



# WLG4SP-1H162120A00

W4

MINIATURE PHOTOELECTRIC SENSORS

**SICK**  
Sensor Intelligence.



Illustration may differ



Ordering information

Type	Part no.
WL4SP-1H162120A00	1136381

Other models and accessories → [www.sick.com/W4](http://www.sick.com/W4)

Detailed technical data

Features

<b>Functional principle</b>	Photoelectric retro-reflective sensor
<b>Functional principle detail</b>	Without reflector minimum distance (autocollimation/coaxial optics), ClearSens, MultiMode
<b>MultiMode</b>	1 Highly-transparent objects 2 Semi-transparent objects 3 Opaque objects 4 Bottles/Trays 5 Check of foil tear 6 Manual (specific setting via IO-Link)
<b>Sensing range</b>	
<div>Sensing range min.</div> <div>Sensing range max.</div> <div>Maximum distance range from reflector to sensor (operating reserve 1)</div> <div>Recommended distance range from reflector to sensor (operating reserve 3,75)</div> <div>Reference reflector</div> <div>Recommended sensing range for the best performance</div>	<div>0 m</div> <div>7.1 m</div> <div>0 m ... 7.1 m</div> <div>0 m ... 5 m</div> <div>Reflector PL80</div> <div>0 m ... 5 m</div>
<b>Polarisation filters</b>	Yes
<b>Emitted beam</b>	
<div>Light source</div>	PinPoint LED

Type of light	Visible red light
Shape of light spot	Point-shaped
Light spot size (distance)	150 mm (5 m)
Maximum dispersion of the emitted beam around the standardized transmission axis (squint angle)	< +/- 1.5° (at T <sub>a</sub> = +23 °C)
<b>Key LED figures</b>	
Normative reference	EN 62471:2008-09   IEC 62471:2006, modified
LED risk group marking	Free group
Wave length	635 nm
Average service life	100,000 h at T <sub>a</sub> = +25 °C
<b>Adjustment</b>	
Teach-Turn adjustment	BluePilot: Teach-in plus user mode selector
IO-Link	For configuring the sensor parameters and Smart Task functions
<b>Display</b>	
LED blue	BluePilot: Mode display
LED green	Operating indicator Static on: power on Flashing: IO-Link mode
LED yellow	Status of received light beam Static on: object not present Static off: object present Flashing: Below the 1.5 function reserve
<b>Special features</b>	MultiMode
<b>Special applications</b>	Detecting objects wrapped in film, Detecting transparent objects

#### Safety-related parameters

<b>MTTF<sub>D</sub></b>	1,590 years
<b>DC<sub>avg</sub></b>	0%

#### Communication interface

<b>IO-Link</b>	✓, IO-Link V1.1
Data transmission rate	COM2 (38,4 kBaud)
Cycle time	2.3 ms
Process data length	16 Bit
Process data structure	Bit 0 = switching signal Q <sub>L1</sub> Bit 1 = switching signal Q <sub>L2</sub> Bit 2 ... 15 = Current receiver level (live)
VendorID	26
DeviceID HEX	0x800321
DeviceID DEC	8389409
Compatible master port type	A
SIO mode support	Yes

#### Electronics

<b>Supply voltage U<sub>B</sub></b>	10 V DC ... 30 V DC <sup>1)</sup>
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<sup>1)</sup> Limit values.

<sup>2)</sup> This switching output must not be connected to another output.

