

# EN

# P1MWxxx

Contrast Sensor



## Interface Description

# IO-Link P1MWxxx

## Vendor ID

Product	hex	dec	hex (Bytes)	dec (Bytes)
wenglor sensoric GmbH	0x0057	87	00 57	0 87

## Device ID

Product	hex	dec	hex (Bytes)	dec (Bytes)
P1MW001	0x00006A	106	00 00 6A	0 0 106
P1MW002	0x00006B	107	00 00 6B	0 0 107

## IO-Link Information

IO-Link Version:	V1.1.4
Parameter Server / Data Storage:	Yes
Blockparameter:	Yes
MinCycletime:	1 ms
SIO-Mode:	Yes
COM-Mode:	COM3
ISDU:	Yes
Process data In (Device to Master):	24 Bit
Process data Out (Master to Device):	8 Bit

## IO-Link Profiles

- Common Profile
- Function Class Identification
- Function Class Diagnosis
- Smart Sensor Profil - Transducer Disable

## Process Data Input (Device -> Master)

Subindex	Name	Bit Offset	Data Type	Range
1	Signal	8	16 Bit	0...1023
2	not used	4	4 Bit	
3	Teach Ongoing	3	1 Bit	0 = false 1 = true
4	Error	2	1 Bit	0 = false 1 = true
5	Warning	1	1 Bit	0 = false 1 = true
6	SSC1 - Switching Signal 1	0	1 Bit	0 = false 1 = true

	Octet 0 (MSB)								Octet 1 (LSB)							
Subindex	1															
Bit Offset	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8
	Signal ... 1023															

	Octet 8							
Subindex	2		3	4	5	6		
Bit Offset	7	6	5	4	3	2	1	0

## Process Data Output (Master -> Device)

Subindex	Name	Bit Offset	Data Type	Range
1	Control Signal (LED Control)	0	1 Bit	0 = Enabled 1 = Disabled
2	Teach Input	1	1 Bit	0 = Enabled 1 = Disabled
3				

Octet 0 (MSB)								
Subindex	3						2	1
Bit Offset	7	6	5	4	3	2	1	0

## Identification

Name	Index (hex)	Index (dec)	Sub-index	R/W	Data type	Data Storage	Dynamic	Modify others	Default value	Range
<b>Identification</b>										
Vendor Name	0x0010	16	0	R	String				wenglor sensoric GmbH	
Vendor Text	0x0011	17	0	R	String				the innovative family	
Product Name	0x0012	18	0	R	String				P1MWxxx	
Product ID	0x0013	19	0	R	String				P1MWxxx	
Product Text	0x0014	20	0	R	String				Contrast Sensor	
Serial Number	0x0015	21	0	R	String				-	
Hardware Identification Key									P1MW	
Hardware Version	0x0016	22	0	R	String				-	
Firmware Version	0x0017	23	0	R	String				-	
Application Specific Tag	0x0018	24	0	R/W	String 32 Byte	X			***	
Function Tag	0x0019	25	0	R/W	String 32 Byte	X			***	
Location Tag	0x001A	26	0	R/W	String 32 Byte	X			***	

## Parameter

Name	Index (hex)	Index (dec)	Sub-index	R/W	Data type	Data Storage	Dynamic	Modify others	NFC	Default value	Range
<b>General Settings</b>											
System Commands	0x0002	2	0	W	Uint8			X		-	Device Reset = 0x80 (128) Restore Factory Settings = 0x82 (130)
<b>Service Functions</b>											
System Commands	0x0002	2	0	W	Uint8			X		-	Locator Start = 0x7E (126) Locator Stop = 0x7F (127) Application Reset = 0x81 (129) Back-to-box = 0x83 (131)
<b>Device Settings</b>											
Device Access Locks.Local Parameterization Lock	0x000C	12	3	R/W	Bool	X				0 = Unlocked	0 = Unlocked 1 = Locked
<b>Mesasured Value Settings</b>											
Emitted Light	0x00E0	224	0	R/W	Uint8	X				0 = On	0 = On 1 = Off

