



SPEETEC

CAPTURES MOTION.
WITHOUT CONTACT.

Non-contact motion sensors

SICK
Sensor Intelligence.

CAPTURES MOTION. WITHOUT CONTACT.



Product description

The rugged and maintenance-free SPEETEC laser surface motion sensor detects the movements of object surfaces without contact. This detection requires no scale or measuring elements. The laser Doppler effect based technology enables the SPEETEC to measure the speed, length, movement direction and position of objects on almost any

surface. The non-contact measurement method used by the sensor makes it particularly suitable for applications with soft or sensitive surfaces that would be damaged by tactile measurement. The SPEETEC is also ideal for encoder applications with fast and dynamic processes that are unsuitable for encoders.

At a glance

- Non-contact measurement of the speed, length and position of objects without measuring elements
- Compatible with many materials, colors and surfaces
- Very high measurement accuracy and repeatability
- Laser class 1
- Rugged design, compact dimensions, low weight
- TTL or HTL interface
- Speed: up to 10 m/s

Your benefits

- Opens up new possibilities for measuring sensitive, soft or smooth objects
- Optical sensors avoid damage to, and contamination of the surfaces being measured and ensure a high product quality
- Slip-free measurement increases the measurement accuracy thereby optimizing productivity and process quality
- Thanks to the use of class 1 lasers, no expensive laser protection measures and no specially trained personnel are required
- High measurement accuracy, including in start-stop operation and at short measurement lengths
- Easy to incorporate into existing applications thanks to the standardized encoder interface and compact dimensions
- Rugged and maintenance-free



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→ www.sick.com/SPEETEC_1D

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



Fields of application

- Consumer goods industry, e.g., packaging, digital printing
- Machine construction, e.g., extrusion, metal processing, surface treatment
- Tire manufacturing, e.g., tire building
- Construction materials industry, e.g., insulating materials, dry construction
- Quality control
- Cutting processes

Detailed technical data

Safety-related parameters

MTTFd: mean time to dangerous failure	33 years ¹⁾
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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.

Performance

Nominal measuring distance	50 mm
Static mounting tolerance	Ca. ± 5 mm ¹⁾
Direction of movement	1D, x-direction
Movement detection	Bi-directional
Measuring increment (resolution in µm/pulse)	4 - 2,000 (At 90° electrical)
Speed measuring range	> 0 m/s ... 10 m/s ²⁾
Permissible acceleration	≤ 30 m/s ²
Accuracy	
Measurement accuracy	0.1% ³⁾
Repeatability	0.05 % ⁴⁾
Internal sampling rate	330 µs
Latency period	2.9 ms

¹⁾ Mounting the device outside the specified measuring distance will not affect the accuracy of the measurement for suitable materials.

²⁾ Continuous operation <0.1 m/s not recommended.

³⁾ Error limit for systematic measurement deviation in accordance with DIN 1319-1:1995. Valid between 0.2 m/s ... 10 m/s, regular adjustment required.

⁴⁾ 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.

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. measuring 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 W 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.

Mechanical data

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

¹⁾ Exceeding these values will result in lower accuracy (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 lower accuracy (see: Permissible deviations from nominal alignment).

Electrical data

Supply voltage	12 V ... 30 V
Communication interface	TTL / RS-422 ¹⁾ HTL / Push pull ¹⁾
Output frequency	≤ 625 kHz
Connection type	Male connector, M12, 8-pin, A-coded
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	
TTL / RS-422	✓ ²⁾
HTL / Push pull	✓ ³⁾
Initialization time	Max. 3 s

¹⁾ With 4-channels unless noted.

²⁾ Short-circuit to another channel or GND permissible for a maximum of 30 s. No protection in the case of a short-circuit channel to U_s.

³⁾ Short-circuit to another channel, U_s or GND for max. 30 s.

