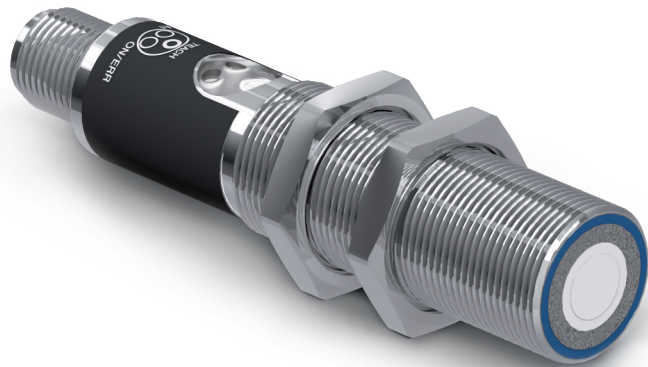


# EN

# U18T001

Ultrasonic Distance Sensor



Interface Protocol

# U18T001

## 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)
U18T001	0x160301	1442561	16 03 01	22 3 1

## IO-Link Information

IO-Link version:	V1.1
Data storage:	Yes
Block parameters:	Yes
Min. cycle time:	3,3 ms
SIO mode:	Yes
COM mode:	COM2
ISDU:	Yes
Process data input (device to master):	32 Bit
Process data output (master to device):	8 Bit

## IO-Link Profiles

Common Profile  
Smart Sensor Profile - Measuring Sensor, Type 3.1  
Function Class Sensor Control (Transducer Disable)  
Firmware Update

# Process Input Data

## Device to Master

Subindex	Name	Bit offset	Length	Range
1	Measured value: Distance in mm Distance in 1/10 inch	16	Int16	50...600 mm 19...236 1/10 inch
2	Scale	8	8 bit	-3 = mm -1 = 1/10 inch
3	Error/warning message 4	7	1 bit	0 = false 1 = true
4	Error/warning message 3	6	1 bit	0 = false 1 = true
5	Error/warning message 2	5	1 bit	0 = false 1 = true
6	Error/warning message 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 point 2	1	1 bit	0 = false 1 = true
10	SSC1 – Switching point 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	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										
	Measured value: 16 bit [0...15]																Scale																									

# Process Output Data

## Master to Device, for Process Data Type “Millimeter/ Inch”

Subindex	Name	Bit offset	Length	Range
1	Emitted Signal	0	1 Bit	0 = Enabled 1 = Disabled
2	Find me	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

# Process Output Data

## Master to Device, for Process Data Type “Millimeter/ Inch + External Temperature”

Subindex	Name	Bit offset	Length	Range
1	External temperature	0	SIInt8	-30...+60 °C

Octet 0								
Subindex	1	1	1	1	1	1	1	
Bit offset	7	6	5	4	3	2	1	0
External temperature								

## Identification

Name	Index (hex)	Index (dec)	Sub-index	R/W	Data type	Data storage	Dynamic	Modifies others	Default value	Range
<b>Identification</b>										
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				U18T001	
Product ID	0x0013	19	0	R	String 32 Byte				U18T001	
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				-	
<b>Tags</b>										
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			***	
<b>Sensor localisation</b>										
Find me	0x1200	4608	0	R/W	String 32 Byte				0 = Off 1 = Blinking	