<b>Ripple</b>	$\leq 5 \text{ V}_{pp}$	
<b>Usage category</b>	DC-12 (According to EN 60947-5-2) DC-13 (According to EN 60947-5-2)	
<b>Current consumption</b>	$\leq 20 \text{ mA}$ , without load. At $U_B = 24 \text{ V}$	
<b>Protection class</b>	III	
<b>Digital output</b>		
Number	2	
Type	Push-pull: PNP/NPN	
Switching mode	Light/dark switching	
Signal voltage PNP HIGH/LOW	Approx. $U_B - 2.5 \text{ V} / 0 \text{ V}$	
Signal voltage NPN HIGH/LOW	Approx. $U_B / < 2.5 \text{ V}$	
Output current $I_{max.}$	$\leq 100 \text{ mA}$	
Circuit protection outputs	Reverse polarity protected Overcurrent protected Short-circuit protected	
Response time	$\leq 500 \mu\text{s}$	
Repeatability (response time)	150 $\mu\text{s}$	
Switching frequency	1,000 Hz	
<b>Pin/Wire assignment</b>		
Function of pin 4/black (BK)	Digital output, light switching, object present $\rightarrow$ output $Q_{L1}$ LOW <sup>2)</sup> IO-Link communication C	
Function of pin 4/black (BK) – detail	The pin 4 function of the sensor can be configured Additional possible settings via IO-Link	
Function of pin 2/white (WH)	Digital output, dark switching, object present $\rightarrow$ output $\bar{Q}_{L1}$ HIGH <sup>2)</sup>	
Function of pin 2/white (WH) – detail	The pin 2 function of the sensor can be configured Additional possible settings via IO-Link	

<sup>1)</sup> Limit values.

<sup>2)</sup> This switching output must not be connected to another output.

## Mechanics

<b>Housing</b>	Rectangular	
<b>Design detail</b>	Slim	
<b>Dimensions (W x H x D)</b>	12.1 mm x 41.9 mm x 18.6 mm	
<b>Connection</b>	Cable, 4-wire, 2 m	
<b>Connection detail</b>		
Deep-freeze property	Do not bend below 0 °C	
Conductor size	0.14 mm <sup>2</sup>	
Cable diameter	Ø 3.4 mm	
Length of cable (L)	2 m	
<b>Material</b>		
Housing	Plastic, VISTAL®	
Front screen	Plastic, PMMA	
Cable	Plastic, PVC	
<b>Maximum tightening torque of the fixing screws</b>	0.4 Nm	

## Ambient data

<b>Enclosure rating</b>	IP66 (EN 60529) IP67 (EN 60529)
<b>Ambient operating temperature</b>	-40 °C ... +60 °C
<b>Ambient temperature, storage</b>	-40 °C ... +75 °C
<b>Typ. Ambient light immunity</b>	Artificial light: ≤ 50,000 lx Sunlight: ≤ 50,000 lx
<b>Shock resistance</b>	30 g, 11 ms (3 positive and 3 negative shocks along X, Y, Z axes, 18 total shocks (EN60068-2-27))
<b>Vibration resistance</b>	10 Hz ... 1,000 Hz (Amplitude 1 mm, 3 x 30 min (EN60068-2-6))
<b>Air humidity</b>	35 % ... 95 %, relative humidity (no condensation)
<b>Electromagnetic compatibility (EMC)</b>	EN 60947-5-2
<b>Resistance to cleaning agent</b>	ECOLAB
<b>UL File No.</b>	NRKH.E181493 & NRKH7.E181493

## Smart Task

<b>Smart Task name</b>	Base logics
<b>Logic function</b>	Direct AND OR
<b>Timer function</b>	Deactivated Switch-on delay Off delay ON and OFF delay Impulse (one shot)
<b>Inverter</b>	Yes
<b>Switching frequency</b>	SIO Logic: 800 Hz <sup>1)</sup>
<b>Response time</b>	SIO Logic: 600 µs <sup>1)</sup>
<b>Repeatability</b>	SIO Logic: 200 µs <sup>1)</sup>
<b>Switching signal</b>	
Switching signal Q <sub>L1</sub>	Switching output
Switching signal $\bar{Q}_{L1}$	Switching output

<sup>1)</sup> Use of Smart Task functions without IO-Link communication (SIO mode).

