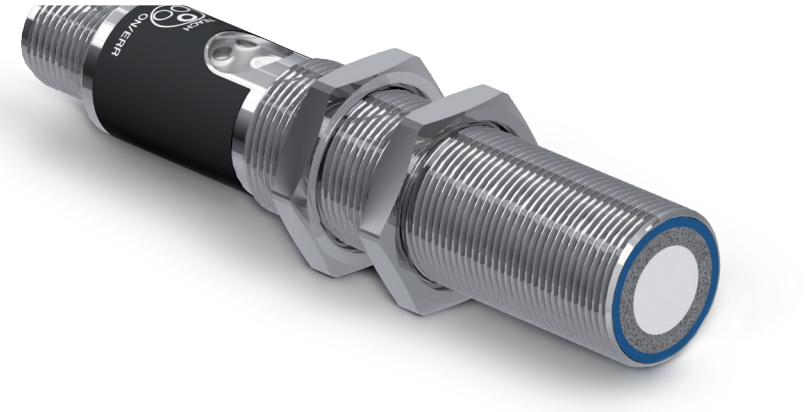
EN

wenglor
the innovative family

# U18T004

## Ultrasonic Distance Sensor



IO-Link

## Interface Protocol

Subject to change without notice
Available as PDF file only
Version 1.1.0
As of: 04/02/2025
www.wenglor.com

# U18T004

## 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) |
|---|---|---|---|---|
| U18T004 | 0x160304 | 1442564 | 16 03 04 | 22 3 4 |

## 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:<br>Distance in mm<br>Distance in 1/10 inch | 16 | Int16 | 100…1,200 mm<br>39...473 1/10 inch |
| 2 | Scale | 8 | 8 bit | –3 = mm<br>–1 = 1/10 inch |
| 3 | Error/warning message 4 | 7 | 1 bit | 0 = false<br>1 = true |
| 4 | Error/warning message 3 | 6 | 1 bit | 0 = false<br>1 = true |
| 5 | Error/warning message 2 | 5 | 1 bit | 0 = false<br>1 = true |
| 6 | Error/warning message 1 | 4 | 1 bit | 0 = false<br>1 = true |
| 7 | Error | 3 | 1 bit | 0 = false<br>1 = true |
| 8 | Warning | 2 | 1 bit | 0 = false<br>1 = true |
| 9 | SSC1 – switching point 2 | 1 | 1 bit | 0 = false<br>1 = true |
| 10 | SSC1 – switching point 1 | 0 | 1 bit | 0 = false<br>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<br>1 = Disabled |
| 2 | Find me | 1 | 1 Bit | 0 = Disabled<br>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 | SInt8 | –30…+60 °C |

| | Octet 0 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Subindex** | **1** | **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 |
|---|---|---|---|---|---|---|---|---|---|---|
| **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 | | | | U18T004 | |
| Product ID | 0x0013 | **19** | 0 | R | String 32 Byte | | | | U18T004 | |
| 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 | | | *** | |
| **Sensor localisation** | | | | | | | | | | |
| Find me | 0x1200 | **4608** | 0 | R/W | String 32 Byte | | | | 0 = Off | 0 = Off<br>1 = Blinking |

