	–	Hardware Revision	R	char [16]	1.0.0	–
17 _h	–	Firmware Revision	R	char [16]	1.0.0	–
18 _h	–	Application Specific Tag	R/W	char [32]	<user string, 32 bytes (variable length)>	<vendor specific>
FUNCTION AND LOCATION TAG						
19 _h	-	Function Tag	R/W	char [32]	<user string, 32 bytes (variable length)>	“***”
1A _h	-	Location Tag	R/W	char [32]	<user string, 32 bytes (variable length)>	“***”
FUNCTION CLASS – DIAGNOSIS (8003 _h)						
24 _h	00 _h	Device Status ⁽¹⁾	R	uint8	0 = Device is OK, 1 = Maintenance required, 2 = Out of specification, 3 = Functional check, 4 = Failure, 5...255 Reserved	–
25 _h	-	Detailed Device Status ⁽¹⁾	R	array	–	–

⁽¹⁾This parameter is stored in a volatile memory

FUNCTION CLASS – TEACH-IN CHANNEL SELECT (8004 _h)						
3A _h	–	Teach Select ⁽¹⁾	R/W	uint8	00 _h : Default (SSC1) 01 _h : SSC1 02 _h : SSC2 FF _h : ALL	00 _h
FUNCTION CLASS – TEACH STATUS (8007 _h TO 8009 _h)						
3B _h	01 _h	Teach State ⁽¹⁾	R	bool[4]	00 _h : Idle 01 _h : SP1 Success 02 _h : SP2 Success 03 _h : SP12 Success 04 _h : Wait for command 05 _h : Busy 06 _h : Reserved 07 _h : Error 08 _h ... 12 _h : Reserved	00 _h
	02 _h	Flag SP1 → TP1 ⁽¹⁾	R	bool	00 _h : Teach point not taught or not successful 01 _h : Teach point successfully taught	00 _h
	03 _h	Flag SP1 → TP2 ⁽¹⁾	R	bool	00 _h : Teach point not taught or not successful 01 _h : Teach point successfully taught	00 _h
	04 _h	Flag SP2 → TP1 ⁽¹⁾	R	bool	00 _h : Teach point not taught or not successful 01 _h : Teach point successfully taught	00 _h
	05 _h	Flag SP2 → TP2 ⁽¹⁾	R	bool	00 _h : Teach point not taught or not successful 01 _h : Teach point successfully taught	00 _h
SSC1 PARAMETER						
3C _h	01 _h	Setpoint 1	R/W	uint32	Recommended value: (2234 ... 14894 = 15% S _d to 100% S _d)	14894 100% S _d
	02 _h	Setpoint 2	R/W	uint32	Recommended value: (2234...14894 = 15% S _d to 100% S _d), but must be lower than Setpoint 1. N/A if Single-Point mode is selected	0% S _d
SSC1 CONFIGURATION						
3D _h	01 _h	Logic	R/W	uint8	00 _h : High active 01 _h : Low active	00 _h
	02 _h	Mode	R/W	uint8	00 _h : Deactivated 01 _h : Single Point 02 _h : Window Mode 03 _h : Two Points	01 _h
	03 _h	Hysteresis Width	R/W	uint32	0 ... 16383 (e.g. If SSC1 Configuration Mode = Single Point, SP1 = 50% S _d = 7447, Hysteresis Width = 10% of S _d = 1489)	1488 9.99% of S _d
SSC2 PARAMETER						
3E _h	01 _h	Setpoint 1	R/W	uint32	Recommended value: (2234 ... 14894 = 15% S _d to 100% S _d)	11916 80% S _d
	02 _h	Setpoint 2	R/W	uint32	Recommended value: (2234...14894 = 15% S _d to 100% S _d), but must be lower than Setpoint 1. N/A if Single-Point mode is selected.	0 0% S _d
SSC2 CONFIGURATION						
3F _h	01 _h	Logic	R/W	uint8	00 _h : High active 01 _h : Low active	00 _h
	07 _h	Mode	R/W	uint8	00 _h : Deactivated 01 _h : Single Point 02 _h : Window Mode 03 _h : Two Points	01 _h
	08 _h	Hysteresis Width	R/W	uint32	0 ... 16383 (e.g. If SSC1 Configuration Mode = Single Point, SP1 = 50% S _d = 7447, Hysteresis Width = 10% of S _d = 1489)	1488 9.99% of S _d

⁽¹⁾ This parameter is stored in a volatile memory

HYSTERESIS WIDTH RECOMMENDED BY CONTRINEX



TEACH OFFSET

41 _h	01 _h	Teach offset	R/W	int16	from -x to +x	00 _h
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OSS CONFIGURATION

42 _h	01 _h	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 _h
	02 _h	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 _h
	03 _h	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 _h
	04 _h	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 _h
	05 _h	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 _h
	06 _h	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 _h
	07 _h	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 _h
	08 _h	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 _h