## Diagnosis

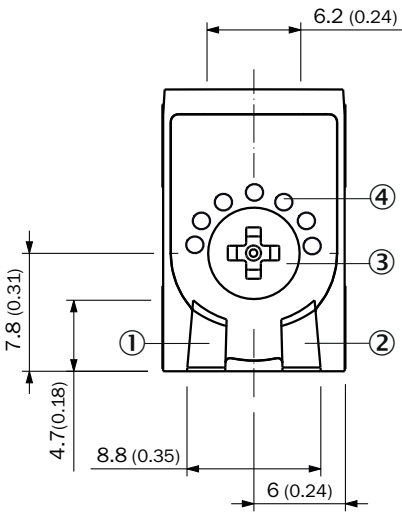
<b>Device temperature</b>	
Measuring range	Very cold, cold, moderate, warm, hot
<b>Device status</b>	Yes
<b>Detailed device status</b>	Yes
<b>Operating hour counter</b>	Yes
<b>Operating hours counter with reset function</b>	Yes
<b>Quality of teach</b>	Yes
<b>Quality of run</b>	Yes, Contamination display

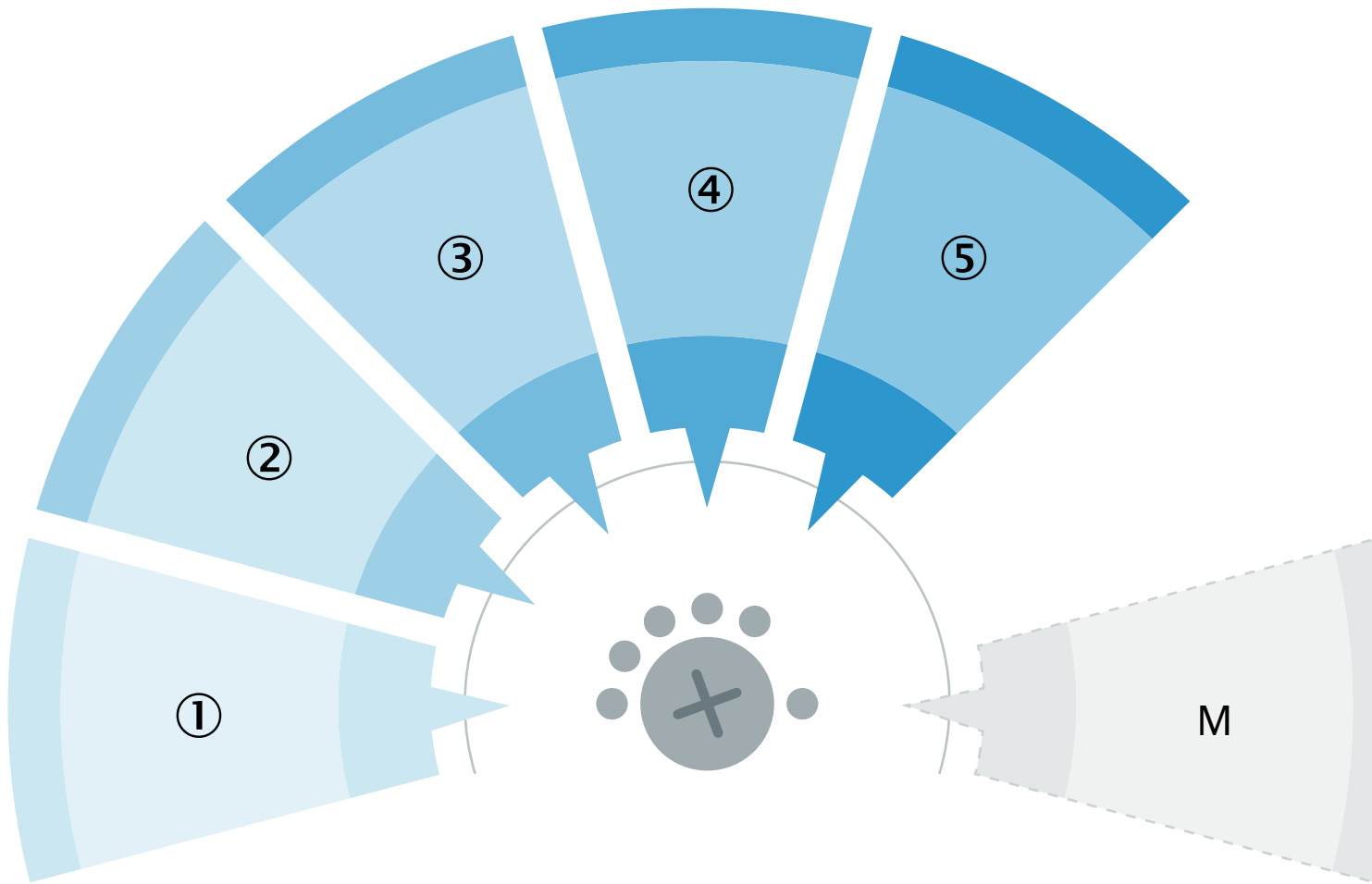
## Classifications

<b>ECLASS 5.0</b>	27270902
<b>ECLASS 5.1.4</b>	27270902

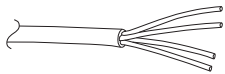
