



NCV50B-11CC0100100 rental device

SPEETEC 1D

NON-CONTACT MOTION SENSORS

SICK
Sensor Intelligence.



Illustration may differ

Ordering information

| Type | Part no. |
|----------------------------------|----------|
| NCV50B-11CC0100100 rental device | 1116362 |

Other models and accessories → www.sick.com/SPEETEC_1D



Detailed technical data

Features

| | |
|------------------|--|
| Specialty | <p>SPEETEC closes the gap between tactile measuring wheel systems and complex laser Doppler sensors – and is suitable for almost all surfaces and objects thanks to the non-contact measurement that uses no measuring elements. This opens up new fields of application in motion monitoring.</p> <p>NCV50B is the preferred choice for retrofitting and use in end-customer applications where easy mounting is important. The NCV50B achieves a very high measurement accuracy with large mounting tolerances, which allows quick and easy mounting without a reference measurement or calibration.</p> <p>Non-contact measurement on moving objects without measuring elements.</p> <p>Class 1 laser Rental device</p> |
|------------------|--|

Safety-related parameters

| | |
|--|------------------------|
| MTTFd: mean time to dangerous failure | 33 years ¹⁾ |
|--|------------------------|

¹⁾ This product is a standard product and does not constitute a safety component as defined in the Machinery Directive. Calculation based on nominal load of components, average ambient temperature 40 °C, frequency of use 8760 h/a. All electronic failures are considered hazardous. For more information, see document no. 8015532.

System

| | |
|---|--|
| Light source | 2 continuous beam lasers ¹⁾ |
| Wave length | 850 nm |
| Laser class | 1 (IEC 60825-1:2014) |
| Type of light | Invisible infrared light |
| Typ. measurement field size (distance) | 2 mm x 3 mm (at 50 mm) 8 mm x 3 mm (at 45 mm) 8 mm x 3 mm (at 55 mm) |
| Laser power (per laser) | 0.78 mW ²⁾ |

¹⁾ L10 ≥ 32,500 h (not temperature-dependent). The lasers are always on when the sensor is supplied with voltage. To increase the service life of the sensor, we recommend completely disconnecting the sensor from the voltage supply when it is not needed. No warranty claims relating to the reaching of the service life of the laser will be accepted.

²⁾ The device must not be operated if the screen is damaged or missing.

Performance

| | |
|--|------------------------------------|
| Nominal measuring distance | 50 mm |
| Static mounting tolerance | Ca. ± 5 mm ¹⁾ |
| Possible static measuring distance | 30 ... 100 mm ²⁾ |
| Direction of movement | 1D, x-direction |
| Start/stop | Possible |
| Movement detection | Bidirectional |
| Measuring increment ($\mu\text{m}/\text{pulse}$) | 100 |
| Speed measuring range | > 0 m/s ... 10 m/s ³⁾ |
| Permissible acceleration | ≤ 30 m/s ² |
| Accuracy | |
| Measurement accuracy | 0.1 % ⁴⁾ |
| Repeatability | 0.05 % ⁵⁾ |
| Internal sampling rate | 330 μs |
| Latency | 2.9 ms |

¹⁾ Mounting the device closer than the specified measuring distance will not affect the accuracy of the measurement for suitable materials. Operation outside of the tolerance is possible with restrictions.

²⁾ The possible measuring distance depends on the material and must be identified in each case for the material used in the application, see the "Permissible measuring distance" table. The static mounting tolerance is included in the range mentioned above and is not additionally available.

³⁾ No continuous operation < 0.05 m/s recommended.

⁴⁾ Error limit for systematic measurement deviation in accordance with DIN 1319-1:1995. Valid between 0.2 m/s ... 10 m/s. The achievable measurement accuracy depends on the accuracy of installation. See "Permissible deviations from nominal alignment".

⁵⁾ Maximum permissible measurement deviation in accordance with DIN 1319-1:1995 under constant conditions. Valid between 0.2 m/s ... 10 m/s, averaged over 0.25 m measuring length.

