



CONTRAST, COLOR, LUMINESCENCE, FORK, ARRAY AND GLARE SENSORS

PRODUCTS AT A GLANCE

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

SICK
Sensor Intelligence.



OPTICAL CHALLENGES – RELIABLE SENSOR SOLUTIONS

A WIDE VARIETY

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

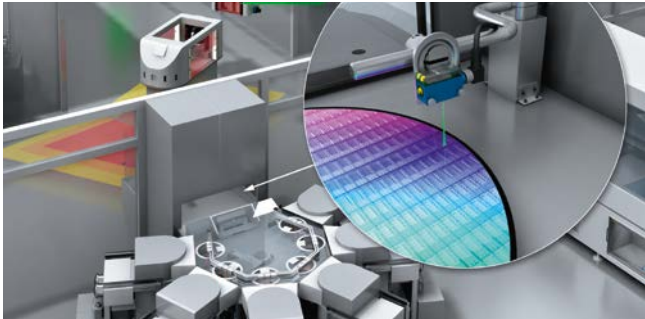
However, nothing escapes SICK sensors – with a diversified product range, they ensure that the widest range of optical characteristics can be detected safely and reliably. And all of this is possible even when the challenge seems impossible at first.



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.



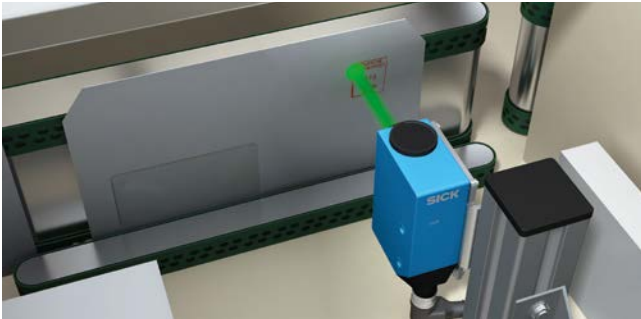
Detecting and differentiating contrasts

| | |
|------------------------|----|
| Contrast sensors | 10 |
| RS10 | 12 |

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.



Detecting packaging with faulty printing.



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



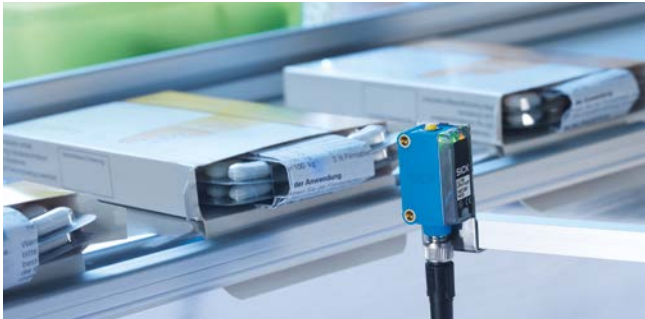
Detecting and differentiating colors

Color sensors 13

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.

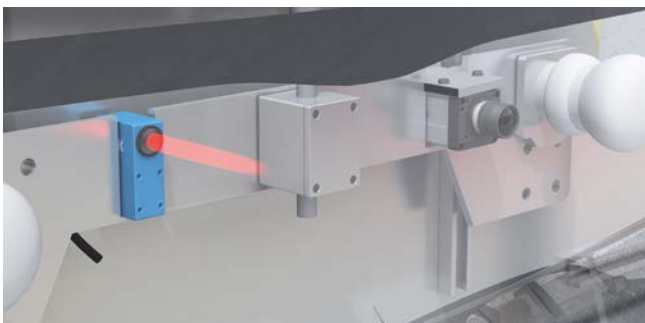
Examples



Monitoring the placement of packaging inserts in the pharmaceutical industry.



Monitoring glue application in the wood processing industry.



Quality control for front screen in the automotive industry.



Detecting luminescence and invisible marks

Luminescence sensors 15

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.

