



ULTRASONIC SENSORS

ULTIMATE ULTRASONIC SENSOR SOLUTION FROM SICK

UM30, UM18, UM12, UC30, UC12, UC4, UD18

SICK
Sensor Intelligence.

VIRTUALLY UNLIMITED USE – REGARDLESS OF COLOR, SHINE, AND TRANSPARENCY



Ultrasonic sensors from SICK perform measurement and detection in a wide variety of application areas on colored, shiny, or transparent surfaces, which are particularly challenging for optical sensors. Even adverse ambient conditions such as dust, dirt, or fog hardly affect the measurement result. The broad detection range also allows for a large field to be monitored with just one sensor – with a measuring range of 13 mm to 8 m.

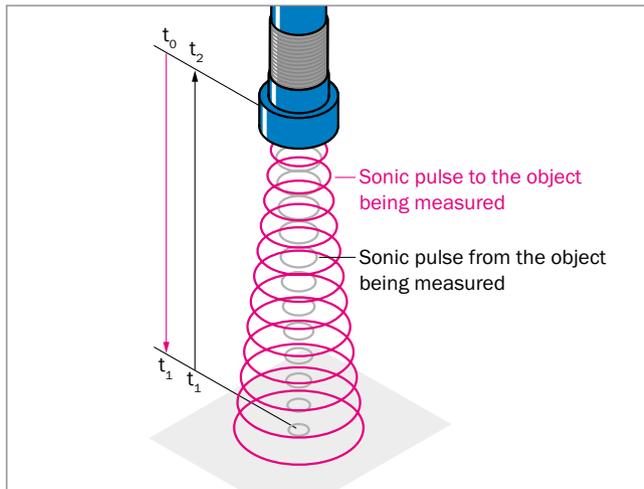


FOR MAXIMUM RELIABILITY ON DEMANDING SURFACES

- Maximum reliability through intelligent analysis of measured values
- Precise measurement results thanks to temperature measurement directly in the sensor head with automatic temperature compensation
- Synchronization and multiplexing for optimal process workflows when using several sensors with short mounting distances
- Simple and reliable solution for virtually any application using the “Distance to object”, “Window”, and “Object between sensor and background” switching modes
- Solution for complex applications thanks to adjustable filter settings
- Individually adjustable sound cone for optimal adaptation to the application



DISTANCE MEASUREMENT – AS FAST AS THE SPEED OF SOUND



(Sonic) time-of-flight measurement

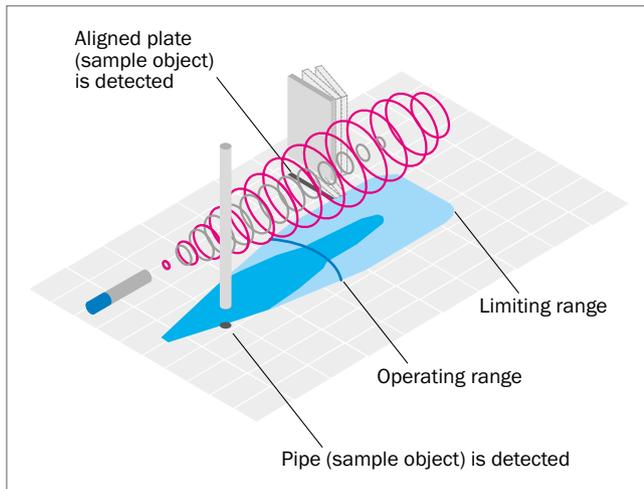
(Sonic) time-of-flight measurement

The sensor emits a sonic pulse that is reflected by the object being measured. The time required for the pulse to go from the sensor to the object and come back again is measured and evaluated and converted into the distance as follows.

$$\text{Distance} = \text{speed of sound} \times \frac{\text{total sonic time of flight } (t_2)}{2}$$

Sensing ranges of ultrasonic sensors

In general on ultrasonic sensors, the less sound the object being measured absorbs, the greater the possible sensing range. The operating range specifies the distance up to which measurement on common objects with sufficient functional reserves is possible. Under ideal conditions, the sensor can even be used up to its limiting range.



Sensing ranges

Switch panels are used for ideal assessment of application capability. The dark blue area shown in these switch panels shows an example of the sensor's working area if a round pipe is detected. The light blue area shows the maximum detection range which can be achieved under ideal conditions for easily detectable objects, such as the aligned plate given here. This area between the sensor and the object being measured should be kept free of other objects to prevent them from being detected accidentally.

The detectability and detection range of an object depend on its reflective properties, size and alignment. Depending on the application, the sensor may also be able to detect very small objects, e.g. metal wire.

IO-LINK FOR TOP PRODUCTION PERFORMANCE

Integrated communications right down to the lowest field level of the automation pyramid is crucial in order to better exploit the performance of modern sensors and actuators and make your machines and systems more productive.

With IO-Link, leading automation manufacturers have established a benchmark solution to the problem of clearing those final hurdles in the communication chain, by seamlessly integrating sensors into an automation network. This brings new ways of increasing flexibility, reliability, and efficiency and can reduce the costs associated with your system.

Like to know more about IO-Link?



Speak to your contact person at SICK or click here → [IO-Link](#)



INDIVIDUALLY ADJUSTABLE SOUND CONE – AN OPTIMAL SOLUTION FOR YOUR APPLICATION

You now have infinitely variable adjustment options for your SICK ultrasonic sensor's detection range, so it can be adapted perfectly to suit your application.

Adjusting the sensor sensitivity gives you direct control over the sound cone's behavior and, therefore, over the sensor's detection range. This means that objects in the immediate surroundings can be displayed or hidden. Up until now, there were three pre-configured sensitivity levels available – now, the detection range can also be adjusted variably. It does not matter whether the sound cone is large or small, narrow or wide, or whether the detection range is slowly increasing or the largest size possible from the beginning of the measurement on: with our Connect+ accessory or via IO-Link with the established SOPAS Engineering Tool from SICK, the adjustment possibilities are endless.

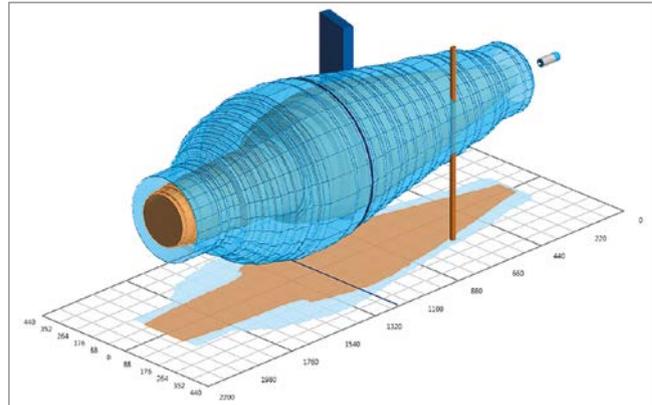
Tank walls, for example, can be hidden in level applications, different container sizes can be verified when inspecting empty containers, and even larger areas can be monitored with just one sensor.

This functionality, which is unique on the market, represents an individual and therefore optimal solution for your application. Even in changing conditions, the sensor can always be optimized to meet your requirements.

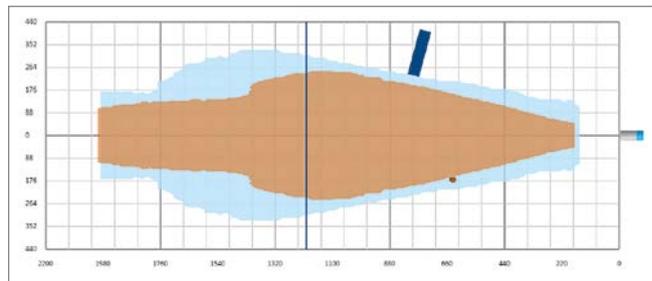
Ultrasonic sensors with adjustable sound cone

UM30-2 → [page 19](#)

UC30-2 → [page 39](#)



Sound cone adjustment with live measurement value visualization in SOPAS ET – 3D



Sound cone adjustment with live measurement value visualization in SOPAS ET – 2D

IO-Link offers you a number of benefits

- ⊕ Sensor integration at fieldbus level offers integrated communication to increase system productivity
- ⊕ Easy device replacement with automatic configuration increases machine availability
- ⊕ Interference-proof signal transmission increases system reliability
- ⊕ Automatic sensor configuration according to the manufacturing process increases flexibility within the application
- ⊕ Minimal cabling and use of unshielded cables reduce the cost of projects
- ⊕ Visualization on a PC provides a clear overview of the sensor functionality to find the optimal solution for your application
- ⊕ Several diagnostic options, e.g. when signal strength decreases, to avoid downtime and to enable planning
- ⊕ Automated electronic parts lists using device IDs simplify the documentation process, reducing the costs related to this

Ultrasonic sensors with IO-Link

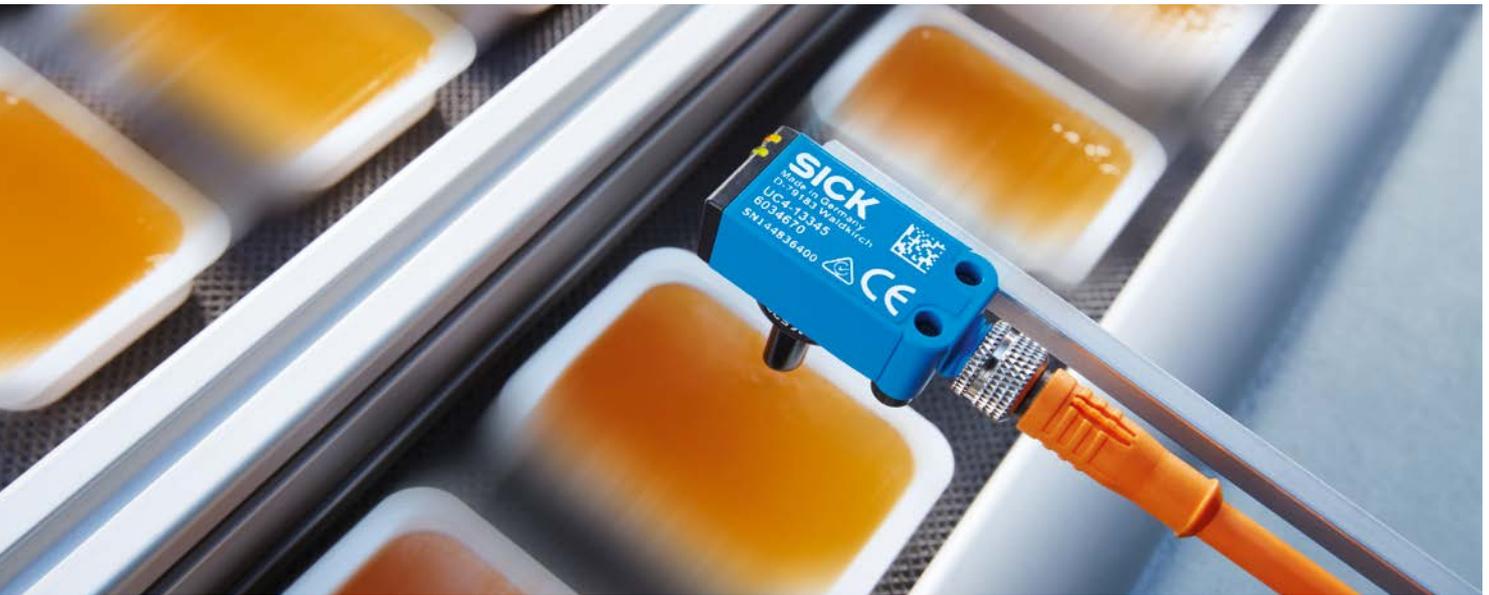
UM30-2 → [page 19](#)

UM18-2 Pro → [page 28](#)

UC30-2 → [page 39](#)

UC4 → [page 49](#)

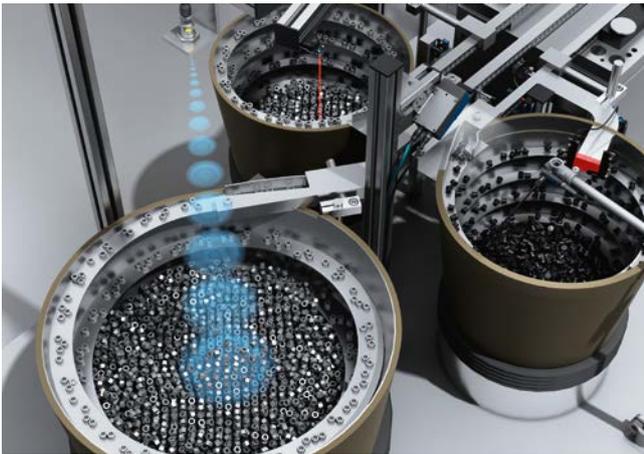
THE SUITABLE ULTRASONIC SENSOR FOR EVERY CHALLENGING APPLICATION



Ultrasonic sensors are true all-rounders. Whether it is position detection, distance measurement or the detection of solid, powdered or liquid substances: Ultrasonic sensors from SICK demonstrate their reliability and precision in virtually any application

The choice is yours – every ultrasonic sensor in the SICK portfolio can handle the following applications:

Filling level control



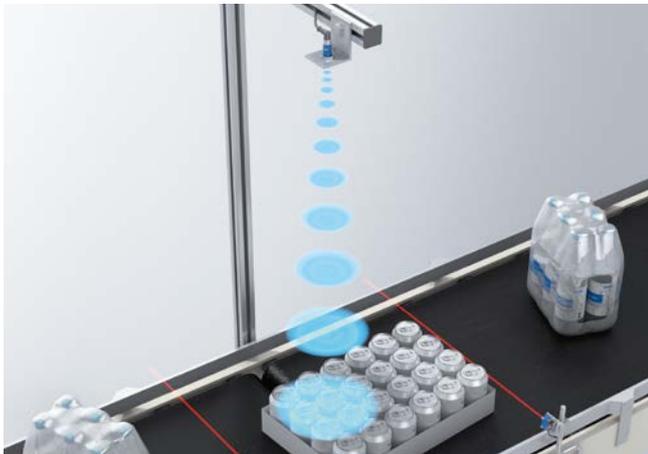
Regulating and monitoring the filling level of liquids and bulk materials ensures process reliability regardless of the material in question

Presence detection of flat objects



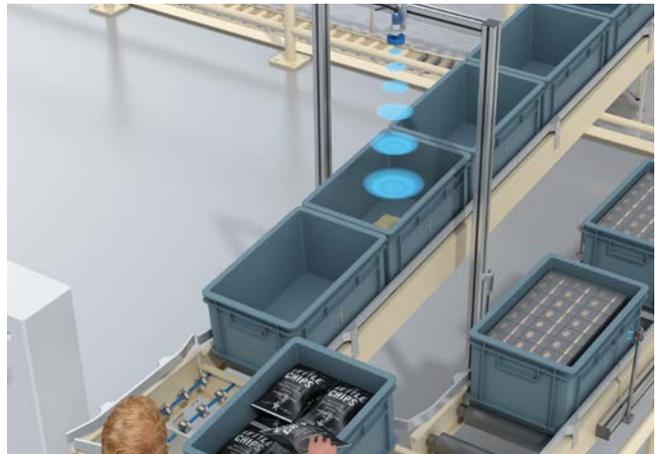
Detecting very flat objects which are difficult to detect optically using edge detection maximizes productivity

Presence detection of different objects



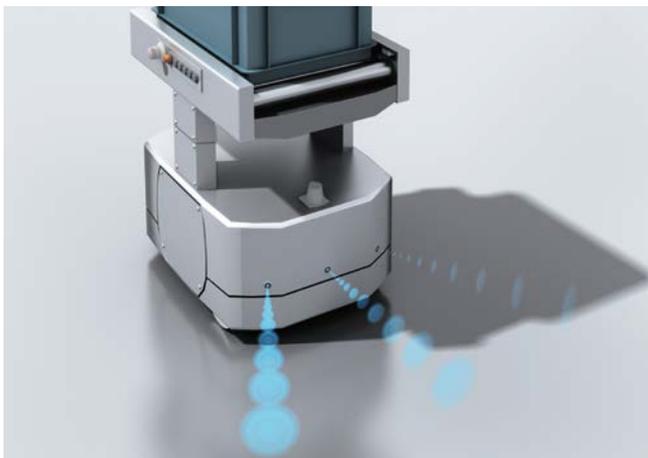
Detecting objects with different shapes and reflective properties maximizes machine flexibility

Monitoring of empty containers



Monitoring the presence of different objects in containers increases efficiency in logistical applications

Collision prevention



Detecting obstructions over a large area in order to control and brake automated guided vehicle enables a high level of automation

Rip detection



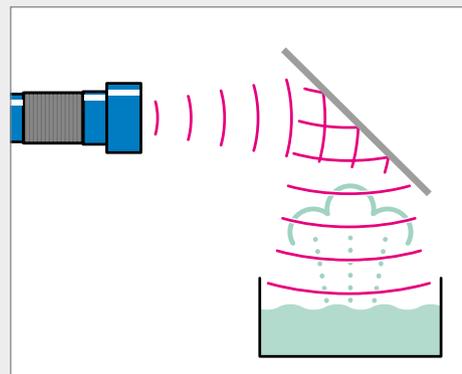
Detecting rips or tears in paper and metal rolls, films, textiles, and wires reduces system downtimes

TIP

Sonic deflection

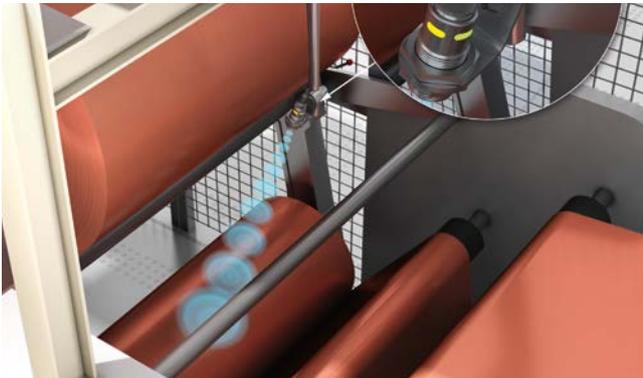
When installation space is restricted, it may be a good idea to use a deflecting plate. Ideally, the deflecting plate should be installed in the blind zone of the sensor.