Ambient data

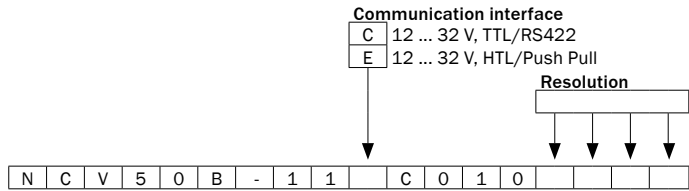
EMC	EN 61000-6-2, EN 61000-6-3
Enclosure rating	IP65 (EN 60529) ¹⁾ IP67 (EN 60529) ¹⁾
Permissible relative humidity	70 % ²⁾
Temperature	
Operating temperature range	0 °C ... +45 °C ³⁾
Storage temperature range	-32 °C ... +60 °C, without package
Resistance	
Resistance to shocks	30 g, 6 ms (EN 60068-2-27)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

Type code



Available resolutions

Designation in the type code	Resolution / Measurement step (90° electrical)	Resolution / Measurement step (360° electrical)
0004	4 µm	16 µm
0020	20 µm	80 µm
0100	100 µm	400 µm
0200	200 µm	800 µm
1,000	1,000 µm	4,000 µm

Permissible lengths of cable

Speed (m/s)	Resolution / Measurement step (90° electrical)	Frequency	Permissible lengths of cable for TTL	Permissible lengths of cable for HTL
0.1	4 µm	6.25 kHz	350 m	100 m
1	4 µm	62.5 kHz	350 m	20 m
4	4 µm	250 kHz	350 m	5 m
5	4 µm	312.5 kHz	250 m	2 m
10	4 µm	625 kHz	250 m	-
For four-fold evaluation, differential, the frequency is calculated as follows:				
$\text{Frequency} = (\text{speed} / \text{resolution}) / 4$				
Example:				
$(5.0 \text{ m/s} / 4 \text{ µm}) / 4 = 312.5 \text{ kHz}$				