## Parameters

Name	Index (hex)	Index (dec)	Sub-index	R/W	Data type	Data storage	Dynamic	Modifies others	Default value	Range
<b>Device settings</b>										
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)
Local parameterization locked	0x000C	12	3	R/W	Bool	X			0 = unlocked	1 = Local parameterization locked
<b>Measured value settings</b>										
Sensor mode	0x0110	272	0	R/W	Uint8	X			1 = Synchron	0 = Normal 1 = Synchron 3 = Barrier emitter 4 = Barrier receiver 5 = Multiplex master 6 = Multiplex sub
Filter	0x00D0	208	0	R/W	Uint8	X			0	0...20
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 2 = Extra narrow
Process data type	0x0114	276	0	R/W	Uint8	X		X	0 = Millimeter	0 = Millimeter 1 = Inch 2 = Millimeter (with external temperature) 3 = Inch (with external temperature)
Temperature mode	0x0049	73	0	R/W	Uint8	X			0 = Internal	0 = Internal 1 = External
<b>External temperature</b>										
External temperature value (only if extern by parameter)	0x0059	89	0	R/W	Sint8		X		23	-30...+60 °C
<b>Multiplex master</b>										
Number of multiplex sub-sensors	0x005A	90	0	R/W	Uint8	X			1	1-15
<b>Multiplex Sub</b>										
Address of multiplex sub-sensors	0x005B	91	0	R/W	Uint8	X			1	1-15
<b>Switching point 1 – SSC1</b>										
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...200 mm
<b>SSC1 foreground (teach-in mode = foreground)</b>										
SSC1 switching point	0x0270	624	0	R/W	Uint16	X			600 mm	50...600 mm
<b>SSC1 window (SSC1 teach-in mode = window)</b>										
SSC1 switch point near	0x0271	625	0	R/W	Uint16	X			200 mm	50...600 mm
SSC1 switch point far	0x0272	626	0	R/W	Uint16	X			250 mm	50...600 mm
<b>Switching point 2 – SSC2</b>										
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...200 mm
<b>SSC2 foreground (teach-in mode = foreground)</b>										
SSC2 switching point	0x0280	640	0	R/W	Uint16	X			600 mm	50...600 mm
<b>SSC2 window (SSC1 teach-in mode = window)</b>										
SSC2 switch point near	0x0281	641	0	R/W	Uint16	X			200 mm	50...600 mm
SSC2 switch point far	0x0282	642	0	R/W	Uint16	X			250 mm	50...600 mm

Name	Index (hex)	Index (dec)	Sub-index	R/W	Data type	Data storage	Dynamic	Modifies others	Default value	Range
<b>Teach-in (depending on teach-in mode)</b>										
SSC1 teach-in	0x0200	<b>512</b>	0	W	Uint8			X	0 = No action	0 = No action 1 = Teach-in foreground/background 2 = Teach-in window Switching point near 3 = Teach-in window Switching point far
SSC2 teach-in	0x0201	<b>513</b>	0	W	Uint8			X	0 = No action	0 = No action 1 = Teach-in foreground/background 2 = Teach-in window Switching point near 3 = Teach-in window Switching point far
<b>Pin function</b>										
E/A1 pin function	0x0040	<b>64</b>	0	R/W	Uint8	X		X	0 = Switching output	0 = Switching output SSC1 1 = Error output 2 = Warning output 3 = Emitted signal disengageable 5 = Disabled
E3 pin function	0x0042	<b>66</b>	0	R/W	Uint8	X		X	5 = Disabled	4 = Extern Teach enabled 5 = Extern Teach disabled
<b>Digital Outputs</b>										
<b>A1 (SSC, error/warning output)</b>										
A1 On delay	0x0050	<b>80</b>	0	R/W	Uint16	X			0 ms	0...10,000 ms
A1 Off delay	0x0060	<b>96</b>	0	R/W	Uint16	X			0 ms	0...10,000 ms
A1 NC/NO	0x0210	<b>528</b>	0	R/W	Uint8	X			0 = NO	0 = NO 1 = NC
A1 NPN/PNP/P-P	0x0220	<b>544</b>	0	R/W	Uint8	X			0 = PNP	0 = PNP 1 = NPN 2 = Push-pull
<b>Digital Inputs</b>										
<b>E1 Settings</b>										
E1 Input Ub active/inactive	0x0260	<b>608</b>	0	R/W	Uint8	X			0 = Ub active	0 = Ub active 1 = Ub inactive
<b>Analog Output</b>										
<b>O Analog Output</b>										
Analog Teach-In	0x0080	<b>128</b>	0	W	Uint8			X	0 = No action	0 = No action 1 = 0 V 2 = 10 V
Analog point low (0 V)	0x0081	<b>129</b>	0	R/W	Uint16	X			50 mm	50...600 mm
Analog point high (10 V)	0x0082	<b>130</b>	0	R/W	Uint16	X			600 mm	50...600 mm

