

EN

P1PY1xx

P2PY1xx

Long-Range Laser Distance Sensors



Interface Description

P1PY1xx / P2PY1xx

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)
P1PY101	0x370F65	3608421	37 0F 65	55 15 101
P1PY102	0x370F66	3608422	37 0F 66	55 15 102
P1PY103	0x370F67	3608423	37 0F 67	55 15 103
P1PY104	0x370F68	3608424	37 0F 68	55 15 104
P1PY107	0x370F6B	3608427	37 0F 6B	55 15 107
P1PY108	0x370F6C	3608428	37 0F 6C	55 15 108
P1PY109	0x370F6D	3608429	37 0F 6D	55 15 109
P1PY109S01	0x370FFC	3608572	37 0F FC	55 15 252
P1PY111	0x370F6F	3608431	37 0F 6F	55 15 111
P1PY113	0x370F71	3608433	37 0F 71	55 15 113
P1PY131	0x370F83	3608451	37 0F 83	55 15 131
P1PY133	0x370F85	3608453	37 0F 85	55 15 133
P1PY137	0x370F89	3608457	37 0F 89	55 15 137
P1PY138	0x370F8A	3608458	37 0F 8A	55 15 138
P2PY101	0x371665	3610213	37 16 65	55 22 101
P2PY103	0x371667	3610215	37 16 67	55 22 103
P2PY105	0x371669	3610217	37 16 69	55 22 105
P2PY106	0x37166A	3610218	37 16 6A	55 22 106
P2PY107	0x37166B	3610219	37 16 6B	55 22 107
P2PY108	0x37166C	3610220	37 16 6C	55 22 108
P2PY109	0x37166D	3610221	37 16 6D	55 22 109

IO-Link Information

IO-Link Version:	V1.1
Data Storage:	Yes
Blockparameter:	Yes
Min Cycle time:	0,8 ms
SIO-Mode:	Yes
COM-Mode:	COM3
ISDU:	Yes
Process data In (Device to Master):	32 Bit
Process data Out (Master to Device):	8 Bit

IO-Link Profiles

Common Profile
Function Class Identification
Function Class Diagnosis
Function Class Extended Identification
Smart Sensor Profil – Measuring Sensor, Type 3.3
Smart Sensor Profil – Transducer Disable

Process data (length: 32 Bit)

Device to Master

Subindex	Name	Bit Offset	Length	Range
1	Measurement Value: Distance in mm Distance in 1/10 Inch	16	Int16	2,0...393,7 1/10 inch 50...10000 mm
2	Scale	8	Int8	- 3 = mm
3	Indication Error/Warning 4	7	1 Bit	0 = false 1 = true
4	Indication Error/Warning 3	6	1 Bit	0 = false 1 = true
5	Indication Error/Warning 2	5	1 Bit	0 = false 1 = true
6	Indication Error/Warning 1	4	1 Bit	0 = false 1 = true
7	Error	3	1 Bit	0 = false 1 = true
8	Warning	2	1 Bit	0 = false 1 = true
9	SSC1 – Switching Signal 2	1	1 Bit	0 = false 1 = true
10	SSC1 – Switching Signal 1	0	1 Bit	0 = false 1 = true

These values are outside the measurement range and show information about the measurement

Measured Value = 0x8008 – 32760 Object too close
 0x7FF8 32760 Object too far
 0x7FFC 32764 No measurement data

	Octet 0 (MSB)								Octet 1								Octet 2								Octet 3 (LSB)							
Subindex	1																2								3	4	5	6	7	8	9	10
Bit Offset	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	Measurement value 16 bit [0...15]																Scale															

Process data (length: 8 Bit)

Master to Device

Subindex	Name	Bit Offset	Length	Range
1	Control Signal (for Transducer)	0	1 Bit	0 = Enabled 1 = Disabled
2	Find Me	1	1 Bit	0 = Off 1 = Blinking
3	Teach SSC1	3	1 Bit	0 → 1 Start Teach
4	Teach SSC2	4	1 Bit	0 → 1 Start Teach
5	Acceleration Sensor Reset (P1PY111, P1PY113, P2PYxxx)	7	1 Bit	1 = Reset

