



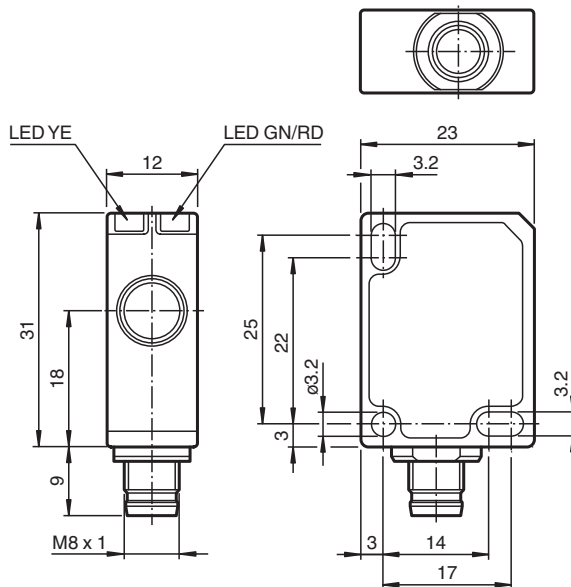
## Ultrasonic sensor UC400-F77-EP-IO-V31

- 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         | 30 ... 400 mm                                       |
| Adjustment range      | 40 ... 400 mm                                       |
| Dead band             | 0 ... 30 mm                                         |
| Standard target plate | 20 mm x 20 mm                                       |
| Transducer frequency  | approx. 310 kHz                                     |
| Response delay        | minimum : 10 ms<br>factory setting: 37 ms           |
| Sensor cycle time     | ≥ 10 ms (factory setting) ;<br>programmable to 60 s |

#### Memory

Release date: 2022-12-05 Date of issue: 2022-12-05 Filename: 261243\_eng.pdf

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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## Technical Data

|                                                 |       |                                                                                                                                                        |
|-------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Non-volatile memory                             |       | EEPROM                                                                                                                                                 |
| Write cycles                                    |       | 300000                                                                                                                                                 |
| <b>Indicators/operating means</b>               |       |                                                                                                                                                        |
| 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                                                                                |
| <b>Electrical specifications</b>                |       |                                                                                                                                                        |
| Operating voltage                               | $U_B$ | 10 ... 30 V DC, ripple 10 % <sub>SS</sub>                                                                                                              |
| No-load supply current                          | $I_0$ | ≤ 40 mA                                                                                                                                                |
| Power consumption                               | $P_0$ | ≤ 400 mW                                                                                                                                               |
| Time delay before availability                  | $t_v$ | ≤ 300 ms                                                                                                                                               |
| <b>Interface</b>                                |       |                                                                                                                                                        |
| Interface type                                  |       | IO-Link (via C/Q = Pin 4)                                                                                                                              |
| IO-Link revision                                |       | 1.1                                                                                                                                                    |
| Device profile                                  |       | Smart Sensor                                                                                                                                           |
| Device ID                                       |       | 0x300301 (3146497)                                                                                                                                     |
| 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                                                                                                                                                      |
| <b>Input/Output</b>                             |       |                                                                                                                                                        |
| 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                           |       | ≤ 109 Hz                                                                                                                                               |
| Multiplex operation                             |       | ≤ 109 Hz / n, n = number of sensors, n ≤ 10                                                                                                            |
| <b>Output</b>                                   |       |                                                                                                                                                        |
| 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: 16 Hz programmable max. 35 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) |
| <b>Compliance with standards and directives</b> |       |                                                                                                                                                        |
| Standard conformity                             |       |                                                                                                                                                        |
| Standards                                       |       | EN IEC 60947-5-2:2020<br>IEC 60947-5-2:2019<br>IEC 61131-9:2013                                                                                        |
| <b>Approvals and certificates</b>               |       |                                                                                                                                                        |
| UL approval                                     |       | cULus Listed, Class 2 Power Source                                                                                                                     |
| CCC approval                                    |       | CCC approval / marking not required for products rated ≤ 36 V                                                                                          |
| <b>Ambient conditions</b>                       |       |                                                                                                                                                        |
| Ambient temperature                             |       | -25 ... 70 °C (-13 ... 158 °F)                                                                                                                         |
| Storage temperature                             |       | -40 ... 85 °C (-40 ... 185 °F)                                                                                                                         |
| <b>Mechanical specifications</b>                |       |                                                                                                                                                        |

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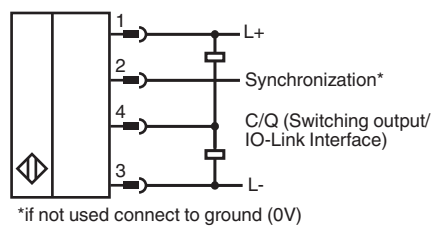
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Technical Data

|                                     |                                                                                                                 |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| 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: 40 mm<br>far switch point: 400 mm<br>Output mode: Window mode<br>Output logic: normally open |
| Beam width                          | wide                                                                                                            |

Connection



Connection Assignment



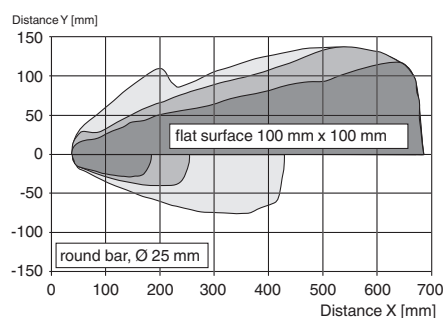
Wire colors in accordance with EN 60947-5-2

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

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## Characteristic Curve

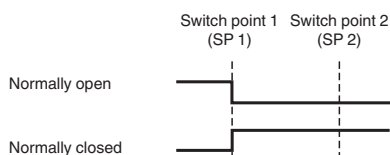
### Characteristic response curve



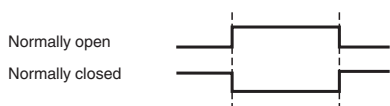
wide sound beam  
 medium-sized sound beam  
 narrow sound beam

### Switching output modes

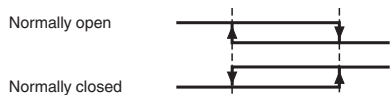
#### 1. Switch point mode



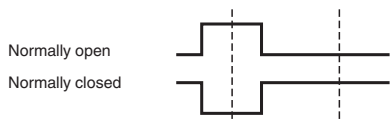
#### 2. Window mode



#### 3. Hysteresis mode



#### 4. Retroreflective mode



## Accessories

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

## Accessories

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

## 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.com](http://www.pepperl-fuchs.com).

### 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.