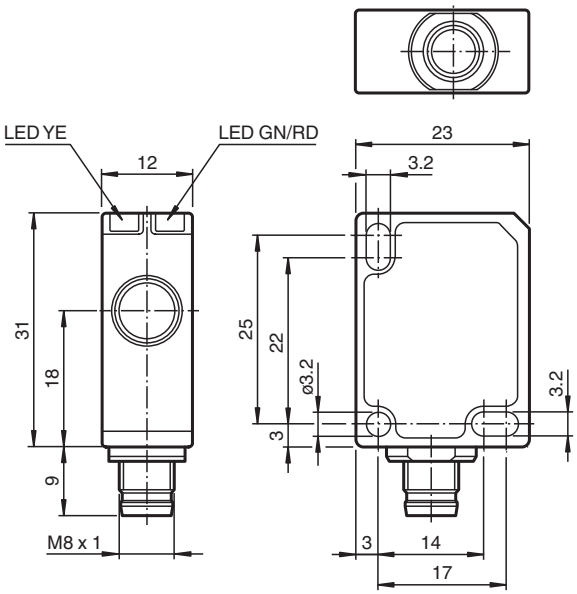
# Ultrasonic sensor

## UC250-F77-EP-IO-V31

- IO-Link interface for service and process data
- Programmable via DTM with PACTWARE
- Continuous distance value via IO-Link process data
- Selectable sound lobe width
- Synchronization options
- Temperature compensation
- Push-pull output

Single head system

## Dimensions




## Technical Data

| | | |
|---|---|---|
| **General specifications** | | |
| Sensing range | | 20 ... 250 mm |
| Adjustment range | | 25 ... 250 mm |
| Dead band | | 0 ... 20 mm |
| Standard target plate | | 10 mm x 10 mm |
| Transducer frequency | | approx. 400 kHz |
| Response delay | | minimum : 8 ms<br>factory setting: 29 ms |
| Sensor cycle time | | ≥ 8 ms (factory setting) ;<br>programmable to 60 s |
| **Memory** | | |

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## Technical Data

| | | |
|---|---|---|
| Non-volatile memory | | EEPROM |
| Write cycles | | 300000 |
| **Indicators/operating means** | | |
| LED green | | solid: power on<br>flashing: standby mode or IO-Link communication |
| LED yellow | | solid: object in evaluation range<br>flashing: switch point programming, object detected |
| LED red | | solid: error<br>flashing: switch point programming, object not detected |
| **Electrical specifications** | | |
| Operating voltage | $U_B$ | 10 ... 30 V DC , ripple 10 %$_{SS}$ |
| No-load supply current | $I_0$ | ≤ 40 mA |
| Power consumption | $P_0$ | ≤ 400 mW |
| Time delay before availability | $t_v$ | ≤ 300 ms |
| **Interface** | | |
| Interface type | | IO-Link (via C/Q = Pin 4) |
| IO-Link revision | | 1.1 |
| Device profile | | Smart Sensor |
| Device ID | | 0x300300 (3146496) |
| Transfer rate | | COM2 (38.4 kBit/s) |
| Min. cycle time | | 2.3 ms |
| Process data width | | 16 bit |
| SIO mode support | | yes |
| Compatible master port type | | A |
| **Input/Output** | | |
| Input/output type | | 1 synchronization connection, bidirectional |
| 0 Level | | 0 ... 1 V |
| 1 Level | | 2.5 V ... $U_B$ |
| Input impedance | | > 22 kΩ |
| Output rated operating current | | current source < 2.5 mA |
| Pulse length | | ≥ 1 ms with external control, low active |
| Synchronization frequency | | |
| Common mode operation | | ≤ 141 Hz |
| Multiplex operation | | ≤ 141 Hz / n , n = number of sensors , n ≤ 10 |
| **Output** | | |
| Output type | | 1 push-pull (4 in 1) output, short-circuit protected, reverse polarity protected |
| Rated operating current | $I_e$ | 100 mA , short-circuit/overload protected |
| Voltage drop | $U_d$ | ≤ 2.5 V |
| Repeat accuracy | | ≤ ± 0.1 % of full-scale value |
| Switching frequency | f | factory setting: 20 Hz programmable max. 45 Hz |
| Range hysteresis | H | 1 % of the adjusted operating range (default settings), programmable , min. 1 mm |
| Temperature influence | | ≤ ± 0.75 % of the end value (with temperature compensation) from 10 minutes after switching on the sensor ; 0.17 %/K (without temperature compensation) |
| **Compliance with standards and directives** | | |
| Standard conformity | | |
| Standards | | EN IEC 60947-5-2:2020<br>IEC 60947-5-2:2019<br>IEC 61131-9:2013 |
| **Approvals and certificates** | | |
| UL approval | | cULus Listed, Class 2 Power Source |
| CCC approval | | CCC approval / marking not required for products rated ≤36 V |
| **Ambient conditions** | | |
| Ambient temperature | | -25 ... 70 °C (-13 ... 158 °F) |
| Storage temperature | | -40 ... 85 °C (-40 ... 185 °F) |
| **Mechanical specifications** | | |