## Parameters

| Name | Index (hex) | Index (dec) | Sub-index | R/W | Data type | Data storage | Dynamic | Modifies others | Default value | Range |
|---|---|---|---|---|---|---|---|---|---|---|
| **Device settings** | | | | | | | | | | |
| System command | 0x0002 | **2** | 0 | W | Uint8 | | | X | — | Device reset = 0x80 (128)<br>Application reset = 0x81 (129)<br>Restore factory settings = 0x82 (130)<br>Back to box = 0x83 (131) |
| Local parameterization locked | 0x000C | **12** | 3 | R/W | Bool | X | | | 0 = unlocked | 0 = unlocked<br>1 = Local parameterization locked |
| **Measured value settings** | | | | | | | | | | |
| Sensor mode | 0x0110 | **272** | 0 | R/W | Uint8 | X | | | 1 = Synchron | 0 = Normal<br>1 = Synchron<br>3 = Barrier emitter<br>4 = Barrier receiver<br>5 = Multiplex master<br>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<br>1 = Off |
| Sonic cone | 0x0111 | **273** | 0 | R/W | Uint8 | X | | | 0 = Standard | 0 = Standard<br>1 = Narrow<br>2 = Extra narrow |
| Process data type | 0x0114 | **276** | 0 | R/W | Uint8 | X | | X | 0 = Millimeter | 0 = Millimeter<br>1 = Inch<br>2 = Millimeter (with external temperature)<br>3 = Inch (with external temperature) |
| Temperature mode | 0x0049 | **73** | 0 | R/W | Uint8 | X | | | 0 = Internal | 0 = Internal<br>1 = External |
| **External temperature** | | | | | | | | | | |
| External temperature value (only if extern by parameter) | 0x0059 | **89** | 0 | R/W | Sint8 | | X | | 23 | –30…+60 °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 point 1 – SSC1** | | | | | | | | | | |
| SSC1 teach-in mode | 0x0290 | **656** | 0 | R/W | Uint8 | X | | X | 0 = Foreground | 0 = Foreground<br>1 = Background<br>3 = Window |
| SSC1 additional hysteresis | 0x0300 | **768** | 0 | R/W | Uint16 | X | | | 0 mm | 0...500 mm |
| **SSC1 foreground (teach-in mode = foreground)** | | | | | | | | | | |
| SSC1 switching point | 0x0270 | **624** | 0 | R/W | Uint16 | X | | | 1,200 mm | 100…1,200 mm |
| **SSC1 window (SSC1 teach-in mode = window)** | | | | | | | | | | |
| SSC1 switch point near | 0x0271 | **625** | 0 | R/W | Uint16 | X | | | 500 mm | 100…1,200 mm |
| SSC1 switch point far | 0x0272 | **626** | 0 | R/W | Uint16 | X | | | 600 mm | 100…1,200 mm |
| **Switching point 2 – SSC2** | | | | | | | | | | |
| SSC2 teach-in mode | 0x0291 | **657** | 0 | R/W | Uint8 | X | | X | 0 = Foreground | 0 = Foreground<br>1 = Background<br>3 = Window |
| SSC2 additional hysteresis | 0x0301 | **769** | 0 | R/W | Uint16 | X | | | 0 mm | 0…500 mm |
| **SSC2 foreground (teach-in mode = foreground)** | | | | | | | | | | |
| SSC2 switching point | 0x0280 | **640** | 0 | R/W | Uint16 | X | | | 1,200 mm | 100…1,200 mm |
| **SSC2 window (SSC1 teach-in mode = window)** | | | | | | | | | | |
| SSC2 switch point near | 0x0281 | **641** | 0 | R/W | Uint16 | X | | | 500 mm | 100…1,200 mm |
| SSC2 switch point far | 0x0282 | **642** | 0 | R/W | Uint16 | X | | | 600 mm | 100…1,200 mm |

| Name | Index (hex) | Index (dec) | Sub-index | R/W | Data type | Data storage | Dynamic | Modifies others | Default value | Range |
|---|---|---|---|---|---|---|---|---|---|---|
| **Teach-in (depending on teach-in mode)** | | | | | | | | | | |
| SSC1 teach-in | 0x0200 | **512** | 0 | W | Uint8 | | | X | 0 = No action | 0 = No action<br>1 = Teach-in foreground/ background<br>2 = Teach-in window Switching point near<br>3 = Teach-in window Switching point far |
| SSC2 teach-in | 0x0201 | **513** | 0 | W | Uint8 | | | X | 0 = No action | 0 = No action<br>1 = Teach-in foreground/ background<br>2 = Teach-in window Switching point near<br>3 = Teach-in window Switching point far |
| **Pin function** | | | | | | | | | | |
| E/A1 pin function | 0x0040 | **64** | 0 | R/W | Uint8 | X | | X | 0 = Switching output | 0 = Switching output SSC1<br>1 = Error output<br>2 = Warning output<br>3 = Emitted signal disengageable<br>5 = Disabled |
| E3 pin function | 0x0042 | **66** | 0 | R/W | Uint8 | X | | X | 5 = Disabled | 4 = Extern Teach enabled<br>5 = Extern Teach disabled |
| **Digital outputs** | | | | | | | | | | |
| **A1 (SSC, error/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 NC/NO | 0x0210 | **528** | 0 | R/W | Uint8 | X | | | 0 = NO | 0 = NO<br>1 = NC |
| A1 NPN/PNP/P-P | 0x0220 | **544** | 0 | R/W | Uint8 | X | | | 0 = PNP | 0 = PNP<br>1 = NPN<br>2 = Push-pull |
| **Digital inputs** | | | | | | | | | | |
| **E1 settings** | | | | | | | | | | |
| E1 Input Ub active/inactive | 0x0260 | **608** | 0 | R/W | Uint8 | X | | | 0 = Ub active | 0 = Ub active<br>1 = Ub inactive |
| **Analog output** | | | | | | | | | | |
| **O Analog output** | | | | | | | | | | |
| Analog Teach-In | 0x0080 | **128** | 0 | W | Uint8 | | | X | 0 = No action | 0 = No action<br>1 = 4 mA<br>2 = 20 mA |
| Analog point low (4 mA) | 0x0081 | **129** | 0 | R/W | Uint16 | X | | | 100 mm | 100…1,200 mm |
| Analog point high (20 mA) | 0x0082 | **130** | 0 | R/W | Uint16 | X | | | 1,200 mm | 100…1,200 mm |
| Analog substitution values | 0x0084 | **132** | 0 | R/W | Uint8 | X | | | 0 = Off | 0 = Off<br>1 = On |