Turning the sound deflection downward keeps aggressive chemical out-gassing away from the sensor head and extends its service life. Turning the sound deflection upward prevents deposits accumulating on the sensor head, e.g. in a contaminated, oily or humid atmosphere. This helps to optimize measurement and detection.



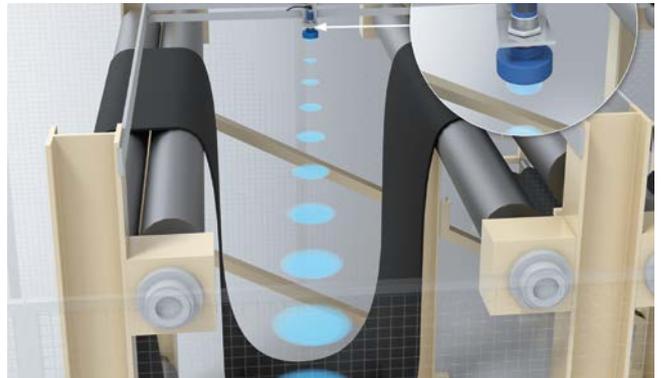


Diameter control



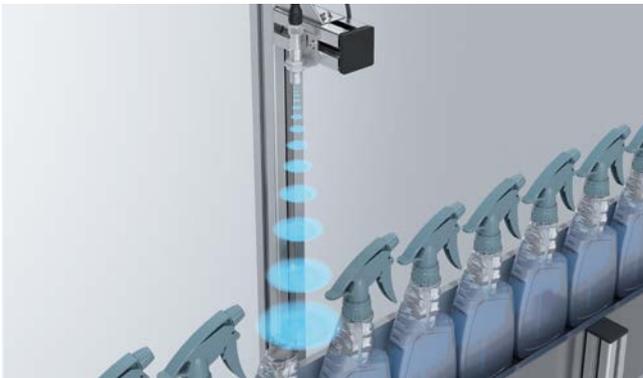
Regulating the rolling and unrolling of different materials for the purposes of process monitoring increases system reliability

Slack regulation



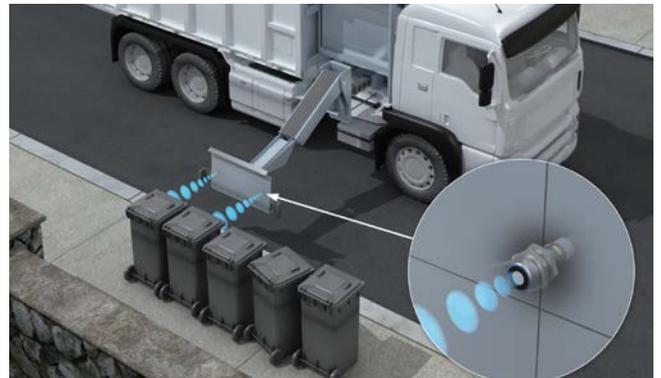
Adjusting the material feed according to the slack depth improves the process quality

Process and quality control



Detecting incorrectly produced or unfinished goods and incorrect alignment reduces system downtimes and ensures highest productivity

Positioning



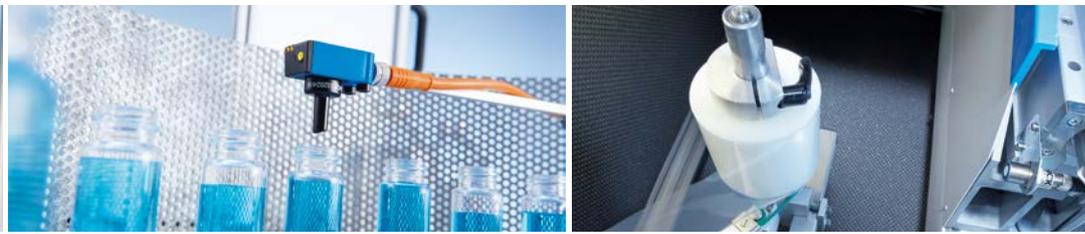
Distance measurement for different materials ensures reliable positioning

Are you looking for ultrasonic sensors with a higher level of pressure and chemical resistance?

We can help you here too and would be delighted to help you choose the right sensor for your application.

→ www.sick.com/UP56





Dimension measurement



UM30, UM18 and UC30

Measuring the dimensions of different objects helps to increase system flexibility. Implementing multiplex mode simply by connecting pin 5 and assigning an address in the sensor prevents mutual interference between the sensors. This guarantees maximum process stability.

Area monitoring



UM30, UM18 and UC30

When using multiple sensors: Implementing synchronization mode by simply connecting pin 5 increases the detection range and reduces mutual interference between the sensors. This improves the process stability.

All ultrasonic sensors from SICK

Three-dimensional detection range provides cost-effective coverage of large areas

Can't find your application?

Your SICK contact partners will be happy to help you find the suitable ultrasonic sensor solution to meet your requirements.

You can find contact information on the back page of this product information or at → www.sick.com



DOUBLE LAYER DETECTION USING ULTRASONIC TECHNOLOGY



The UD18 specializes in checking for double layers and splices using ultrasonic technology. Operating with precision, it is able to determine whether one, two or no material layers are present between its sender and receiver. Where the UD18 really excels is checking for double layers in paper, cardboard, shiny metal, and transparent plastic. It is possible to teach in up to four sensitivity levels and switch between them during operation, allowing the sensor to tackle even the most complex of applications and ensure permanent system availability with a consistently excellent level of production quality.

Typical fields of application

Printing and paper industries

- Sheet-fed printing presses
- Paper processing
 - Collating machines
 - Folding machines
 - Copiers
 - Cutting machines

Packaging and processing industries

- Double layer detection of packaging materials
- Splice and label detection

Electronics and solar industries Automotive and parts supplier industries, machine building

- Circuit board manufacturing
- Manufacturing of solar cells and silicon wafers
- Double layer detection of chip cards
- Infeed of metal sheets
- Monitoring of separation and counting of bank notes in ATMs



Principle of operation

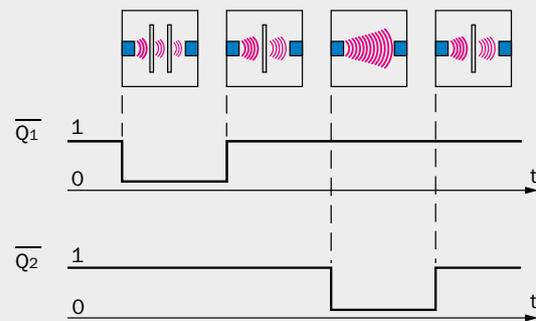
The sender sends ultrasonic waves toward the receiver. If there is no material between the sender and receiver, the ultrasonic waves arrive at the receiver at full strength. If one or two material layers are between the sender and receiver, then the ultrasonic waves are attenuated accordingly. The receiver directly evaluates the respective ultrasonic pulse and sets the corresponding output signals.

- Material classifications: no layers, single layer, double layer
- Variable mounting distance from 20 mm to 70 mm
- 3 sensitivity levels can be selected
- Up to 4 individual sensitivity levels can be taught in even for detecting materials glued over the entire surface
- Changing the sensitivity levels during operation
- Additional configuration and visualization options via [à Connect+ Software](#)



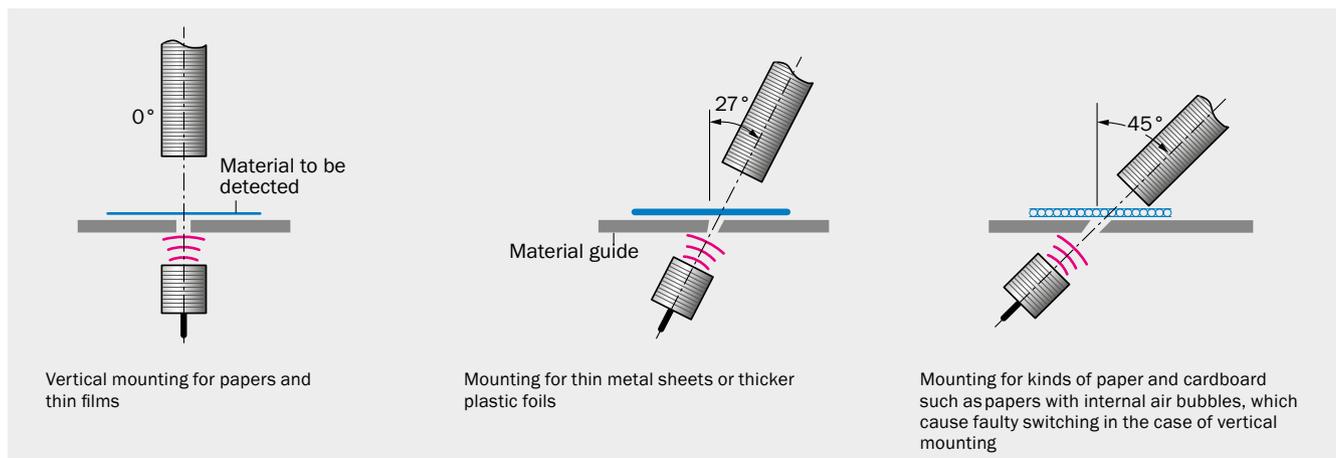
Switching behavior

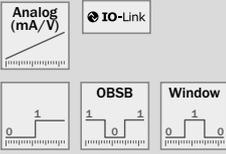
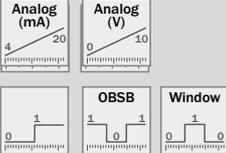
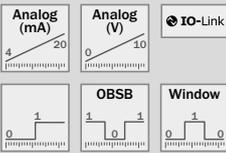
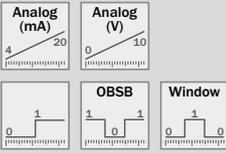
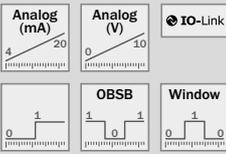
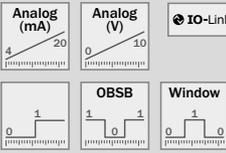
The two switching outputs Q1 and Q2 are assigned as normally closed with the switching states “Double layer” (Q1) and “No material” or “Single layer” (Q2), as shown in the following diagram. This means all operating states that occur can be reliably detected and output. At the same time, this ensures that the sensor outputs the information “No material” or “Double layer” if there is a wire break, which stops the system so that the wire break can be found.

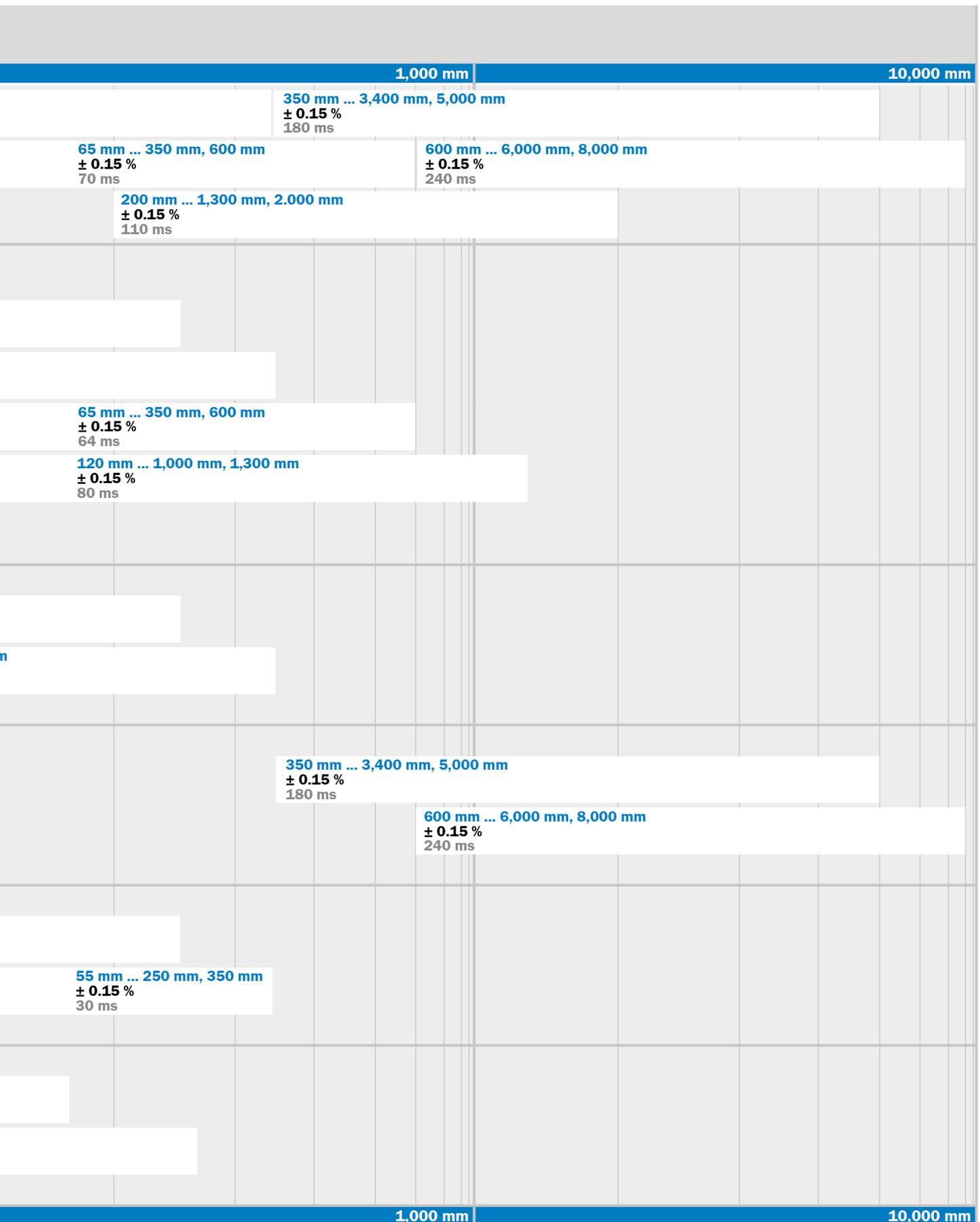


Sensor alignment

Depending on the material properties and thickness, the best detection results in each case can be achieved with different sensor alignments. If the sender is installed with a recess or a material guide is used between the sender and receiver, a cutout is required for detection. SICK recommends a diameter of 18 mm for the cutout. If only a smaller cutout is possible, check that the results provide a reliable solution for the respective application.