ECLASS 6.0	27270902
ECLASS 6.2	27270902
ECLASS 7.0	27270902
ECLASS 8.0	27270902
ECLASS 8.1	27270902
ECLASS 9.0	27270902
ECLASS 10.0	27270902
ECLASS 11.0	27270902
ECLASS 12.0	27270902
ETIM 5.0	EC002717
ETIM 6.0	EC002717
ETIM 7.0	EC002717
ETIM 8.0	EC002717
UNSPSC 16.0901	39121528

Adjustments

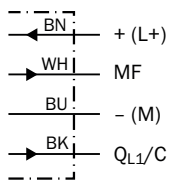




## Connection type



## Connection diagram



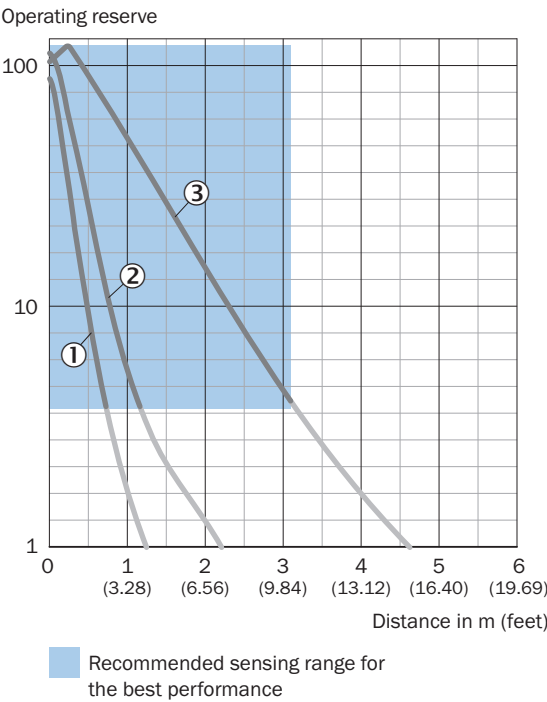
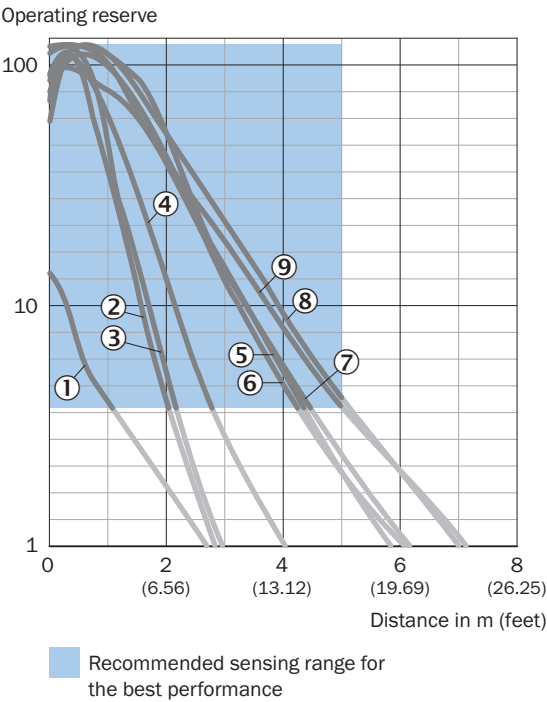
Truth table