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

Parameter

Name	Index (hex)	Index (dec)	Sub-index	R/W	Datatype	Data Storage	Dynamic	Modify others	Default value	Range
Identification										
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				PxPY1xx	
Product ID	0x0013	19	0	R	String				PxPY1xx	
Product Text	0x0014	20	0	R	String				Long-Range Laser Distance Sensors	
Serial Number	0x0015	21	0	R	String				—	
Hardware Version	0x0016	22	0	R	String				—	
Firmware Version	0x0017	23	0	R	String				—	
Tags										
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			***	
Sensor Localisation										
Find Me	0x1200	4608	0	R/W	Uint8		X		0 = Off	0 = Off 1 = Blinking
Device Settings										
System Command	0x0002	2	0	W	Uint8			X	—	Device Reset = 0x80 (128) Restore Factory Settings = 0x82 (130)
Device Access Locks.Data Storage Lock	0x000C	12	2	R/W	Bool	X			0 = unlocked	0 = unlocked 1 = Data Storage Locked
Device Access Locks.Local Parameterization Lock	0x000C	12	3	R/W	Bool	X			0 = unlocked	0 = unlocked 1 = Local Parameterization locked
Button Illumination	0x0091	145	0	R/W	Uint8	X			P1PYxxx: 0 = On P2PYxxx: not available	0 = On 1 = Off
Measurement Value Settings										
Object Detection	0x0111	273	0	R/W	Uint8	X			0 = First Object	0 = First Object 1 = Last Object 2 = Most Intens Object
Measurement Mode	0x0110	272	0	R/W	Uint8	X			1 = Precision	0 = Speed 1 = Precision 2 = Precision Plus
Sensitivity	0x0115	277	0	R/W	Uint8	X			0 = Maximum	0 = Maximum 1 = Medium 2 = Low 3 = Minimum
Noise Filter	0x00D0	208	0	R/W	Uint8	X			0 = Off	0 = Off 1...9
Emitted Light	0x00E0	224	0	R/W	Uint8	X			0 = On	0 = On 1 = Off
Measurement Unit (Process Data)	0x0114	276	0	R/W	Uint8	X		X	0 = Millimeter	0 = Millimeter 1 = Inch
Detection Range Near	0x0112	274	0	R/W	Uint16	X			0 mm	P1PY13x: 50...5000 mm Rest: 50...10.000 mm
Detection Range Far	0x0113	275	0	R/W	Uint16	X			30.000 mm	P1PY13x: 50...5000 mm Rest: 50...10.000 mm 30.000 mm = No Limitation