Interfaces		Operating range, limiting range	
		10 mm	100 mm
UM30-2  → page 19		30 mm ... 250 mm, 350 mm $\pm 0.15 \%$ 50 ms	
UM18-2  Core → page 27		20 mm ... 150 mm, 250 mm $\pm 0.15 \%$ 32 ms	
		30 mm ... 250 mm, 350 mm $\pm 0.15 \%$ 32 ms	
Pro  → page 28			
UM12  → page 34		20 mm ... 150 mm, 250 mm $\pm 0.15 \%$ 24 ms	
		40 mm ... 240 mm, 350 mm $\pm 0.15 \%$ 30 ms	
UC30  → page 39			
UC12  → page 44		20 mm ... 150 mm, 250 mm $\pm 0.15 \%$ 30 ms	
UC4  → page 49		13 mm ... 100 mm, 150 mm $\pm 0.15 \%$ 30 ms	
		13 mm ... 150 mm, 250 mm $\pm 0.15 \%$ 10 ms/30 ms	
		10 mm	100 mm



		
UM30	UM18	UM12
The universal application solver	Simple set up, perfect detection	Small sensor, great benefits

Technical data overview			
Operating range, Limiting range	30 mm ... 250 mm, 350 mm 65 mm ... 350 mm, 600 mm 200 mm ... 1,300 mm, 2,000 mm 350 mm ... 3,400 mm, 5,000 mm 600 mm ... 6,000 mm, 8,000 mm	20 mm ... 150 mm, 250 mm 30 mm ... 250 mm, 350 mm 65 mm ... 350 mm, 600 mm 120 mm ... 1,000 mm, 1,300 mm	20 mm ... 150 mm, 250 mm 40 mm ... 240 mm, 350 mm
Resolution	≥ 0.18 mm	≥ 0.069 mm	≥ 0.069 mm
Repeatability	± 0.15 %	± 0.15 %	± 0.15 %
Output time, Response time	8 ms, 32 ms 16 ms, 64 ms 23 ms, 92 ms 43 ms, 180 ms 60 ms, 240 ms	8 ms, 32 ms 8 ms, 32 ms 16 ms, 64 ms 20 ms, 80 ms	8 ms, 24 ms 10 ms, 30 ms
Switching frequency	25 Hz 12 Hz 8 Hz 4 Hz 3 Hz	25 Hz 25 Hz 12 Hz 10 Hz	30 Hz 25 Hz
Analog output	4 mA ... 20 mA, ≤ 500 Ω 0 V ... 10 V, ≥ 100,000 Ω	4 mA ... 20 mA, ≤ 500 Ω 0 V ... 10 V, ≥ 100,000 Ω	4 mA ... 20 mA, ≤ 500 Ω 0 V ... 10 V, ≥ 100,000 Ω
Digital output	PNP NPN Push-pull: PNP/NPN	PNP NPN Push-pull: PNP/NPN	PNP NPN
IO-Link	✓, V1.1	✓, V1.0 / ✓, V1.1	-
Enclosure rating	IP 65 / IP67	IP65 / IP67	IP65 / IP67
Sending axis	Straight	Straight / Angled	Straight

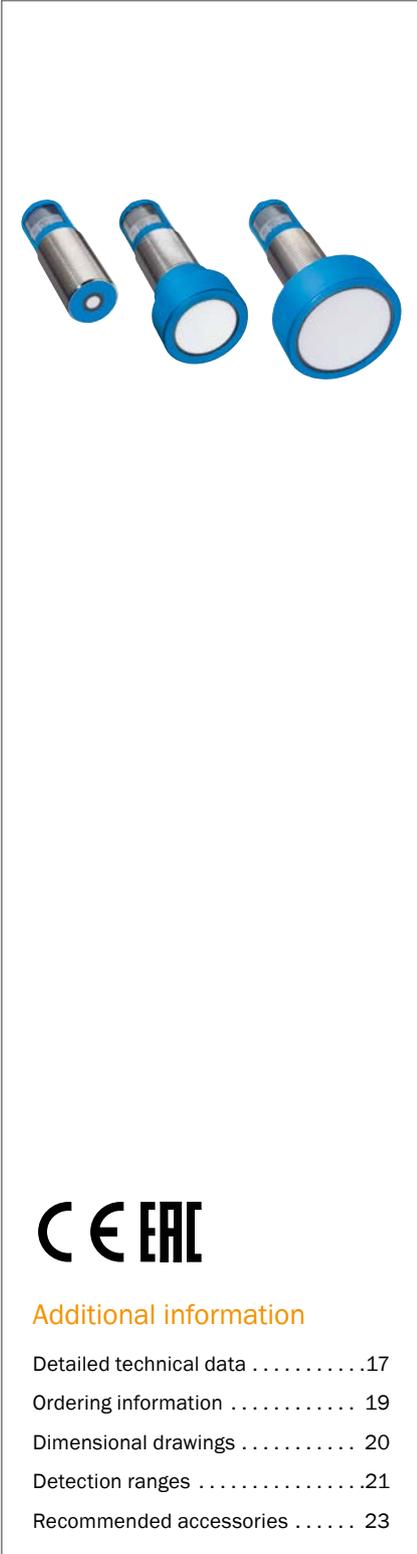
At a glance			
	<ul style="list-style-type: none"> Reliable measurement, regardless of material color, transparency, gloss, or ambient light Sensing range up to 8,000 mm Display enables fast and flexible sensor adjustment Immune to dirt, dust, humidity, and fog Versatile interfaces including IO-Link available Adjustable sensitivity 	<ul style="list-style-type: none"> Reliable measurement, regardless of material color, transparency, gloss, or ambient light Sensing ranges up to 1,300 mm Short metal or plastic M18 housing from 42 mm in length Straight or angled design Immune to dirt, dust, humidity, and fog Versatile interfaces including IO-Link available 	<ul style="list-style-type: none"> Reliable measurement, regardless of material color, transparency, gloss, or ambient light Very short and rugged M12 metal housing Variants with PNP/NPN digital output or analog output Immune to dirt, dust, humidity, and fog Detection, measurement, or positioning with ultrasound technology Cable teach-in
Detailed information	→ 16	→ 24	→ 32

			
UC30	UC12	UC4	UD18
Rugged. Reliable. Rectangular.	Ultrasonic technology housed in an industry-proven design	Small, precise, ultrasonic	Double layer and splice detection

350 mm ... 3,400 mm, 5,000 mm 600 mm ... 6,000 mm, 8,000 mm	20 mm ... 150 mm, 250 mm 55 mm ... 250 mm, 350 mm	13 mm ... 100 mm, 150 mm 13 mm ... 150 mm, 250 mm 20 mm ... 150 mm, 250 mm	20 mm ... 60 mm 30 mm ... 70 mm
≥ 0.18 mm ± 0.15 %	≥ 0.1 mm ± 0.15 %	≥ 0.1 mm ± 0.15 %	1 material layer -
43 ms, 180 ms 60 ms, 240 ms	8 ms, 30 ms	8 ms, 24 ms 5 ms, 10 ms	2 ms (trigger mode: < 0.5 ms), 2,5ms 5 ms (trigger mode: < 0.5 ms), 5,5 ms
4 Hz 3 Hz	25 Hz	30 Hz 100 Hz	250 Hz 100 Hz
4 mA ... 20 mA, ≤ 500 Ω 0 V ... 10 V, ≥ 100,000 Ω	-	4 mA ... 20 mA, ≤ 500 Ω 0 V ... 10 V, ≥ 100,000 Ω	-
PNP NPN Push-pull: PNP/NPN ✓, V1.0 / ✓, V1.1	PNP NPN -	PNP NPN Push-pull: PNP/NPN ✓, V1.0 / ✓, V1.1	PNP NPN -
IP65 / IP67 Straight	IP 65 / IP67 Straight	IP65 / IP67 Straight	IP65 Straight / Angled

<ul style="list-style-type: none"> Reliable measurement, regardless of material color, transparency, gloss, or ambient light Rugged housing with teach-in buttons Sensing ranges up to 8,000 mm Analog output, push-pull digital output with IO-Link or two PNP/NPN digital outputs Immune to dirt, dust, humidity, and fog Adjustable sensitivity 	<ul style="list-style-type: none"> Transparent foils, glass, liquids and bottles are detected, regardless of the material color and ambient light Easy and quick teach-in with teach-in button Insensitive to dirt, dust and fog Two complementary digital outputs (Q, /Q) Very good background suppression (BGS) 	<ul style="list-style-type: none"> Reliable measurement, regardless of material color, transparency, gloss, or ambient light Ultrasonic technology in a small housing Detection, measurement, and positioning with ultrasonic technology Variants with PNP/NPN digital output, analog output or push-pull output with IO-Link Teach-in button Precise background suppression Immune to dirt, dust, humidity, and fog 	<ul style="list-style-type: none"> Material classifications: no layers, single layer, double layers Plug-and-play; sensitivity levels that can be selected, taught in, and changed during operation Up to four individual sensitivity levels Variable mounting distance LEDs visible from any direction Immune to dirt, dust, and humidity
→ 36	→ 42	→ 46	→ 52

THE UNIVERSAL APPLICATION SOLVER



Product description

The sensors of the UM30 product family impress with high flexibility. Various sensing ranges of up to 8,000 mm as well as countless configuration options leave no applications unsolved. The high measurement accuracy provided by in-

ternal temperature compensation, along with color-independent object detection, immunity to contamination, and a wide operating temperature range up to 70 °C all ensure reliable operation, even under the most challenging conditions.

At a glance

- Reliable measurement, regardless of material color, transparency, gloss, or ambient light
- Sensing range up to 8,000 mm
- Display enables fast and flexible sensor adjustment
- Immune to dirt, dust, humidity, and fog
- Versatile interfaces including IO-Link available
- Adjustable sensitivity

Your benefits

- Easy system integration due to compact design
- Flexible adaptation to application requirements due to numerous configuration options and adjustable sensitivity
- Reliable measurement results since synchronization and multiplex mode prevents mutual interference of sensors
- Inexpensive area monitoring possible due to sensor synchronization
- Offline sensor configuration on display enables pre-configuration and saves time when commissioning the system
- Integrated temperature compensation for high measurement accuracy
- ObSB mode enables detection of any object between the sensor and a taught-in background

→ www.sick.com/UM30

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.



Detailed technical data

Performance

Operating range, limiting range	30 mm ... 250 mm, 350 mm 65 mm ... 350 mm, 600 mm 200 mm ... 1,300 mm, 2,000 mm 350 mm ... 3,400 mm, 5,000 mm 600 mm ... 6,000 mm, 8,000 mm
Target	Natural objects
Resolution	≥ 0.18 mm
Repeatability ¹⁾	± 0.15 %
Accuracy ^{1) 2)}	± 1 %
Temperature compensation	✓
Response time ²⁾	
30 mm ... 250 mm, 350 mm	32 ms
65 mm ... 350 mm, 600 mm	64 ms
200 mm ... 1,300 mm, 2,000 mm	92 ms
350 mm ... 3,400 mm, 5,000 mm	180 ms
600 mm ... 6,000 mm, 8,000 mm	240 ms
Switching frequency	
30 mm ... 250 mm, 350 mm	25 Hz
65 mm ... 350 mm, 600 mm	12 Hz
200 mm ... 1,300 mm, 2,000 mm	8 Hz
350 mm ... 3,400 mm, 5,000 mm	4 Hz
600 mm ... 6,000 mm, 8,000 mm	3 Hz
Output time	
30 mm ... 250 mm, 350 mm	8 ms
65 mm ... 350 mm, 600 mm	16 ms
200 mm ... 1,300 mm, 2,000 mm	23 ms
350 mm ... 3,400 mm, 5,000 mm	43 ms
600 mm ... 6,000 mm, 8,000 mm	60 ms
Ultrasonic frequency (typical)	
30 mm ... 250 mm, 350 mm	320 kHz
65 mm ... 350 mm, 600 mm	400 kHz
200 mm ... 1,300 mm, 2,000 mm	200 kHz
350 mm ... 3,400 mm, 5,000 mm	120 kHz
600 mm ... 6,000 mm, 8,000 mm	80 kHz
Detection area (typical)	See diagrams
Additional function ⁴⁾	<ul style="list-style-type: none"> • Adjustable operating modes: Switching point (Dt0) / Switching window / Background (ObSB) • Teach-in of digital output, set levels of digital output, invertable • Set on delay digital output • Teach-in of analog output, scaling of analog output, invertable • Synchronization of up to 50 sensors • Multiplexing: no cross talk of up to 50 sensors • Adjustable measurement filters: Measured value filters / Filter strength / Foreground suppression / Detection area / Sensitivity and sound beam • Teach-in button(s) (can be deactivated) • Display (can be deactivated) • Reset to factory default

¹⁾ Referring to current measurement value.

²⁾ Temperature compensation can be switched off, without temperature compensation: 0.17 % / K.

³⁾ Subsequent smoothing of the analog output, depending on the application, may increase the response time by up to 200 %.

⁴⁾ Functions may vary depending on sensor type.

Interfaces

IO-Link	✓, V1.1 (process data, diagnosis, parameterization, data storage)										
Digital output ^{1) 2) 3)}	1 x PNP, ≤ 200 mA 1 x NPN, ≤ 200 mA 2 x PNP, ≤ 200 mA 2 x NPN, ≤ 200 mA 1 x Gegentakt: PNP/NPN, ≤ 100 mA										
Analog output	<table border="0"> <tr> <td>Type</td> <td>1 x Power output / voltage output</td> </tr> <tr> <td>Function</td> <td>Automatic selection of analog current or voltage output dependent on load</td> </tr> <tr> <td>Current ⁴⁾</td> <td>4 mA ... 20 mA, ≤ 500 Ω</td> </tr> <tr> <td>Voltage</td> <td>0 V ... 10 V, ≥ 100,000 Ω</td> </tr> <tr> <td>Resolution</td> <td>12 bit</td> </tr> </table>	Type	1 x Power output / voltage output	Function	Automatic selection of analog current or voltage output dependent on load	Current ⁴⁾	4 mA ... 20 mA, ≤ 500 Ω	Voltage	0 V ... 10 V, ≥ 100,000 Ω	Resolution	12 bit
Type	1 x Power output / voltage output										
Function	Automatic selection of analog current or voltage output dependent on load										
Current ⁴⁾	4 mA ... 20 mA, ≤ 500 Ω										
Voltage	0 V ... 10 V, ≥ 100,000 Ω										
Resolution	12 bit										
Multifunctional input (MF)	1 x MF										
Hysteresis	<table border="0"> <tr> <td>30 mm ... 250 mm, 350 mm</td> <td>3 mm</td> </tr> <tr> <td>65 mm ... 350 mm, 600 mm</td> <td>5 mm</td> </tr> <tr> <td>200 mm ... 1,300 mm, 2,000 mm</td> <td>20 mm</td> </tr> <tr> <td>350 mm ... 3,400 mm, 5,000 mm</td> <td>50 mm</td> </tr> <tr> <td>600 mm ... 6,000 mm, 8,000 mm</td> <td>100 mm</td> </tr> </table>	30 mm ... 250 mm, 350 mm	3 mm	65 mm ... 350 mm, 600 mm	5 mm	200 mm ... 1,300 mm, 2,000 mm	20 mm	350 mm ... 3,400 mm, 5,000 mm	50 mm	600 mm ... 6,000 mm, 8,000 mm	100 mm
30 mm ... 250 mm, 350 mm	3 mm										
65 mm ... 350 mm, 600 mm	5 mm										
200 mm ... 1,300 mm, 2,000 mm	20 mm										
350 mm ... 3,400 mm, 5,000 mm	50 mm										
600 mm ... 6,000 mm, 8,000 mm	100 mm										

¹⁾ PNP: HIGH = $V_s - (< 2 V)$ / LOW = 0 V.

²⁾ NPN: HIGH = ≤ 2 V / LOW = U_v .

³⁾ Push-pull: PNP/NPN HIGH = $U_v - (< 3 V)$ / LOW < 3 V.

⁴⁾ For 4 mA ... 20 mA and $V_s \leq 20 V$ max. load ≤ 100 Ω.

Mechanics/electronics

Supply voltage V_s ^{1) 2)}	DC 9 V ... 30 V
Power consumption ³⁾	≤ 2.4 W
Initialization time	< 300 ms
Design	Cylindrical
Housing material	Nickel-plated brass, PBT, display: TPU, ultrasonic transducer: polyurethane foam, glass epoxy resin
Connection type	Male connector, M12, 5-pin
Indication	LED display, 2 x LED
Weight	150 g ... 270 g
Sending axis	Straight
Enclosure rating	IP 65 / IP67
Protection class	III

¹⁾ Limit values, reverse-polarity protected Operation in short-circuit protected network: max. 8 A, class 2.

²⁾ 15 V ... 30 V when using the analog voltage output.

³⁾ Without load.