Electrical data

| | |
|--|-------------------------------------|
| Supply voltage | 12 V ... 30 V |
| Communication interface | TTL / RS-422 |
| Output frequency | ≤ 625 kHz |
| Connection type | Male connector, M12, 8-pin, A-coded |
| Parameterization and diagnostic interface with digital input and output | No |
| Power consumption | < 8 W |
| Load current | ≤ 30 mA, per channel |
| Reverse polarity protection | ✓ |
| Protection class | III according to DIN EN 61140 |
| Short-circuit resistant outputs | ✓ ¹⁾ |
| Initialization time | Max. 3 s ²⁾ |

¹⁾ Short-circuit to another channel or GND permissible for a maximum of 30 s. No protection in the case of a short-circuit channel of U_S .

²⁾ Digital output DO can have an undefined state during this time.

Mechanical data

| | |
|-------------------|---|
| Dimensions | 140 mm x 95 mm x 32.5 mm (without plug) |
| Weight | 400 g |

¹⁾ Exceeding these values will result in a higher systematic measurement error, see "Permissible deviations from nominal alignment".

| | | |
|--------------------------|-------------------------|------------------------------------|
| Material | Housing | Aluminum |
| | Screen | PMMA |
| | Plug insert | PA66, copper-zinc alloy (CuZn) |
| Permissible angle | Permissible pitch angle | $\leq \pm 1.5^\circ$ ¹⁾ |
| | Permissible yaw angle | $\leq \pm 1.5^\circ$ ¹⁾ |
| | Permissible roll angle | $\leq \pm 10^\circ$ ¹⁾ |

¹⁾ Exceeding these values will result in a higher systematic measurement error, see "Permissible deviations from nominal alignment".

Ambient data

| | | |
|--------------------------------------|--|---|
| EMC | EN 61000-6-2, EN 61000-6-3 | |
| Enclosure rating | IP65 (EN 60529) ¹⁾ IP67 (EN 60529) ¹⁾ | |
| Permissible relative humidity | 70 % ²⁾ | |
| Temperature | Operating temperature range | 0 °C ... +45 °C ³⁾ |
| | Storage temperature range | -32 °C ... +60 °C, without package |
| Resistance | Resistance to shocks | 30 g, 6 ms (EN 60068-2-27) |
| | Resistance to vibration | 20 g, 10 Hz ... 2,000 Hz (EN 60068-2-6) |

¹⁾ For suitable mating connector and correct mounting of the mating connector.

²⁾ Condensation on laser modules and screen not permitted.

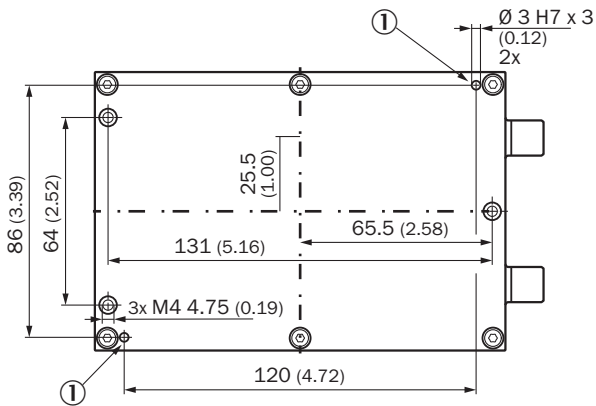
³⁾ If the permissible temperature range is exceeded, the sensor switches off the laser to protect it against damage. No signal is outputted in this case. The variant with parameterization and diagnostic functions offers the option of monitoring the internal temperature and therefore the reserves up until the point of switching off.