Name	Index (hex)	Index (dec)	Sub-index	R/W	Data type	Data Storage	Dynamic	Modify others	NFC	Default value	Range
Noise Filter	0x00D0	208	0	R/W	Uint8	X				2 = Minimum	0 = Maximum 1 = Medium 2 = Minimum
Hysteresis	0x0250	592	0	R/W	Uint8	X				2 = Minimum	0 = Maximum 1 = Medium 2 = Minimum
<b>SSC1 (Teach Mode = 2P Teach)</b>											
<b>Teach Settings</b>											
SSC1 Teach Mode	0x0290	656	0	R/W	Uint8	X				0 = 2P Teach	0 = 2P Teach 1 = Dynamic Teach 2 = Jump Detection
SSC1 Teach-In	0x0200	512	0	W	Uint8			X		1 = Do Teach	0 = No Teach 1 = Do Teach 2 = Dynamic Teach Start 3 = Dynamic Teach Stop
Teach Status	0x01F0	496	0	R	Uint8					0 = Idle	0 = Idle 1 = Ongoing 2 = Last Teach Failed 3 = Last Teach Successful 4 = Last Teach Warning 5 = Teach Type Changed 6 = Last teach canceled 7 = Last teach not possible: emitter disabled 8 = Jump detection enabled 9 = Locked
<b>Teach Values</b>											
Configuration Mode	0x0240	576	0	R/W	Uint8					Auto	0 = Auto 1 = Manual
Selected Light Intensity	0x0116	278	0	R/W	Uint8	X				0 = High	0 = High 1 = Medium 2 = Low
Mark Type	0x011A	282	0	R/W	Uint8	X				0 = Dark	0 = Dark 1 = Bright
Sensitivity	0x0115	277	0	R/W	Uint8	X				20	5 ... 90
Switch Point	0x0270	624	0	R	Uint16	X	X				0 ... 1023
<b>SSC1 (Teach Mode = Dynamic Teach)</b>											
<b>Teach Settings</b>											
SSC1 Teach Mode	0x0290	656	0	R/W	Uint8	X				0 = 2P Teach	0 = 2P Teach 1 = Dynamic Teach 2 = Jump Detection
Dynamic Teach Duration	0x02E0	736	0	R/W	Uint16	x				60	10 ... 600
Dynamic Teach Strategy	0x01f2	498	0	R/W	Uint8	x				0 = Bright Mark	0 = Dark Mark 1 = Bright Mark
SSC1 Teach-In	0x0200	512		W				x		2	2 = Start Teach
SSC1 Teach-In	0x0201	513		W				x		3	3 = Stop Teach
Teach Status	0x01F0	496	0	R	Uint8					0 = Idle	0 = Idle 1 = Ongoing 2 = Last Teach Failed 3 = Last Teach Successful 4 = Last Teach Warning 5 = Teach Type Changed 6 = Last teach canceled 7 = Last teach not possible: emitter disabled 8 = Locked 10 = Last teach not possible: Jump Detection enabled
<b>Teach Values</b>											
Configuration Mode	0x0240	576	0	R/W	Uint8	X				0 = Auto	0 = Auto 1 = Manual
Selected Light Intensity	0x0116	278	0	R/W	Uint8	X				0 = High	0 = High 1 = Medium 2 = Low
Mark Type	0x011A	282	0	R/W	Uint8	X				1 = Bright	0 = Dark 1 = Bright

