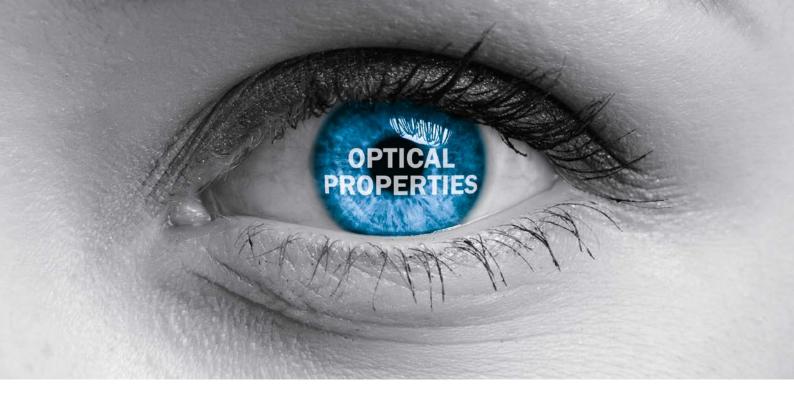


REGISTRATION SENSORS

PRODUCTS AT A GLANCE

Contrast, color, luminescence, fork, array, pattern glare and register sensors





OPTICAL CHALLENGES - RELIABLE SENSOR SOLUTIONS

A WIDE VARIETY

The process control details are often not visible to the human eye. Colors, contrasts, glare, or even entire patterns flash by and the eye cannot detect them.

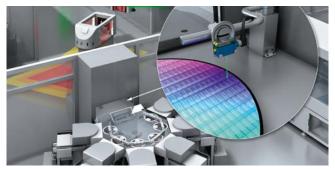
However, nothing escapes SICK sensors – with a diversified product range, they ensure that the widest range of optical characteristics can be detected safely and reliably. And all of this is possible even when the challenge seems impossible at first.



DETECTING AND DIFFERENTIATING CONTRASTS

If you need to differentiate between light and dark, various color levels, gray scale values, and contrasts during your processes, then you will always find yourself faced with the challenge of reliable contrast differentiation. In all of these cases, detecting the finest details and smallest deviations is key.

Examples



Differentiating surface coatings in wafer production.



Detecting registration marks on printing machines.



Detecting print marks on envelope-stuffing or labeling machines.



Detecting and differentiating contrasts

 Contrast sensors
 10

 Register sensors
 21

DETECTING AND DIFFERENTIATING COLORS

Differentiating by color is a complex task and is particularly challenging when the nuances are only slight. Light blue or blue, yellow or orange – something which seems very simplistic to the eye can often cause difficulties in industrial processes. If you have to differentiate or select your process control by color, then you will find yourself faced with the challenge of detecting color.

Examples



Monitoring stampings.



PSDI control on a packaging machine based on a color element.



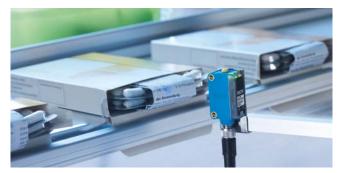
Detecting packaging with faulty printing.



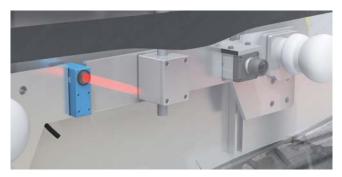
DETECTING LUMINESCENCE AND INVISIBLE MARKS

Often the human eye does not see what has to be detected and evaluated. The reason for this is markings which are only visible under UV light. Luminescence sensors are crucial if you want to work with or uniquely allocate marks like this and detect specific content in your processes, or if your processes require differentiation regardless of color, pattern, or surface quality.

Examples



Monitoring the placement of packaging inserts in the pharmaceutical industry.



Quality control for front screen in the automotive industry.



Monitoring glue application in the wood processing industry.