Classifications

| | |
|---------------------|----------|
| ECLASS 5.0 | 27270790 |
| ECLASS 5.1.4 | 27270790 |
| ECLASS 6.0 | 27270790 |
| ECLASS 6.2 | 27270790 |
| ECLASS 7.0 | 27270790 |
| ECLASS 8.0 | 27270790 |
| ECLASS 8.1 | 27270790 |
| ECLASS 9.0 | 27270790 |
| ECLASS 10.0 | 27270790 |
| ECLASS 11.0 | 27270790 |
| ECLASS 12.0 | 27275201 |

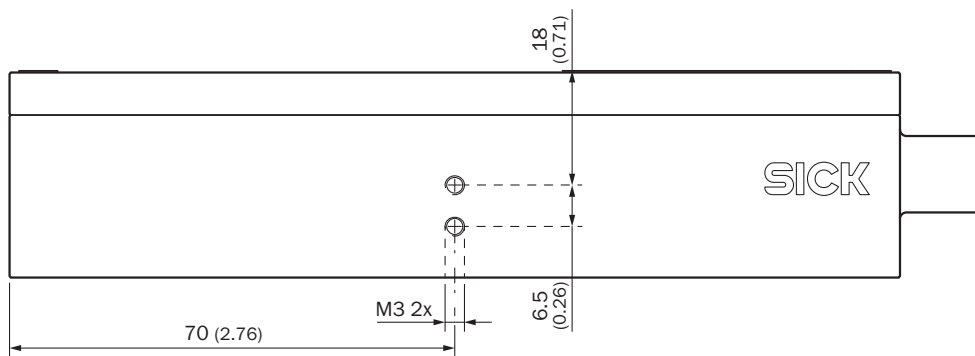
Dimensional drawing (Dimensions in mm (inch))

