UM30

The universal application solver
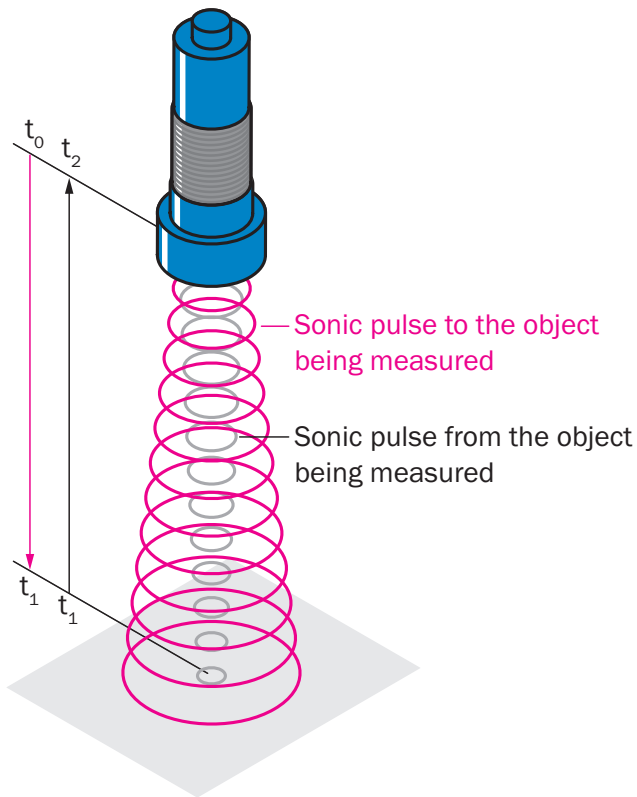
ULTRASONIC SENSORS

SICK
Sensor Intelligence.

Advantages

Virtually unlimited use – regardless of color, gloss, and transparency

SICK ultrasonic sensors perform measurement and detection tasks 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. No matter where they are: the ultrasonic sensors from SICK are at your side in any industry. The extensive product portfolio offers you a wide range of solutions for your application. See for yourself.

Find out more about the principle of operation of the ultrasonic sensors.

t_0 t_2

t_1 t_1

— Sonic pulse to the object being measured

Sonic pulse from the object being measured

Aligned plate (sample object) is detected

Limiting range

Operating range

Pipe (sample object) is detected

(Acoustic) time-of-flight measurement

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

Distance = speed of sound x total acoustic time of flight (t2) / 2
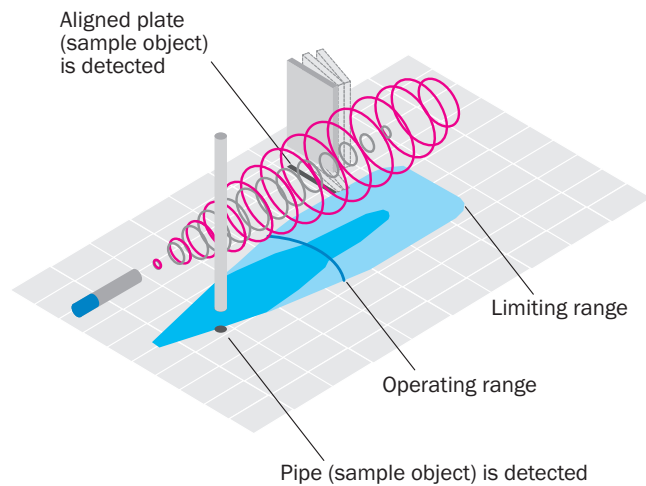
Scanning range of ultrasonic sensors

In general on ultrasonic sensors, the less sound the object being measured absorbs, the greater the possible scanning range. The operating range specifies the distance up to which measurement on common objects with sufficient operating reserves is possible. Under ideal conditions, the sensor can even be used up to its limiting range. 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 range if a round rod is detected. The light blue area shows the maximum detection range (limiting 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 measuring object 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.