Ambient data

Ambient temperature operation	-25 °C ... +70 °C
Ambient storage temperature	-40 °C ... +85 °C

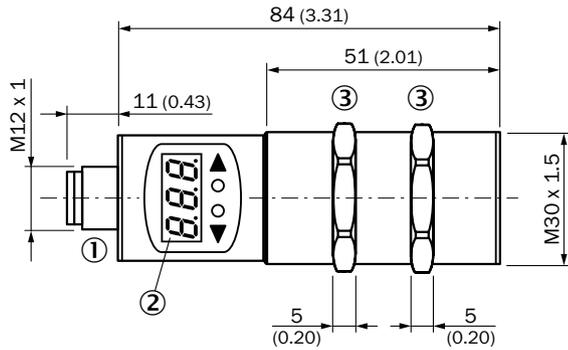
Ordering information

UM30-2

Operating range, limiting range	Output time, Response time	Communication interface	Digital output	Analog output	Type	Part no.
30 mm ... 250 mm, 350 mm	8 ms, 32 ms	-	1 x PNP	-	UM30-211111	6037660
				4 mA ... 20 mA 0 V ... 10 V	UM30-211118	6036921
			2 x PNP	-	UM30-211112	6037664
					UM30-211115	6037669
			2 x NPN	-	UM30-211114	6037674
					UM30-211113	6036916
		IO-Link, V1.1	1 x Push-pull: PNP/NPN	-	UM30-21111B	6068447
65 mm ... 350 mm, 600 mm	16 ms, 64 ms	-	1 x PNP	-	UM30-212111	6037661
				4 mA ... 20 mA 0 V ... 10 V	UM30-212118	6036922
			2 x PNP	-	UM30-212112	6037665
					UM30-212115	6037670
			2 x NPN	-	UM30-212114	6037675
					UM30-212113	6036917
		IO-Link, V1.1	1 x Push-pull: PNP/NPN	-	UM30-21211B	6068448
200 mm ... 1,300 mm, 2,000 mm	23 ms, 92 ms	-	1 x PNP	-	UM30-213111	6037537
				4 mA ... 20 mA 0 V ... 10 V	UM30-213118	6036923
			2 x PNP	-	UM30-213112	6037666
					UM30-213115	6037671
			2 x NPN	-	UM30-213114	6037676
					UM30-213113	6036918
		IO-Link, V1.1	1 x Push-pull: PNP/NPN	-	UM30-21311B	6068449
350 mm ... 3,400 mm, 5,000 mm	43 ms, 180 ms	-	1 x PNP	-	UM30-214111	6037662
				4 mA ... 20 mA 0 V ... 10 V	UM30-214118	6036924
			2 x PNP	-	UM30-214112	6037667
					UM30-214115	6037672
			2 x NPN	-	UM30-214114	6037677
					UM30-214113	6036919
		IO-Link, V1.1	1 x Push-pull: PNP/NPN	-	UM30-21411B	6068450
600 mm ... 6,000 mm, 8,000 mm	60 ms, 240 ms	-	1 x PNP	-	UM30-215111	6037663
				4 mA ... 20 mA 0 V ... 10 V	UM30-215118	6036925
			2 x PNP	-	UM30-215112	6037668
					UM30-215115	6037673
			2 x NPN	-	UM30-215114	6037678
					UM30-215113	6036920
		IO-Link, V1.1	1 x Push-pull: PNP/NPN	-	UM30-21511B	6068451

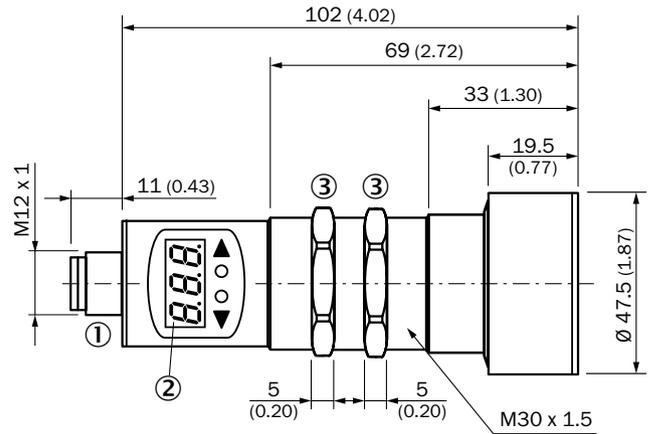
Dimensional drawings (Dimensions in mm (inch))

UM30-211, UM30-212, UM30-213



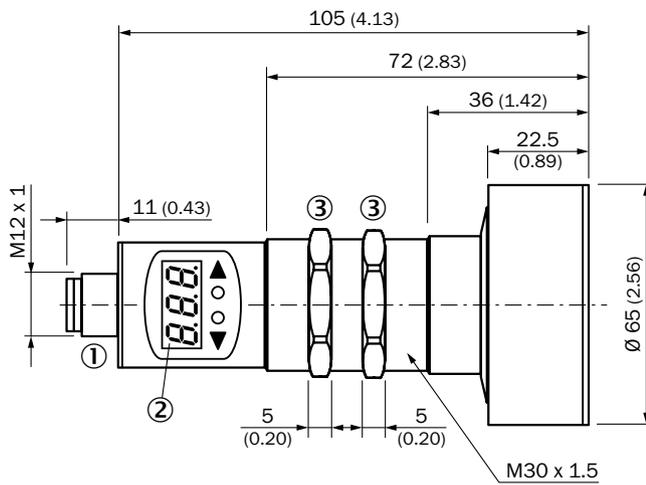
- ① Connection
- ② Display
- ③ Mounting nuts, SW 36 mm

UM30-214



- ① Connection
- ② Display
- ③ Mounting nuts, SW 36 mm

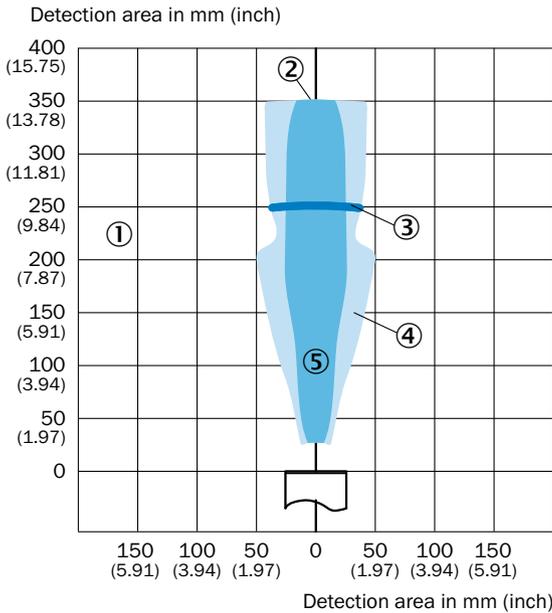
UM30-215



- ① Connection
- ② Display
- ③ Mounting nuts, SW 36 mm

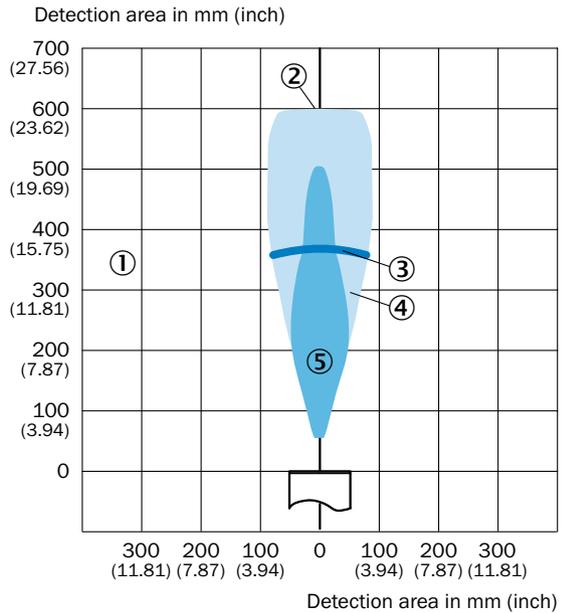
Detection ranges

UM30-211



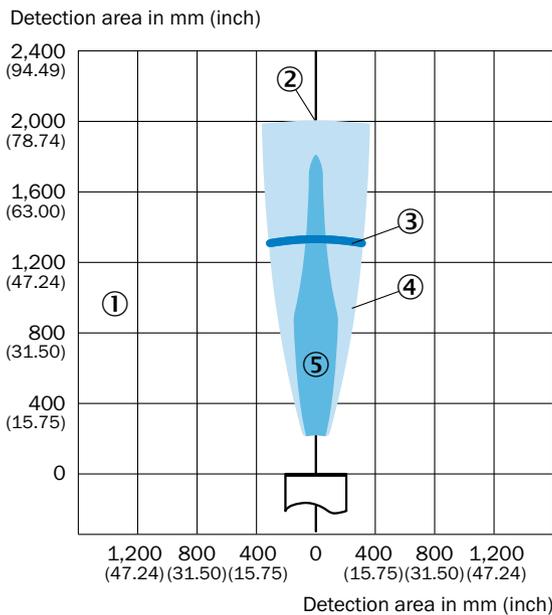
- ① Detection range dependent on reflection properties, size, and alignment of the object
- ② Limiting range
- ③ Operating range
- ④ Example object: aligned plate 500 mm x 500 mm
- ⑤ Example object: cylindrical bar with a diameter of 10 mm

UM30-212



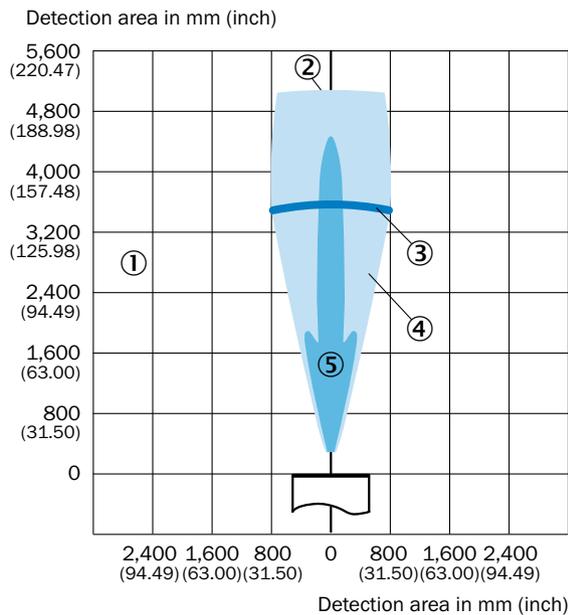
- ① Detection range dependent on reflection properties, size, and alignment of the object
- ② Limiting range
- ③ Operating range
- ④ Example object: aligned plate 500 mm x 500 mm
- ⑤ Example object: pipe with 27 mm diameter

UM30-213



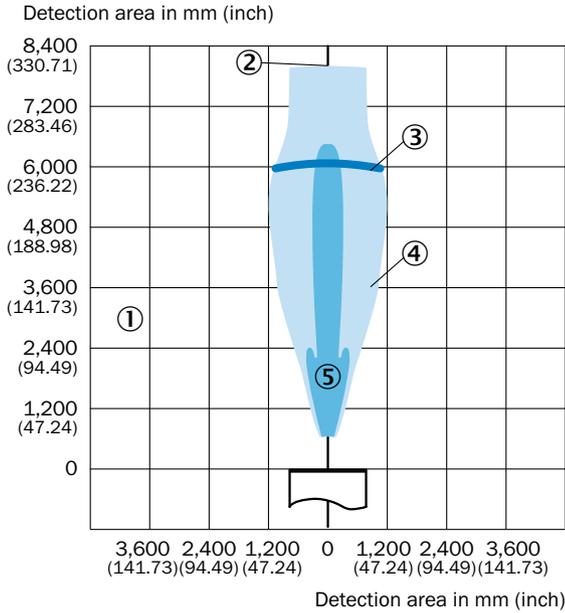
- ① Detection range dependent on reflection properties, size, and alignment of the object
- ② Limiting range
- ③ Operating range
- ④ Example object: aligned plate 500 mm x 500 mm
- ⑤ Example object: pipe with 27 mm diameter

UM30-214, UC30-214



- ① Detection range dependent on reflection properties, size, and alignment of the object
- ② Limiting range
- ③ Operating range
- ④ Example object: aligned plate 500 mm x 500 mm
- ⑤ Example object: pipe with 27 mm diameter

UM30-215, UC30-215



- ① Detection range dependent on reflection properties, size, and alignment of the object
- ② Limiting range
- ③ Operating range
- ④ Example object: aligned plate 500 mm x 500 mm
- ⑤ Example object: pipe with 27 mm diameter

Recommended accessories

Mounting systems

Mounting brackets and plates

	Brief description	Type	Part no.
	Mounting bracket for M30 sensors	BEF-WN-M30	5308445

Connection systems

Modules and gateways

	Type	Part no.
	IOLA2US-01101 (SiLink2 Master)	1061790

Plug connectors and cables

	Connection type head A	Connection type head B	Cable	Length of cable	Type	Part no.
	Female connector, M12, 5-pin, straight, A-coded	Flying leads	PVC, Sensor/actuator cable, unshielded	2 m	YF2A15-020VB5X-LEAX	2096239

Reflectors and optics

Deflector mirrors

	Brief description	Type	Part no.
	90° sound deflection plate for UM30-21xxxx, UM30-22xxxx, UM30-23xxxx, stainless steel	USP-UM30	5312916

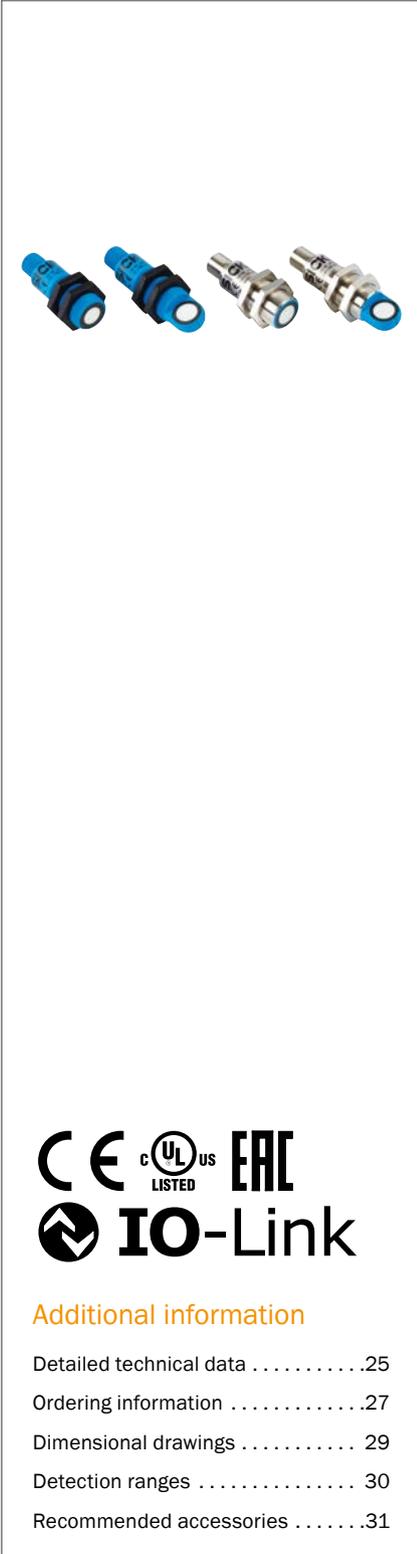
Further accessories

Programming and configuration tools

	Brief description	Type	Part no.
	Tool for visualization, configuration and cloning, 3-digit LED display, supply voltage: DV 9 V ... 30 V	Connect+ adapter (CPA)	6037782

You can find additional accessories online → www.sick.com/UM30

SIMPLE SET UP, PERFECT DETECTION



Additional information

Detailed technical data25
 Ordering information27
 Dimensional drawings 29
 Detection ranges 30
 Recommended accessories31

Product description

The UM18 sensor product family provides simplicity and high functionality. The UM18 ultrasonic sensors are available in straight and angled versions for easy machine integration. A metal or plastic housing allows use in demanding ambient conditions. Due to four sensing ranges up to a total of 1,300 mm and LED status feedback, the sensors are

suitable for a broad range of applications. Whether analog or PNP/NPN switching output, one or two push-pull switching outputs with IO-Link or the combination of analog and push-pull switching output with IO-Link, sensors of the UM18 product family leave nothing to be desired.

At a glance

- Reliable measurement, regardless of material color, transparency, gloss, or ambient light
- Sensing ranges up to 1,300 mm
- Short metal or plastic M18 housing from 42 mm in length
- Straight or angled design
- Immune to dirt, dust, humidity, and fog
- Versatile interfaces including IO-Link available

Your benefits

- Four sensing ranges up to a total of 1,300 mm for countless application possibilities
- Easy integration due to a short M18 housing, straight or angled
- Measurement filters and variants with temperature compensation for reliable measurement results and very high process reliability
- Rugged, one-piece housing ensures highest plant availability
- Synchronization or multiplex mode for the simultaneous use of up to 20 sensors increases application flexibility and process reliability
- Various output signals for solving complex applications
- Teach-in via cable prevents unintentional sensor adjustment, reducing machine downtime
- Rugged, reliable ultrasound technology

→ www.sick.com/UM18

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.