Detecting luminescence and invisible marks

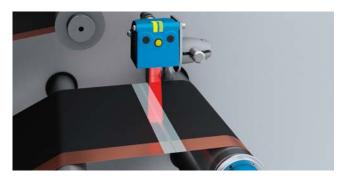
DETECTING GLARE AND GLARE DIFFERENCES

Detecting glossy surfaces and differentiating them from matte areas is particularly challenging as often the differences in the level of glare are only minimal. However, glare offers unexpected possibilities for controlling processes regardless of color, transparency, or pattern. If you would like to record glare differences, detect reflective objects, or detect non-reflective areas, then you will need to detect glare.

Examples



Detecting protective packaging.



Detecting splice connections in sheets.



Detecting authenticity features.



DETECTING OBJECTS AND MANAGING LABELS IN LINE WITH THE THROUGH-BEAM PRINCIPLE

Hitting the mark without the need for extensive preparation is the very definition of precision. However, fork sensors from SICK do not just boast accuracy but also an outstanding array of equipment: senders and receivers are located in the housing, which saves time during alignment.

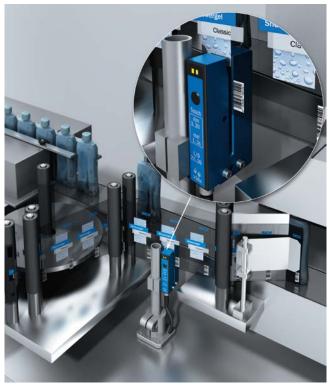
Examples



The fork sensor WFS is ideal for the detection of non-transparent labels. Thanks it its slim fork design, it is ideal for integration into the machine concept.



Safe object detection with fork sensors from SICK. Whether the light source uses red, infrared or laser light, we have the ideal solution for your application with WFM, WFN, and WFL.



The UFnext ultrasonic fork sensor detects both transparent, opaque, and also printed labels, making it the obvious choice for label detection.

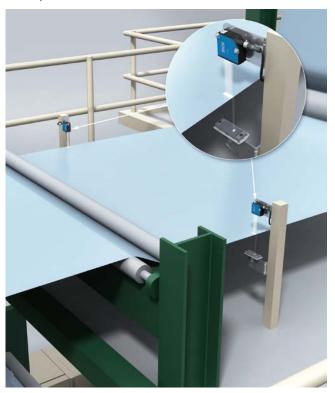


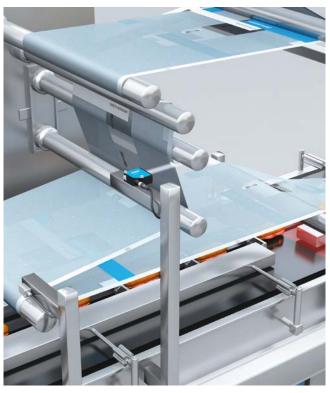
Detecting objects and managing labels in line with the through-beam principle

DETECTING EDGES, LINES, AND DIAMETERS

The array sensor from SICK is the ideal solution for accurate web edge and line tracing. Whether you need to position print marks, control web edges, or monitor unchanging diameters, the Ax20 is the ideal solution with its measuring principle of operation.

Examples





The Ax20 line sensor is the efficient solution for accurate web edge control, width and diameter detection as well as the detection of small parts. Thanks to its scanning principle, it can be flexibly integrated into the machine concept.



Detecting edges, lines, and diameters

DETECTING PATTERNS

Company logos, labels, printed information, and all recurrent optical elements on a product represent optical patterns. Being able to detect the positions of these more and more accurately makes many processes a lot easier, whether these are in packaging, labeling, or internal logistics. Do you also work with labeled or printed objects in your processes? Then you have to detect patterns.

Examples



Tube positioning in the packaging industry.



Detecting cutting positions.



Monitoring labels in the packaging industry.