Name	Index (hex)	Index (dec)	Sub-index	R/W	Data type	Data Storage	Dynamic	Modify others	NFC	Default value	Range
Sensitivity	0x0115	277	0	R/W	Uint8	X				20	5 ... 90
Switch Point	0x0270	624	0	R	Uint16	X	X				0 ... 1023
<b>SSC1 (Teach Mode = Jump Detection)</b>											
<b>Teach Settings</b>											
SSC1 Teach Mode	0x0290	656	0	R/W	Uint8	X				0 = 2P Teach	0 = 2P Teach 1 = Dynamic Teach 2 = Jump Detection
Selected Light Intensity	0x0116	278	0	R/W	Uint8	X				0 = High	0 = High 1 = Medium 2 = Low
Signal Jump Minimum	0x02A0	672	0	R/W	Uint16	X			X	300	10 ... 1000
Signal Jump Direction	0x02A2	674	0	R/W	Uint8	X			X	0 = Positive	0 = Positive 1 = Negative 2 = Both
Signal Jump Impulse	0x02A3	675	0	R/W	Uint16	X			X	0 = Hold	0 = Hold 1 ... 10000 ms
Signal Jump Cycle Offset	0x02A4	676	0	R/W	Uint16	X			X	2000	10 ... 5000
Maximum Recorded Signal Jump	0x02AF	687	0	R	Uint32		X				0 ... 1024
Signal Jump Command	0x02C0	704	0	W	Uint8			X			1 = Reset Maximum Recorded Signal Jump
<b>Pin Function</b>											
A1 Pin Function	0x0040	64	0	R/W	Uint8	X		X		0 = Switching Output SSC 1	0 = Switching Output SSC1 1 = Error Output 2 = Warning Output
A2 Pin Function	0x0041	65	0	R/W	Uint8	X		X		4 = Teach Input	1 = Error Output 2 = Warning Output 4 = Teach Input 5 = Disabled 6 = Antivalent Output of SSC1
<b>Digital Outputs</b>											
<b>A1 Settings</b>											
A1 NO/NC	0x0210	528	0	R/W	Uint8	X				0 = NO	0 = NO 1 = NC
A1 NPN/PNP/P-P	0x0220	544	0	R/W	Uint8	X				P1MW001: 0 = PNP P1MW002: 1 = NPN	0 = PNP 1 = NPN 2 = Push-Pull
On Delay	0x0050	80	0	R/W	Uint16	X				0	0 ... 10000 ms
Off Delay	0x0060	96	0	R/W	Uint16	X				0	0 ... 10000 ms
Impulse	0x0070	112	0	R/W	Uint16	X				0	0 ... 10000 ms
<b>A2 Settings (A2 Pin Function = Error/Warning)</b>											
A2 NO/NC	0x0211	529	0	R/W	Uint8	X				0 = NO	0 = NO 1 = NC
A2 NPN/PNP/P-P	0x0221	545	0	R/W	Uint8	X				P1MW001: 0 = PNP P1MW002: 1 = NPN	0 = PNP 1 = NPN 2 = Push-Pull
On Delay	0x0051	81	0	R/W	Uint16	X				0	0 ... 10000 ms
Off Delay	0x0061	97	0	R/W	Uint16	X				0	0 ... 10000 ms
Impulse	0x0071	113	0	R/W	Uint16	X				0	0 ... 10000 ms
<b>Digital Inputs</b>											
<b>E2 (Teach input or Trigger)</b>											
Ub Active/Inactive	0x0261	609	0	R/W	Uint8	X				0 = Ub Active	0 = Ub Active 1 = Ub Inactive