Applications in focus

Ultrasonic sensors are true all-rounders. SICK ultrasonic sensors demonstrate their reliability and precision in virtually any application, from measuring distances or detecting solid, powdered, or liquid media. No matter the industry, no matter the application.
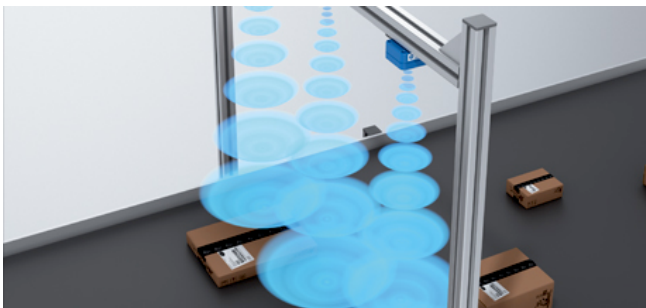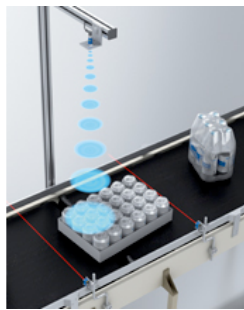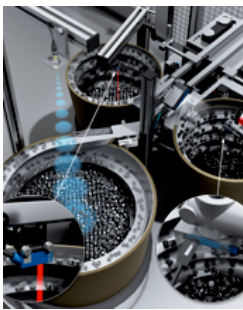

SICK ultrasonic sensors show their strengths in the contact-free detection of objects in all imaginable applications. These all-rounders reliably and precisely master all automation requirements on your processes.

Individually adjustable sonic beams – the optimal solution for your application and unique in the market

Adjusting the sensor sensitivity gives you direct control of the sonic beam's behavior and, therefore, the sensor's detection range. This means objects in the environment can be displayed or blanked – with infinite adjustment.

It doesn't matter whether the sonic beam is large or small, narrow or wide, or whether the detection range is slowly increasing or the largest size possible. Tank walls, for example, can be blanked in level applications, different container sizes can be verified when inspecting empty containers, and even larger areas can be monitored with just one sensor.
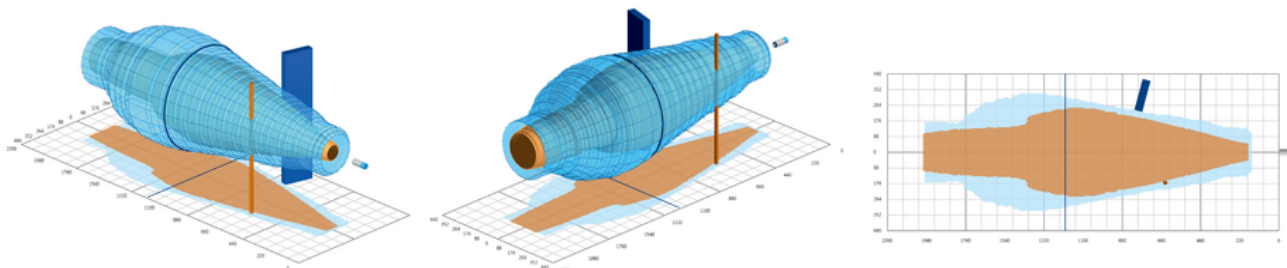
+ The infinitely and individually adjustable detection range is the optimal solution for your application. If the ambient conditions change, the sensor can be quickly and easily adjusted to the new requirements. Thanks to the Connect+ software or the SOPAS Engineering Tool from SICK, there are practically no limits to the adjustment options.

IO-Link

As a co-founder of IO-Link, SICK offers one of the broadest IO-Link portfolios on the market. Smart Sensors with IO-Link generate and receive data and information which goes beyond conventional switching signals or measured process parameters.

Your advantages at a glance

- Sensor integration at fieldbus level offers integrated communication to increase system productivity
- Easy device replacement with automatic parameterization 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 reduces the cost of projects
- Visualization on a PC provides a clear overview of the sensor functionality, making it 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 associated costs

Speak to your contact person at SICK or click here.

IO-Link solves the problem of clearing those final hurdles in the communication chain by seamlessly integrating sensors into an automation network. This brings about new ways of increasing flexibility, reliability, and efficiency and can reduce the costs associated with your system.

SICK LifeTime Services

SICK's services increase machine and plant productivity, enhance the safety of people all over the world, provide a solid foundation for a sustainable business operation, and protect investment goods. In addition to its usual consulting services, SICK provides direct on-site support during the conceptual design and commissioning phases as well as during operation.