KTS Core

Universal contrast detection in modern housing



KTS Prim

Innovative TwinEye-Technology for better contrast detection

Technical data overview			
Dimensions (W x H x D)	26 mm x 62 mm x 47.5 mm	26 mm x 62 mm x 47.5 mm	
Sensing distance	13 mm	13 mm / 25 mm	
Type of light	LED, White LED, RGB	LED, RGB	
Light spot size	1.2 mm x 3.9 mm	0.9 mm x 3.8 mm 1.2 mm x 5.3 mm 3.8 mm x 0.9 mm 5.3 mm x 1.2 mm Ø 9 mm	
Switching frequency	25 kHz / 12.5 kHz	50 kHz / 70 kHz / 25 kHz	
Response time	20 μs / 40 μs	3 μs / 10 μs / 20 μs	
Output function	Light/darkswitching	Light/darkswitching	
Adjustment	2-point teach-in Dynamic Teach-in	1-point teach-in, 2-point teach-in, dynamic Teach-in, auto mode	
Connection type	Male connector M12, 4-pin	Male connector M12, 4-pin Male connector M12, 5-pin	
IO-Link	-	v / -	

At a glance

- White LED or RGB LED
- · High gray line resolution
- Very large dynamic range means reliable detection of contrasts on glossy materials
- 25 kHz / 12.5 kHz switching frequency
- Display for easy sensor adjustment
- 2-point and dynamic teach-in
- Manual switching threshold adjustment
- Light/dark switching

- TwinEye-Technology for increased depth of field and sensing distance tolerance
- 50 kHz switching frequency and 5 µs jitter
- Large dynamic range means reliable detection of contrasts on glossy materials
- 7-segment display
- Color mode
- Mounting feedback
- IO-Link and automation functions
- Flexible sensor setting thanks to various sensor parameters





Detailed information

→ www.sick.com/KTS Core

→ www.sick.com/KTS Prime



KTX Prime

Contrast detection with TwinEye-Technology in tried-and-tested housing. Innovation in familiar housing for the very best sensor performance



KTM Core

Mini, easy, speedy



KTM Prime

Mini, easy, speedy, robust

30 mm x 53 mm x 78.5 mm	21 mm x 31.5 mm x 12 mm	21 mm x 31.5 mm x 12 mm 22.2 mm x 48.6 mm x 15.25 mm
13 mm / 25 mm	12.5 mm	12.5 mm / 11 mm
LED, RGB	LED, white	LED, RGB LED, white
3.8 mm x 0.9 mm 5.3 mm x 1.2 mm 0.9 mm x 3.8 mm 1.2 mm x 5.3 mm Ø 9 mm	Ø 1 mm Ø 2 mm	1.5 mm x 3.5 mm Ø 2 mm
50 kHz / 70 kHz	10 kHz	15 kHz
3 µs / 10 µs	50 μs	35 µs
Light/darkswitching	Light/darkswitching	Light/darkswitching
1-point teach-in, 2-point teach-in, dynamic Teach-in, auto mode	Potentiometer	2-point teach-in static/dynamic + proximity to mark
Male connector M12, 4-pin Male connector M12, 5-pin	Male connector M8, 4-pin Cable with M12 male connector, 4-pin Cable open end, 4-wire	Male connector M8, 4-pin Cable with M12 male connector, 4-pin
v / -	-	v / -

- TwinEye-Technology for increased depth of field and sensing distance tolerance
- 50 kHz switching frequency and 5 μs
- Large dynamic range means reliable detection of contrasts on glossy materials
- · 7-segment display
- · Color mode
- · Assembly feedback
- IO-Link and automation functions
- Flexible sensor setting thanks to various sensor parameters



→ www.sick.com/KTX_Prime

- · Small, tried-and tested housing
- · High grayscale resolution
- Very large dynamic range means reliable detection of contrasts on glossy materials
- Switching frequency: 10 kHz
- White light