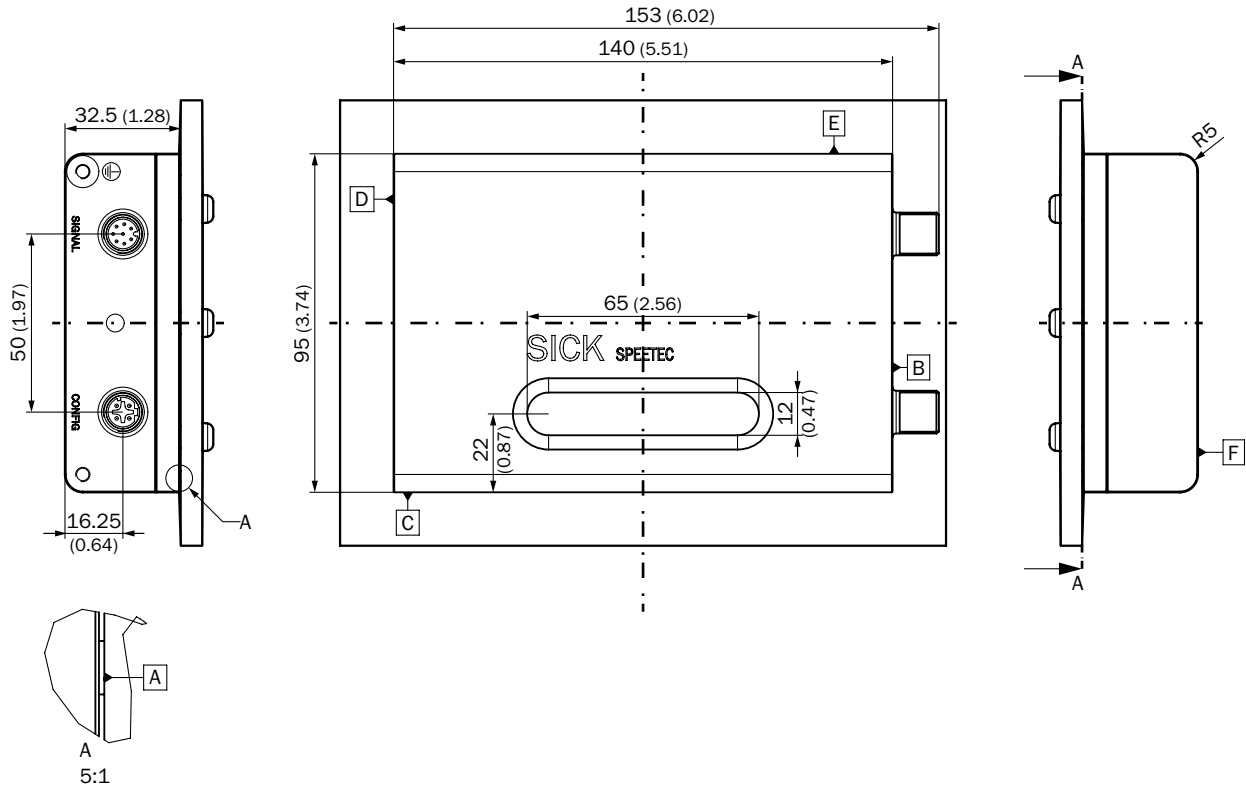
Ordering information

- **Measuring distance:** 50 mm
- **Supply voltage:** 12 V ... 30 V

Part no.	Type	Resolution / Measurement step (90° electrical)	Output level
1106854	NCV50B-11CC0100004	4 µm	TTL
1106855	NCV50B-11CC0100100	100 µm	TTL
1106856	NCV50B-11EC0100004	4 µm	HTL
1106857	NCV50B-11EC0100100	100 µm	HTL

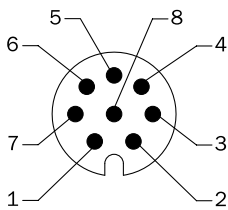
Dimensional drawings (Dimensions in mm (inch))

SPEETEC



PIN assignment

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

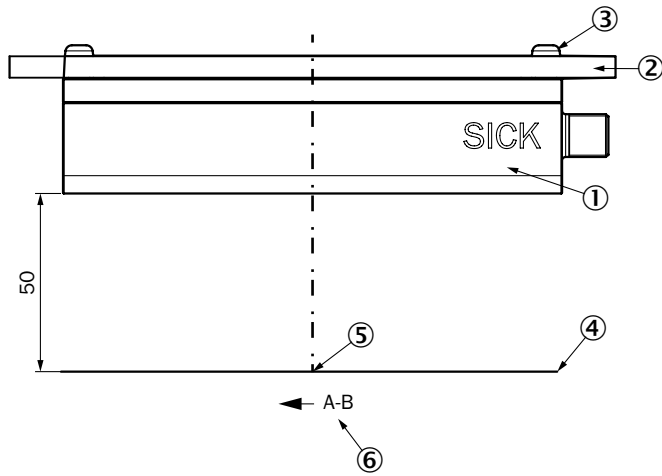


View of M12 male device connector

Male connector M12, 8-pin	Wire color	TTL/HTL signal	Explanation
1	Brown	A-	Signal cable
2	White	A	Signal cable
3	Black	B-	Signal cable
4	Pink	B	Signal cable
5	Yellow	Do not wire!	Warning: Do not wire!
6	Violet	Do not wire!	Warning: Do not wire!
7	Blue	GND	Ground connection
8	Red	+U _s	Supply voltage
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.

