

EN

U1KM00x

Ultrasonic Reflex Sensor



Interface Protocol

IO-Link U1KM00x

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)
U1KM001	0x0000A2	162	00 00 A2	0 0 162
U1KM002	0x0000A3	163	00 00 A3	0 0 163
U1KM003	0x0000A4	164	00 00 A4	0 0 164

IO-Link Information

IO-Link version:	V1.1
Data storage:	Class 1
Block parameters:	Yes
Min. cycle time:	2,3 ms
SIO mode:	Yes
COM mode:	COM3
ISDU:	Yes
Process data input (device to master):	32 Bit
Process data output (master to device):	8 Bit

IO-Link Profiles

Smart Sensor Profile - Measuring Sensor, Type 3.1
Firmware Update
Common Profile: Identification & Diagnosis
Locator
Smart Sensor Profile - Sensor Control

Process Input Data

Process Input Data (Device -> Master)

Subindex	Name	Bit offset	Length	Range
1	Measurement Data Channel (MDC) - Measurement value: Distance	16	Int16	250...3000 mm
2	MDC - Scale	8	8 Bit	-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 out of measurement range and provide information about the measurement:

Measured value = 0x8008 – 32760 Out of range (-)
 0x7FF8 32760 Out of range (+)
 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
	Measured value: 16 bit [0...15]																Scale															

Process Output Data

Master to Device

Subindex	Name	Bit Offset	Length	Range
1	Control Signal Channel (CSC)	0	1 Bit	0 = Emitted signal enabled 1 = Emitted signal disabled
2	Locator	1	1 Bit	0 = Disabled 1 = Enabled
3	Teach SSC1	3	1 Bit	0 -> 1 Start Teach
4	Teach SSC2	4	1 Bit	0 -> 1 Start Teach

	Octet 0							
Subindex				4	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	Modifies others	Default value	Range
Identification										
Vendor name	0x0010	16	0	R	String 32 Byte				wenglor sensoric GmbH	
Vendor text	0x0011	17	0	R	String 32 Byte				the innovative family	
Product name	0x0012	18	0	R	String 32 Byte				U1KM001 U1KM002 U1KM003	
Product ID	0x0013	19	0	R	String 32 Byte				U1KM001 U1KM002 U1KM003	
Product text	0x0014	20	0	R	String 32 Byte				Ultrasonic distance sensor	
Serial number	0x0015	21	0	R	String 9 Byte				-	
Hardware version	0x0016	22	0	R	String 32 Byte				-	
Firmware version	0x0017	23	0	R	String 32 Byte				-	
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			***	
Hardware identification key	0x43BE	17342	0	R	String 32 Byte				-	

Parameters

Name	Index (hex)	Index (dec)	Sub-index	R/W	Data type	Data storage	Dynamic	Modifies others	Default value	Range
General settings										
Device access locks.local parameterization	0x000C	12	3	R/W	Bool	X			0 = unlocked	0 = Local parameterization unlocked 1 = Local parameterization locked
Service functions										
System command	0x0002	2	0	W	UInt8			X	-	Device Reset = 0x80 (128) Application Reset = 0x81 (129) Restore Factory Settings = 0x82 (130) Back-to-box = 0x83 (131)
Measured value settings										
Sensor mode	0x0110	272	0	R/W	UInt8	X		X	0 = Normal	0 = Normal 1 = Synchron 5 = Multiplex master 6 = Multiplex sub
Object detection mode	0x0115	277	0	R/W	UInt8	X			0 = First Object	0 = First Object 1 = Last Object 2 = Best Signal
Detection range near	0x0112	274	0	R/W	UInt16	X			0 = No limitation	250...3000 mm 0 = No limitation
Detection range far	0x0113	275	0	R/W	UInt16	X			10000 = No limitation	250...3000 mm 10000 = No limitation
Filter settings.filter mode	0x00D0	208	0	R/W	UInt8	X			0 = Median	0 = Median Filter 1 = Acceptance Filter 2 = Foreground Filter 3 = Background Filter 4 = Special Weak Signal Filter
Filter settings.filter level	0x00D0	208	1	R/W	UInt8	X			1 = Weak	1 = Weak 2 = Medium 3 = High
Detection threshold	0x0116	278	0	R/W	UInt16	X			30	10 ... 50
Emitted signal	0x00E0	224	0	R/W	UInt8	X			0 = On	0 = On 1 = Off
Sonic cone	0x0111	273	0	R/W	UInt8	X			0 = Standard	0 = Standard 1 = Narrow
Temperature Mode	0x0049	73	0	R/W	UInt8	X		X	0 = Internal	0 = Internal 1 = External
External temperature										
External temperature value (°C)	0x0059	89	0	R/W	Sint8				23	-30...+50 °C
Multiplex master										
Number of multiplex sub-sensors	0x005A	90	0	R/W	UInt8	X			1	1-15
Multiplex sub										
Address of multiplex sub-sensors	0x005B	91	0	R/W	UInt8	X			1	1-15
Switching signal channel 1 - SSC1										
SSC1 Teach-in mode	0x0290	656	0	R/W	UInt8	X		X	0 = Foreground	0 = Foreground 1 = Background 3 = Window
SSC1 Additional hysteresis	0x0300	768	0	R/W	UInt16	X			0 mm	0...500 mm
SSC1 Foreground / Background										
SSC1 Switching point	0x0270	624	0	R/W	UInt16	X			3000 mm	250...3000 mm
SSC1_Window										
SSC1 Switch point near	0x0271	625	0	R/W	UInt16	X			500 mm	250...3000 mm
SSC1 Switch point far	0x0272	626	0	R/W	UInt16	X			750 mm	250...3000 mm