- Small, tried-and-tested housing, also available in stainless steel
- High grayscale resolution
- Very large dynamic range means reliable detection of contrasts on glossy materials
- Static and dynamic teach-in in one variant
- Switching frequency: 15 kHz
- KTM Prime with IO-LInk functions



→ www.sick.com/KTM Cor



→ www.sick.com/KTM Prime







Long sensing distance – precise detection



CTΩ

Laser contrast sensor and CAN communication

Technical data overview		
Dimensions (W x H x D)	12 mm x 40 mm x 22 mm	30.4 mm x 53 mm x 80 mm
Sensing distance	40 mm	10 mm / 20 mm / 60 mm / 150 mm
Type of light	Laser, Red	LED, RGB Laser, Red
Light spot size	1 mm x 2 mm	0.8 mm x 4 mm 1.5 mm x 5.5 mm 13 mm x 13 mm Ø 0.3 mm Ø 3 mm
Switching frequency	1.5 kHz	17 kHz / 22.5 kHz
Response time	400 µs	22 μs / 30 μs
Adjustment	Static 2-point teach-in	Static 2-point teach-in, Dynamic teach-in (min/max)
Connection type	Male connector M12, 4-pin	Male connector M12, 5-pin Male connector M12,8-pin
IO-Link	-	-

At a glance

- Very small housing
- Precise, small laser spot
- Sensing distance up to 60 mm
- Simple 2-point teach-in
- Switching frequency of 1,5 kHz
- Reliable operation for jittering materials
- Laser version offers sensing distances of 30 mm to 800 mm
- Very small and precise laser light spot (Class II)
- Fast switching frequency of 17 kHz
- Detection reliability displayed in the bar graph display
- CAN interface version for parameter setup, diagnostics and function selection
- Very precise light spot



→ www.sick.com/KT3



→ www sick com/KT8



Technical data overview		
Dimensions (W x H x D)	12 mm x 31.5 mm x 21 mm	30.4 mm x 53 mm x 80 mm
Sensing distance	12.5 mm	12.5 mm / 60 mm
Type of light	LED, RGB	LED, RGB
Light spot size	1.5 mm x 6.5 mm	2 mm x 4 mm 13 mm x 13 mm
Switching frequency	1.7 kHz	0.5 kHz / 1 kHz / 3 kHz / 3.5 kHz / 6 kHz
Response time	300 µs	85 μs, 145 μs, 160 μs, 500 μs, 1,000 μs
Output (channel)	1 color / 8 colors via IO-Link	1 color / 4 colors
Adjustment	1-point-teach-in	Static 1-point teach-in
Connection type	Cable with male connector Cable	Male connector
IO-Link	v / -	-

At a glance

- · Color sensor in a new miniature housing
- Static and teach-in method for 1 color using control cable or control panel
- Over IO-Link up to 8 colors teachable
- Switching frequency: 1.7 kHz
- Sensing distance: 12.5 mm
- Compatibility with older color sensors thanks to cable with male connector M12
- One (CS8-1) or four (CS8-4) colors can be saved
- 12.5 mm or 60 mm sensing distance
- Fast response time up to 85 µs
- High resolution color
- Bar graph display shows the correlation of the colors
- Extremely precise light spot and high resolution
- Metal housing with two light exits (interchangeable)





Detailed information

→ www.sick.com/CSM

→ www.sick.com/CS8







Small, intelligent luminescence sensor

The solution for standard applications

Technical data overview			
Dimensions (W x H x D)	12 mm x 31.5 mm x 21 mm	30.4 mm x 80 mm x 53 mm	
Sensing distance	12.5 mm	10 mm / 20 mm / 50 mm / 90 mm	
Type of light	LED, ultraviolet light	LED, ultraviolet light	
Light spot size	2 mm x 2.5 mm	2 mm x 6 mm 3 mm x 9 mm 15 mm x 15 mm 12 mm x 12 mm	
Light emission	Long side	Long side	
Switching frequency	6 kHz	1.5 kHz	
Response time	80 µs	350 μs	
Output function	Light/darkswitching	Light switching	
Analog output Q _A	-	-	
Adjustment	2-point teach-in static/dynamic	-	
Connection type	Cable with M12 male connector, 4-pin Male connector M8, 4-pin	Male connector M12, 4-pin Male connector M12, 5-pin	
IO-Link	v / -	-	