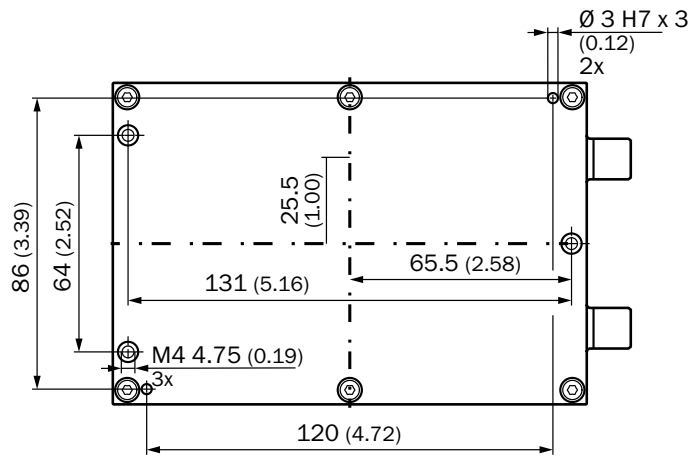
Attachment specifications

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

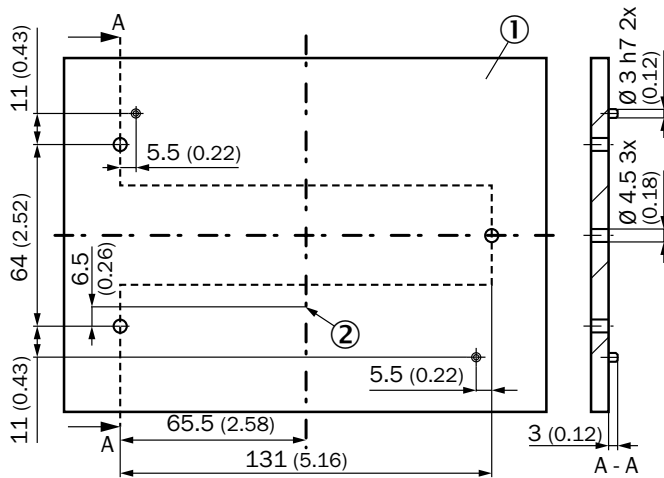


- ① Sensor
- ② Mounting surface
- ③ M4 screws
- ④ The surface to be measured
- ⑤ Measurement point on x-/y-plane, 82.5 mm from the mounting plane
- ⑥ Forward material movement: signal sequence A before B

Nominal alignment of the sensor to the surface (x-/y-plane)

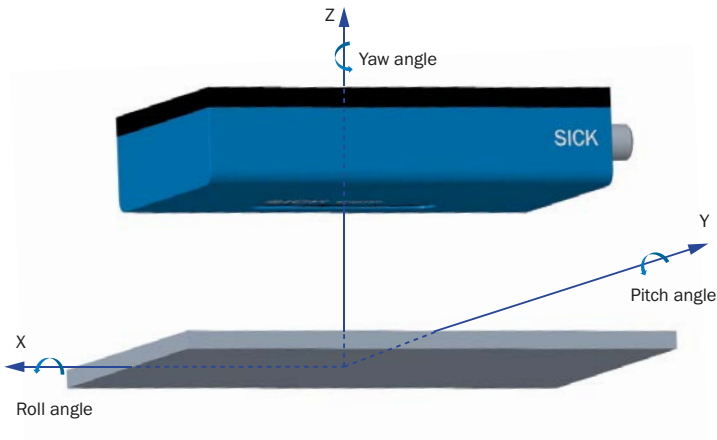


Attachment specifications



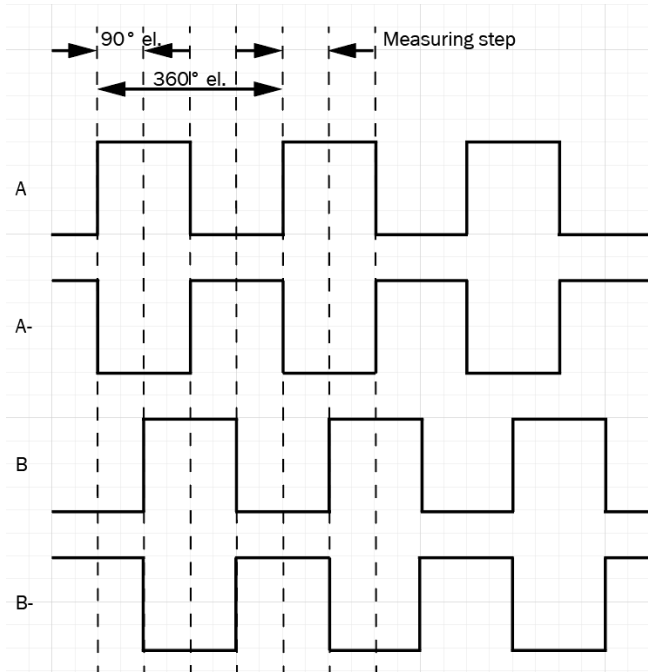
- ① Mounting surface
- ② Measurement point on x-/y-plane, 82.5 mm from the mounting plane