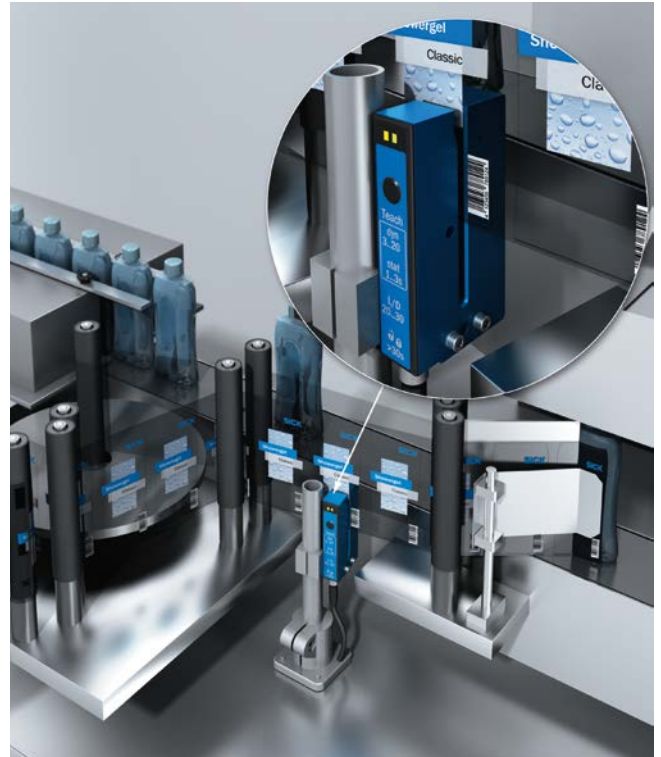
Examples



The fork sensor WFS is ideal for the detection of non-transparent labels. Thanks to 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.



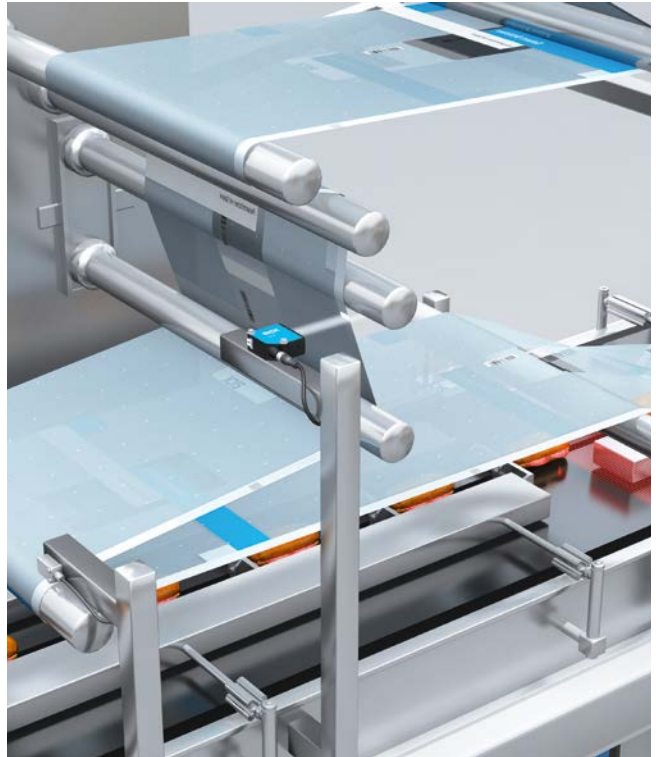
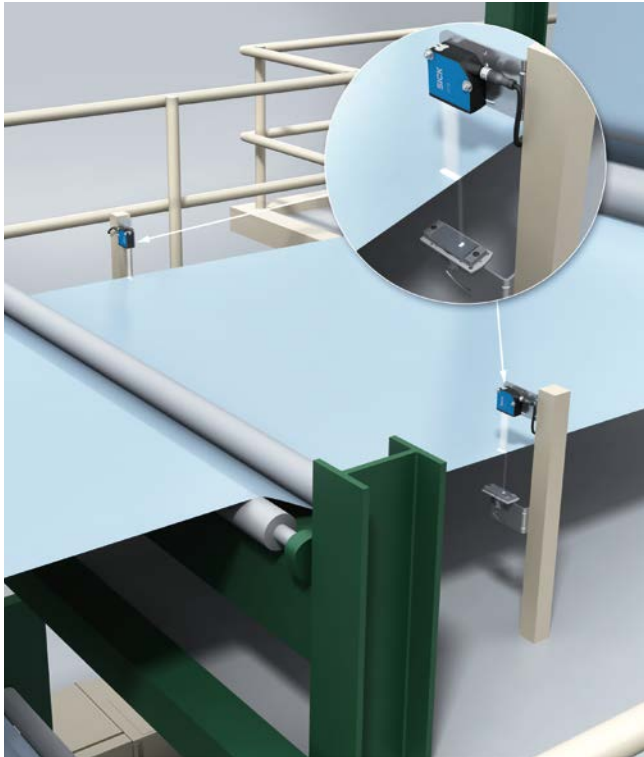
Detecting objects and managing labels in line with the through-beam principle

Fork sensors.17

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

| | |
|--------------------|----|
| Array sensor | 18 |
|--------------------|----|

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.