At a glance

- Luminescence sensor in a miniature hous-
- Static and dynamic teach-in methods in a single variant
- Reliable detection even at a low level luminescence
- Switching frequency: 6 kHz
- Operating range: 8 ... 20 mm
- IO-Link function
- Compatibility with older LUT sensors thanks to cable with male connector M12

- Rugged metal housing • Sensing distance: 10, 20, or 50 mm
- Sensing ranges can be selected with interchangeable lenses
- Sender LED UV (375 nm)





Detailed information

→ www.sick.com/LUT3



LIITS

For universal use with easy adjustment



UT9

The new standard for high-performance luminescence sensors

30.4 mm x 53 mm x 80 mm	30.4 mm x 53 mm x 80 mm
10 mm / 20 mm / 50 mm / 90 mm	10 mm / 20 mm / 50 mm / 90 mm / 150 mm
LED, ultraviolet light	LED, ultraviolet light LED, Blue
2 mm x 6 mm 3 mm x 9 mm 15 mm x 15 mm 12 mm x 12 mm Ø 6 mm	2 mm x 6 mm 3 mm x 9 mm 5 mm x 12 mm 5 mm x 15 mm 12 mm x 12 mm
Long side	Long side / long and short side, exchangeable
2.5 kHz	0.5 kHz / 2.5 kHz / 6.5 kHz
200 μs	$1 \text{ ms} / 75 \mu \text{s} / 200 \mu \text{s}$
Light switching	
0 mA 13 mA	0 mA 13 mA
-	Static 2-point teach-in with manual fine adjustment
Male connector M12, 5-pin	Male connector M12, 4-pin Male connector M12, 5-pin
-	v / -

- Tough metal housing
- Simple sensitivity adjustment in 8 stages
- Bar graph display provides information about the luminescence intensity
- Sensing distances selectable through interchangeable lenses
- Additional optical filters suppress background luminescence
- Fiber-optic cable connection (with 20 mm lens)
- · Switching and analog output

- Simple teach-in
- Operating range up to 250 mm
- · Version with IO-Link for remote monitoring
- Bar graph display provides information about the luminescence intensity
- High speed (6.5 kHz), standard (2.5 kHz), high resolution (500 Hz) models
- Additional optical filters suppress background luminescence
- Fiber-optic cable connection (with 20 mm lens)
- · Switching and analog output



→ www.sick.com/LUT8

→ www.sick.com/LUT9





UFnext

The clear choice for detecting transparent labels



Precise detection for optimum label detection

Technical data overview		
Dimensions (W x H x D)	18 mm x 47,5 mm x 92,5 mm	10 mm x 25 mm x 64.3 mm
Functional principle	Ultrasonic detection principle	Optical detection principle
Fork width	3 mm	3 mm
Fork depth	69 mm	42 mm
MDO	Gap between labels: 2 mm Size of labels: 2 mm	Gap between labels: 2 mm Size of labels: 2 mm
Light source	-	LED, Infrared light
Switching frequency	1.5 kHz	10 kHz / 15 kHz
Response time	250 μs	46 μs / 50 μs
Output function	Light/darkswitching, selectable via button	Light/darkswitching, selectable via button
Adjustment	1-point teach-in, 2-point teach-in, dynamic Teach-in	1-point teach-in, 2-point teach-in, dynamic Teach-in
Connection type	Male connector M8, 4-pin	Male connector M8, 4-pin Cable, 4-wire 2 m
IO-Link	-	v / -