Permissible deviations from nominal alignment



Interfaces

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




Accessories

Connection systems


Plug connectors and cables

Connecting cables

Figure	Brief description	Length of cable	Type	Part no.
	Head A: female connector, M12, 8-pin, straight Head B: Flying leads Cable: PUR, halogen-free, shielded, 4 x 2 x 0.25 mm ² , 7 mm	2 m	DOL-1208-G02MAC1	6032866
		5 m	DOL-1208-G05MAC1	6032867
		10 m	DOL-1208-G10MAC1	6032868
		20 m	DOL-1208-G20MAC1	6032869




Dimensional drawings → [page 12](#)

Field-attachable connectors


Figure	Brief description	Type	Part no.
	Head A: female connector, M12, 8-pin, straight Head B: - Cable: shielded	DOS-1208-GA	6028369
	Head A: male connector, M12, 8-pin, straight Head B: - Cable: shielded	STE-1208-GA	6028370

Dimensional drawings → [page 12](#)

Cables (ready to assemble)

Figure	Brief description	Type	Part no.
	Head A: cable Head B: Flying leads Cable: SSI, PUR, shielded, 4 x 2 x 0.25 mm ² + 2 x 0.5 mm ² + 1 x 0.14 mm ² , 7.5 mm	LTG-2411-MW	6027530
	Head A: cable Head B: Flying leads Cable: SSI, PUR, halogen-free, shielded, 4 x 2 x 0.25 mm ² + 2 x 0.5 mm ² + 2 x 0.14 mm ² , 7.8 mm	LTG-2512-MW	6027531
	Head A: cable Head B: Flying leads Cable: SSI, TTL, HTL, PUR, halogen-free, shielded, 4 x 2 x 0.25 mm ² + 2 x 0.5 mm ² + 2 x 0.14 mm ² , 7.8 mm, UV and saltwater-resistant	LTG-2612-MW	6028516

Connection cables

Figure	Brief description	Length of cable	Type	Part no.
	Head A: female connector, M12, 8-pin, straight Head B: male connector, M12, 8-pin, straight Cable: PUR, halogen-free, shielded, 7.7 mm	5 m	DSL-1208-G05MAC1	6032913



Dimensional drawings → [page 12](#)

Alignment brackets

Figure	Brief description	Type	Part no.
	Adjustment bracket for NCV50	BEF-WN-NCV50-ADJST	2117003

Dimensional drawings → [page 12](#)

Mounting bracket

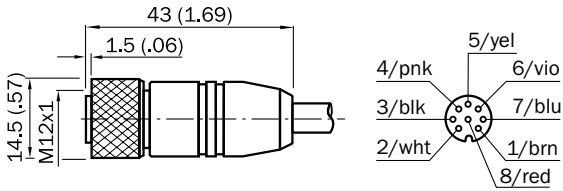
Figure	Brief description	Type	Part no.
	Mounting bracket for photoelectric proximity switch on NCV50	BEF-MK-NCV50-W49G6	2117457
	Mounting bracket for NCV50	BEF-WN-NCV50-Mounting bracket	2117456

Dimensional drawings → [page 13](#)

Dimensional drawings for accessories (Dimensions in mm (inch))

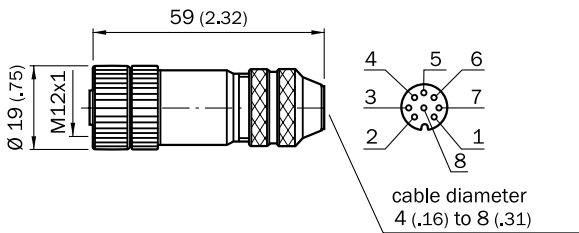
Plug connectors and cables

DOL-1208-GxxMAC1

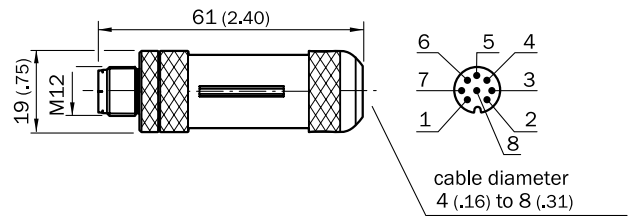


All dimensions in mm (inch)