Name	Index (hex)	Index (dec)	Sub-index	R/W	Data type	Data storage	Dynamic	Modifies others	Default value	Range
Switching Signal Channel 2 - SSC2										
SSC2 Teach-in mode	0x0291	657	0	R/W	UInt8	X		X	0 = Foreground	0 = Foreground 1 = Background 3 = Window
SSC2 Additional Hysteresis	0x0301	769	0	R/W	UInt16	X			0 mm	0...500 mm
SSC1 Foreground / Background										
SSC2 Switching point	0x0280	640	0	R/W	UInt16	X			3000 mm	250...3000 mm
SSC2 window (SSC1 teach-in mode = window)										
SSC2 switch point near	0x0281	641	0	R/W	UInt16	X			500 mm	250...3000 mm
SSC2 switch point far	0x0282	642	0	R/W	UInt16	X			750 mm	250...3000 mm
Teach-in										
SSC1 Teach-in	0x0200	512	0	W	UInt8			X		1 = Teach-in Foreground / Background 2 = Teach-in switch point near 3 = Teach-in switch point far
SSC2 Teach-in	0x0201	513	0	W	UInt8			X		1 = Teach-in Foreground / Background 2 = Teach-in switch point near 3 = Teach-in switch point far
Pin function										
I/O1 Pin function	0x0040	64	0	R/W	UInt8	X		X	0 = SSC1 Output	0 = SSC1 Output 1 = Error Output 2 = Warning Output 3 = Emitted Signal Disengageable 5 = Disabled
I/O2 Pin function	0x0041	65	0	R/W	UInt8	X		X	U1KM001 0 = SSC2 Output U1KM002 0 = SSC2 Output U1KM004 6 = Antivalent Switching Output	0 = SSC2 Output 1 = Error Output 2 = Warning Output 4 = Extern Teach 5 = Disabled 6 = Antivalent Switching Output
Digital Outputs										
O1 Settings										
O1 On delay	0x0050	80	0	R/W	UInt16	X			0 ms	0...10,000 ms
O1 Off delay	0x0060	96	0	R/W	UInt16	X			0 ms	0...10,000 ms
O1 NC/NO	0x0210	528	0	R/W	UInt8	X			0 = NO	0 = NO 1 = NC
O1 NPN/PNP/P-P	0x0220	544	0	R/W	UInt8	X			U1KM001 0 = PNP U1KM002 1 = NPN U1KM004 0 = PNP	0 = PNP 1 = NPN 2 = Push-pull
O2 Settings										
O2 On delay	0x0051	81	0	R/W	UInt16	X			0 ms	0 = Ub active 1 = Ub inactive
O2 Off delay	0x0061	97	0	R/W	UInt16	X			0 ms	0 = No action 1 = 0 V 2 = 10 V
O2 NO/NC	0x0211	529	0	R/W	UInt8	X			0 = NO	0 = NO 1 = NC
O2 NPN/PNP/P-P	0x0221	545	0	R/W	UInt8	X			0 = PNP 1 = NPN 0 = PNP	0 = PNP 1 = NPN 2 = Push-Pull