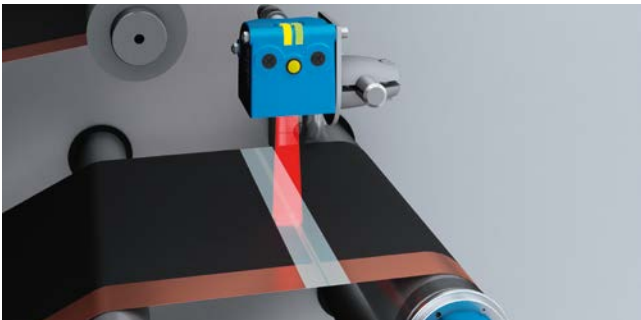
Examples



Detecting protective packaging.



Detecting authenticity features.



Detecting splice connections in sheets.



Detecting glare and glare differences

| | |
|---------------------|----|
| Glare sensors | 19 |
|---------------------|----|

| | | | |
|--|--|--|---|
| | | | |
| | KTL180 | KTS Core | KTS Prime |
| | Safe object detection at high machine speeds | Universal contrast detection in modern housing | Innovative TwinEye-Technology for better contrast detection |

| Technical data overview | | | | |
|-------------------------|---|--|---|--|
| Dimensions (W x H x D) | 10.5 mm x 33.2 mm x 71.9 mm | 26 mm x 62 mm x 47,5 mm | 26 mm x 62 mm x 47,5 mm | |
| Sensing distance | 0 mm ... 1,400 mm | 13 mm | 13 mm / 25 mm / 40 mm / 70 mm / 150 mm | |
| Type of light | LED, white | LED, RGB LED, white | LED, RGB LED, white | |
| Light spot size | - | 1.2 mm x 3.9 mm | 0.9 mm ... 12 mm | |
| Switching frequency | 31.2 kHz | 4 kHz / 25 kHz / 12.5 kHz | 70 kHz / 50 kHz / 25 kHz / 11,5 kHz / 6,25 kHz / 1,5 kHz | |
| Response time | 16 µs | 20 µs / 40 µs / 120 µs | 3 µs / 10 µs / 20 µs / 42 µs / 80 µs / 320 µs | |
| Output function | PNP, NPN | PNP, NPN, PUSH/PULL | PNP, NPN, PUSH/PULL | |
| Teach-in mode | - | 1-point teach-in 2-point teach-in teach-in dynamic | n-point, 1-point, 2-point teach-in teach-in dynamic auto-mode | |
| Connection type | Male connector M8, 4-pin Cable M12 male connector, 5-pin Cable open end, 4-wire | Male connector M12, 4-pin | Male connector M12, 4-pin Male connector M12, 5-pin | |
| IO-Link | - | - | ✓ | |

| At a glance | | | | |
|----------------------|---|--|---|--|
| | <ul style="list-style-type: none"> • 31.2 kHz switching frequency at a response time of 16 µs • High dynamic range • Multi-functional 7-segment display • Job save for easy format change • 1-point, 2-point and dynamic teach-in • Master-slave function • A wide range of different fibers | <ul style="list-style-type: none"> • White LED or RGB LED • High gray line resolution • Very large dynamic range means reliable detection of contrasts on glossy materials • 4 kHz switching frequency • Display for easy sensor adjustment • 1-point, 2-point and dynamic teach-in • Manual switching threshold adjustment • Light/dark switching | <ul style="list-style-type: none"> • 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 • Assembly feedback • IO-Link and automation functions | |
| | | | | |
| Detailed information | → www.sick.com/KTL180 | → www.sick.com/KTS_Core | → www.sick.com/KTS_Prime | |