The range of services not only covers aspects like maintenance and inspection, but also includes performance checks as well as upgrades and retrofits. Modular or customized service contracts extend the service life of plants and therefore increase their availability. If faults occur or limit values are exceeded, these are detected at all times by the corresponding sensors and systems.
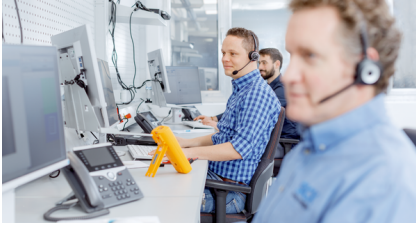
Consulting and design
Application-specific advice on the product, its integration and the application itself.

commissioning and maintenance
Application-optimized and sustainable — thanks to professional commissioning and maintenance by a trained SICK service technician.

service contracts
Extended warranty, SICK Remote Service, 24-hour helpdesk, maintenance, availability guarantees and other modular components can be individually combined on request.

Technical data overview

Measuring range		
	Operating range	30 mm ... 6,000 mm (depending on type)
	Limiting range	350 mm ... 8,000 mm (depending on type)
Resolution		≥ 0.18 mm
Repeatability		± 0.15 %
Response time		32 ms ... 240 ms 32 ms ... 240 ms [1]
Output time		8 ms ... 60 ms (depending on type)
Switching frequency		25 Hz 12 Hz 8 Hz 4 Hz 3 Hz
Analog output		4 mA ... 20 mA, ≤ 500 Ω [2] 0 V ... 10 V, ≥ 100,000 Ω
Digital output		
	Type	PNP / NPN / push-pull: PNP/NPN (depending on type)
-		
IO-Link		✔, IO-Link V1.1
Enclosure rating		IP65 / IP67
Sending axis		Straight

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

[2] For 4 mA ... 20 mA and V_S ≤ 20 V max. load ≤ 100 Ω.

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 internal 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

Fields of application

- Level regulation for liquids and bulk materials
- Detection, measurement and positioning of dark, shiny, and transparent materials
- Diameter check for metal, paper, and plastic coils
- Continuous detection of fabrics and wire grids
- Collision avoidance
- Outdoor applications

Ordering information

Other models and accessories ➜ www.sick.com/UM30

- **Operating range, limiting range:** 30 mm ... 250 mm, 350 mm
- **Connection type:** male connector, M12, 5-pin
- **Response time:** 32 ms
- **Weight:** 150 g
- **Sending axis:** straight

Digital output	Communication interface	Communication Interface detail	Type	Part no.
1 x NPN	-	–	UM30-211115	6037669
1 x PNP	-	–	UM30-211111	6037660
1 x push-pull: PNP/NPN	IO-Link	IO-Link V1.1	UM30-21111B	6068447
2 x NPN	-	–	UM30-211114	6037674
2 x PNP	-	–	UM30-211112	6037664

- **Operating range, limiting range:** 30 mm ... 250 mm, 350 mm
- **Connection type:** male connector, M12, 5-pin
- **Response time:** 32 ms (Subsequent smoothing of the analog output, depending on the application, may increase the response time by up to 200 %.)
- **Type of analog output:** Current output / voltage output
- **Communication interface:** -
- **Weight:** 150 g
- **Sending axis:** straight

Digital output	Type	Part no.
–	UM30-211113	6036916
1 x PNP	UM30-211118	6036921

- **Operating range, limiting range:** 65 mm ... 350 mm, 600 mm
- **Connection type:** male connector, M12, 5-pin
- **Response time:** 64 ms
- **Weight:** 150 g
- **Sending axis:** straight

Digital output	Communication interface	Communication Interface detail	Type	Part no.
1 x NPN	-	–	UM30-212115	6037670
1 x PNP	-	–	UM30-212111	6037661
			UM30-212111S10	6050943
1 x push-pull: PNP/NPN	IO-Link	IO-Link V1.1	UM30-21211B	6068448
2 x NPN	-	–	UM30-212114	6037675
2 x PNP	-	–	UM30-212112	6037665

