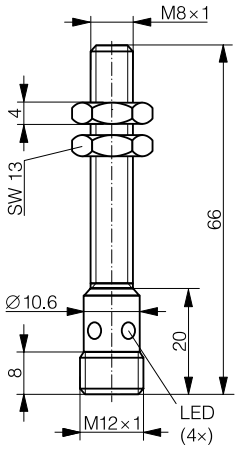
CONTRINEX

INDUCTIVE SENSOR
BASIC SMART
ISWE-M8MP-NSS-A0

HOUSING	OPERATING DISTANCE	MOUNTING
M8	0 … 3 mm	Embeddable





ISWE-M8MP-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

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 Nickel Silver
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°C[1]
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

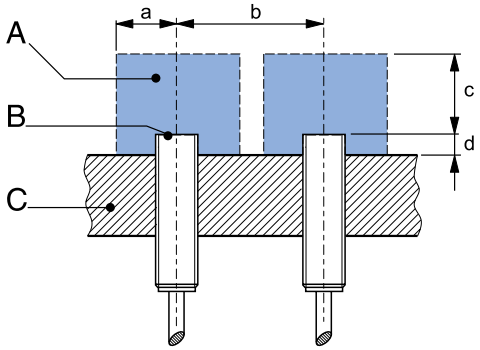
Steel FE 360	**1**	Copper	**0.26**	Aluminum	**0.30**	Brass	**0.38**	Stainless Steel V2A	**0.7**

CORRECTION FACTORS FOR EMBEDDABLE MOUNTING IN SUPPORT OF

Steel FE 360	**1**	Aluminum	**0.54**	Brass	**0.64**	Stainless Steel V2A	**0.74**

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

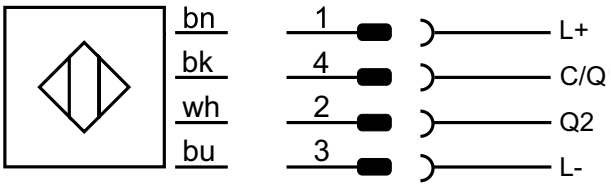


A : metal free zone
B : sensing face
C : support

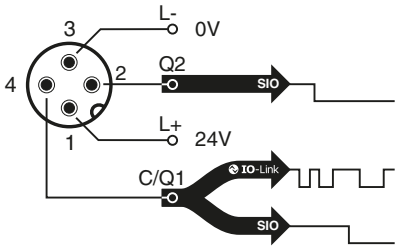
	a	b	c	d	Max. Tightening Torque
ISWE-M8MP-NSS-A0	9	12	9	0	8 Nm (2.5 Nm first 10 mm)

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	330101_h
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/
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 $3 \cdot S_d \times 3 \cdot S_d \times 1$ mm³, FE 360 standard target

Part number	Part reference	S_d	Mounting	Repeat accuracy	Weight
330-020-534	ISWE-M8MP-NSS-A0	0 … 3 mm	Embeddable	< 6 μm[1] 50 μm[2]	20 g

[1] measured under 3ø confidence level (99.7%) at 0.33 Sd, constant temperature, and constant voltage supply
[2] measured under 3ø confidence level (99.7%) at 0.67 Sd, 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)

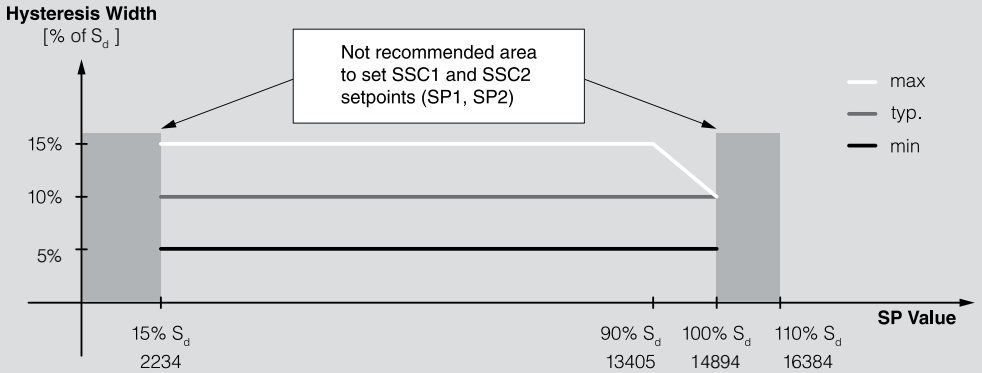
Index	Sub Hex	Name	Access	Data Type	Value	Default
SYSTEM						
02_h	00_h	Standard Command[(1)]	W	uint8	05_h = ParamDownloadStore, $07E_h$ = Locator Start, $07F_h$ = Locator Stop, 40_h = Teach Apply, 41_h = Single Value Teach SP1, 42_h = Single Value Teach SP2, 43_h = Two Value Teach for SP1 → TP1, 44_h = 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	AFh	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 $08_h \ldots 12_h$: 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



If Single-Point Mode
hysteresis width = x % of S_d

If Window Mode
hysteresis width = x % of S_d

If Two-Point Mode
hysteresis width is not applicable

TEACH OFFSET

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

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 Souce 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