## Diagnosis

Name	Index (hex)	Index (dec)	Sub-index	R/W	Data type	Data Storage	Dynamic	Modify others	Default value	Range
<b>Status</b>										
Device Status	0x0024	36	0	R	Uint8		X		0	0 = Device is OK 1 = Maintenance required 2 = Out of specification 3 = Functional check 4 = Failure
Detailed Device Status	0x0025	37	0	R	Array of StringT3		X		0	Shows the pending Events (maximum 4)
<b>Additional Status</b>										
Additional status Information	0x1300	4864	1	R	Bool		X		0	Contaminated Optics
			2							Emitted Light Off
			3							Fatal Error
			4							Temperature Error
			5							Temperature High
			6							Temperature Low
			7							Undervoltage
			8							Power Fault
			9							Short Circuit
<b>Device Simulation</b>										
Simulation Mode	0x0310	784	0	R/W	Uint8		X		0 = off	0 = off 1 = on
<b>Device Simulation Enabled (Simulation Mode = 1)</b>										
Signal Value	0x0315	789	0	R/W	Uint16		X		65535 = Use Process Value	0 ... 9999 65535 = Use Process Value
Simulation SSC1	0x0331	817	0	R/W	Uint8		X		255 = Use Process Value	0 = Off 1 = On 255 = Use process Value
Simulation Contaminated Optics	0x031C	796	0	R/W	Uint8		X		255 = Use Process Value	0 = Off 1 = On 255 = Use process Value
Simulation Fatal Error	0x0323	803	0	R/W	Uint8		X		255 = Use Process Value	0 = Off 1 = On 255 = Use process Value
Simulation Temperature Error	0x0324	804	0	R/W	Uint8		X		255 = Use Process Value	0 = Off 1 = On 255 = Use process Value
Simulation Temperature High	0x0325	805	0	R/W	Uint8		X		255 = Use Process Value	0 = Off 1 = On 255 = Use process Value
Simulation Temperature Low	0x032C	812	0	R/W	Uint8		X		255 = Use Process Value	0 = Off 1 = On 255 = Use process Value
Simulation Undervoltage	0x0327	807	0	R/W	Uint8		X		255 = Use Process Value	0 = Off 1 = On 255 = Use process Value
Simulation Power Fault	0x0329	809	0	R/W	Uint8		X		255 = Use Process Value	0 = Off 1 = On 255 = Use process Value
Simulation Short Circuit	0x0328	808	0	R/W	Uint8		X		255 = Use Process Value	0 = Off 1 = On 255 = Use process Value
<b>Service Functions</b>										
System Commands	0x0002	2	0	W	Uint8			X		Locator Start = 0x7E(126) Locator Stop = 0x7F (127) Back-to-box = 0x83 (131)

## Events

Name	Event Code	Type	Specification
General malfunction – unknown error	0x1000	Error	IO-Link
Short circuit – Check installation	0x7710	Error	IO-Link
Device temperature over-run – Clear source of heat	0x4210	Warning	IO-Link
Device temperature under-run – Insulate device	0x4220	Warning	IO-Link
Temperature fault – Overload	0x4000	Error	IO-Link
Primary supply voltage under-run – Check tolerance	0x5111	Warning	IO-Link
Cleaning Required	0x8C40	Warning	IO-Link
Emitter light changed (on/off)	0x1811	Notification	wenglor specific
Watchdog reset occurred	0x1812	Notification	wenglor specific
Output driver general failure	0x1813	Error	wenglor specific

## Notes for the use of the IODD

### RAM-memory

The changed parameters are stored in the volatile memory of the sensor. This could be used for testing and if the configuration of the sensor changes often (e. g. for different production batches).

### Changes have the following effects

- Sensor behavior is adjusted immediately without a restart according to the changed parameter.
- In case of a sensor restart (e. g. by turning power off and on) the settings are lost.
- Changes have no effects on the OTP-memory of the sensor.

### OTP-memory

By writing the parameters, they are stored in the non-volatile memory. At every start-up the OTP parameters are loaded to the RAM of the sensor. The OTP-memory has limited write cycles. The wenglor sensoric GmbH can guarantee at least 240 writes to the OTP-memory at delivery.

The current number of writes is readable from the parameter “Counter OTP memory”.

### Procedure to save parameters in the OTP-memory of the sensor:

1. Test the sensor settings within the application until the desired configuration is clear.
2. Set the parameter “Write parameters to OTP-memory” to “write parameters” and send it to the sensor.
3. The configuration is applied directly, and after a restart it is loaded from the OTP-memory.
4. New configuration is stored in the sensors RAM and OTP-memory.