Mounting side

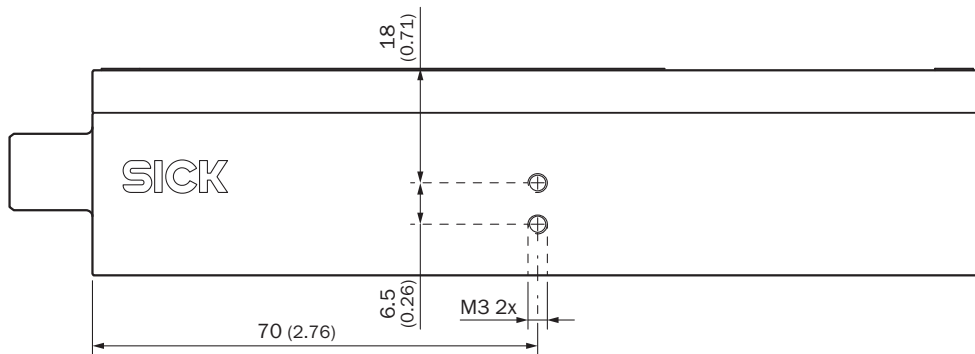


① Ø 3 H7 x 3 holes for accommodating locating pins

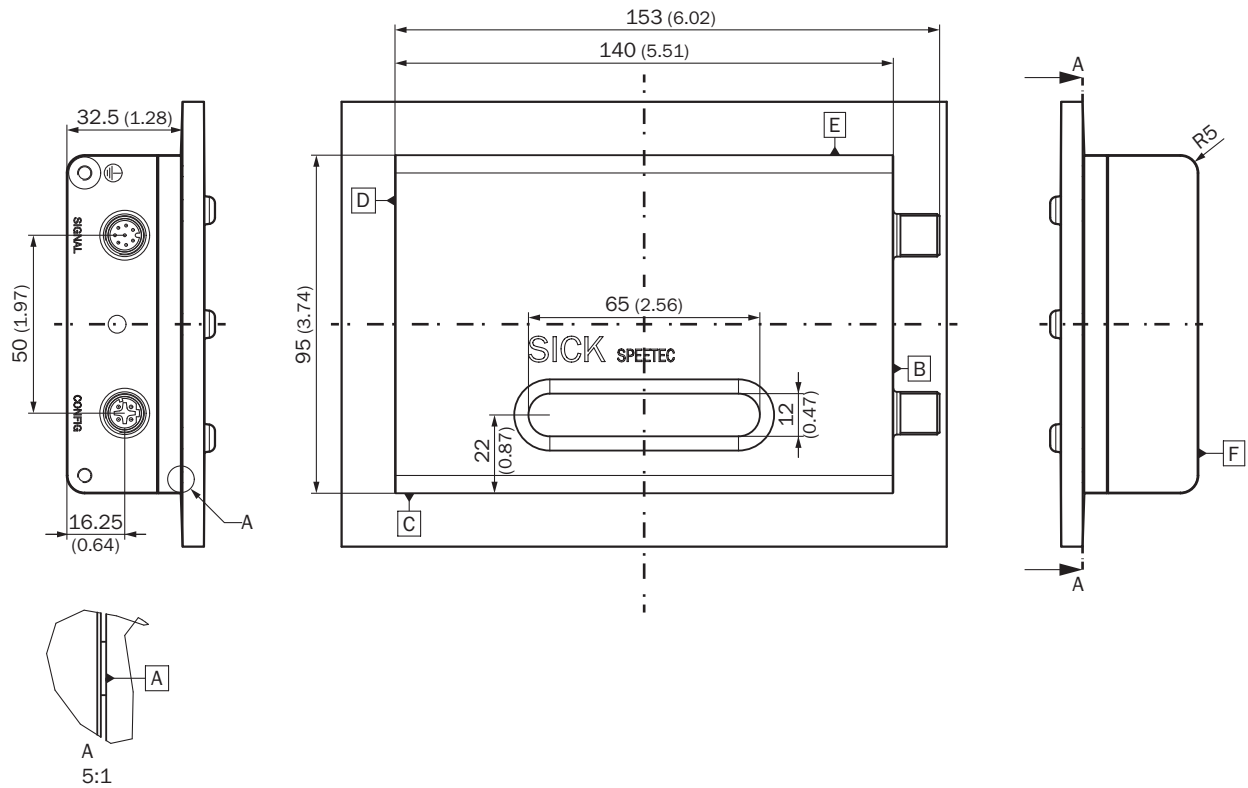
Side view with threaded holes for proximity sensors



Side view with threaded holes for proximity sensors

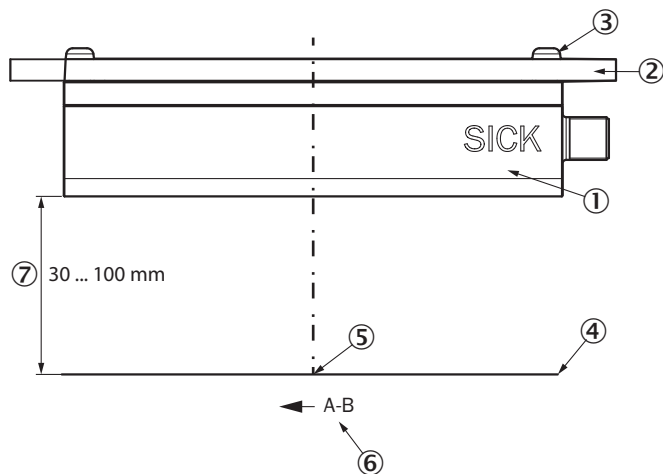


SPEETEC 1D



Attachment specifications

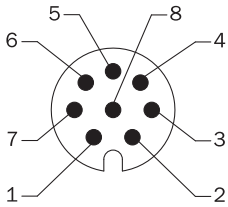
Nominal alignment of the sensor to the surface (z-axis)



- ① Sensor
- ② Mounting surface
- ③ M4 screws
- ④ Surface to be measured
- ⑤ Measuring point on x-/y-plane, 82.5 mm away from the mounting level
- ⑥ Forward material movement; signal sequence A before B
- ⑦ Measuring distance between sensor and surface, also see "Permissible measuring distance" table

| Material | Permissible measuring distance |
|----------------------|--------------------------------|
| Wood, sawed | 30 ... 100 mm |
| Paper, white | 30 ... 100 mm |
| Conveyor belt, black | 50 ... 80 mm |
| Textile | 40 ... 60 mm |

