# Reflex Sensor
**with Background Suppression**

# P1PH303
Part Number

PNG smart

- **Condition monitoring**
- **IO-Link 1.1**
- **Low switching distance deviation for black/white**
- **Reliably detect objects against any background**

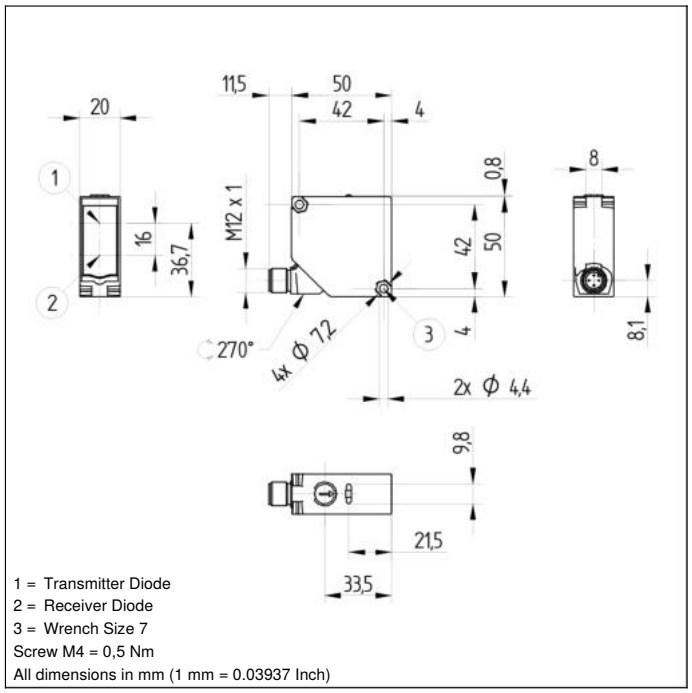
The reflex sensor with background suppression works with red light according to the angle measurement principle and is designed to detect objects against any background. The sensor always has the same switching distance, regardless of the color, shape and surface of the objects. The sensor detects minimal height differences and, for example, differentiates reliably various parts from each other. The IO-Link interface can be used to configure the reflex sensors (PNP/NPN, NC/NO, switching distance), as well as for reading out switching statuses and distance values.


## Technical Data

| | |
|---|---|
| **Optical Data** | |
| Range | 500 mm |
| Adjustable Range | 50...500 mm |
| Switching Hysteresis | < 5 % |
| Light Source | Red Light |
| Service Life (T = +25 °C) | 100000 h |
| Max. Ambient Light | 10000 Lux |
| Light Spot Diameter | see Table 1 |
| **Electrical Data** | |
| Supply Voltage | 15...30 V DC |
| Supply Voltage with IO-Link | 18...30 V DC |
| Current Consumption (Ub = 24 V) | < 20 mA |
| Switching Frequency | 800 Hz |
| Switching Frequency (interference-free mode) | 500 Hz |
| Response Time | 1,25 ms |
| Response time (interference-free mode) | 2 ms |
| Temperature Drift | < 5 % |
| Temperature Range | -40...60 °C |
| Switching Output Voltage Drop | < 2 V |
| Switching Output/Switching Current | 100 mA |
| Short Circuit Protection | yes |
| Reverse Polarity Protection | yes |
| Overload Protection | yes |
| Interface | IO-Link V1.1 |
| Protection Class | III |
| **Mechanical Data** | |
| Setting Method | Potentiometer |
| Housing Material | Plastic |
| Degree of Protection | IP67/IP68 |
| Connection | M12 × 1; 4-pin |
| Optic Cover | PMMA |
| NPN NO/NC antivalent | ● |
| IO-Link | ● |
| Connection Diagram No. | 213 |
| Control Panel No. | A32 |
| Suitable Connection Equipment No. | 2 |
| Suitable Mounting Technology No. | 380 |