Name	Index (hex)	Index (dec)	Sub-index	R/W	Datatype	Data Storage	Dynamic	Modify others	Default value	Range
Switching Signal Channel 1 - SSC1										
SSC1 Teach-Mode	0x0290	656	0	R/W	Uint8	X		X	0 = Foreground	0 = Foreground 1 = Background 2 = Window
SSC1 Switch Point	0x0270	624	0	R/W	Uint16	X			5.000 mm	P1PY13x: 50...5000 mm Rest: 50...10.000 mm
SSC1 Hysteresis	0x0300	768	0	R/W	Uint16	X			15 mm	5...1000 mm
SSC1 Window Near	0x0271	625	0	R/W	Uint16	X			30 mm	P1PY13x: 1...5000 mm Rest: 1...10.000 mm
SSC1 Window Far	0x0272	626	0	R/W	Uint16	X			30 mm	P1PY13x: 1...5000 mm Rest: 1...10.000 mm
Switching Signal Channel 2 - SSC2										
SSC2 Teach Mode	0x0291	657	0	R/W	Uint8	X		X	0 = Foreground	0 = Foreground 1 = Background 2 = Window
SSC2 Switch Point	0x0280	640	0	R/W	Uint16	X			5.000 mm	P1PY13x: 50...5000 mm Rest: 50...10.000 mm
SSC2 Hysteresis	0x0301	769	0	R/W	Uint16	X			15 mm	5...1000 mm
SSC2 Window Near	0x0281	641	0	R/W	Uint16	X			30 mm	P1PY13x: 1...5000 mm Rest: 1...10.000 mm
SSC2 Window Far	0x0282	642	0	R/W	Uint16	X			30 mm	P1PY13x: 1...5000 mm Rest: 1...10.000 mm
Teach-In										
SSC1 Teach-In	0x0200	512	0	W	Uint8			X	—	1 = Do Teach-In
SSC2 Teach-In	0x0201	513	0	W	Uint8			X	—	1 = Do Teach-In
Pin Function										
E/A1 Pin Function	0x0040	64	0	R/W	Uint8	X		X	PxPY1x7, PxPY1x8: 1 = Error Output Rest: 0 = Switching Output	0 = Switching Output SSC1 1 = Error Output 2 = Warning Output 3 = Emitted Light Disengageable 4 = Extern Teach 5 = Disabled 10 = Acceleration Sensor Reset Input
E/A2 Pin Function	0x0041	65	0	R/W	Uint8	X		X	PxPY1x7, PxPY1x8: not available PxPY109, P1PY109S01: Antivalent Switching Output Rest: 0 = Switching Output	0 = Switching Output SSC2 1 = Error Output 2 = Warning Output 3 = Emitted Light Disengageable 4 = Extern Teach 5 = Disabled 6 = Antivalent Switching Output 10 = Acceleration Sensor Reset Input
E3 Pin Function	0x0042	66	0	R/W	Uint8	X		X	3 = Emitted Light Disengageable	3 = Emitted Light Disengageable 4 = Extern Teach 5 = Disabled 10 = Acceleration Sensor Reset Input

Name	Index (hex)	Index (dec)	Sub-index	R/W	Datatype	Data Storage	Dynamic	Modify others	Default value	Range
Digital Outputs										
A1 (SSC, Error or Warning Output)										
A1 On Delay	0x0050	80	0	R/W	Uint16	X			0 ms	0...10.000 ms
A1 Off Delay	0x0060	96	0	R/W	Uint16	X			0 ms	0...10.000 ms
A1 NO/NC	0x0210	528	0	R/W	Uint8	X			P1PY109S01: NC Rest = NO	0 = NO 1 = NC
A1 NPN/PNP/P-P	0x0220	544	0	R/W	Uint8	X			PxPY1x1, PxPY102, PxPY109, P1PY109S01, P2PY105: 0 = PNP PxPY1x3, PxPY104, P2PY106: 1 = NPN	0 = PNP 1 = NPN 2 = Push-Pull
A2 (SSC, Error or Warning Output)										
A2 On Delay	0x0051	81	0	R/W	Uint16	X			0 ms	0...10.000 ms
A2 Off Delay	0x0061	97	0	R/W	Uint16	X			0 ms	0...10.000 ms
A2 Config.Logic	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			PxPY1x1, PxPY102, PxPY109, P1PY109S01, P2PY105: 0 = PNP PxPY1x3, PxPY104, P2PY106: 1 = NPN	0 = PNP 1 = NPN 2 = Push-Pull
Digital Inputs										
E1 (Teach Input or Emitted Light)										
E1 Input Ub Active/Inactive	0x0260	608	0	R/W	Uint8	X			0 = Ub active	0 = Ub Active 1 = Ub Inactive
E2 (Teach Input or Emitted Light)										
E2 Input Ub Active/Inactive	0x0261	609	0	R/W	Uint8	X			0 = Ub active	0 = Ub Active 1 = Ub Inactive
E3 (Teach Input or Emitted Light)										
E3 Input Ub Active/Inactive	0x0262	610	0	R/W	Uint8	X			0 = Ub active	0 = Ub Active 1 = Ub Inactive
Analog Outputs										
O Analog Output (PxPY1x7, PxpY1x8)										
O Analog Teach-In	0x0080	128	0	W	Uint8			X	—	1 = Teach 0 V / 4 mA 2 = Teach 10 V / 20 mA
O Analog 0 V / 4 mA	0x0081	129	0	R/W	Uint16	X			50 mm	P1PY13x: 50...5000 mm Rest: 50...10.000 mm
O Analog 10 V / 20 mA	0x0082	130	0	R/W	Uint16	X			P1PY13x: 5000 mm Rest: 10.000 mm	P1PY13x: 50...5000 mm Rest: 50...10.000 mm
O Analog Substitute Values	0x0084	132	0	R/W	Uint8	X			PxPY1x8: 1 = Enabled PxPY1x7: not available	0 = Disabled 1 = Enabled

