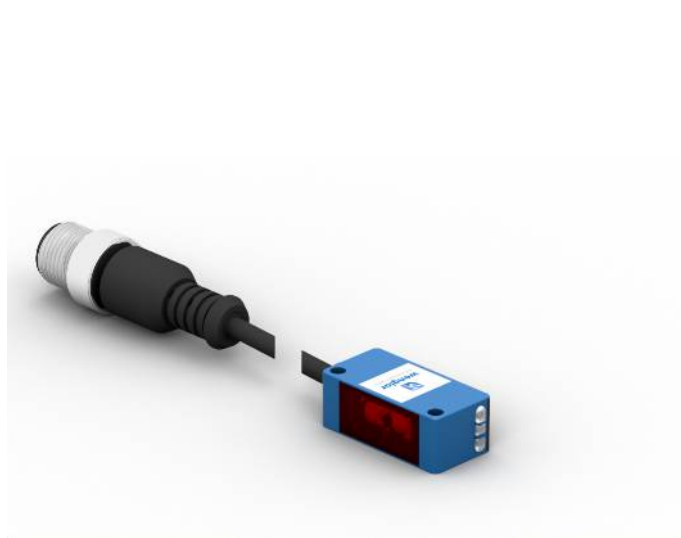


# Laser Distance Sensor

Time of Flight

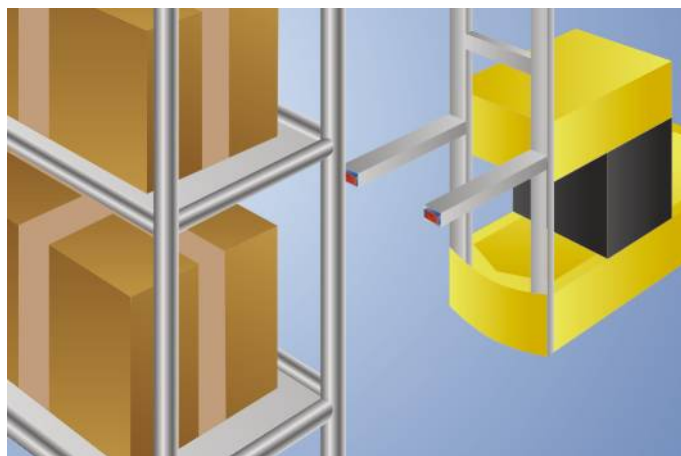
## P1KY102 LASER

Part Number



- 2 mutually independent switching outputs
- IO-Link interface
- Large working range
- Miniature design

The high-performance distance sensor with compact format accurately determines distance between the sensor and the object on the basis of transit time measurement. Two mutually independent switching outputs and the intelligent IO-Link interface permit multifunctional use for precisely ascertaining distance to an object, or for detecting the object at any two switching points. A large working range of 0 to 1500 mm ensures top performance with a miniature format and flexibility where range is concerned. Thanks to laser class 1, the sensor's laser beam is harmless for the human eye.