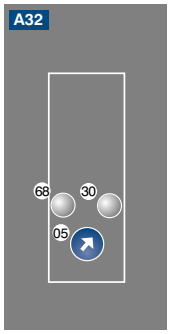
## Complementary Products

| |
|---|
| IO-Link Master |
| Set Protective Housing Z1PS001 |
| Software |

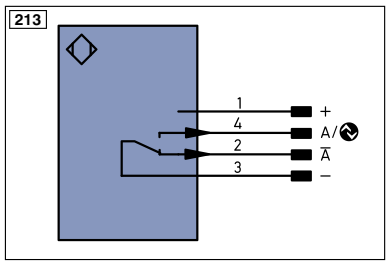



1 = Transmitter Diode
2 = Receiver Diode
3 = Wrench Size 7
Screw M4 = 0,5 Nm
All dimensions in mm (1 mm = 0.03937 Inch)

## Ctrl. Panel




05 = Switching Distance Adjuster
30 = Switching Status/Contamination Warning
68 = Supply Voltage Indicator




Legend

| | |
|---|---|
| + | Supply Voltage + |
| – | Supply Voltage 0 V |
| ~ | Supply Voltage (AC Voltage) |
| A | Switching Output (NO) |
| Ā | Switching Output (NC) |
| V | Contamination/Error Output (NO) |
| V̄ | Contamination/Error Output (NC) |
| E | Input (analog or digital) |
| T | Teach Input |
| Z | Time Delay (activation) |
| S | Shielding |
| RxD | Interface Receive Path |
| TxD | Interface Send Path |
| RDY | Ready |
| GND | Ground |
| CL | Clock |
| E/A | Output/Input programmable |
| | IO-Link |
| PoE | Power over Ethernet |
| IN | Safety Input |
| OSSD | Safety Output |
| Signal | Signal Output |
| BI_D+/- | Ethernet Gigabit bidirect. data line (A-D) |
| EN0 RS422 | Encoder 0-pulse 0-0̄ (TTL) |
| PT | Platinum measuring resistor |
| nc | not connected |
| U | Test Input |
| Ū | Test Input inverted |
| W | Trigger Input |
| W– | Ground for the Trigger Input |
| O | Analog Output |
| O– | Ground for the Analog Output |
| BZ | Block Discharge |
| AW | Valve Output |
| a | Valve Control Output + |
| b | Valve Control Output 0 V |
| SY | Synchronization |
| SY– | Ground for the Synchronization |
| E+ | Receiver-Line |
| S+ | Emitter-Line |
| ⏚ | Grounding |
| SnR | Switching Distance Reduction |
| Rx+/– | Ethernet Receive Path |
| Tx+/– | Ethernet Send Path |
| Bus | Interfaces-Bus A(+)/B(–) |
| La | Emitted Light disengageable |
| Mag | Magnet activation |
| RES | Input confirmation |
| EDM | Contactor Monitoring |
| ENA RS422 | Encoder A/Ā (TTL) |
| ENB RS422 | Encoder B/B̄ (TTL) |
| ENA | Encoder A |
| ENB | Encoder B |
| AMIN | Digital output MIN |
| AMAX | Digital output MAX |
| AOK | Digital output OK |
| SY In | Synchronization In |
| SY OUT | Synchronization OUT |
| OLT | Brightness output |
| M | Maintenance |
| rsv | reserved |

Wire Colors according to IEC 60757

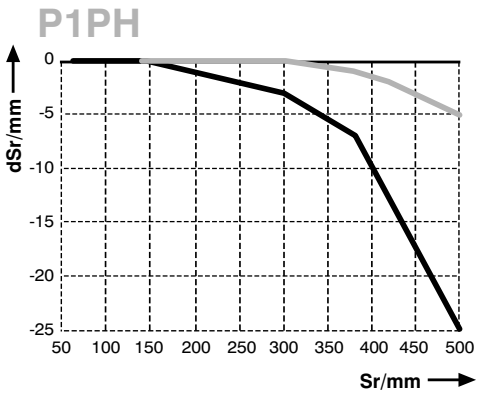
| | |
|---|---|
| BK | Black |
| BN | Brown |
| RD | Red |
| OG | Orange |
| YE | Yellow |
| GN | Green |
| BU | Blue |
| VT | Violet |
| GY | Grey |
| WH | White |
| PK | Pink |
| GNYE | Green/Yellow |

## Table 1

| Detection Range | 60 mm | 250 mm | 500 mm |
|---|---|---|---|
| Light Spot Diameter | 11 mm | 13 mm | 15 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