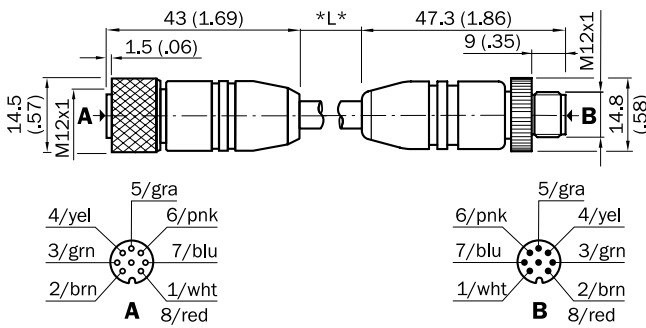
DOS-1208-GA01



STE-1208-GA01

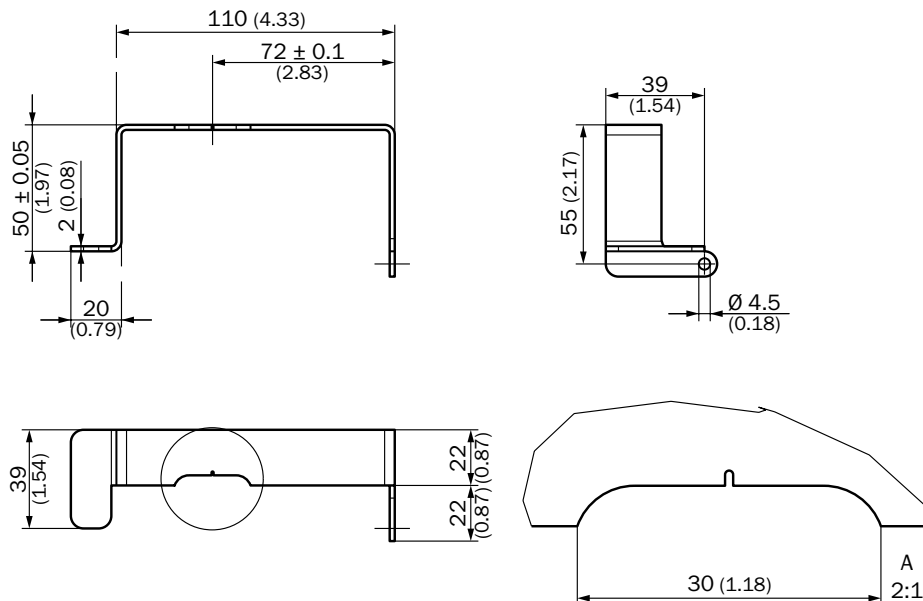


DSL-1208-G05MAC1



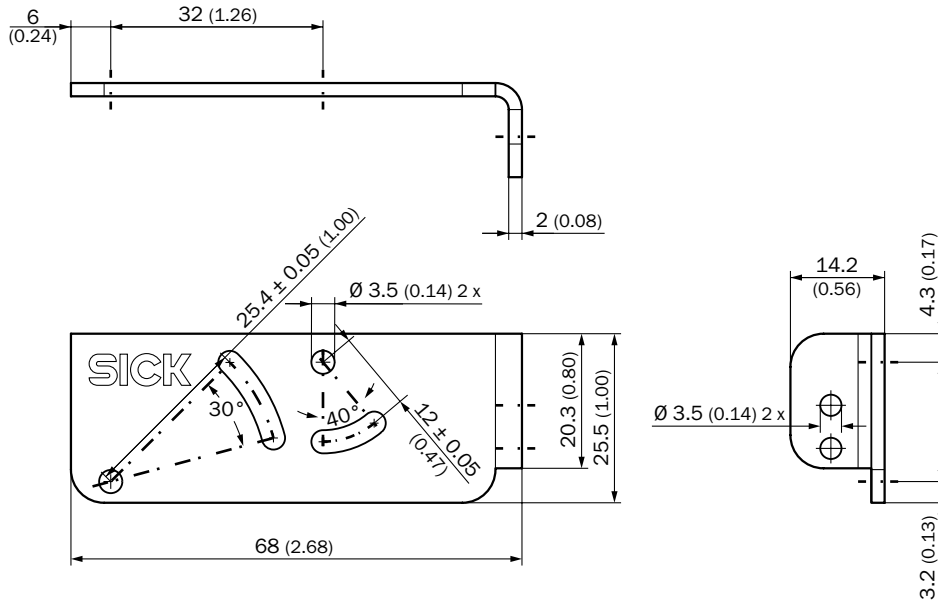
Alignment brackets

BEF-WN-NCV50-ADJST

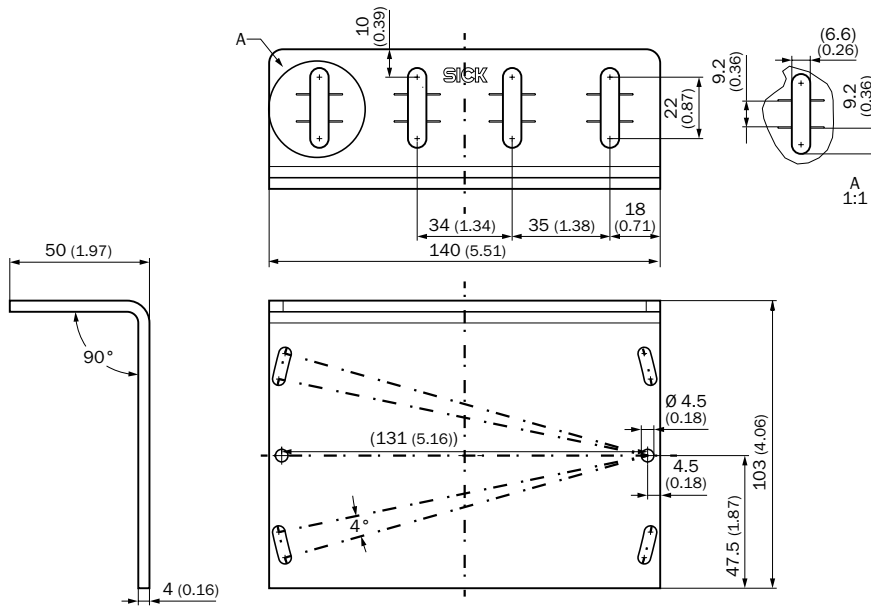


Mounting bracket

BEF-MK-NCV50-W49G6



BEF-WN-NCV50-Monting bracket



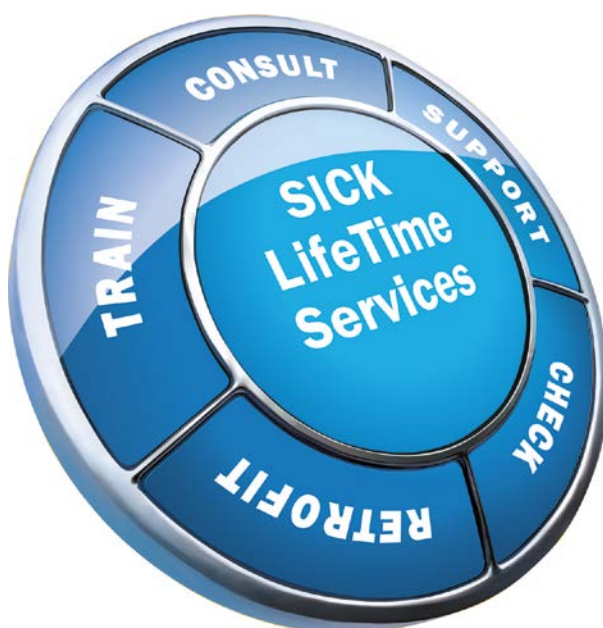
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SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 10,000 employees and over 50 subsidiaries and equity investments as well as numerous agencies worldwide, SICK is always close to its customers. 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.

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