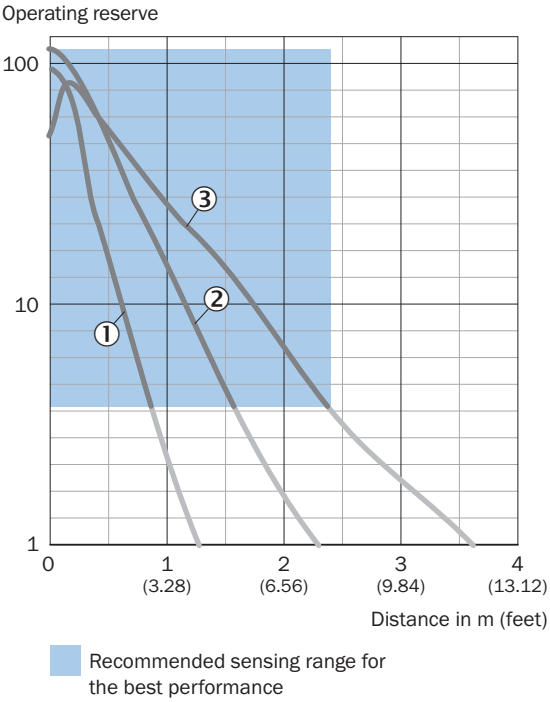
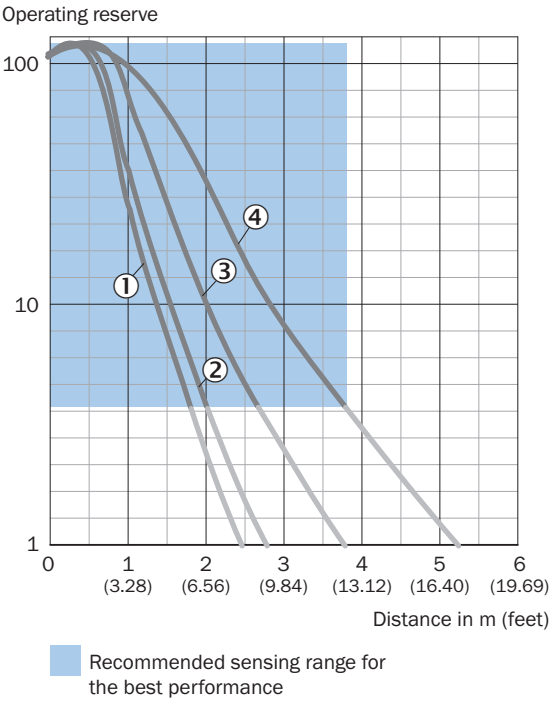
	Dark switching $\bar{Q}$ (normally open (upper switch), normally closed (lower switch))	
	Object not present → Output LOW	Object present → Output HIGH
Light receive	✓	✗
Light receive indicator	☀	✗
Load resistance to L+	⚡	✗
Load resistance to M	✗	⚡

	Light switching Q (normally closed (upper switch), normally open (lower switch))	
	Object not present → Output HIGH	Object present → Output LOW
Light receive	✓	✗
Light receive indicator	☀	✗
Load resistance to L+	✗	⚡
Load resistance to M	⚡	✗