Observation

Name	Index (hex)	Index (dec)	Sub-index	R/W	Datatype	Data Storage	Dynamic	Modify others	Default value	Range
Object Information Access	0x1210	4624	0	R/W	UInt8	X			0	0 = Disabled 1 = Enabled
Object Information (only if enabled)										
Object Detection Status	0x1211	4625	1	R	UInt16		X		0	0 = Object 1 ... 3 = Object 4 255 = No Object
Distance Object 1			2	R	Sint16		X		0	50...10.000 mm
Distance Object 2			3	R	Sint16		X		0	-1 = No object detected
Distance Object 3			4	R	Sint16		X		0	-32760 = Too close
Distance Object 4			5	R	Sint16		X		0	32760 = Too far
Signal Object 1			6	R	Sint16		X		0	-1 = No object detected
Signal Object 2			7	R	Sint16		X		0	
Signal Object 3			8	R	Sint16		X		0	
Signal Object 4			9	R	Sint16		X		0	

Diagnosis

Name	Index (hex)	Index (dec)	Sub-index	R/W	Datatype	Data Storage	Dynamic	Modify others	Default value	Range
Status										
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)
Additional Status Information	0x1300	4864	0	R	UInt32		X		0	Value 0 = No Warning / Errors Measurement: Bit 0 = Signal Warning Bit 1 = Contamination optics Bit 2 = Contamination in range Bit 3 = Ambient light to high Bit 4 = Object to Close Bit 5 = Object to Far Bit 6 = No Measurement data Bit 8 = Emitted Light off Other: Bit 17 = Fatal Device Error Bit 18 = Temperature Error Bit 19 = Temperature Warning High Bit 20 = Temperature Warning Low Bit 21 = Analog Output Error (if implemented) Bit 28 = Undervoltage detection Bit 29 = Short Circuit Bit 30 = Acceleration Sensor (if implemented)
Self Check	0x2518	9496	0	R	UInt32		X		—	—

Name	Index (hex)	Index (dec)	Sub-index	R/W	Datatype	Data Storage	Dynamic	Modify others	Default value	Range
Condition Monitoring Configuration										
Process Data Indication										
Indication Error/Warning 1	0x1310	4880	0	R/W	Uint8	X			Signal Warning	31 = No Warning / Error Mapped
Indication Error/Warning 2	0x1311	4881	0	R/W	Uint8	X			Contamination Optic	0 = Signal Warning 1 = Contamination Optic
Indication Error/Warning 3	0x1312	4882	0	R/W	Uint8	X			Ambient Light	2 = Contamination Range 3 = Ambient Light 4 = Object Too Close 5 = Object Too Far 6 = No Measurement Data 8 = Emitted Light Off
Indication Error/Warning 4	0x1313	4883	0	R/W	Uint8	X			P1PY111, P1PY113, P2PYxxx: Acceleration Sensor Rest: Temperature Warning High	17 = Fatal Error 18 = Temperature Error 19 = Temperature Warning High 20 = Temperature Warning Low 21 = Analog Output Error (if implemented) 28 = Undervoltage 29 = Short Circuit 30 = Acceleration Sensor (if implemented)
Warning Output Configuration	0x1314	4884	0	R/W	Uint32	X			•Signal Warning •Contamination optics •Contamination in range •Ambient light to high •Temperature Warning High •Temperature Warning Low •Undervoltage detection	0 = Not use as Warning / Error 1 = Used as Warning / Error Measurement: Bit 0 = Signal Warning Bit 1 = Contamination Optic Bit 2 = Contamination Range Bit 3 = Ambient Light Bit 4 = Object Too Close Bit 5 = Object Too Far Bit 6 = No Measurement Data Bit 8 = Emitted Light Off Other:
Error Output Configuration	0x1315	4885	0	R/W	Uint32	X			•Object to close •Object to far •No Measurement data •Fatal Device Error •Temperature Error •Short Circuit	Bit 17 = Fatal Error Bit 18 = Temperature Error Bit 19 = Temperature Warning High Bit 20 = Temperature Warning Low Bit 21 = Analog Output Error (if implemented) Bit 28 = Undervoltage Bit 29 = Short Circuit Bit 30 = Acceleration Sensor (if implemented)
Acceleration Sensor (P1PY111, P1PY113, P2PYxxx)										
Acceleration Sensor	0x1320	4896	0	R/W	Uint8	X			1 = On	0 = Off 1 = On
Acceleration Threshold	0x1321	4897	0	R/W	Uint16	X			50	1...100 %
Counter	0x1323	4899	0	W	Uint32		X		0	0 = No Event Detected 1... Number of detected Events
Measuring Data Channel										
Lower Limit	0x4080	16512	1	R	Int32				50	50 mm 2,0 1/10 Inch
Upper Limit			2	R	Int32				10.000	10.000 mm 393,7 1/10 Inch
Unit Code			3	R	Uint16				1010 = Meter	1010= Meter 1019 = Inch
Scale			4	R	Int8				- 3/ -1	- 3 = mm - 1 = 1/10 Inch