Diagnosis

Name	Index (hex)	Index (dec)	Sub-index	R/W	Data type	Data Storage	Dynamic	Modifies others	Default value	Range
Device Status Information										
Device status	0x0024	36	0	R	Uint8		X		0 = Proper Operation	0 = Proper Operation 1 = Maintenance-Required 2 = Out-of-Specification 3 = Functional-Check 4 = Failure
Detailed device status	0x0025	37	0	R	Array of Octect-StringT3		X		0	Show the current active Events
Additional status information	0x1300	4864	0	R	Uint32		X		0	Value 0 = No Warning / Errors Measurement: Bit 0 = Signal Warning Bit 4 = Out of range (-) Bit 5 = Out of range (+) Bit 6 = No Measurement data Bit 8 = Emitted Signal off Other: Bit 17 = Fatal Device Error Bit 29 = Short Circuit
Self-check	0x2518	9496	0	R	Uint32		X		-	
Service Functions										
System Command	0x0002	2	0	W	Uint8					Locator Start = 0x7E (126) Locator Stop = 0x7F (127)
Condition monitoring configuration										
Process data indication										
Indication error/warning 1	0x1310	4880	0	R/W	Uint8				17 = Fatal device error	31 = No warning / Error mapped Measurement:
Indication error/warning 2	0x1311	4881	0	R/W	Uint8				29 = Short circuit	0 = Signal warning
Indication error/warning 3	0x1312	4882	0	R/W	Uint8				0 = Signal warning	4 = Out of range (-) 5 = Out of range (+) 6 = No measurement data
Indication error/warning 4	0x1313	4883	0	R/W	Uint8				06 = No measurement data	8 = Emitted signal Off Other: 17 = Fatal device error 29 = Short circuit
Warning output configuration										
Warning output configuration	0x1314	4884	0	R/W	Uint32	X			1 = Signal warning	0 = Not used as Warning / Error 1 = Used as Warning / Error
Error output configuration										
Error output configuration	0x1315	4885	0	R/W	Uint32	X			537002048 = No measurement data, fatal device error, short circuit	Measurement: Bit 0 = Signal Warning Bit 4 = Out of range (-) Bit 5 = Out of range (+) Bit 6 = No Measurement Data Bit 8 = Emitted Signal Off Other: Bit 17 = Fatal Device Error Bit 29 = Short Circuit
Measurement data information										
MDC Descr.Lower Value	0x4080	16512	1	R	Int32				250	250 mm
MDC Descr.Upper Value			2	R	Int32				3000	3000 mm
MDC Descr.Unit			3	R	Uint16				1010 = Meter	1010 = Meter
MDC Descr.Scale			4	R	Int8				- 3	10 ⁻³ meters = mm

Name	Index (hex)	Index (dec)	Sub-index	R/W	Data type	Data Storage	Dynamic	Modifies others	Default value	Range
Device simulation										
Simulation mode	0x0310	784	0	R/W	UInt8		X		0 = Off	0 = Off 1 = On
Device simulation enabled (Simulation mode = 1)										
Simulation measured value	0x0315	789	0	R/W	UInt32				65536 = Use process value	250... 3000 measurement value [mm] 10001 = Out of range (+) 10002 = No Measurement data 65536 = Use Process Value
Simulation SSC1	0x0331	817	0	R/W	UInt8				2 = Use process value	0 = Off 1 = Active 2 = Use process values
Simulation SSC2	0x0332	818	0	R/W	UInt8					
Simulation signal warning	0x031B	795	0	R/W	UInt8					
Simulation fatal device error	0x0323	803	0	R/W	UInt8					
Simulation short circuit	0x0328	808	0	R/W	UInt8					

Observation

Name	Index (hex)	Index (dec)	Sub-index	R/W	Data type	Data storage	Dynamic	Modifies others	Default value	Range
Object Information										
Object used for outputs (process data and digital outputs)	0x1211	4625	1	R	UInt16		X			255 = No object detected 1 ... 5 = Object 1 ... 5
Distance Object 1	0x1211	4625	2	R	UInt16		X			0 = No measurement data -32760 = Out of range (-) 32760 = Out of range (+) 250 ... 3000 measurement value [mm]
Distance Object 2	0x1211	4625	3	R	UInt16		X			
Distance Object 3	0x1211	4625	4	R	UInt16		X			
Distance Object 4	0x1211	4625	5	R	UInt16		X			
Distance Object 5	0x1211	4625	6	R	UInt16		X			
Signal Amplitude Object 1	0x1211	4625	7	R	UInt16		X			0 = No measurement data 0 ... 16500 measured signal amplitude
Signal Amplitude Object 2	0x1211	4625	8	R	UInt16		X			
Signal Amplitude Object 3	0x1211	4625	9	R	UInt16		X			
Signal Amplitude Object 4	0x1211	4625	10	R	UInt16		X			
Signal Amplitude Object 5	0x1211	4625	11	R	UInt16		X			
Distance Information										
Minimum Measured Distance	0x1212	4626	0	R	Sint16		X			250... 3000 measurement value [mm]
Minimum Measured Distance	0x1213	4627	0	R	Sint16		X			32760 = Out of range (+) 32764 = No Measurement data- -32760 = Out of range (-)
Reset Distance Information	0x1214	4628	0	R/W	UInt8			X		0 = No action 1 = Reset Min / Max

Events

Name	Event code	Type	Specification
General malfunction – unknown error	0x1000	Error	IO-Link
Short circuit – check installation	0x7710	Error	IO-Link