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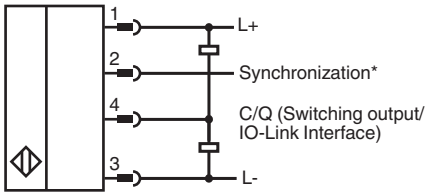
## Technical Data

| | | |
|---|---|---|
| Connection type | | Connector plug M8 x 1 , 4-pin |
| Degree of protection | | IP67 |
| Material | | |
| Housing | | Polycarbonate |
| Transducer | | epoxy resin/hollow glass sphere mixture; polyurethane foam |
| Installation position | | any position |
| Mass | | 9 g |
| Tightening torque, fastening screws | | max. 0.2 Nm |
| **Factory settings** | | |
| Output | | near switch point: 25 mm<br>far switch point: 250 mm<br>Output mode: Window mode<br>Output logic: normally open |
| Beam width | | wide |

## Connection




*if not used connect to ground (0V)

## Connection Assignment


Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |

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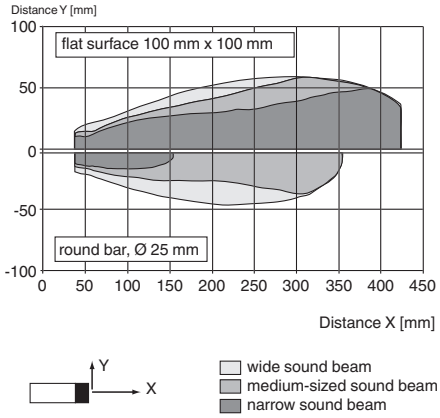
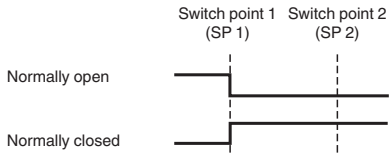
## Characteristic Curve

### Characteristic response curve

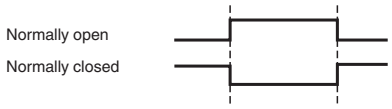



### Switching output modes

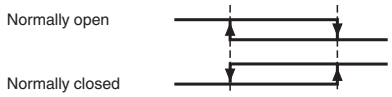
1. Switch point mode



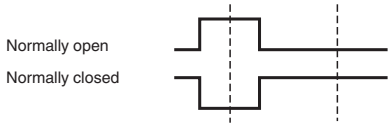

2. Window mode




3. Hysteresis mode




4. Retroreflective mode




## Accessories

| | | |
|---|---|---|
|  | **V31-GM-2M-PVC** | Female cordset single-ended M8 straight A-coded, 4-pin, PVC cable grey |
|  | **V31-GM-1M-PVC-V1-G** | Cordset M8 socket straight to M12 plug straight A-coded, 4-pin, PVC cable grey |
|  | **OMH-ML7-01** | Mounting aid for ML7 and ML8 series, Mounting bracket |
|  | **OMH-ML7-02** | Mounting aid for ML7 and ML8 series, Mounting bracket |
|  | **ICE2-8IOL-G65L-V1D** | EtherNet/IP IO-Link master with 8 inputs/outputs |

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## Accessories

| | | |
|---|---|---|
|  | **ICE3-8IOL-G65L-V1D** | PROFINET IO IO-Link master with 8 inputs/outputs |
|  | **ICE1-8IOL-G30L-V1D** | Ethernet IO-Link module with 8 inputs/outputs |
|  | **ICE1-8IOL-G60L-V1D** | Ethernet IO-Link module with 8 inputs/outputs |
|  | **ICE2-8IOL-K45P-RJ45** | EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, push-in connectors |
|  | **ICE2-8IOL-K45S-RJ45** | EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, screw terminal |
|  | **ICE3-8IOL-K45P-RJ45** | PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, push-in terminals |
|  | **ICE3-8IOL-K45S-RJ45** | PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, screw terminal |
|  | **IO-Link-Master02-USB** | IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection |

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## Function

### Adjustment possibilities

The sensor features a switching output with 2 programmable switch points. Programming the switch points, the output mode, the output logic and the beam width can be done in two different ways:

- Using the sensor's programming button
- Using the IO-link interface of the sensor. This method requires an IO-link master (e.g. IO-link-Master02-USB) and the associated software. The download link is available on the product page for the sensor at www.pepperl-fuchs.

### Synchronization

The sensor features a synchronization input for suppressing ultrasonic mutual interference („cross talk").
The following synchronization modes are available:

1. Automatic multiplex mode.
2. Automatic common mode
3. Externally controlled synchronization

### Further Documentation

- For information on programming via programming button and synchronisation you may refer to the commissioning instruction.
- For detailed information on application and programming via IO-Link we provide a manual.

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