- **Operating range, limiting range:** 65 mm ... 350 mm, 600 mm
- **Connection type:** male connector, M12, 5-pin
- **Response time:** 64 ms (Subsequent smoothing of the analog output, depending on the application, may increase the response time by up to 200 %.)
- **Type of analog output:** Current output / voltage output
- **Communication interface:** -
- **Weight:** 150 g
- **Sending axis:** straight

Digital output	Type	Part no.
–	UM30-212113	6036917
1 x PNP	UM30-212118	6036922

- **Operating range, limiting range:** 200 mm ... 1,300 mm, 2,000 mm
- **Connection type:** male connector, M12, 5-pin
- **Response time:** 92 ms
- **Weight:** 150 g
- **Sending axis:** straight

Digital output	Communication interface	Communication Interface detail	Type	Part no.
1 x NPN	-	–	UM30-213115	6037671
1 x PNP	-	–	UM30-213111	6037537
			UM30-213111S12	6057291
1 x push-pull: PNP/NPN	IO-Link	IO-Link V1.1	UM30-21311B	6068449
2 x NPN	-	–	UM30-213114	6037676
2 x PNP	-	–	UM30-213112	6037666

- **Operating range, limiting range:** 200 mm ... 1,300 mm, 2,000 mm
- **Connection type:** male connector, M12, 5-pin
- **Response time:** 92 ms (Subsequent smoothing of the analog output, depending on the application, may increase the response time by up to 200 %.)
- **Type of analog output:** Current output / voltage output
- **Communication interface:** -
- **Weight:** 150 g
- **Sending axis:** straight

Digital output	Type	Part no.
–	UM30-213113	6036918
1 x PNP	UM30-213118	6036923

- **Operating range, limiting range:** 350 mm ... 3,400 mm, 5,000 mm
- **Connection type:** male connector, M12, 5-pin
- **Response time:** 180 ms
- **Weight:** 210 g
- **Sending axis:** straight

Digital output	Communication interface	Communication Interface detail	Type	Part no.
1 x NPN	-	–	UM30-214115	6037672
1 x PNP	-	–	UM30-214111	6037662
1 x push-pull: PNP/NPN	IO-Link	IO-Link V1.1	UM30-21411B	6068450

Digital output	Communication interface	Communication Interface detail	Type	Part no.
2 x NPN	-	–	UM30-214114	6037677
2 x PNP	-	–	UM30-214112	6037667

- **Operating range, limiting range:** 350 mm ... 3,400 mm, 5,000 mm
- **Connection type:** male connector, M12, 5-pin
- **Response time:** 180 ms (Subsequent smoothing of the analog output, depending on the application, may increase the response time by up to 200 %.)
- **Type of analog output:** Current output / voltage output
- **Communication interface:** -
- **Weight:** 210 g
- **Sending axis:** straight

Digital output	Type	Part no.
–	UM30-214113	6036919
1 x PNP	UM30-214118	6036924

- **Operating range, limiting range:** 600 mm ... 6,000 mm, 8,000 mm
- **Connection type:** male connector, M12, 5-pin
- **Response time:** 240 ms
- **Weight:** 270 g
- **Sending axis:** straight

Digital output	Communication interface	Communication Interface detail	Type	Part no.
1 x NPN	-	–	UM30-215115	6037673
1 x PNP	-	–	UM30-215111	6037663
1 x push-pull: PNP/NPN	IO-Link	IO-Link V1.1	UM30-21511B	6068451
2 x NPN	-	–	UM30-215114	6037678
2 x PNP	-	–	UM30-215112	6037668

- **Operating range, limiting range:** 600 mm ... 6,000 mm, 8,000 mm
- **Connection type:** male connector, M12, 5-pin
- **Response time:** 240 ms (Subsequent smoothing of the analog output, depending on the application, may increase the response time by up to 200 %.)
- **Type of analog output:** Current output / voltage output
- **Communication interface:** -
- **Weight:** 270 g
- **Sending axis:** straight

Digital output	Type	Part no.
–	UM30-215113	6036920
1 x PNP	UM30-215118	6036925

SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

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

For us, that is "Sensor Intelligence."

WORLDWIDE PRESENCE:

Contacts and other locations –**www.sick.com**

SICK AG | Waldkirch | Germany | www.sick.com

SICK
Sensor Intelligence.