Name	Index (hex)	Index (dec)	Sub-index	R/W	Datatype	Data Storage	Dynamic	Modify others	Default value	Range
Device Simulation										
Simulation Mode	0x0310	784	0	R/W	Uint8		X		0	0 = Off 1 = On
Device Simulation Enabled (Simulation Mode= 1)										
Simulation Measurement Value	0x0315	789	0	R/W	Uint32		X		65536	0...10.001 measurement value [mm] 10.001 = Too Far 10.002 = No Measurement 65536 = Use Process Value
Simulation SSC1	0x0331	817	0	R/W	Uint8		X		2	0 = Off 1 = Active 2 = Use Process Value
Simulation SSC2	0x0332	818	0	R/W	Uint8		X		2	0 = Off 1 = Active 2 = Use Process Value
Simulation Analog Output Voltage (PxPY107)	0x0316	790	0	R/W	Uint32		X		21, 1	10,1 V = Use Process Value 0,0...10,0 V (values transferred in 1/10 V)
Simulation Analog Output Current (PxPY108)	0x0316	790	0	R/W	Uint32		X		10, 1	21,1 mA = Use Process Value 3,5...21,0 mA (values transferred in 1/10 mA)
Simulation Signal Warning	0x031B	795	0	R/W	Uint8		X		2	0 = Off 1 = Active 2 = Use Process Value
Simulation Contamination Optic	0x031C	796	0	R/W	Uint8		X		2	
Simulation Interference Range	0x031D	797	0	R/W	Uint8		X		2	
Simulation Ambient Light	0x031E	798	0	R/W	Uint8		X		2	
Simulation Fatal Error	0x0323	803	0	R/W	Uint8		X		2	
Simulation Temperature Error	0x0324	804	0	R/W	Uint8		X		2	
Simulation Temperature Warning High	0x0325	805	0	R/W	Uint8		X		2	
Simulation Temperature Warning Low	0x032C	812	0	R/W	Uint8		X		2	
Simulation Analog Output Error (if implemented)	0x0326	806	0	R/W	Uint8		X		PxPY1x7, PxPY1x8: 2 Rest: not available	
Simulation Undervoltage	0x0327	807	0	R/W	Uint8		X		2	
Simulation Short Circuit	0x0328	808	0	R/W	Uint8		X		2	
Simulation Acceleration Sensor (if implemented)	0x0329	809	0	R/W	Uint8		X		P1PY111, P1PY113, P2PYxxx: 2 Rest: not available	

Events

Name	Event Code	Type	Specification
Maintenance required – Cleaning	0x8C40	Notification	IO-Link
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
Acceleration Sensor	0x1801	Warning	wenglor specific