At a glance

- · Detection of transparent, opaque or printed labels
- Unaffected by metallic foils and labels
- Fast response time of 250 µs
- Simple and accurate adjustment via "+"/"-"-buttons or teach-in
- Rugged, IP 65 aluminum housing

- · Housing with slim forked shape
- Simple and precise setting of the switching threshold via IO-Link, teach-in button, or plus/minus buttons
- Light/dark switching function
- Fast response time: 50 µs
- PNP or NPN switching output
- Plastic housing with IP 65 enclosure rating
- Smart sensor with integrated IO-Link interface





Detailed information



WEnov

The specialist for high-speed applications



WFI

The perfect sensor for the detection of very small parts and precise positioning



//EM

Plug-and-play fork sensors – connect and get started

10 mm x 32 mm x 57 mm
...
10 mm x 150 mm x 110 mm
Optical detection principle
2 mm ... 225 mm
42 mm ... 95 mm
0.2 mm

LED, Infrared light 10~kHz / 15~kHz $46~\mu\text{s} / 100~\mu\text{s}$ Light/darkswitching, selectable via button

Male connector M8, 4-pin

v / -

10 mm x 40,5 mm x 47 mm
...
10 mm x 158,5 mm x 110 mm
Optical detection principle
2 mm ... 120 mm
42 mm ... 95 mm
0.05 mm

10 kHz / 11 kHz
60 µs / 100 µs
Light/darkswitching, selectable via button
1-point teach-in, 2-point teach-in,
dynamic Teach-in

Laser, visible red light

Male connector M8, 4-pin

✓ / -

10 mm x 50 mm x 59,5 mm

10 mm x 200 mm x 141,8 mm Optical detection principle

> 30 mm ... 180 mm 42 mm ... 124 mm

0.8 mm

1 mm LED, visible red light

4 kHz

125 µs Light/darkswitching

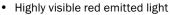
-

Male connector M8, 3-pin Cable, 3-wire

Infrared light source

- Simple and accurate adjustment via teach-in or manually via "+"/"-" buttons
- Fast response time (max. 100 µs)
- PNP and NPN switching output
- Light/dark switching function
- 21 different models with different fork widths and depths
- · Rugged, IP 65 aluminum housing

- High-precision laser (Class 1)
- Simple and precise setting via teachin
- Fast response time (max. 100 μs)
- Minimum detectable object size of just 0.05 mm
- PNP and NPN output signal switching device
- Light/dark switching function
- 21 different models with different fork widths and depths
- Rugged, IP 65 aluminum housing



- No setup, out-of-the-box operation
- 360° output indicator
- 5 fork sizes: maximum depth
 120 mm, maximum width 180 mm
- Rugged, IP 67 aluminum housing



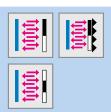
→ www.sick.com/WI



→ www.sick.com/WF



→ www.sick.com/WFN







Ax20E Edge

Ax20E array sensors – edge detection

Ax20D Diameter

Ax20D array sensors – diameter detection

Technical data overview		
Dimensions (W x H x D)	24.3 mm x 59.8 mm x 54.1 mm	24.3 mm x 59.8 mm x 54.1 mm
Functional principle	Edge detection, proximity and reflector / Edge detection, reflector	Diameter detection, proximity and reflector
Sensing distance	25 mm / 100 mm	25 mm / 100 mm
MDO	0.8 mm / 1.6 mm	0.8 mm / 1.6 mm
Type of light	LED, White	LED, White
Measurement range	20 mm / 30 mm	20 mm / 30 mm
Reproducibility	0.03 mm 0.05 mm	0.03 mm 0.05 mm
Light spot size	30 mm x 5 mm 50 mm x 10 mm	30 mm x 5 mm 50 mm x 10 mm
Analog output Q _A	4 mA 20 mA	4 mA 20 mA
Connection type	Male connector M12, 5-pin	Male connector M12, 5-pin
IO-Link	-	-