## Diagnosis

Name	Index (hex)	Index (dec)	Sub-index	R/W	Data type	Data Storage	Dynamic	Modifies others	Default value	Range
<b>Status</b>										
Device status	0x0024	<b>36</b>	0	R	UInt8		X		0 = Device is OK	0 = Device is OK 1 = maintenance required 2 = out of specification 3 = function check 4 = failure
Detailed device status	0x0025	<b>37</b>	0	R	Array of Octect-StringT3		X		0	Shows upcoming events (4 max.)
Additional status information	0x1300	<b>4864</b>	0	R	UInt32		X		0	Value 0 = no error/warning Measurement: Bit 0 = signal warning Bit 4 = object too close Bit 5 = object too far Bit 6 = no measurement data Bit 8 = emitted signal off Other: Bit 17 = fatal device error Bit 28 = undervoltage detection Bit 29 = short circuit
Self-check	0x2518	<b>9496</b>	0	R	UInt32		X		–	–
<b>Condition monitoring functions</b>										
<b>Process data indication</b>										
Indication error/warning 1	0x1310	<b>4880</b>	0	R/W	UInt8	X			17 = fatal device error	31 = no warning / error mapped Measurement: 0 = signal warning 4 = object too close 5 = object too far 6 = no measurement data 8 = emitted signal off Other: 17 = fatal device error 28 = undervoltage 29 = short circuit
Indication error/warning 2	0x1311	<b>4881</b>	0	R/W	UInt8	X			29 = short circuit	
Indication error/warning 3	0x1312	<b>4882</b>	0	R/W	UInt8	X			28 = undervoltage	
Indication error/warning 4	0x1313	<b>4883</b>	0	R/W	UInt8	X			06 = no measurement data	
Warning output configuration	0x1314	<b>4884</b>	0	R/W	UInt32	X			268435457 = Signal Warning, Undervoltage Detection	0 = not used as warning / error 1 = used as warning / error Measurement: Bit 0 = signal warning Bit 4 = object too close Bit 5 = object too far Bit 6 = no measurement data Bit 8 = emitted signal off Other: Bit 17 = fatal device error Bit 28 = undervoltage Bit 29 = short circuit
Error output configuration	0x1315	<b>4885</b>	0	R/W	UInt32	X			537002048 = No measurement data, fatal device error, short circuit	
<b>Measuring data channel</b>										
Lower limit	0x4080	<b>16512</b>	1	R	Int32				50	50 mm / 19 1/10 inch
Upper limit			2	R	Int32				600	600 mm / 236 1/10 inch
Unit code			3	R	UInt16				1010 = meter	1010 = meter 1019 = inch
Scale			4	R	Int8				–3	10 <sup>-3</sup> meters = mm / 10 <sup>-1</sup> = 1/10 inches

Name	Index (hex)	Index (dec)	Sub-index	R/W	Data type	Data Storage	Dynamic	Modifies others	Default value	Range
<b>Device simulation</b>										
Simulation mode	0x0310	<b>784</b>	0	R/W	Uint8		X		0 = Off	0 = Off 1 = On
<b>Device simulation enabled (Simulation mode = 1)</b>										
Simulation measured value	0x0315	<b>789</b>	0	R/W	Uint32		X		65536 = Use process value	0...600 measurement value [mm] 10001 = Too far 10002 = No measurement 65536 = Use process value
Simulation SSC1	0x0331	<b>817</b>	0	R/W	Uint8		X		2 = Use process value	0 = Off 1 = Active 2 = Use process values
Simulation SSC2	0x0332	<b>818</b>	0	R/W	Uint8		X			
Simulation signal warning	0x031B	<b>795</b>	0	R/W	Uint8		X			
Simulation fatal device error	0x0323	<b>803</b>	0	R/W	Uint8		X			
Simulation undervoltage	0x0327	<b>807</b>	0	R/W	Uint8		X			
Simulation short circuit	0x0328	<b>808</b>	0	R/W	Uint8		X			
Simulation analog output	0x0316	<b>790</b>	0	R/W	Uint8		X		1001 = Use process value	0 = 0 V ... 1000 = 10 V 1001 = Use process value

## Events

Name	Event code	Type	Specification
General malfunction – unknown error	0x1000	Error	IO-Link
Short circuit – check installation	0x7710	Error	IO-Link
Primary supply voltage underrun – check tolerance	0x5111	Warning	IO-Link