PIN assignment



M12 signal male connector, 8-pin and cable, 8-wire

| Male connector M12, 8-pin | Wire color | TTL, HTL standard signal | TTL, HTL signal can be programmed | Explanation |
|---------------------------|---------------------------|--------------------------|-----------------------------------|--|
| 1 | Brown | A- | A- | Signal cable |
| 2 | White | A | A | Signal cable |
| 3 | Black | B- | B- | Signal cable |
| 4 | Pink | B | B | Signal cable |
| 5 | Yellow | Do not wire! | Digital output | Warning: Observe signal variant! |
| 6 | Violet | Do not wire! | Digital input | Warning: Observe signal variant! |
| 7 | Blue | GND | GND | Ground connection of the sensor |
| 8 | Red | +U _S | +U _S | Supply voltage |
| Screen | Screen | Screen | Screen | Connect screen to housing on sensor side, connect to earth on the control side |
| Ground | Earthing point on housing | | | The sensor must be earthed via the housing at the intended earthing point. |

Technical data of digital input

| | | | | |
|--------------------|-----------------------|--|--|--|
| Type | Current Sink Type 1/3 | | | |
| Input voltage HIGH | 15 V ... 30 V | | | |
| Input voltage LOW | -3 V ... 5 V | | | |
| Input current HIGH | 2 mA ... 2.6 mA | | | |
| Input current LOW | 0 mA ... 2.6 mA | | | |

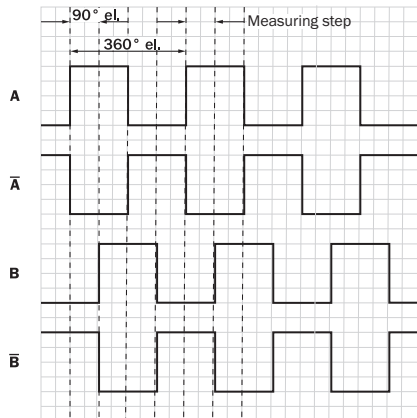
Technical data of digital output

| | | | | |
|---------------------|---|--|--|--|
| Type | Push-Pull Output | | | |
| Output voltage HIGH | (U _S - 2 V) ... U _S | | | |

| Male connector M12, 8-pin | Wire color | TTL, HTL standard signal | TTL, HTL signal can be programmed | Explanation |
|---------------------------|------------------|--------------------------|-----------------------------------|-------------|
| Output voltage LOW | 0 V ... 2 V | | | |
| Output current HIGH | 0.5 mA ... 30 mA | | | |