At a glance

- · Detect position of edge of material
- · Reflector mode version also available
- · Compact, metal housing
- Reproducibility of 0.03 mm
- Sensing distance 25 mm or 100 mm
- Measurement range up to 30 mm
- Analog output 4 mA ... 20 mA

- Detection of diameter and width
- Compact, metal housing
- Reproducibility of 0.03 mm
- Sensing distance 25 mm or 100 mm
- Measurement range up to 30 mm
- Analog output 4 mA ... 20 mA





Detailed information

→ www.sick.com/Ax20

→ www.sick.com/Ax20





PS30

From pattern detection to rapid position identification

Technical data overview	
Dimensions (W x H x D)	46 mm x 77 mm x 46 mm
Max. movement speed	10 m/s
Sensing distance	20 mm
Reproducibility	0.15 mm (at 5 m/s) 0.3 mm (at 10 m/s)
Light spot size	65 mm x 3 mm
Adjustment	Start stop teach Start length teach
Connection type	Male connector M12, 12-pin
IO-Link	-

At a glance

- Rugged housing with rotatable male connector
- Scanning speed up to 10 m/s
- Reproducibility of up to 0.15 mm (2 Sigma)
- Ethernet interface for integration into the machine controller
- Integrated, visible object illumination
- Operating elements with cleartext display
- Software tools for visualized configuration and diagnosis of the sensor
- Automatic configuration when changing objects



Detailed information

→ www.sick.com/PS30





Glare

The authority on gloss

Technical data overview	
Dimensions (W x H x D)	42.5 mm x 44 mm x 43.4 mm
Sensing distance	50 mm
MDO	12 mm x 14 mm
Light source	LED, Red
Light spot size	10 mm x 12 mm
Switching frequency	500 Hz
Response time	1 ms
Adjustment	Static 1-point teach-in / Static 2-point teach-in Dynamic 2-point teach-in /Static 3-point teach-in
Connection type	Male connector M12, 5-pin
IO-Link	-

At a glance

- Object detection and differentiation on the basis of surface gloss level
- Configurable in many different operating modes to meet the requirements of any application
- Integrated alignment aid
- Integrated automation functions
- Two digital push-pull outputs and one configurable input
- Sensitivity adjusts to object properties
- IO-Link provides easy data access from the PLC
- Quick and easy configuration



Detailed information

→ www.sick.com/Glare



Technical data overview	
Dimensions (W x H x D)	15 mm x 62 m x 60 mm
Sensing distance	13 mm
Light source	LED, White
Light spot size	0.8 mm x 3 mm
Response time	≤ 20 µs
Connection type	Male connector M12, 8-pin
IO-Link	-

At a glance

- The register is controlled with individual thresholds
- Unique housing: one screw mounting
- Tight dual-sensor mounting ability
- Detects 1-18 marks of different colors
- Easy teach-in via button



Detailed information

→ www.sick.com/RS10

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SERVICES FOR MACHINES AND SYSTEMS: SICK LifeTime Services

Our comprehensive and versatile LifeTime Services are the perfect addition to the comprehensive range of products from SICK. The services range from product-independent consulting to traditional product services.





Consulting and design Safe and professional



Product and system support Reliable, fast and on-site



Verification and optimization Safe and regularly inspected



Upgrade and retrofits
Easy, safe and economical



Training and education
Practical, focused and professional

SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 8,000 employees and over 50 subsidiaries and equity investments as well as numerous agencies worldwide, we are always close to our 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.

We have extensive experience in various 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 round out 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:

Australia, Austria, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Hong Kong, India, Israel, Italy, Japan, Malaysia, Mexico, Netherlands, New Zealand, Norway, Poland, Romania, Russia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Arab Emirates, USA, Vietnam.

Detailed addresses and further locations → www.sick.com