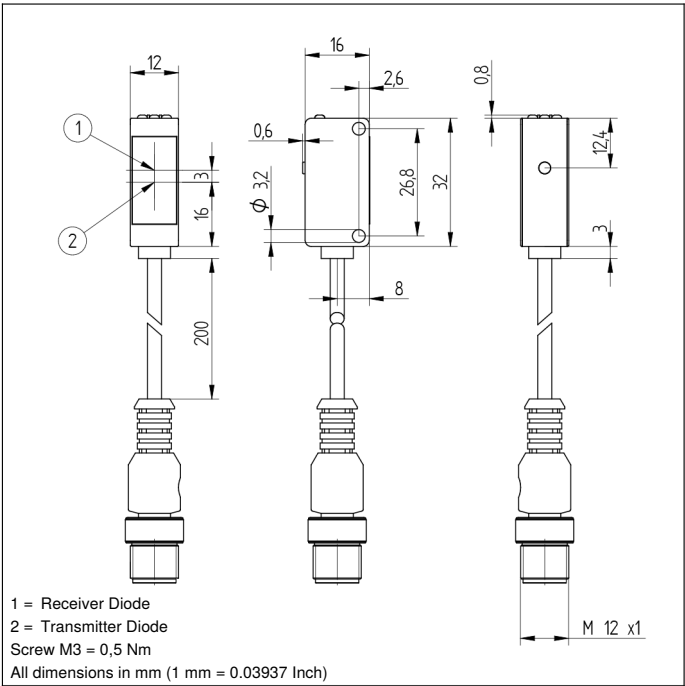
### Technical Data

| Optical Data                                |                  |
|---------------------------------------------|------------------|
| Working Range                               | 0...1500 mm      |
| Setting Range                               | 50...1500 mm     |
| Switching Hysteresis                        | < 30 mm          |
| Light Source                                | Laser (infrared) |
| Wavelength                                  | 940 nm           |
| Service Life (T = +25 °C)                   | 100000 h         |
| Laser Class (EN 60825-1)                    | 1                |
| Max. Ambient Light                          | 10000 Lux        |
| Light Spot Diameter                         | see Table 1      |
| Electrical Data                             |                  |
| Supply Voltage                              | 10...30 V DC     |
| Supply Voltage with IO-Link                 | 18...30 V DC     |
| Current Consumption (U <sub>b</sub> = 24 V) | < 15 mA          |
| Switching Frequency                         | 10 Hz            |
| Response Time                               | < 36 ms          |
| Temperature Drift                           | < 2,5 %          |
| Temperature Range                           | -40...60 °C      |
| Number of Switching Outputs                 | 2                |
| Switching Output Voltage Drop               | < 2,5 V          |
| Switching Output/Switching Current          | 100 mA           |
| Residual Current Switching Output           | < 50 µA          |
| Short Circuit Protection                    | yes              |
| Reverse Polarity Protection                 | yes              |
| Overload Protection                         | yes              |
| Lockable                                    | yes              |
| Interface                                   | IO-Link V1.1     |
| Protection Class                            | III              |
| FDA Accession Number                        | 1720547-001      |
| Mechanical Data                             |                  |
| Setting Method                              | Teach-In         |
| Housing Material                            | Plastic          |
| Optic Cover                                 | PMMA             |
| Degree of Protection                        | IP67/IP68        |
| Connection                                  | M12 × 1; 4-pin   |
| Cable Length                                | 200 mm           |
| Safety-relevant Data                        |                  |
| MTTFd (EN ISO 13849-1)                      | 2266,52 a        |
| PNP NC, PNP NO                              | ●                |
| IO-Link                                     | ●                |
| Connection Diagram No.                      | 223              |
| Control Panel No.                           | A23              |
| Suitable Connection Equipment No.           | 2                |
| Suitable Mounting Technology No.            | 400              |

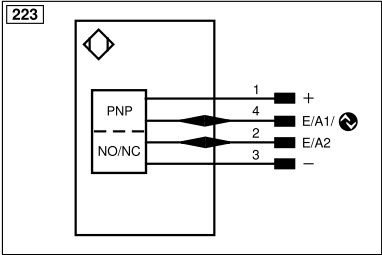
\* Temperature range with permanently installed cable, bending radius: > 20 mm

### Complementary Products

IO-Link Master  
Software



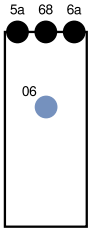
1 = Receiver Diode  
2 = Transmitter Diode  
Screw M3 = 0,5 Nm  
All dimensions in mm (1 mm = 0.03937 Inch)