KTX Prime

Contrast detection with TwinEye-Technology in tried-and-tested housing



KTM Core

Mini, easy, speedy



KTM Prime

Mini, easy, speedy, robust

| | | | |
|--|---|--|--|
| | 30 mm x 53 mm x 78.5 mm | 12 mm x 31.5 mm x 21 mm | 12 mm x 31,5 mm x 21 mm 15.25 mm x 48.6 mm x 22.2 mm |
| | 13 mm / 25 mm / 40 mm / 70 mm / 150 mm | 12.5 mm | 11 mm / 12.5 mm |
| | LED, RGB | LED, white | LED, white LED, RGB Laser, visible red light |
| | 0.9 mm ... 12 mm | Ø 1 mm / Ø 2 mm | 1,5 mm x 6,5 mm Ø 1 mm / Ø 1.7 mm / Ø 1.8 mm / Ø 2 mm |
| | 70 kHz / 50 kHz / 25 kHz / 11.5 kHz / 6.25 kHz | 10 kHz | 15 kHz / 4 kHz / 1,5 kHz |
| | 3 µs / 10 µs / 20 µs / 42 µs / 80 µs | 50 µs | 0,125 ms / 0,333 ms 32 µs / 35 µs |
| | PNP, NPN, PUSH/PULL | PNP, NPN | PNP, NPN |
| | n-point, 1-point, 2-point teach-in teach-in dynamic auto-mode | - | 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 |
| | ✓ | - | ✓ |

- 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
- 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

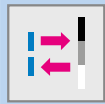


→ www.sick.com/KTM_Core

- 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_Prime



KT8

Laser contrast sensor



RS10

Adjustable individual thresholds

Technical data overview

| | | |
|-------------------------------|--|---------------------------|
| Dimensions (W x H x D) | 30.4 mm x 53 mm x 80 mm | 15 mm x 62 mm x 60 mm |
| Sensing distance | 150 mm | 13 mm |
| Type of light | Laser, Red | LED, White |
| Light spot size | Ø 0.3 mm Ø 3 mm | 0.8 mm x 3 mm |
| Switching frequency | 17 kHz | - |
| Response time | 30 µs | ≤ 20 µs |
| Teach-in mode | Static 2-point teach-in, Dynamic teach-in (min/max) | - |
| Connection type | Male connector M12, 5-pin | Male connector M12, 8-pin |
| IO-Link | - | - |

At a glance

- 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
- Very precise light spot



- 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/KT8

→ www.sick.com/RS10



CSM

Mini, easy, smart



CS8

High-performance color sensing

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 |
| Teach-in mode | 1-point-teach-in | Static 1-point teach-in |
| Connection type | Cable with male connector Cable | Male connector |
| IO-Link | ✓ | - |

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



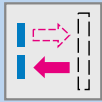
- One (CS8-1) or four (CS8-4) colors can be saved
- 12.5 mm or 60 mm sensing distance
- Fast response time up to 85 µs
- High resolution color
- Bar graph display shows the correlation of the colors
- Extremely precise light spot and high resolution
- Metal housing with two light exits (interchangeable)



Detailed information

→ www.sick.com/CSM

→ www.sick.com/CS8



LUTM

Small, intelligent luminescence sensor



LUT3-6

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 |
| 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 5 mm x 15 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 | - | - |
| Teach-in mode | 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 |
| IO-Link | ✓ | - |

At a glance

- Luminescence sensor in a miniature housing
- 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/LUTM

→ www.sick.com/LUT3



LUT8

For universal use with easy adjustment



LUT9

The new standard for high-performance luminescence sensors

30.4 mm x 53 mm x 80 mm
10 mm / 20 mm / 50 mm / 90 mm

LED, ultraviolet light

2 mm x 6 mm
3 mm x 9 mm
5 mm x 15 mm
12 mm x 12 mm
Ø 6 mm

Long side

2.5 kHz

200 µs

Light switching

0 mA ... 13 mA

-

Male connector M12, 5-pin

-

30.4 mm x 53 mm x 80 mm
10 mm / 20 mm / 50 mm / 90 mm / 150 mm

LED, ultraviolet light
LED, Blue

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 and short side, exchangeable

0.5 kHz / 2.5 kHz / 6.5 kHz

1 ms / 75 µs / 200 µs

0 mA ... 13 mA

Static 2-point teach-in with manual fine adjustment

Male connector M12, 4-pin

Male connector M12, 5-pin

✓

- 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







→ www.sick.com/LUT8

- 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/LUT9

| | | | |
|---|---|--|---|
|  |  |  |  |
| | WFS | UFnext | WFnext |
| | Precise detection for optimum label detection | The clear choice for detecting transparent labels | The specialist for high-speed applications |