Detailed technical data

Performance

	UM18-2 Core	UM18-2 Pro
Operating range, limiting range	20 mm ... 150 mm, 250 mm 30 mm ... 250 mm, 350 mm 65 mm ... 350 mm, 600 mm 120 mm ... 1,000 mm, 1,300 mm	
Target	Natural objects	
Resolution	≥ 0.2 mm	≥ 0.069 mm
Repeatability ¹⁾	± 0.15 %	
Accuracy ¹⁾	0.17 % / K	± 1 % ²⁾
Temperature compensation	-	✓
Response time ³⁾		
20 mm ... 150 mm, 250 mm	32 ms	
30 mm ... 250 mm, 350 mm	32 ms	
65 mm ... 350 mm, 600 mm	64 ms	
120 mm ... 1,000 mm, 1,300 mm	80 ms	
Switching frequency		
20 mm ... 150 mm, 250 mm	25 Hz	
30 mm ... 250 mm, 350 mm	25 Hz	
65 mm ... 350 mm, 600 mm	12 Hz	
120 mm ... 1,000 mm, 1,300 mm	10 Hz	
Output time		
20 mm ... 150 mm, 250 mm	8 ms	
30 mm ... 250 mm, 350 mm	8 ms	
65 mm ... 350 mm, 600 mm	16 ms	
120 mm ... 1,000 mm, 1,300 mm	20 ms	
Ultrasonic frequency (typical)		
20 mm ... 150 mm, 250 mm	380 kHz	
30 mm ... 250 mm, 350 mm	320 kHz	
65 mm ... 350 mm, 600 mm	400 kHz	
120 mm ... 1,000 mm, 1,300 mm	200 kHz	
Detection area (typical)	See diagrams	-
Additional function ⁴⁾	<ul style="list-style-type: none"> Adjustable operating modes: Switching point (DtO) / Switching window / Background (ObSB) Teach-in of digital output, invertible Teach-in of analog output, invertible Reset to factory default 	<ul style="list-style-type: none"> Adjustable operating modes: Switching point (DtO) / Switching window / Background (ObSB) Teach-in of digital output, invertible Teach-in of analog output, invertible Multifunctional input: external teach / synchronization / multiplexing Synchronization of up to 20 sensors Multiplexing: no cross talk of up to 20 sensors Reset to factory default

¹⁾ Referring to current measurement value.

²⁾ Temperature compensation can be switched off, without temperature compensation: 0.17 % / K.

³⁾ Subsequent smoothing of the analog output, depending on the application, may increase the response time by up to 200 %.

⁴⁾ Functions may vary depending on sensor type.

Interfaces

	UM18-2 Core	UM18-2 Pro								
IO-Link	-	✓, V1.0 (process data, parameterization, diagnosis) ✓, V1.1 (Process data, parameterization, diagnosis, data storage)								
Digital output ^{1) 2) 3)}	1 x PNP, ≤ 200 mA 1 x NPN, ≤ 200 mA	1 x Push-pull: PNP/NPN, ≤ 100 mA 2 x Push-pull: PNP/NPN, ≤ 100 mA								
Analog output	<table border="0"> <tr> <td>Type</td> <td>1 x Power output 1 x Voltage output</td> </tr> <tr> <td>Current ⁴⁾</td> <td>4 mA ... 20 mA, ≤ 500 Ω</td> </tr> <tr> <td>Voltage</td> <td>0 V ... 10 V, ≥ 100,000 Ω</td> </tr> <tr> <td>Resolution</td> <td>12 bit</td> </tr> </table>		Type	1 x Power output 1 x Voltage output	Current ⁴⁾	4 mA ... 20 mA, ≤ 500 Ω	Voltage	0 V ... 10 V, ≥ 100,000 Ω	Resolution	12 bit
Type	1 x Power output 1 x Voltage output									
Current ⁴⁾	4 mA ... 20 mA, ≤ 500 Ω									
Voltage	0 V ... 10 V, ≥ 100,000 Ω									
Resolution	12 bit									
Multifunctional input (MF)	-	1 x MF								
Hysteresis	<table border="0"> <tr> <td>20 mm ... 150 mm, 250 mm</td> <td>2 mm</td> </tr> <tr> <td>30 mm ... 250 mm, 350 mm</td> <td>3 mm</td> </tr> <tr> <td>65 mm ... 350 mm, 600 mm</td> <td>5 mm</td> </tr> <tr> <td>120 mm ... 1,000 mm, 1,300 mm</td> <td>20 mm</td> </tr> </table>		20 mm ... 150 mm, 250 mm	2 mm	30 mm ... 250 mm, 350 mm	3 mm	65 mm ... 350 mm, 600 mm	5 mm	120 mm ... 1,000 mm, 1,300 mm	20 mm
20 mm ... 150 mm, 250 mm	2 mm									
30 mm ... 250 mm, 350 mm	3 mm									
65 mm ... 350 mm, 600 mm	5 mm									
120 mm ... 1,000 mm, 1,300 mm	20 mm									

¹⁾ PNP: HIGH = $V_s - (< 2 V)$ / LOW = 0 V.

²⁾ NPN: HIGH = ≤ 2 V / LOW = U_v .

³⁾ Push-pull: PNP/NPN HIGH = $U_v - (< 3 V)$ / LOW < 3 V.

⁴⁾ For 4 mA ... 20 mA and $V_s \leq 20 V$ max. load ≤ 100 Ω.

Mechanics/electronics

	UM18-2 Core	UM18-2 Pro
Supply voltage V_s ^{1) 2)}	DC 10 V ... 30 V	DC 10 V ... 30 V
Power consumption ³⁾	≤ 1.2 W	
Initialization time	< 300 ms	
Design	Cylindrical	
Housing material	PBT, ultrasonic transducer: polyurethane foam, glass epoxy resin	Nickel-plated brass, ultrasonic transducer: polyurethane foam, glass epoxy resin
Connection type	Male connector, M12, 4-pin	Male connector, M12, 5-pin
Indication	2 x LED	
Sending axis, Weight	Straight, 15 g Angled, 20 g	Straight, 25 g Angled, 30 g
Enclosure rating	IP65 / IP67	
Protection class	III	

¹⁾ Limit values, reverse-polarity protected Operation in short-circuit protected network: max. 8 A, class 2.

²⁾ 15 V ... 30 V when using the analog voltage output.

³⁾ Without load.

Ambient data

Ambient temperature operation	-25 °C ... +70 °C
Ambient storage temperature	-40 °C ... +85 °C

Ordering information

UM18-2 Core

Operating range, limiting range	Output time	Sending axis	Digital output	Analog output	Type	Part no.
20 mm ... 150 mm, 250 mm	8 ms, 32 ms	Straight	1 x PNP	-	UM18-217161101	6048408
			1 x NPN		UM18-217165101	6048410
			-	4 mA ... 20 mA	UM18-217166101	6072871
			-	0 V ... 10 V	UM18-217167101	6072873
		Angled	1 x PNP	-	UM18-217161102	6048409
			1 x NPN		UM18-217165102	6048411
			-	4 mA ... 20 mA	UM18-217166102	6072872
			-	0 V ... 10 V	UM18-217167102	6072874
30 mm ... 250 mm, 350 mm	8 ms, 32 ms	Straight	1 x PNP	-	UM18-211161101	6048412
			1 x NPN		UM18-211165101	6048414
			-	4 mA ... 20 mA	UM18-211166101	6072875
			-	0 V ... 10 V	UM18-211167101	6072877
		Angled	1 x PNP	-	UM18-211161102	6048413
			1 x NPN		UM18-211165102	6048415
			-	4 mA ... 20 mA	UM18-211166102	6072876
			-	0 V ... 10 V	UM18-211167102	6072878
65 mm ... 350 mm, 600 mm	16 ms, 64 ms	Straight	1 x PNP	-	UM18-212161101	6048416
			1 x NPN		UM18-212165101	6048418
			-	4 mA ... 20 mA	UM18-212166101	6072879
			-	0 V ... 10 V	UM18-212167101	6072881
		Angled	1 x PNP	-	UM18-212161102	6048417
			1 x NPN		UM18-212165102	6048419
			-	4 mA ... 20 mA	UM18-212166102	6072880
			-	0 V ... 10 V	UM18-212167102	6072882
120 mm ... 1,000 mm, 1,300 mm	20 ms, 80 ms	Straight	1 x PNP	-	UM18-218161101	6048420
			1 x NPN		UM18-218165101	6048422
			-	4 mA ... 20 mA	UM18-218166101	6072883
			-	0 V ... 10 V	UM18-218167101	6072885
		Angled	1 x PNP	-	UM18-218161102	6048421
			1 x NPN		UM18-218165102	6048423
			-	4 mA ... 20 mA	UM18-218166102	6072884
			-	0 V ... 10 V	UM18-218167102	6072886

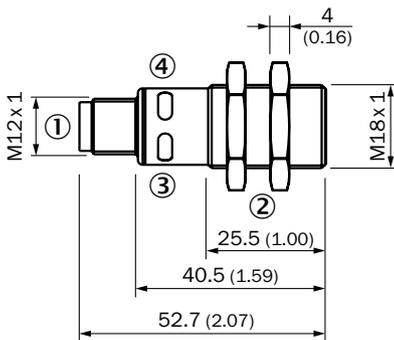
UM18-2 Pro

Operating range, limiting range	Output time	Sending axis	Communication Interface	Digital output	Analog output	Type	Part no.
20 mm ... 150 mm, 250 mm	8 ms, 32 ms	Straight	IO-Link, V1.0	1 x Push-pull: PNP/NPN	-	UM18-21712A211	6048384
			IO-Link, V1.1		4 mA ... 20 mA	UM18-21712B211	6066162
					0 V ... 10 V	UM18-21712C211	6066164
			-	-	-	UM18-21712E211	6068439
					4 mA ... 20 mA	UM18-217126111	6048386
			-	-	0 V ... 10 V	UM18-217127111	6048388
					4 mA ... 20 mA	UM18-21712A212	6048385
		Angled	IO-Link, V1.1	1 x Push-pull: PNP/NPN	4 mA ... 20 mA	UM18-21712B212	6066163
					0 V ... 10 V	UM18-21712C212	6066165
				2 x Push-pull: PNP/NPN	-	UM18-21712D212	6066167
			-	-	4 mA ... 20 mA	UM18-21712E212	6068440
					4 mA ... 20 mA	UM18-217126112	6048387
			-	-	0 V ... 10 V	UM18-217127112	6048389
					4 mA ... 20 mA	UM18-21112A211	6048390
30 mm ... 250 mm, 350 mm	8 ms, 32 ms	Straight	IO-Link, V1.0	1 x Push-pull: PNP/NPN	-	UM18-21112A211	6048390
			IO-Link, V1.1		4 mA ... 20 mA	UM18-21112B211	6066168
					0 V ... 10 V	UM18-21112C211	6066170
			-	-	-	UM18-21112D211	6066172
					4 mA ... 20 mA	UM18-21112E211	6068441
			-	-	4 mA ... 20 mA	UM18-211126111	6048392
					0 V ... 10 V	UM18-211127111	6048394
		Angled	IO-Link, V1.1	1 x Push-pull: PNP/NPN	4 mA ... 20 mA	UM18-21112A212	6048391
					0 V ... 10 V	UM18-21112B212	6066169
				2 x Push-pull: PNP/NPN	-	UM18-21112C212	6066171
			-	-	4 mA ... 20 mA	UM18-21112D212	6066173
					4 mA ... 20 mA	UM18-21112E212	6068442
			-	-	4 mA ... 20 mA	UM18-211126112	6048393
					0 V ... 10 V	UM18-211127112	6048395
65 mm ... 350 mm, 600 mm	16 ms, 64 ms	Straight	IO-Link, V1.0	1 x Push-pull: PNP/NPN	-	UM18-21212A211	6048396
			IO-Link, V1.1		4 mA ... 20 mA	UM18-21212B211	6066174
					0 V ... 10 V	UM18-21212C211	6066176
			-	-	-	UM18-21212D211	6066178
					4 mA ... 20 mA	UM18-21212E211	6068443
			-	-	4 mA ... 20 mA	UM18-212126111	6048398
					0 V ... 10 V	UM18-212127111	6048400
		Angled	IO-Link, V1.1	1 x Push-pull: PNP/NPN	4 mA ... 20 mA	UM18-21212A212	6048397
					0 V ... 10 V	UM18-21212B212	6066175
				2 x Push-pull: PNP/NPN	-	UM18-21212C212	6066177
			-	-	4 mA ... 20 mA	UM18-21212D212	6066179
					4 mA ... 20 mA	UM18-21212E212	6068444
			-	-	4 mA ... 20 mA	UM18-212126112	6048399
					0 V ... 10 V	UM18-212127112	6048401

Operating range, limiting range	Output time	Sending axis	Communication Interface	Digital output	Analog output	Type	Part no.	
120 mm ... 1,000 mm, 1,300 mm	20 ms, 80 ms	Straight	IO-Link, V1.0	1 x Push-pull: PNP/NPN	-	UM18-21812A211	6048402	
			IO-Link, V1.1		4 mA ... 20 mA	UM18-21812B211	6066180	
				0 V ... 10 V	UM18-21812C211	6066182		
					UM18-21812D211	6066184		
				-	-	4 mA ... 20 mA	UM18-21812E211	6068445
			0 V ... 10 V			UM18-218126111	6048404	
		Angled	IO-Link, V1.0	-	-	4 mA ... 20 mA	UM18-218127111	6048406
						0 V ... 10 V	UM18-21812A212	6048403
			IO-Link, V1.1	1 x Push-pull: PNP/NPN	-	UM18-21812B212	6066181	
					4 mA ... 20 mA	UM18-21812C212	6066183	
				0 V ... 10 V	UM18-21812D212	6066185		
					2 x Push-pull: PNP/NPN	-	UM18-21812E212	6068446
			-	-	4 mA ... 20 mA	UM18-218126112	6048405	
					0 V ... 10 V	UM18-218127112	6048407	

Dimensional drawings (Dimensions in mm (inch))

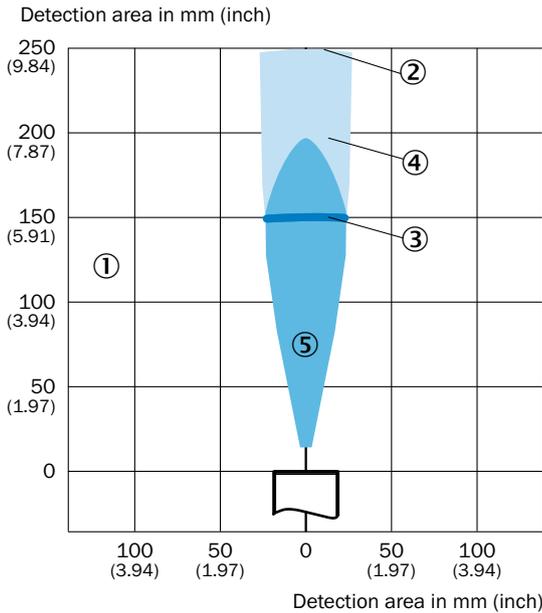
UM18-2xxxxxx1



- ① Connection
- ② Mounting nuts, SW 24 mm
- ③ Status display for supply voltage active (green)
- ④ Status indicator switching/analog output (orange)

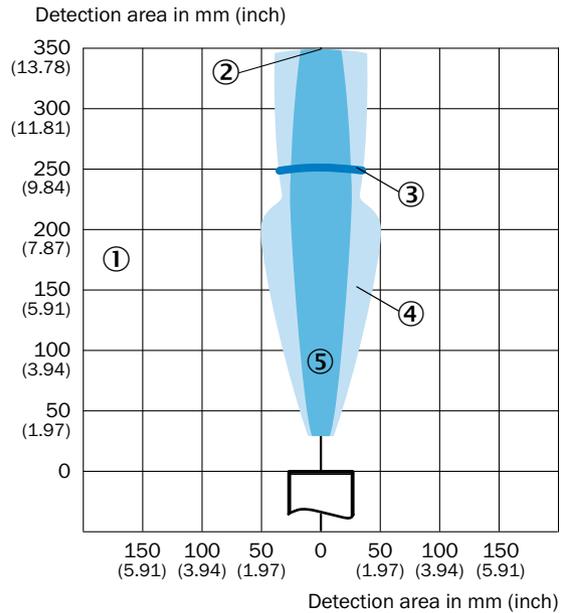
Detection ranges

UM18-217



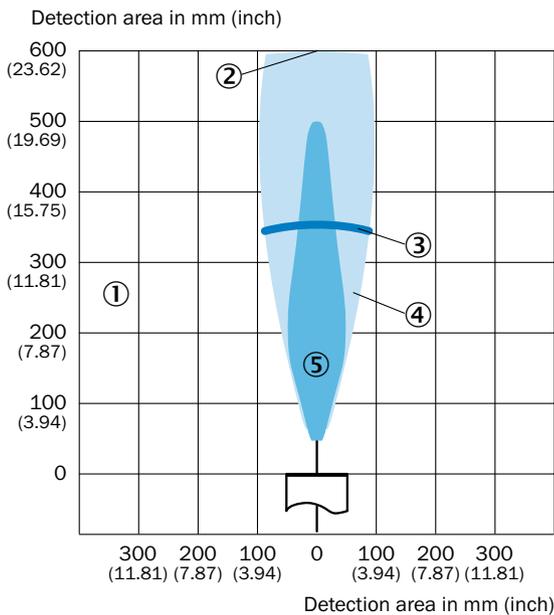
- ① Detection range dependent on reflection properties, size, and alignment of the object
- ② Limiting range
- ③ Operating range
- ④ Example object: aligned plate 500 mm x 500 mm
- ⑤ Example object: cylindrical bar with a diameter of 10 mm