| Legend    |                                            |                                        |                                |
|-----------|--------------------------------------------|----------------------------------------|--------------------------------|
| +         | Supply Voltage +                           | nc                                     | Not connected                  |
| -         | Supply Voltage 0 V                         | U                                      | Test Input                     |
| ~         | Supply Voltage (AC Voltage)                | Ū                                      | Test Input inverted            |
| A         | Switching Output (NO)                      | W                                      | Trigger Input                  |
| Ā         | Switching Output (NC)                      | W-                                     | Ground for the Trigger Input   |
| V         | Contamination/Error Output (NO)            | O                                      | Analog Output                  |
| ȳ         | Contamination/Error Output (NC)            | O-                                     | Ground for the Analog Output   |
| E         | Input (analog or digital)                  | BZ                                     | Block Discharge                |
| T         | Teach Input                                | Amv                                    | Valve Output                   |
| Z         | Time Delay (activation)                    | a                                      | Valve Control Output +         |
| S         | Shielding                                  | b                                      | Valve Control Output 0 V       |
| RxD       | Interface Receive Path                     | SY                                     | Synchronization                |
| TxD       | Interface Send Path                        | SY-                                    | Ground for the Synchronization |
| RDY       | Ready                                      | E+                                     | Receiver-Line                  |
| GND       | Ground                                     | S+                                     | Emitter-Line                   |
| CL        | Clock                                      | ±                                      | Grounding                      |
| E/A       | Output/Input programmable                  | SnR                                    | Switching Distance Reduction   |
| IO-Link   | IO-Link                                    | Rx+/-                                  | Ethernet Receive Path          |
| PoE       | Power over Ethernet                        | Tx+/-                                  | Ethernet Send Path             |
| IN        | Safety Input                               | Bus                                    | Interfaces-Bus A(+)/B(-)       |
| OSSD      | Safety Output                              | La                                     | Emitted Light disengageable    |
| Signal    | Signal Output                              | Mag                                    | Magnet activation              |
| BI_D+/-   | Ethernet Gigabit bidirect. data line (A-D) | RES                                    | Input confirmation             |
| ENo RS422 | Encoder 0-pulse 0/0 (TTL)                  | EDM                                    | Contact Monitoring             |
| PT        | Platinum measuring resistor                | ENARIS422                              | Encoder A/Ā (TTL)              |
|           |                                            | ENBRIS422                              | Encoder B/B̄ (TTL)             |
|           |                                            | ENA                                    | Encoder A                      |
|           |                                            | ENB                                    | Encoder B                      |
|           |                                            | AMIN                                   | Digital output MIN             |
|           |                                            | AMAX                                   | Digital output MAX             |
|           |                                            | ACK                                    | Digital output OK              |
|           |                                            | SY In                                  | Synchronization In             |
|           |                                            | SY OUT                                 | Synchronization OUT            |
|           |                                            | OLT                                    | Brightness output              |
|           |                                            | M                                      | Maintenance                    |
|           |                                            | rsv                                    | Reserved                       |
|           |                                            | Wire Colors according to DIN IEC 60757 |                                |
|           |                                            | BK                                     | Black                          |
|           |                                            | BN                                     | Brown                          |
|           |                                            | RD                                     | Red                            |
|           |                                            | OG                                     | Orange                         |
|           |                                            | YE                                     | Yellow                         |
|           |                                            | GN                                     | Green                          |
|           |                                            | BU                                     | Blue                           |
|           |                                            | VT                                     | Violet                         |
|           |                                            | GY                                     | Grey                           |
|           |                                            | WH                                     | White                          |
|           |                                            | PK                                     | Pink                           |
|           |                                            | GNYE                                   | Green/Yellow                   |

### Ctrl. Panel

A 23



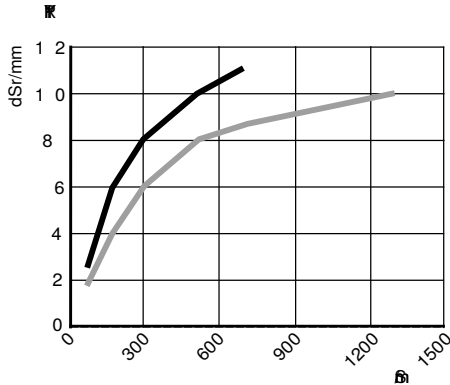
06 = Teach Button  
5a = Switching Status Display, O1  
68 = supply voltage indicator  
6a = Switching Status Display, O2

Table 1

| Working Distance    | 350 mm | 700 mm | 1500 mm |
|---------------------|--------|--------|---------|
| Light Spot Diameter | 14 mm  | 25 mm  | 42 mm   |

### Switching Distance Deviation

Typical characteristic curve based on white, 90 % remission



Sr = Switching Distance  
dSr = Switching Distance Change  
— black 6 % remission  
— grey 18 % remission

