



1) Display and control panel, 2) rotatable 270°, 3) Optical axis emitter, 4) Optical axis receiver



Basic features

| | |
|-------------------------------|---|
| Additional features | Count function Operating hours counter Speed monitoring |
| Approval/Conformity | CE UKCA cULus WEEE |
| Basic standard | IEC 60947-5-2 |
| Operating mode | SIO Mode IO-Link Mode |
| Principle of operation | Photoelectric sensor |
| Reference emitter | Same sensor, through-beam (emitter) |
| Reference reflector | BOS R-1 |
| Scope of delivery | User manual |
| Series | 21M |
| Style | Square Connection can be rotated |

Display/Operation

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|-----------------|--|
| Adjuster | Potentiometer digital |
| Display | Run - LED green Communication - Green LED, flashing LED yellow: Light received Limit range - LED yellow, flashing Error - LED green+yellow, flashing Emitter LED power drop - LED red, flashing Optical function principle - LED multi-color |
| Setting | Sensitivity (Sn) |

Electrical connection

| | |
|--|------------------------------|
| Connection | Connector, M12x1-Male, 4-pin |
| Contact, surface protection | Gold plated |
| Polarity reversal protected | yes |
| Protection against device mix-ups | yes |
| Short-circuit protection | yes |

Electrical data

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|--|---|
| Frequency range of frequency monitor | 10...10000 Imp/Min |
| Input frequency of count function max. | 1000 Hz (SIO mode) 400 Hz (IO-Link mode) |
| Input function | Reset counter |
| Load capacitance max. at Ue | 0.07 µF |
| No-load current I _o max. at Ue | 30 mA |
| Operating voltage U _b | 10...30 VDC |
| Protection class | II |
| Rated insulation voltage U _i | 75 V DC |
| Rated operating current I _e | 100 mA |
| Rated operating voltage U _e DC | 24 V |
| Ready delay t _v max. | 100 ms |
| Residual current I _r max. | 10 µA |
| Ripple max. (% of U _e) | 10 % |
| Start-up delay for counter | 0...255 s |
| Switching frequency | 1000 Hz |
| Turn-off delay t _{off} max. | 0.5 ms |
| Turn-on delay t _{on} max. | 0.5 ms |
| Utilization category | DC -13 |
| Voltage drop U _d max. at I _e | 2.5 V |

Environmental conditions

| | |
|-------------------------|--|
| Ambient temperature | -5...55 °C |
| Contamination scale | 3 |
| EN 60068-2-27, Shock | Half-sinus, 30 g _n , 11 ms, 3x6 |
| EN 60068-2-6, Vibration | 10...55 Hz, amplitude 1 mm, 3x30 min |
| IP rating | IP67 |

Functional safety

| | |
|--------------|-------|
| MTTF (40 °C) | 343 a |
|--------------|-------|

IO-Link

| | |
|--------------------|-------------|
| IO-Link Profil IDs | 0x0001 SSP0 |
|--------------------|-------------|

Interface

| | |
|------------------------------|---|
| Baud rate | 38.4 kBaud |
| Duration of time function | 0...65535 ms |
| Function class, smart sensor | Identification Teach channel Switching signal channel Variable process data Diagnostics |
| Interface | IO-Link 1.1 |
| Interface setting option | Operating mode Teach-In of switchpoints Principle of optical operation Switching output Switching function Hysteresis Time function Count function Frequency converter Data retention active/inactive Emitter on/off Adjuster active/inactive Factory setting (Reset) for more information refer to user's guide |
| Process data IN | 1 byte |
| Process data OUT | 3 bytes |
| Process data cycle min. | 4 ms |
| Profile | Smart Sensor |
| Switching output | 2x PNP/NPN/push-pull NO/NC Pin 4 programmable NO/NC, Pin 2 automatically complementary |
| Time function | Single pulse Turn-on delay switch-off delay On/off delay |

Material

| | |
|--------------------------------------|--|
| Housing material | Zinc, Die casting, Painted Aluminium, Glass, PC |
| Housing material, surface protection | Painted |
| Material sensing surface | Glass, anti-glare |
| Surface protection | Powder coated |

Mechanical data

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|---------------|-------------------|
| Dimension | 15 x 51 x 42.5 mm |
| Mounting part | Screw M4 |

Optical features

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|--------------------------------|---|
| Ambient light max. | 10000 Lux |
| Beam characteristic | Divergent |
| LED group per IEC 62471 | Exempt Group |
| Light spot size | Ø 50 mm at 1 m |
| Light type | LED, red light |
| Polarizing filter | no |
| Principle of optical operation | Diffuse sensor energetic diffuse sensor with background suppression retroreflective sensor through-beam sensor (emitter) through-beam sensor (receiver), depends on setting |
| Special optical feature | Multifunction |
| Switching function, optical | Light/dark switching |
| Wave length | 633 nm |

Principle of operation diffuse sensor

| | |
|--------------------------------|------------|
| Hysteresis H max. (% of Sr) | 10.0 % |
| Range | 1...600 mm |
| Real switching distance sr | 600 mm |
| Repeat accuracy max. (% of Sr) | 2.0 % |

Remarks

The sensor is functional again after the overload has been eliminated.
 Order accessories separately.
 For additional information, refer to user's guide.
 Reference object (target) for diffuse sensor: gray card, 200 x 200, 90 % remission, axial approach.
 For more information about MTTF and B10d see MTTF / B10d Certificate

Indication of the MTTF- / B10d value does not represent a binding composition and/or life expectancy assurance; these are simply experiential values with no warranty implications. These declared values also do not extend the expiration period for defect claims or affect it in any way.

Principle of operation diffuse sensor BGS

| | |
|--|------------|
| Distance deviation 18 % max. (% of Sr) | 10 % |
| Hysteresis H typ. (% of Sr) | 5.0 % |
| Range | 8...200 mm |
| Real switching distance sr | 200 mm |
| Repeat accuracy max. (% of Sr) | 1.0 % |

Principle of operation retroreflective sensor

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|-------|---------|
| Range | 0...7 m |
|-------|---------|

Principle of operation through-beam sensor

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| Range | 0...10 m |
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Range/Distance

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|-------|------------|
| Range | Adjustable |
|-------|------------|

Connector Drawings



Wiring Diagrams (Schematic)