UM18-211



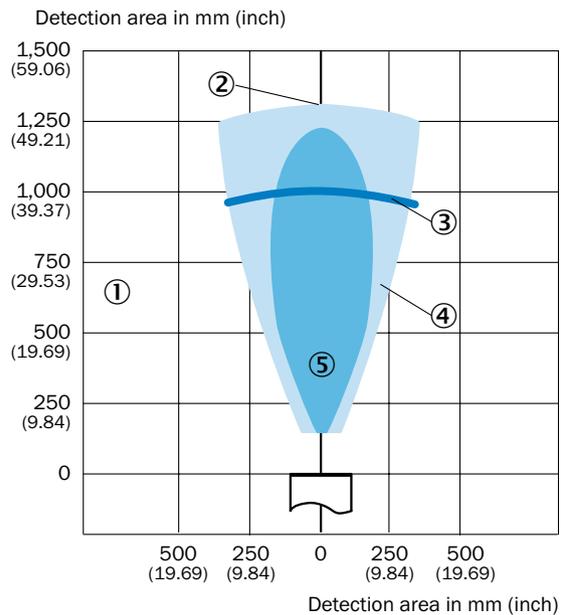
- ① Detection range dependent on reflection properties, size, and alignment of the object
- ② Limiting range
- ③ Operating range
- ④ Example object: aligned plate 500 mm x 500 mm
- ⑤ Example object: cylindrical bar with a diameter of 10 mm

UM18-212



- ① Detection range dependent on reflection properties, size, and alignment of the object
- ② Limiting range
- ③ Operating range
- ④ Example object: aligned plate 500 mm x 500 mm
- ⑤ Example object: pipe with 27 mm diameter

UM18-218



- ① Detection range dependent on reflection properties, size, and alignment of the object
- ② Limiting range
- ③ Operating range
- ④ Example object: aligned plate 500 mm x 500 mm
- ⑤ Example object: pipe with 27 mm diameter

Recommended accessories

Mounting systems

Mounting brackets and plates

	Brief description	Type	Part no.
	Mounting plate for M18 sensors	BEF-WG-M18	5321870

Connection systems

Modules and gateways

	Type	Part no.
	IOLA2US-01101 (SiLink2 Master)	1061790

Plug connectors and cables

	Connection type head A	Connection type head B	Cable	Length of cable	Type	Part no.
	Female connector, M12, 5-pin, straight, A-coded	Flying leads	PVC, Sensor/actuator cable, unshielded	2 m	YF2A15-020VB5X-LEAX	2096239

Reflectors and optics

Deflector mirrors

	Brief description	Type	Part no.
 Illustration may differ	90° sound deflection plate for UM18-1xxxx and UM18-2xxxx, stainless steel, for straight versions	USP-UM18	5323658

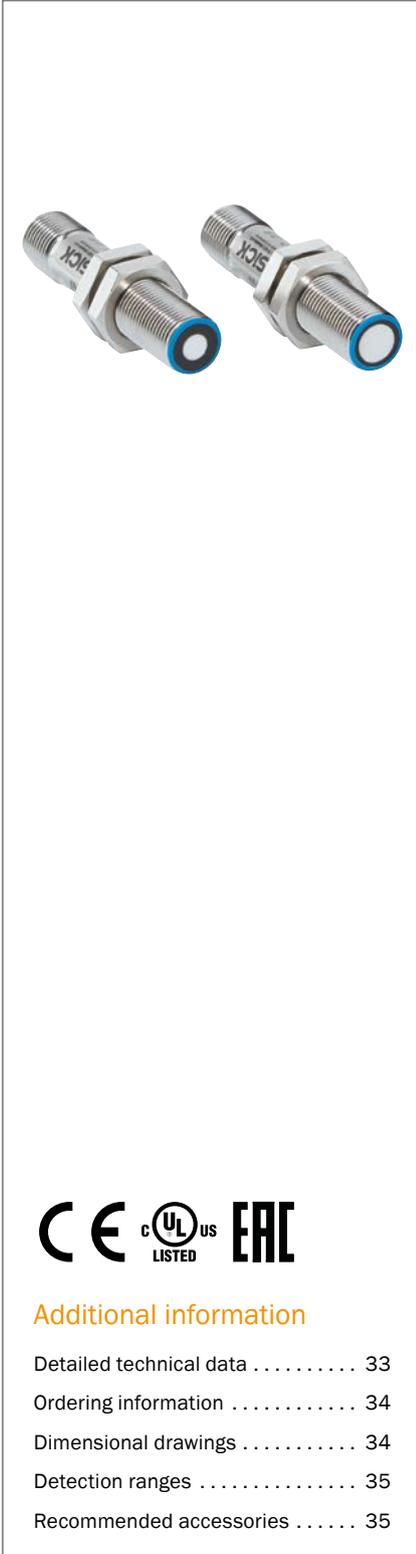
Further accessories

Programming and configuration tools

	Brief description	Type	Part no.
	Tool for visualization, configuration and cloning, 3-digit LED display, supply voltage: DV 9 V ... 30 V	Connect+ adapter (CPA)	6037782

You can find additional accessories online → www.sick.com/UM18

SMALL SENSOR, GREAT BENEFITS



Additional information

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Product description

The sensors in the UM12 product family impress with their compact dimensions in a rugged metal housing. Two sensing ranges up to 350 mm and four available output signals – analog current or voltage output, PNP or NPN switching output – maximize flexibility even where installation space is limited. Color-inde-

pendent detection, high contamination tolerance, and outstanding background suppression deliver stable measurement results even under challenging conditions. With the UM12 ultrasonic sensor in an M12 housing, SICK is now able to offer the proven technology for any application.

At a glance

- Reliable measurement, regardless of material color, transparency, gloss, or ambient light
- Very short and rugged M12 metal housing
- Variants with PNP/NPN digital output or analog output
- Immune to dirt, dust, humidity, and fog
- Detection, measurement, or positioning with ultrasound technology
- Cable teach-in

Your benefits

- Very compact housing dimensions for straightforward machine integration
- Proven M12 housing design ensures compatibility with other technologies
- Analog variants in compact design for complex measuring tasks
- Rugged, one-piece metal housing ensures highest machine uptimes
- Teach-in via cable prevents unintentional sensor adjustment reducing machine downtime
- The sensor’s immunity to external factors enables it to take accurate measurements even in dirty, dusty, humid, and foggy conditions
- Integrated temperature compensation ensures high measurement accuracy at any time for best process quality

→ www.sick.com/UM12

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.



Detailed technical data

Performance

Operating range, limiting range	20 mm ... 150 mm, 250 mm 40 mm ... 240 mm, 350 mm
Target	Natural objects
Resolution	≥ 0.069 mm
Repeatability ¹⁾	± 0.15 %
Accuracy ¹⁾	± 1 %
Temperature compensation	✓
Response time ²⁾	
20 mm ... 150 mm, 250 mm	24 ms
40 mm ... 240 mm, 350 mm	30 ms
Switching frequency	
20 mm ... 150 mm, 250 mm	30 Hz
40 mm ... 240 mm, 350 mm	25 Hz
Output time	
20 mm ... 150 mm, 250 mm	8 ms
40 mm ... 240 mm, 350 mm	10 ms
Ultrasonic frequency (typical)	
20 mm ... 150 mm, 250 mm	380 kHz
40 mm ... 240 mm, 350 mm	500 kHz
Additional function ³⁾	<ul style="list-style-type: none"> Adjustable operating modes: Switching point (DtO) / Switching window/Background (ObSB) Teach-in of digital output, invertible digital output Teach-in of analog output, Invertible analog output Reset to factory default

¹⁾ Referring to current measurement value.

²⁾ Subsequent smoothing of the analog output, depending on the application, may increase the response time by up to 200 %.

³⁾ Functions may vary depending on sensor type.

Interfaces

Digital output	1 x PNP 1 x NPN
Analog output	
Type	1 x Power output 1 x Voltage output
Current ¹⁾	4 mA ... 20 mA, ≤ 500 Ω
Voltage	0 V ... 10 V, ≥ 100,000 Ω
Resolution	12 bit
Hysteresis	
20 mm ... 150 mm, 250 mm	2 mm
40 mm ... 240 mm, 350 mm	3 mm

¹⁾ For 4 mA ... 20 mA and $V_s \leq 20$ V max. load ≤ 100 Ω.

Mechanics/electronics

Supply voltage V_s ¹⁾²⁾	DC 10 V ... 30 V
Power consumption ³⁾	≤ 1.2 W
Initialization time	< 300 ms

¹⁾ Limit values, reverse-polarity protected Operation in short-circuit protected network: max. 8 A, class 2.

²⁾ 15 V ... 30 V when using the analog voltage output.

³⁾ Without load.

Design	Cylindrical
Housing material	Nickel-plated brass, PBT, ultrasonic transducer: polyurethane foam, glass epoxy resin
Connection type	Male connector, M12, 4-pin
Indication	2 x LED
Weight	15 g
Sending axis	Straight
Enclosure rating	IP65 / IP67
Protection class	III

¹⁾ Limit values, reverse-polarity protected Operation in short-circuit protected network: max. 8 A, class 2.

²⁾ 15 V ... 30 V when using the analog voltage output.

³⁾ Without load.

Ambient data

Ambient temperature operation	-25 °C ... +70 °C
Ambient storage temperature	-40 °C ... +85 °C

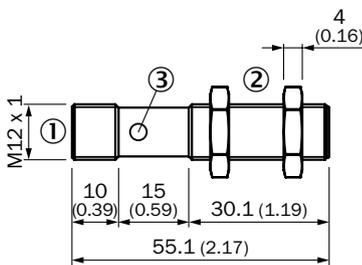
Ordering information

UM12

Operating range, limiting range	Output time	Digital output	Analog output	Type	Part no.
20 mm ... 150 mm, 250 mm	8 ms, 24 ms	1 x PNP	-	UM12-1172211	6053542
		1 x NPN	-	UM12-1172251	6053543
		-	4 mA ... 20 mA	UM12-1172261	6053544
			0 V ... 10 V	UM12-1172271	6053545
40 mm ... 240 mm, 350 mm	10 ms, 30 ms	1 x PNP	-	UM12-1192211	6053546
		1 x NPN	-	UM12-1192251	6053547
		-	4 mA ... 20 mA	UM12-1192261	6053548
			0 V ... 10 V	UM12-1192271	6053549

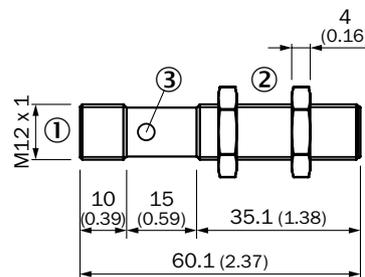
Dimensional drawings (Dimensions in mm (inch))

UM12-11x2211, UM12-11x2251



- ① Connection
- ② Mounting nuts, SW 17 mm
- ③ Status display supply voltage active (green), switching and analog output (orange)

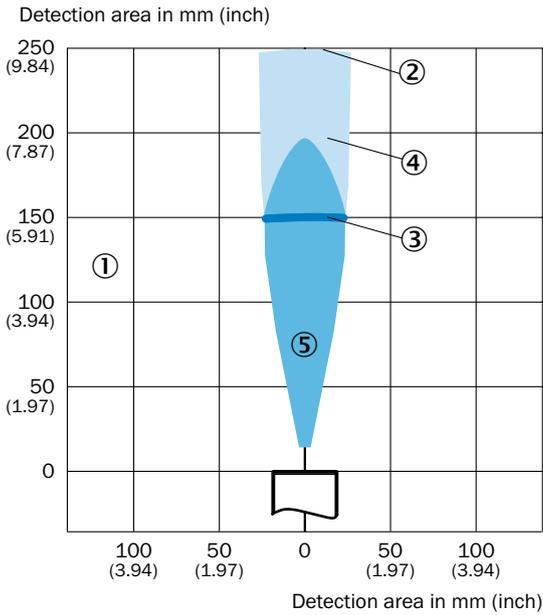
UM12-11x2261, UM12-11x2271



- ① Connection
- ② Mounting nuts, SW 17 mm
- ③ Status display supply voltage active (green), switching and analog output (orange)

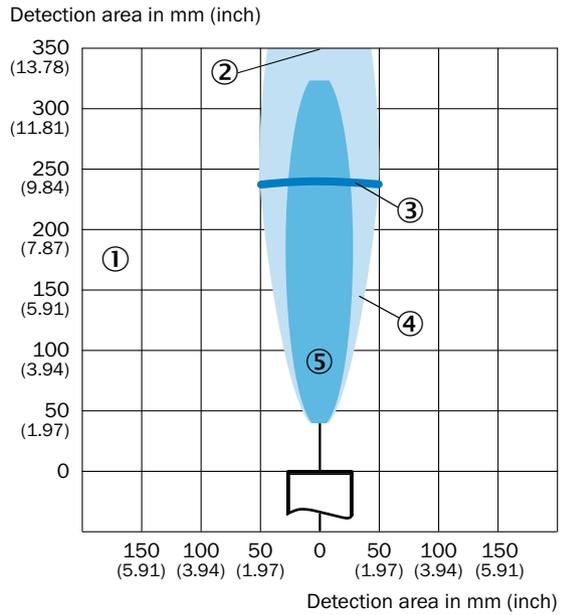
Detection ranges

UM12-117



- ① Detection range dependent on reflection properties, size, and alignment of the object
- ② Limiting range
- ③ Operating range
- ④ Example object: aligned plate 500 mm x 500 mm
- ⑤ Example object: cylindrical bar with a diameter of 10 mm

UM12-119



- ① Detection range dependent on reflection properties, size, and alignment of the object
- ② Limiting range
- ③ Operating range
- ④ Example object: aligned plate 500 mm x 500 mm
- ⑤ Example object: cylindrical bar with a diameter of 10 mm

Recommended accessories

Mounting systems

Mounting brackets and plates

	Brief description	Type	Part no.
	Mounting plate for M12 sensors	BEF-WG-M12	5321869

Connection systems

Plug connectors and cables

	Connection type head A	Connection type head B	Cable	Length of cable	Type	Part no.
	Female connector, M12, 5-pin, straight, A-coded	Flying leads	PVC, Sensor/actuator cable, unshielded	2 m	YF2A15-020VB5X-LEAX	2096239

You can find additional accessories online → www.sick.com/UM12

RUGGED. RELIABLE. RECTANGULAR.



Product description

The sensors of the UC30 product family impress with excellent performance in a compact cubic housing. Due to color-independent detection, high contamination tolerance and outstanding background suppression, UC30 sensors deliver stable measurement results even under challenging conditions.

Various output signals with sensing ranges of up to 8,000 mm as well as high measurement accuracy due to the integrated temperature compensation leave no applications unsolved. Teach-in buttons and IO-Link also extend the diagnostic and configuration options of these ultrasonic sensors.

At a glance

- Reliable measurement, regardless of material color, transparency, gloss, or ambient light
- Rugged housing with teach-in buttons
- Sensing ranges up to 8,000 mm
- Analog output, push-pull digital output with IO-Link or two PNP/NPN digital outputs
- Immune to dirt, dust, humidity, and fog
- Adjustable sensitivity

Your benefits

- Compact cubic housing for straightforward machine integration
- Rugged, plastic housing ensures highest plant availability
- Various output signals for solving complex applications available
- IO-Link with many diagnostic options for fault-free operation and simple maintenance
- Teach-in buttons for fast and easy commissioning
- Rugged ultrasonic technology, measures reliably even in dirty, dusty, humid, and foggy conditions
- Integrated temperature compensation ensures high measurement accuracy at all times for optimum process quality



Additional information

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Recommended accessories 39

→ www.sick.com/UC30

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.