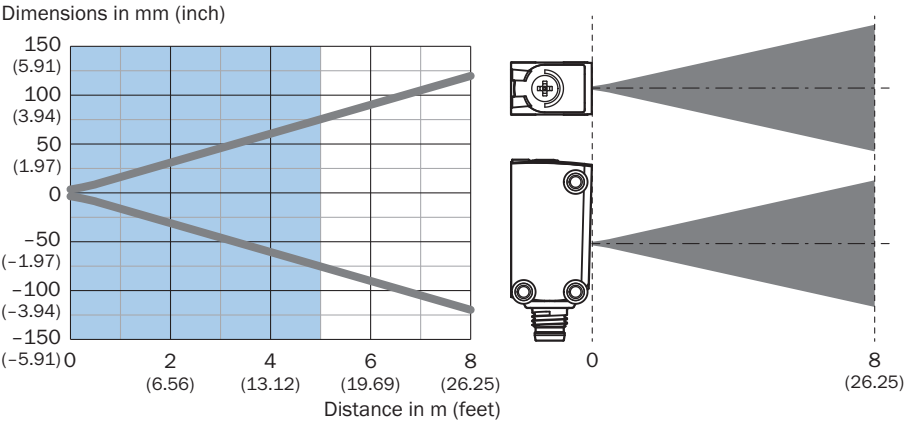


Characteristic curve

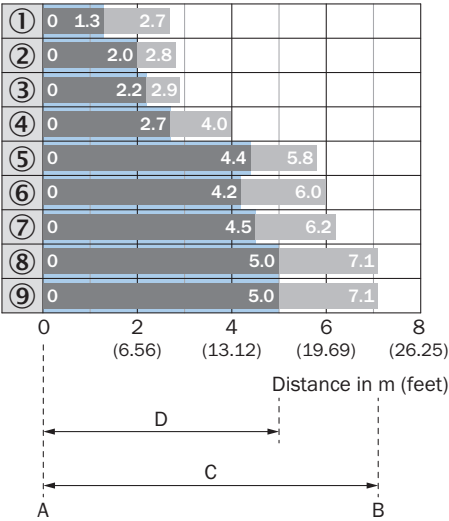




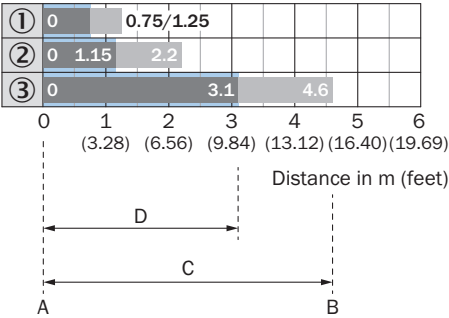
Light spot size



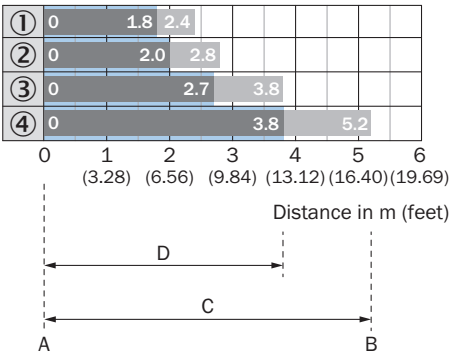
Sensing range diagram



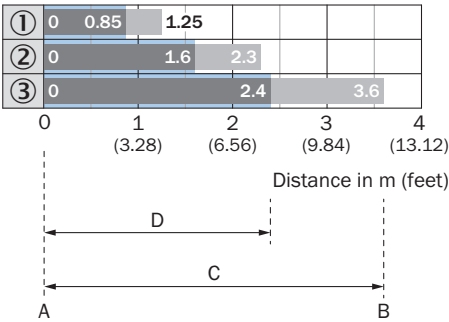
Recommended sensing range for the best performance



Recommended sensing range for the best performance

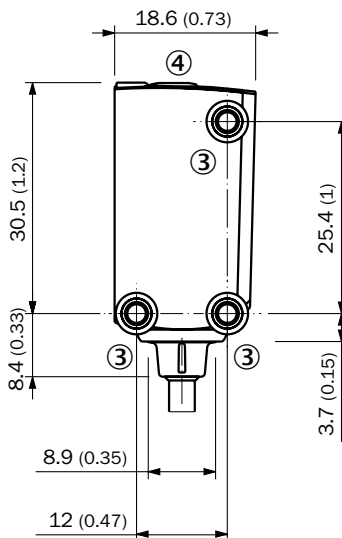
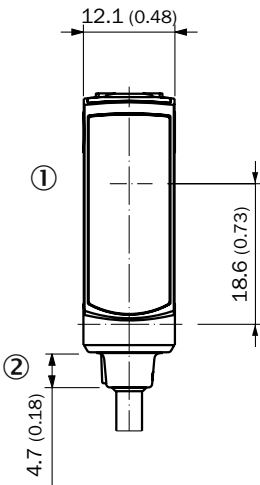


Recommended sensing range for the best performance



Recommended sensing range for the best performance

Dimensional drawing (Dimensions in mm (inch))



## 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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