Diagrams

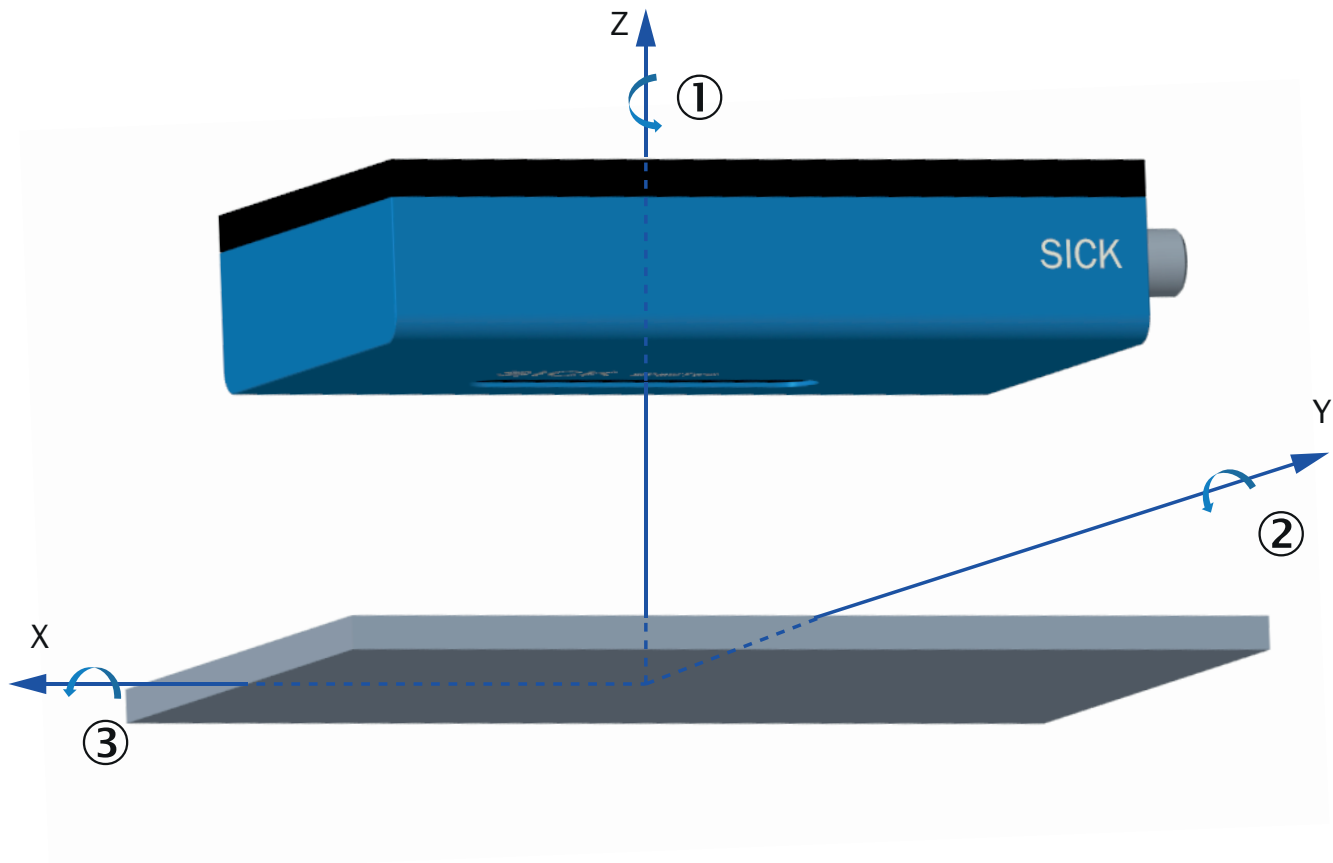
Signal outputs for electrical interfaces TTL and HTL with forward material movement (see assembly specifications)



The measuring step corresponds to 90° electrical. The measuring step [$\mu\text{m}/\text{pulse}$] specified under Performance can only be achieved if the output signals of the sensor are evaluated differentially.

Operation note

Permissible deviations from nominal alignment



- ① Yaw angle
- ② Pitch angle
- ③ Roll angle






| Pitch angle | NCV50B accuracy |
|-------------|-----------------|
| 0,05° | 0,10% |
| 0,10° | 0,10% |
| 0,20° | 0,10% |
| 0,30° | 0,10% |
| 0,50° | 0,10% |
| 0,75° | 0,10% |
| 1,00° | 0,10% |
| 1,50° | 0,10% |