Detailed technical data

Performance

Operating range, limiting range	350 mm ... 3,400 mm, 5,000 mm 600 mm ... 6,000 mm, 8,000 mm
Target	Natural objects
Resolution	≥ 0.18 mm
Repeatability ¹⁾	± 0.15 %
Accuracy ^{1) 2)}	± 1 %
Temperature compensation	✓
Response time ³⁾	
350 mm ... 3,400 mm, 5,000 mm	180 ms
600 mm ... 6,000 mm, 8,000 mm	240 ms
Switching frequency	
350 mm ... 3,400 mm, 5,000 mm	4 Hz
600 mm ... 6,000 mm, 8,000 mm	3 Hz
Output time	
350 mm ... 3,400 mm, 5,000 mm	43 ms
600 mm ... 6,000 mm, 8,000 mm	60 ms
Ultrasonic frequency (typical)	
350 mm ... 3,400 mm, 5,000 mm	120 kHz
600 mm ... 6,000 mm, 8,000 mm	80 kHz
Detection area (typical)	See diagrams
Additional function	<ul style="list-style-type: none"> • Adjustable operating modes: Switching point (DtO) / Switching window/Background (ObSB) • Teach-in of digital output, set levels of digital outputs, invertable • Set on delay digital output • Teach-in of analog output, scaling of analog outputs, invertable • Synchronization of up to 50 sensors • Multiplexing: no cross talk of up to 50 sensors • Adjustable measurement filters: Measured value filters/Filter strength/Foreground suppression/Detection area/Sensitivity and sound beam • Teach-in button(s) (can be deactivated) • Reset to factory default

¹⁾ Referring to current measurement value.

²⁾ Temperature compensation can be switched off, without temperature compensation: 0.17 % / K.

³⁾ Subsequent smoothing of the analog output, depending on the application, may increase the response time by up to 200 %

⁴⁾ Functions may vary depending on sensor type..

Interfaces

IO-Link	✓, V1.0 (process data, parameterization, diagnosis) ✓, V1.1 (process data, parameterization, diagnosis, data storage)
Digital output ^{1) 2) 3)}	2 x PNP, ≤ 100 mA 2 x NPN, ≤ 100 mA 1 x Push-pull: PNP/NPN, ≤ 200 mA
Analog output	Type 1 x Power output / voltage output Function Automatic selection of analog current or voltage output dependent on load Current ⁴⁾ 4 mA ... 20 mA, ≤ 500 Ω Voltage 0 V ... 10 V, ≥ 100,000 Ω Resolution 12 bit
Multifunctional input (MF)	1 x MF
Hysteresis	350 mm ... 3,400 mm, 5,000 mm 50 mm 600 mm ... 6,000 mm, 8,000 mm 100 mm

¹⁾ Push-pull: PNP/NPN HIGH = $U_v - (< 3 V)$ / LOW < 3 V.

²⁾ PNP: HIGH = $V_s - (< 2 V)$ / LOW = 0 V.

³⁾ NPN: HIGH = ≤ 2 V / LOW = U_v .

⁴⁾ For 4 mA ... 20 mA and $V_s \leq 20 V$ max. load ≤ 100 Ω.

Mechanics/electronics

Supply voltage V_s ^{1) 2)}	DC 9 V ... 30 V
Power consumption ³⁾	≤ 1.2 W
Initialization time ⁴⁾	350 mm ... 3,400 mm, 5,000 mm < 380 ms 600 mm ... 6,000 mm, 8,000 mm < 450 ms
Design	Rectangular
Housing material	PBT, PET, ultrasonic transducer: polyurethane foam, glass epoxy resin
Connection type	Male connector, M12, 5-pin
Indication	2 x LED
Weight	180 g 240 g
Sending axis	Straight
Enclosure rating	IP65 / IP67
Protection class	III

¹⁾ Limit values, reverse-polarity protected Operation in short-circuit protected network: max. 8 A, class 2.

²⁾ 15 V ... 30 V when using the analog voltage output.

³⁾ Without load.

⁴⁾ Subsequent smoothing of the analog output, depending on the application, may increase the initialization time by up to 200 %.

Ambient data

Ambient temperature operation	-25 °C ... +70 °C
Ambient storage temperature	-40 °C ... +85 °C

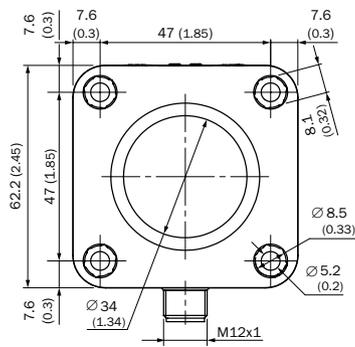
Ordering information

UC30-2

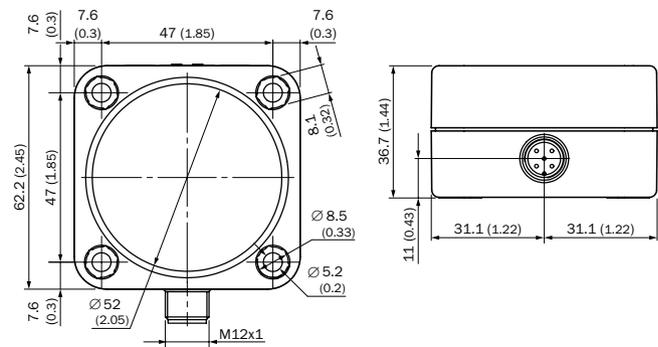
Operating range, limiting range	Output time	Communication Interface	Digital output	Analog output	Type	Part no.
350 mm ... 3,400 mm, 5,000 mm	43 ms, 180 ms	IO-Link, V1.0	1 x Push-pull: PNP/NPN	-	UC30-21416A	6054710
		IO-Link, V1.1			UC30-21416B	6068452
		-	2 x PNP	4 mA ... 20 mA 0 V ... 10 V	UC30-214162	6054711
			-		UC30-214163	6054712
			2 x NPN		UC30-214164	6054713
600 mm ... 6,000 mm, 8,000 mm	60 ms, 240 ms	IO-Link, V1.0	1 x Push-pull: PNP/NPN	-	UC30-21516A	6054714
		IO-Link, V1.1			UC30-21516B	6068453
		-	2 x PNP	4 mA ... 20 mA 0 V ... 10 V	UC30-215162	6054715
			-		UC30-215163	6054716
			2 x NPN		UC30-215164	6054717

Dimensional drawings (Dimensions in mm (inch))

UC30-214

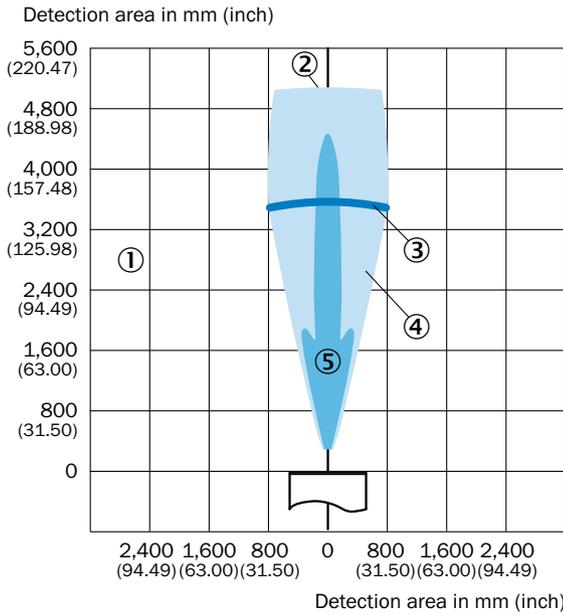


UC30-215



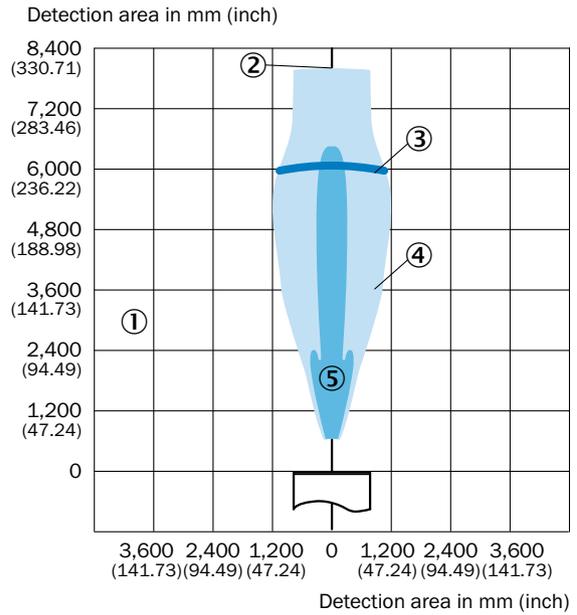
Detection ranges

UM30-214, UC30-214



- ① Detection range dependent on reflection properties, size, and alignment of the object
- ② Limiting range
- ③ Operating range
- ④ Example object: aligned plate 500 mm x 500 mm
- ⑤ Example object: pipe with 27 mm diameter

UM30-215, UC30-215



- ① Detection range dependent on reflection properties, size, and alignment of the object
- ② Limiting range
- ③ Operating range
- ④ Example object: aligned plate 500 mm x 500 mm
- ⑤ Example object: pipe with 27 mm diameter

Recommended accessories

Mounting systems

Universal bar clamp systems

	Brief description	Type	Part no.
	Plate K for universal clamp bracket	BEF-KHS-K01	2022718

Connection systems

Modules and gateways

	Type	Part no.
	IOLA2US-01101 (SiLink2 Master)	1061790

Plug connectors and cables

	Connection type head A	Connection type head B	Cable	Length of cable	Type	Part no.
	Female connector, M12, 5-pin, straight, A-coded	Flying leads	PVC, Sensor/actuator cable, unshielded	2 m	YF2A15-020VB5X-LEAX	2096239

Further accessories

Programming and configuration tools

	Brief description	Type	Part no.
	Tool for visualization, configuration and cloning, 3-digit LED display, supply voltage: DV 9 V ... 30 V	Connect+ adapter (CPA)	6037782

You can find additional accessories online → www.sick.com/UC30

ULTRASONIC TECHNOLOGY HOUSED IN AN INDUSTRY-PROVEN DESIGN



Product description

Ultrasonic technology provides reliable results where optical sensors reach their limits. The UC12 shares the same housing as common photoelectric sensors.

In addition a single teach-in button enables easy setup. Dark or transparent objects are easily detected.

At a glance

- Transparent foils, glass, liquids and bottles are detected, regardless of the material color and ambient light
- Easy and quick teach-in with teach-in button
- Insensitive to dirt, dust and fog
- Two complementary digital outputs (Q, /Q)
- Very good background suppression (BGS)
- Three operating modes: Distance to Object (DtO), Window (Wnd) or Object between sensor and background (ObSB)

Your benefits

- Fast commissioning due to single-button teach-in
- Full mechanical compatibility to photoelectric sensors increase application flexibility without machine modification
- Standard proximity, window and reflection modes provide application flexibility, which increases reliability and productivity
- Integrated temperature compensation ensures high measurement accuracy
- Complementary switching outputs immediately signal broken wiring, reducing faulty production results



Additional information

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→ www.sick.com/UC12

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.



Detailed technical data

Performance

Operating range, limiting range	20 mm ... 150 mm, 250 mm 55 mm ... 250 mm, 350 mm
Target	Natural objects
Resolution	≥ 0.1 mm
Repeatability ¹⁾	± 0.15 %
Accuracy ¹⁾	± 1 %
Temperature compensation	✓
Response time	30 ms
Switching frequency	25 Hz
Output time	8 ms
Ultrasonic frequency (typical)	
20 mm ... 150 mm, 250 mm	380 kHz
55 mm ... 250 mm, 350 mm	500 kHz
Detection area (typical)	See diagrams
Additional function	<ul style="list-style-type: none"> Adjustable operating modes: Switching point (Dt0) / Switching window / Background (ObSB) Teach-in of digital output Teach-in button(s) (can be deactivated) Reset to factory default

¹⁾ Referring to current measurement value.

Interfaces

Digital output ^{1) 2)}	2 x PNP, ≤ 500 mA 2 x NPN, ≤ 500 mA
Function	Complementary digital outputs (Q, \bar{Q})
Hysteresis	2 mm

¹⁾ PNP: HIGH = $V_s - (< 2 V)$ / LOW = 0 V.

²⁾ NPN: HIGH = ≤ 2 V / LOW = U_v .

Mechanics/electronics

Supply voltage V_s ¹⁾	DC 10 V ... 30 V
Power consumption ²⁾	≤ 1.2 W
Initialization time	< 300 ms
Design	Rectangular
Housing material	Die-cast zinc, ultrasonic transducer: polyurethane foam, glass epoxy resin
Connection type	Male connector, M12, 4-pin
Indication	Dual LED
Weight	75 g
Sending axis	Straight
Enclosure rating	IP65 / IP67
Protection class	III

¹⁾ Limit values, reverse-polarity protected, operation in short-circuit protected network: max. 8 A.

²⁾ Without load.

Ambient data

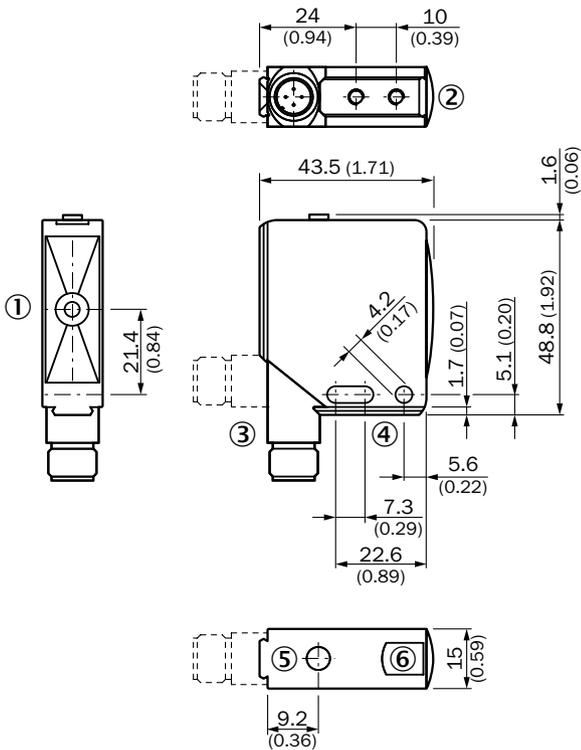
Ambient temperature operation	-25 °C ... +70 °C
Ambient storage temperature	-40 °C ... +85 °C

Ordering information

UC12

Operating range, limiting range	Digital output	Type	Part no.
20 mm ... 150 mm, 250 mm	2 x PNP	UC12-11231	6029831
	2 x NPN	UC12-11235	6029833
55 mm ... 250 mm, 350 mm	2 x PNP	UC12-12231	6029832
	2 x NPN	UC12-12235	6029834

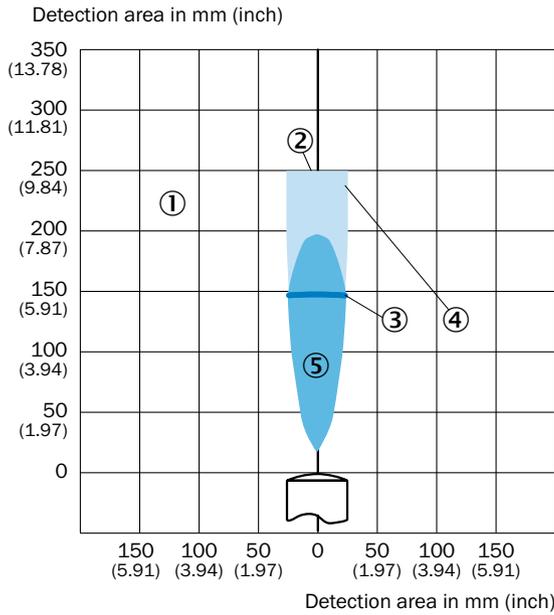
Dimensional drawing (Dimensions in mm (inch))



- ① Sender and receiver axis
- ② M4 threaded mounting hole, 4 mm deep
- ③ Connection
- ④ Fixing hole
- ⑤ Operating elements
- ⑥ Status indicator digital output (orange) and power on (green)

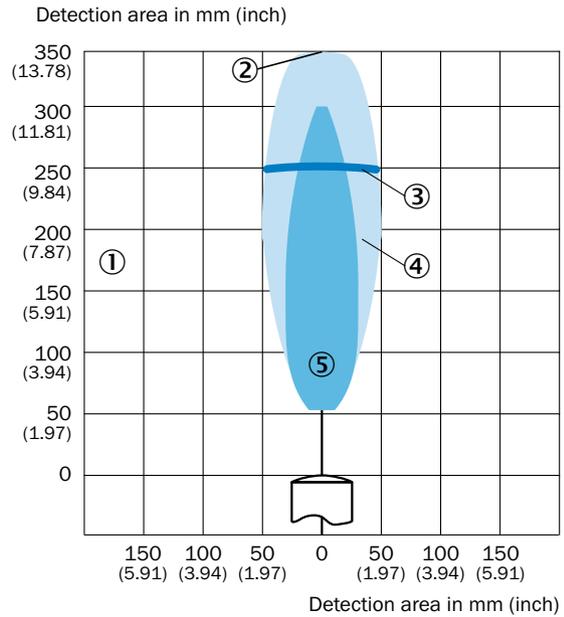
Detection ranges

UC12-11



- ① Detection range dependent on reflection properties, size, and alignment of the object
- ② Limiting range
- ③ Operating range
- ④ Example object: aligned plate 10 mm x 10 mm
- ⑤ Example object: cylindrical bar with a diameter of 10 mm

UC12-12



- ① Detection range dependent on reflection properties, size, and alignment of the object
- ② Limiting range
- ③ Operating range
- ④ Example object: aligned plate 10 mm x 10 mm
- ⑤ Example object: cylindrical bar with a diameter of 10 mm

Recommended accessories

Mounting systems

Mounting brackets and plates

	Brief description	Type	Part no.
	Mounting bracket, small	BEF-WK-W12	2012938

Connection systems

Plug connectors and cables

	Connection type head A	Connection type head B	Cable	Length of cable	Type	Part no.
	Female connector, M12, 5-pin, straight, A-coded	Flying leads	PVC, Sensor/actuator cable, unshielded	2 m	YF2A15-020VB5X-LEAX	2096239

You can find additional accessories online → www.sick.com/UC12

SMALL, PRECISE, ULTRASONIC



Product description

The UC4 ultrasonic sensor family combines state-of-the-art ultrasonic technology in a miniature housing. With reliable functionality in even difficult operating conditions, the UC4 is a real miniature all-rounder when it comes to demanding, specialized tasks such as detecting transparent objects or measuring the levels of fluids and bulk materials. Even

in situations with high requirements for background suppression or contamination tolerance, the UC4 with switching, analog, or push-pull output with IO-Link has proven itself as the ideal choice. And to top it all off, the portfolio even includes variants with increased switching frequency for extremely fast applications.