TMU – SENSOR TIMER UNIT

43 _h	01 _h	Timer Mode	R/W	uint8	0 = No Timer 1 = Stretch ON 2 = Delay ON 3 = Delay and Stretch ON 4 = One Shot	00 _h
	02 _h	Timer Value	R/W	uint16	0 ... 65535 ms	0000 _h
	03 _h	Timer Source	R/W	uint8	0 = SSC1 1 = SSC2 2 = ALR1	00 _h

⁽¹⁾ Only available if OSS2 Logic = 4 = INPUT

CTU – SENSOR COUNTER UNIT						
44 _h	01 _h	Counter Mode	R/W	uint8	0 = Falling Edge 1 = Rising Edge 2 = Both	00 _h
	02 _h	Counter Value	R/W	uint16	0 ... 65535	0000 _h
	03 _h	Counter Source	R/W	uint8	0 = SSC1 1 = SSC2 2 = TSSP	00 _h
	04 _h	Counter Reset Source	R/W	uint8	0 = ALR1 1 = TSSP	01 _h
SMU – SENSOR MONITOR UNIT						
46 _h	01 _h	Current Temperature ⁽¹⁾	R	uint16	–	0000 _h
	02 _h	Max. Lifetime Temperature	R	uint16	Set at 70°C durring manufacturing	0091 _h
	03 _h	Min. Lifetime Temperature	R	uint16	Set at -25°C durring manufacturing	0032 _h
	04 _h	Lifetime Power-On Cycles	R	uint32	–	00000000 _h
	05 _h	Lifetime EMC Disturbances	R	uint32	–	00000000 _h
	06 _h	EVENT FLAG ⁽¹⁾⁽²⁾	R	uint8	B0 (Coil failure) B1 (Short circuit on output) B2 (EMC disturbances) B3 (Collision on output) B4 (Under voltage) B5 (Over temperature)	00 _h
SMAU – SENSOR MEASUREMENT ALARM UNIT						
47 _h	01 _h	Sensor Alarm 1 Threshold	R/W	uint16	value of temperature or counter	00 _h
	02 _h	Sensor Alarm 1 Hysteresis	R/W	uint16	value of temperature or counter	00 _h
	03 _h	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 _h
	04 _h	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 _h
DEVICE CHARACTERISTIC						
49 _h	01 _h	Profile Compatibility	R	char []	“SSP 2.7”	–
	02 _h	Detection Range Max.	R	char []	Depends on sensor type	–
	03 _h	Supply Voltage Range (U _b)	R	char []	“10...30 VDC”	–
	04 _h	Max. Output Current	R	char []	“≤ 200 mA”	–
	05 _h	Ambient Temperature Range (T _A)	R	char []	“–25 ... 70°C”	–
	06 _h	Storage Temperature Range (T _S)	R	char []	“–25 ... 70°C”	–
	07 _h	Enclosure Rating	R	char []	“IP67”	–
LEDC - LED CONFIGURATION						
4B _h	01 _h	Yellow ON - SIO	R/W	uint8	0 = OSS1 1 = OSS2 2 = OSS1 or OSS2 3 = OFF	0
	02 _h	Green ON - SIO	R/W	uint8	0 = POWER 1 = OFF	0
	03 _h	Blinking Alarm - SIO	R/W	uint8	0 = ALR1 1 = OFF	0
	04 _h	LED IO-Link	R/W	uint8	0 = Green STD IO-Link 1Hz 1 = Id mode Green 5Hz 2 = Same as SIO	0

⁽¹⁾ This parameter is stored in a volatile memory

⁽²⁾ 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 _h	11 _h	Index Not Available	Access occurs to a not existing index
80 _h	12 _h	Subindex Not Available	Access occurs to a not existing subindex
80 _h	23 _h	Access Denied	Write access on a read-only parameter
80 _h	30 _h	Parameter Value Out Of Range	Written parameter value is outside its permitted value range
80 _h	33 _h	Parameter Length Overrun	Written parameter length is above its predefined length
80 _h	34 _h	Parameter Length Underrun	Written parameter length is below its predefined length
80 _h	35 _h	Function Not Available	Written command is not supported by the device application

EVENTS

Code	Type	Name	Description
1800 _h	Warning	EMC Disturbances	EMC Disturbances detected by sensor
1801 _h	Warning	Under IOL Voltage	Under IOL Voltage detected by sensor
1803 _h	Warning	Short Circuit	Short Circuit detected by sensor
1804 _h	Error	Under Voltage	Under Voltage detected by sensor
1807 _h	Error	Ferrite, Coil, PCB Failure	Ferrite, Coil, PCB Failure detected by sensor
1808 _h	Notification	Alarm 1	Alarm 1 Threshold reached