## Diagnosis

| Name | Index (hex) | Index (dec) | Sub-index | R/W | Data type | Data storage | Dynamic | Modifies others | Default value | Range |
|---|---|---|---|---|---|---|---|---|---|---|
| **Status** | | | | | | | | | | |
| Device status | 0x0024 | **36** | 0 | R | Uint8 | | X | | 0 = Device is OK | 0 = Device is OK<br>1 = Maintenance required<br>2 = Out of specification<br>3 = Function check<br>4 = Failure |
| Detailed device status | 0x0025 | **37** | 0 | R | Array of Octect-StringT3 | | X | | 0 | Shows upcoming events (4 max.) |
| Additional status information | 0x1300 | **4864** | 0 | R | Uint32 | | X | | 0 | Value 0 = No error/warning<br>Measurement:<br>Bit 0 = Signal warning<br>Bit 4 = Object too close<br>Bit 5 = Object too far<br>Bit 6 = No measurement data<br>Bit 8 = Emitted signal off<br>Other:<br>Bit 17 = Fatal device error<br>Bit 28 = Undervoltage detection<br>Bit 29 = Short circuit |
| Self-check | 0x2518 | **9496** | 0 | R | Uint32 | | X | | – | – |
| **Condition monitoring functions** | | | | | | | | | | |
| **Process data indication** | | | | | | | | | | |
| Indication error/warning 1 | 0x1310 | **4880** | 0 | R//W | Uint8 | X | | | 17 = Fatal device error | 31 = No warning / error mapped<br>Measurement:<br>0 = Signal warning<br>4 = Object too close<br>5 = Object too far<br>6 = No measurement data<br>8 = Emitted signal off<br>Other:<br>17 = Fatal device error<br>28 = Undervoltage<br>29 = Short circuit |
| Indication error/warning 2 | 0x1311 | **4881** | 0 | R//W | Uint8 | X | | | 29 = Short circuit | |
| Indication error/warning 3 | 0x1312 | **4882** | 0 | R//W | Uint8 | X | | | 28 = Undervoltage | |
| Indication error/warning 4 | 0x1313 | **4883** | 0 | R//W | Uint8 | X | | | 06 = No Measure-ment Data | |
| Warning output configuration | 0x1314 | **4884** | 0 | R//W | Uint32 | X | | | 268435457 = Signal warning, undervoltage detection | 0 = Not used as warning / error<br>1 = Used as warning / error<br><br>Measurement:<br>Bit 0 = Signal warning<br>Bit 4 = Object too close<br>Bit 5 = Object too far<br>Bit 6 = No measurement data<br>Bit 8 = Emitted signal off<br>Other:<br>Bit 17 = Fatal device error<br>Bit 28 = Undervoltage<br>Bit 29 = Short circuit |
| Error output configuration | 0x1315 | **4885** | 0 | R//W | Uint32 | X | | | 537002048 = No measurement data, fatal device error, short circuit | |
| **Measuring data channel** | | | | | | | | | | |
| Lower limit | 0x4080 | **16512** | 1 | R | Int32 | | | | 100 | 100 mm / 39 1/10 inch |
| Upper limit | | | 2 | R | Int32 | | | | 1,200 | 1,200 mm / 473 1/10 inch |
| Unit code | | | 3 | R | Uint16 | | | | 1010 = Meter | 1010 = Meter<br>1019 = Inch |
| Scale | | | 4 | R | Int8 | | | | – 3 | $10^{-3}$ meters = mm / $10^{-1}$ = 1/10 inches |

| 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<br>1 = On |
| **Device simulation enabled (simulation mode = 1)** | | | | | | | | | | |
| Simulation measured value | 0x0315 | **789** | 0 | R/W | Uint32 | | X | | 65536 = Use process value | 0…1,200 measurement value [mm]<br>10001 = Too far<br>10002 = No measurement<br>65536 = Use process value |
| Simulation SSC1 | 0x0331 | **817** | 0 | R/W | Uint8 | | X | | 2 = Use process value | 0 = Off<br>1 = Active<br>2 = Use process values |
| Simulation SSC2 | 0x0332 | **818** | 0 | R/W | Uint8 | | X | | | |
| Simulation signal warning | 0x031B | **795** | 0 | R/W | Uint8 | | X | | | |
| Simulation fatal device error | 0x0323 | **803** | 0 | R/W | Uint8 | | X | | | |
| Simulation undervoltage | 0x0327 | **807** | 0 | R/W | Uint8 | | X | | | |
| Simulation short circuit | 0x0328 | **808** | 0 | R/W | Uint8 | | X | | | |
| Simulation analog output | 0x0316 | **790** | 0 | R/W | Uint8 | | X | | 1001 = Use process value | 0 = 4 mA…1000 = 20 mA<br>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 |