Recommended accessories

Other models and accessories → www.sick.com/SPEETEC_1D

| | Brief description | Type | Part no. |
|---|---|-------------------------------|----------|
| Alignment aids | | | |
|  | Laser spot detector map to visualize the SPEETEC NCV50 laser spot for the eye and to determine the correct operating point. | BEF-SPEETEC-LSD | 2120614 |
| Optics cloths | | | |
|  | Cloth for cleaning optical surfaces | Lens cloth | 4003353 |
| Signal and status indicators | | | |
|  | Digital display with resistive touch screen, for SPEETEC, incremental encoders and measuring wheel encoders. Multi-function device for use as tachometer, speed measuring device, pulse counter, position display, piece counter and total counter. Communication interface: incremental. Communication interface detailed: RS-422, RS485 | DIS-IPDTACCRO000 | 4119630 |
| Device protection (mechanical) | | | |
|  | Table housing suitable for installation of the DIS-IPDTACCRO000 display unit | DIS-DH30M | 7135599 |
| Mounting brackets and plates | | | |
|  | Mounting bracket for MWS120 measuring wheel system and SPEETEC 1D laser surface motion sensors | BEF-WF-MWS-NCV | 2113284 |
|  | 1 piece, The BEF-WN-NCV50 mounting bracket makes it possible to easily and correctly mount the sensors while complying with the specified tolerances for distance and angle. The BEF-WN-NCV50 mounting bracket can be combined with the BEF-WF-MWS120 mounting bracket. This makes it possible to mount on the machine frame., Mounting bracket, screws for mounting the NCV50 | BEF-WN-NCV50 mounting bracket | 2117456 |
| Terminal and alignment brackets | | | |
|  | 1 piece, Bracket for mounting SICK photoelectric proximity sensors, W4, W9, G6 to the NCV50. SICK photoelectric proximity sensors from the W4, W9, G6 series can be easily mounted on the NCV50 using the BEF-MK-NCV50-W49G6. This makes it possible to better detect material edges and makes length measurement more exact. The position of the scanning point in the direction of movement is specified by the mounting position, the position in the y-direction can be adjusted using the bracket slots., Adjustment aid, screws for mounting the photoelectric proximity sensor | BEF-MK-NCV50-W49G6 | 2117457 |
|  | Suitable for NCV50 / SPEETEC. Simplifies mounting of the SPEETEC at the right distance and angle to the surface. Packaging unit: 1 unit, Adjustment aid, screws for mounting the NCV50 | BEF-WN-NCV50-ADJUST | 2117003 |
| Others | | | |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, straight • Connection type head B: Flying leads • Signal type: Incremental, SSI • Cable: 2 m, 8-wire, PUR, halogen-free • Description: Incremental, SSI, shielded, Head A: female connector, M12, 8-pin, straight Head B: cable Cable: suitable for drag chain, PVC, shielded, 4 x 2 x 0.25 mm², Ø 7.0 mm • Connection systems: Flying leads | DOL-1208-G02MAC1 | 6032866 |