At a glance

- Reliable measurement, regardless of material color, transparency, gloss, or ambient light
- Ultrasonic technology in a small housing
- Detection, measurement, and positioning with ultrasonic technology
- Variants with PNP/NPN digital output, analog output or push-pull output with IO-Link
- Teach-in button
- Precise background suppression
- Immune to dirt, dust, humidity, and fog

Your benefits

- Mini housing allows for quick and easy integration, even in the most confined spaces
- Teach-in button for fast and easy commissioning
- Integrated temperature compensation ensures high measurement accuracy at all times for optimum process quality
- Various operating modes provide optimal application flexibility and solutions, which increase reliability and productivity
- Full mechanical compatibility to photoelectric sensors allows for the use of the suitable technology for every application without machine modification
- The sensor's immunity to optically difficult environment enables it to take accurate measurements even in dirty, dusty, humid, and foggy conditions



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→ www.sick.com/UC4

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.



Detailed technical data

Performance

Operating range, limiting range ¹⁾	13 mm ... 100 mm, 150 mm 13 mm ... 150 mm, 250 mm 20 mm ... 150 mm, 250 mm
Target	Natural objects
Resolution	≥ 0.1 mm
Repeatability ²⁾	± 0.15 %
Accuracy ²⁾	
13 mm ... 100 mm, 150 mm	0.17 % / K
13 mm ... 150 mm, 250 mm	± 1 %
20 mm ... 150 mm, 250 mm	± 1 %
Temperature compensation ¹⁾	
13 mm ... 100 mm, 150 mm	-
13 mm ... 150 mm, 250 mm	✓
20 mm ... 150 mm, 250 mm	✓
Response time ³⁾	
13 mm ... 100 mm, 150 mm	24 ms
13 mm ... 150 mm, 250 mm	10 ms
20 mm ... 150 mm, 250 mm	24 ms
Switching frequency ¹⁾	
13 mm ... 100 mm, 150 mm	30 Hz
13 mm ... 150 mm, 250 mm	100 Hz
20 mm ... 150 mm, 250 mm	30 Hz
Output time	8 ms 5 ms
Ultrasonic frequency (typical)	380 kHz
Detection area (typical)	See diagrams
Additional function ⁴⁾	<ul style="list-style-type: none"> Adjustable operating modes: Switching point (DtO) / Switching window / Background (ObSB) Teach-in of digital output, invertable digital output Teach-in button(s) (can be deactivated) Reset to factory default

¹⁾ Teach-in from 21 mm.

²⁾ Referring to current measurement value.

³⁾ Subsequent smoothing of the analog output, depending on the application, may increase the response time by up to 200 %.

⁴⁾ Functions may vary depending on sensor type.

Interfaces

IO-Link	✓, V1.0 (process data, parameterization) ✓, V1.1 (process data, parameterization, diagnosis, data storage)
Digital output ^{1) 2) 3)}	1 x PNP, ≤ 200 mA 1 x NPN, ≤ 200 mA 1 x Gegentakt: PNP/NPN, ≤ 100 mA
Analog output	
Type	1 x Power output 1 x Voltage output
Current ⁴⁾	4 mA ... 20 mA, ≤ 500 Ω
Voltage	0 V ... 10 V, ≥ 100,000 Ω
Resolution	12 bit
Hysteresis	2 mm

¹⁾ PNP: HIGH = $V_s - (< 2 \text{ V})$ / LOW = 0 V.

²⁾ NPN: HIGH = ≤ 2 V / LOW = U_v .

³⁾ Push-pull: PNP/NPN HIGH = $U_v - (< 3 \text{ V})$ / LOW < 3 V.

⁴⁾ For 4 mA ... 20 mA and $V_s \leq 20 \text{ V}$ max. load ≤ 100 Ω.

Mechanics/electronics

Supply voltage V_s ¹⁾	DC 15 V ... 30 V
Power consumption ²⁾	≤ 0.75 W ≤ 0.9 W
Initialization time	< 300 ms
Design	Rectangular
Housing material	ABS-plastic, ultrasonic transducer: polyurethane foam, glass epoxy resin
Connection type	Male connector, M8, 3-pin Cable with male connector (300 mm), M8, 3-pin
Indication	2 x LED
Weight	10 g
Sending axis	Straight
Enclosure rating	IP65 / IP67
Protection class	III

¹⁾ Limit values, reverse-polarity protected, operation in short-circuit protected network: max. 8 A.

²⁾ Without load.

Ambient data

Ambient temperature operation ¹⁾	-25 °C ... +70 °C
Ambient storage temperature	-40 °C ... +85 °C

¹⁾ At operating temperatures of > 50 °C, the rear side of the UC4 must be installed with its surface flat against a bracket.

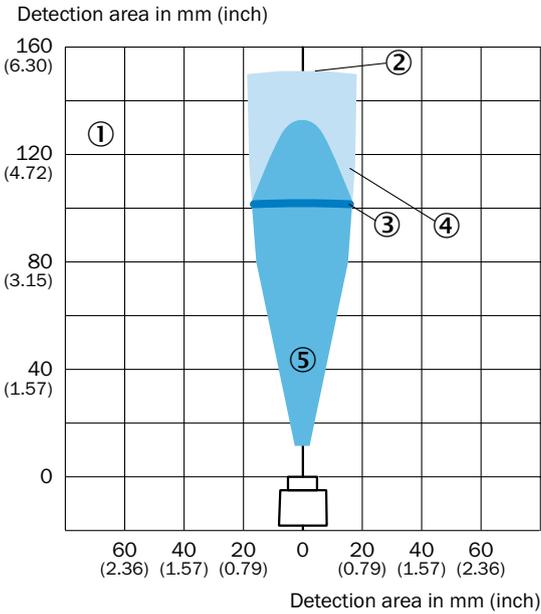
Ordering information

UC4

Operating range, limiting range	Output time	Communication Interface	Type of digital outputs	Analog output	Type	Part no.		
13 mm ... 100 mm, 150 mm	8 ms, 24 ms	-	1 x PNP	-	UC4-11341	6034667		
			1 x NPN		UC4-11345	6034668		
13 mm ... 150 mm, 250 mm	8 ms, 24 ms		1 x PNP		UC4-13341	6034669		
			1 x NPN		UC4-13345	6034670		
	5 ms, 10 ms		1 x PNP		UC4-13341S01	6049509		
			1 x NPN		UC4-13345S02	6049510		
20 mm ... 150 mm, 250 mm	8 ms, 24 ms		IO-Link, V1.0 IO-Link, V1.1		-	4 mA ... 20 mA	UC4-13346	6054708
						0 V ... 10 V	UC4-13347	6054709
13 mm ... 150 mm, 250 mm	8 ms, 24 ms	Push-pull: PNP/NPN		-	UC4-1334A	6063574		
		Push-pull: PNP/NPN		-	UC4-1334B	6068454		
						UC4-1354B	6063576	

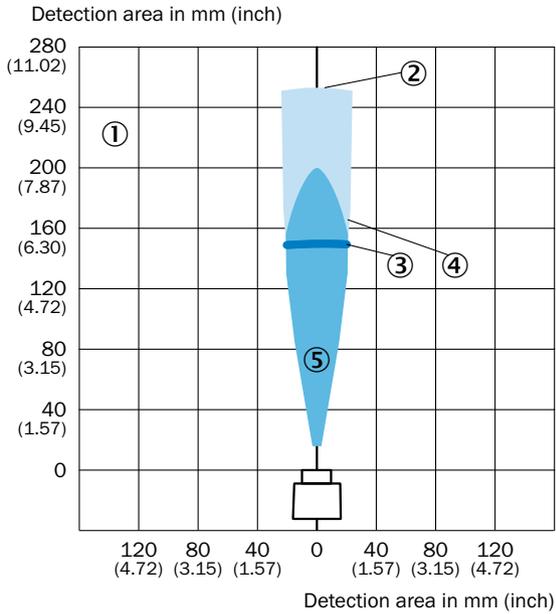
Detection ranges

UC4-11



- ① Detection range dependent on reflection properties, size, and alignment of the object
- ② Limiting range
- ③ Operating range
- ④ Example object: aligned plate 100 mm x 100 mm
- ⑤ Example object: cylindrical bar with a diameter of 10 mm

UC4-13



- ① Detection range dependent on reflection properties, size, and alignment of the object
- ② Limiting range
- ③ Operating range
- ④ Example object: aligned plate 100 mm x 100 mm
- ⑤ Example object: cylindrical bar with a diameter of 10 mm

Recommended accessories

Mounting systems

Mounting brackets and plates

	Brief description	Type	Part no.
	Mounting bracket for wall mounting	BEF-W4-A	2051628

Connection systems

Modules and gateways

	Type	Part no.
	IOLA2US-01101 (SiLink2 Master)	1061790

Plug connectors and cables

	Connection type head A	Connection type head B	Cable	Length of cable	Type	Part no.
	Female connector, M8, 3-pin, straight, A-coded	Flying leads	PVC, Sensor/actuator cable, unshielded	2 m	YF8U13-020VA1X-LEAX	2095860

Further accessories

Hardware

	Brief description	Type	Part no.
	Accessory for ultrasonic channeling for the product family UC4	SonicTube UC4	5329249

You can find additional accessories online → www.sick.com/UC4

DOUBLE LAYER AND SPLICE DETECTION FOR PAPER, CARDBOARD, METAL, AND PLASTIC



Product description

The UD18-2 specializes in checking for double layers and splices using ultrasonic technology. Operating with precision, it is able to determine whether one, two or no material layers are present between its sender and receiver. Where the UD18-2 really excels is checking for double layers in paper, cardboard, shiny

metal, and transparent plastic. It is possible to teach in up to four sensitivity levels and switch between them during operation, allowing the sensor to tackle even the most complex of applications and ensure permanent system availability with a consistently excellent level of production quality.

At a glance

- Material classifications: no layers, single layer, double layers
- Plug-and-play; sensitivity levels that can be selected, taught in, and changed during operation
- Up to four individual sensitivity levels
- Variable mounting distance
- LEDs visible from any direction
- Immune to dirt, dust, and humidity

Your benefits

- Maximum productivity and quality thanks to reliable material transportation monitoring
- Rapid commissioning thanks to plug-and-play plus a range of sensitivity levels to choose from
- Easy to switch between sensitivity levels during operation, preventing downtimes during material changes
- Individual teach-in of various materials, making it possible to tackle even the most demanding applications
- The utmost flexibility during installation thanks to variable mounting distance
- LEDs visible from any direction, making it easy to monitor double sheet detections
- Reliable detection in dirty, dusty, and humid conditions thanks to the ultrasonic technology's immunity to these environments



Additional information

Detailed technical data 53
 Ordering information 54
 Recommended accessories 54

→ www.sick.com/UD18

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.



Detailed technical data

Performance

Installation distance	20 mm ... 60 mm, 40 mm ± 3 mm (default setting) 30 mm ... 70 mm, 50 mm ± 3 mm (default setting)
Target	Natural objects
Resolution	1 material layer
Response time ¹⁾	
20 mm ... 60 mm	2.5 ms
30 mm ... 70 mm	5.5 ms
Switching frequency	
20 mm ... 60 mm	250 Hz
30 mm ... 70 mm	100 Hz
Output time ¹⁾	
20 mm ... 60 mm	2 ms, trigger mode: < 0.5 ms
30 mm ... 70 mm	5 ms, trigger mode: < 0.5 ms
Ultrasonic frequency (typical)	
20 mm ... 60 mm	400 kHz
30 mm ... 70 mm	200 kHz
Additional function ²⁾	<ul style="list-style-type: none"> • 3 selectable sensitivity levels • Teach-in of up to 4 individual sensitivity level • Sensitivity level changeover during operation • Set parameters via Connect+ Software
Blind zone	7 mm ... 7 mm (from sender and receiver)
Permissible angle deviation	± 45° perpendicular to material layer
Detectable material	<ul style="list-style-type: none"> • Paper with grammages: 20 g/m² ... 2,000 g/m² • Plastic sheets and foils: ≤ 0.4 mm • Self-adhesive films, metal sheets: ≤ 0.3 mm • Corrugated cardboard: single wall F, N and G flute sizes • Washi • Wafer • PCB • Paper with grammages: 100 g/m² ... 2,000 g/m² • Metal-laminated sheets and films: ≤ 5 mm • Self-adhesive films, metal sheets: ≤ 2 mm • Corrugated cardboard: single wall F, N and G flute sizes • Washi • Wafer • PCB

¹⁾ Set parameters via Connect+ Software.

²⁾ Functions may vary depending on sensor type.

Interfaces

Digital output ^{1) 2)}	2 x PNP, ≤ 200 mA 2 x NPN, ≤ 200 mA
Function	Q ₁ : switching output double layer, Q ₂ : switching output single / no layer, normally closed
Control input	3 x

¹⁾ Outputs Q₁ and Q₂ short-circuit protected.

²⁾ PNP: Active = V_s - (< 2 V) / Inactive = 0 V;
NPN: Active ≤ 2 V / Inactive = V_s.

Mechanics/electronics

Supply voltage V_s ¹⁾	DC 20 V ... 30 V
Power consumption ²⁾	≤ 1.5 W
Initialization time	< 300 ms < 750 ms
Design	Cylindrical
Housing material	Nickel-plated brass, PBT, PA, ultrasonic transducer: polyurethane foam, glass epoxy resin
Connection type	Connection cable with open end: 7 x 0,25 mm ² , 2 m, PUR, sender: connection cable to receiver with M8 male connector, 3-pin, 1 m, PUR, receiver: connection cable to sender with M8 female connector, 3-pin, 1.2 m, PUR
Indication	2 x LED
Sending axis, Weight	Straight, 130 g Angled, 160 g
Enclosure rating	IP65
Protection class	III

¹⁾ Limit values, reverse-polarity protected, operation in short-circuit protected network: max. 8 A.

²⁾ Without load.

Ambient data

Ambient temperature operation	+5 °C ... +60 °C
Ambient storage temperature	-40 °C ... +85 °C

Ordering information

UD18-2

Output time	Response time	Sending axis	Type of digital outputs	Type	Part no.
2 ms, trigger mode: < 0.5 ms	2.5 ms	Straight	2 x PNP	UD18-22CC221	6058910
			2 x NPN	UD18-22CC241	6058911
		Angled	2 x PNP	UD18-22CC222	6058912
			2 x NPN	UD18-22CC242	6058913
5 ms, trigger mode: < 0.5 ms	5.5 ms	Straight	2 x PNP	UD18-22DC221	6058914
			2 x NPN	UD18-22DC241	6058915

Recommended accessories

Mounting systems

Mounting brackets and plates

	Brief description	Type	Part no.
	Mounting plate for M18 sensors	BEF-WG-M18	5321870

Further accessories

Programming and configuration tools

	Brief description	Type	Part no.
	Tool for visualization, configuration and cloning, 3-digit LED display, supply voltage: DV 9 V ... 30 V	Connect+ adapter (CPA)	6037782

You can find additional accessories online → www.sick.com/UD18

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Detailed addresses and further locations → www.sick.com