| Technical data overview | | | | |
|-------------------------------|--|--|---|--|
| Dimensions (W x H x D) | 10 mm x 25 mm x 64.3 mm | 18 mm x 47,5 mm x 92,5 mm | 10 mm x 32 mm x 57 mm ... 10 mm x 150 mm x 110 mm | |
| Functional principle | Optical detection principle | Ultrasonic detection principle | Optical detection principle | |
| Fork width | 3 mm | 3 mm | 2 mm ... 225 mm | |
| Fork depth | 42 mm | 69 mm | 42 mm ... 95 mm | |
| MDO | Gap between labels: 2 mm Size of labels: 2 mm | Gap between labels: 2 mm Size of labels: 2 mm | 0.2 mm | |
| Light source | LED, Infrared light | - | LED, Infrared light | |
| Switching frequency | 10 kHz / 15 kHz | 1.5 kHz | 10 kHz / 15 kHz | |
| Response time | 46 µs / 50 µs | 250 µs | 46 µs / 100 µs | |
| Output function | Light/darkswitching, selectable via button | Light/darkswitching, selectable via button | Light/darkswitching, selectable via button | |
| Teach-in mode | 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 Cable, 4-wire 2 m | Male connector M8, 4-pin | Male connector M8, 4-pin | |
| IO-Link | ✓ | - | ✓ | |

At a glance

- 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



- 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



- 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



| | | | |
|----------------------|--|--|--|
| Detailed information | → www.sick.com/WFS | → www.sick.com/UF | → www.sick.com/WF |
|----------------------|--|--|--|



WFE

The allrounder among the fork sensors



WFL

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



WFM

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

| | | |
|---|---|---|
| 10 mm x 59.3 mm x 57 mm ... 10 mm x 150 mm x 110 mm | 10 mm x 40,5 mm x 47 mm ... 10 mm x 158,5 mm x 110 mm | 10 mm x 50 mm x 59,5 mm ... 10 mm x 200 mm x 141,8 mm |
| Optical detection principle | Optical detection principle | Optical detection principle |
| 2 mm ... 120 mm | 2 mm ... 120 mm | 30 mm ... 180 mm |
| 42 mm ... 95 mm | 42 mm ... 95 mm | 42 mm ... 124 mm |
| 0.5 mm | 0.05 mm | 0.8 mm 1 mm |
| LED, visible red light | Laser, visible red light | LED, visible red light |
| 5 kHz | 10 kHz / 11 kHz | 4 kHz |
| 100 µs | 60 µs / 100 µs | 125 µs |
| Light/darkswitching | Light/darkswitching, selectable via button | Light/darkswitching |
| - | 1-point teach-in 2-point teach-in dynamic Teach-in | - |
| Male connector M8, 3-pin Cable, 3-wire | Male connector M8, 4-pin | Male connector M8, 3-pin Cable, 3-wire |
| - | ✓ | - |

- 5 different fork widths from 30 mm to max. 180 mm
- High switching frequency of 5 kHz
- Minimum detectable object (MDO) of 0.5 mm
- Durable hybrid housing made from ABS with carbon steel frame
- Sensitivity adjustment
- Light/dark switching
- Push-pull output



→ www.sick.com/WFE

- High-precision laser (Class 1)
- Simple and precise setting via teach-in
- 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



→ www.sick.com/WFL

- Highly visible red emitted light
- 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/WFM






AS30

More flexibility and efficient communication

| Technical data overview | |
|------------------------------|--|
| Dimensions (W x H x D) | 31 mm x 62 mm x 52.2 mm |
| Functional principle | Mid/center, position determination, Edge detection |
| Sensing distance | 25 mm / 100 mm |
| Light source | LED, white |
| Light spot size | 11.1 mm ... 62.5 mm |
| Switching output | PUSH/PULL |
| Measuring range | 20 mm ... 30 mm 90 mm ... 110 mm |
| Reproducibility | 0.03 mm / 0.05 mm / 0.2 mm |
| Analog output Q _A | 4 mA ... 20 mA |
| Connection type | Male connector M12, 5-pin |
| IO-Link | - |

At a glance

- Teach-in of selected edges possible
- Full color TFT display
- Various operating modes for different applications
- Core and Prime variant for different fields of application
- Large measuring range of up to 50 mm
- Sensing distance of 25 mm or 100 mm
- Repeatability of up to 30 µm



Detailed information → www.sick.com/AS30



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 |
| Teach-in mode | 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

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SERVICES FOR MACHINES AND PLANTS: 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 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.

SICK has extensive experience in various industries and understands their processes and requirements. With intelligent sensors, SICK delivers exactly what the 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 SICK a reliable supplier and development partner.

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

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