| | Brief description | Type | Part no. |
|---|--|------------------|----------|
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, straight • Connection type head B: Flying leads • Signal type: Incremental, SSI • Cable: 5 m, 8-wire, PUR, halogen-free • Description: Incremental, SSI, shielded, Head A: female connector, M12, 8-pin, straight Head B: cable Cable: suitable for drag chain, PVC, shielded, 4 x 2 x 0.25 mm², Ø 7.0 mm • Connection systems: Flying leads | DOL-1208-G05MAC1 | 6032867 |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, straight • Connection type head B: Flying leads • Signal type: Incremental, SSI • Cable: 10 m, 8-wire, PUR, halogen-free • Description: Incremental, SSI, shielded, Head A: female connector, M12, 8-pin, straight Head B: cable Cable: suitable for drag chain, PVC, shielded, 4 x 2 x 0.25 mm², Ø 7.0 mm • Connection systems: Flying leads | DOL-1208-G05MAD3 | 2121359 |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, straight • Connection type head B: Flying leads • Signal type: Incremental, SSI • Cable: 20 m, 8-wire, PUR, halogen-free • Description: Incremental, SSI, shielded, Head A: female connector, M12, 8-pin, straight Head B: cable Cable: suitable for drag chain, PVC, shielded, 4 x 2 x 0.25 mm², Ø 7.0 mm • Connection systems: Flying leads | DOL-1208-G10MAC1 | 6032868 |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, straight • Connection type head B: Male connector, M12, 8-pin, straight • Cable: 5 m, 8-wire, PUR, halogen-free • Description: Shielded, Connection cable, M12, 8-pin, straight male connector / straight female connector, 2 m, PUR halogen-free, shielded | DOL-1208-G20MAC1 | 6032869 |
|  | <ul style="list-style-type: none"> • Connection type head A: Flying leads • Connection type head B: Flying leads • Signal type: SSI, Incremental • Items supplied: By the meter • Cable: 11-wire, PUR • Description: SSI, Incremental, shielded | DSL-1208-G05MAC1 | 6032913 |
|  | <ul style="list-style-type: none"> • Connection type head A: Flying leads • Connection type head B: Flying leads • Signal type: SSI, Incremental • Items supplied: By the meter • Cable: 12-wire, PUR, halogen-free • Description: SSI, Incremental, shielded | LTG-2411-MW | 6027530 |
|  | <ul style="list-style-type: none"> • Connection type head A: Flying leads • Connection type head B: Flying leads • Signal type: SSI, TTL, HTL, Incremental • Items supplied: By the meter • Cable: 12-wire, UV and saltwater-resistant, PUR, halogen-free • Description: SSI, TTL, HTL, Incremental, shielded, Head A: cable Head B: cable Cable: suitable for drag chain, PUR, halogen-free, shielded, UV and saltwater resistant, 4 x 2 x 0.25 mm² + 2 x 0.5 mm² + 2 x 0.14 mm², Ø 7.8 mm | LTG-2512-MW | 6027531 |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, straight, A-coded • Description: Shielded • Connection systems: Screw-type terminals • Permitted cross-section: 0.25 mm² ... 0.5 mm² | LTG-2612-MW | 6028516 |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, straight, A-coded • Description: Shielded • Connection systems: Screw-type terminals • Permitted cross-section: ≤ 0.5 mm² | DOS-1208-GA | 6028369 |
|  | <ul style="list-style-type: none"> • Connection type head A: Male connector, M12, 8-pin, straight, A-coded • Description: Shielded • Connection systems: Screw-type terminals • Permitted cross-section: ≤ 0.5 mm² | STE-1208-GA | 6028370 |

| | Brief description | Type | Part no. |
|---|--|------------------|----------|
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, angled • Connection type head B: Flying leads • Signal type: HIPERFACE[®], Incremental • Cable: 20 m, 8-wire, PUR • Description: HIPERFACE[®], Incremental, shielded | DOL-1208-W20MAC1 | 6037727 |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, angled • Connection type head B: Flying leads • Signal type: HIPERFACE[®], Incremental • Cable: 2 m, 8-wire, PUR, halogen-free • Description: HIPERFACE[®], Incremental, shielded | DOL-1208-W02MAC1 | 6037724 |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, angled • Connection type head B: Flying leads • Signal type: HIPERFACE[®], Incremental • Cable: 5 m, 8-wire, PUR, halogen-free • Description: HIPERFACE[®], Incremental, shielded | DOL-1208-W05MAC1 | 6037725 |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, angled • Connection type head B: Flying leads • Signal type: HIPERFACE[®], Incremental • Cable: 10 m, 8-wire, PUR, halogen-free • Description: HIPERFACE[®], Incremental, shielded | DOL-1208-W10MAC1 | 6037726 |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, angled, A-coded • Signal type: Ethernet • Cable: CAT5, CAT5e • Description: Ethernet, shielded, M12 female connector, A-coded • Connection systems: QUICKON connection • Permitted cross-section: 0.14 mm² ... 0.34 mm² | DOS-1208-WA | 6043358 |
| Photoelectric sensors | | | |
| | WTB4SL-3P3261 | WTB4SL-3P3261 | 1058238 |

SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is “Sensor Intelligence.”

WORLDWIDE PRESENCE:

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