UC4

Small, precise, ultrasonic
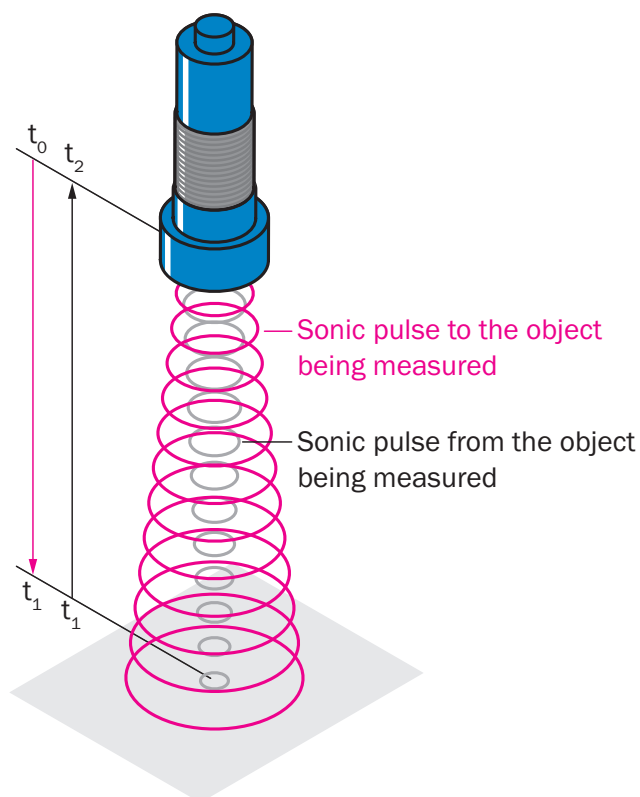
SICK
Sensor Intelligence.

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.

— 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
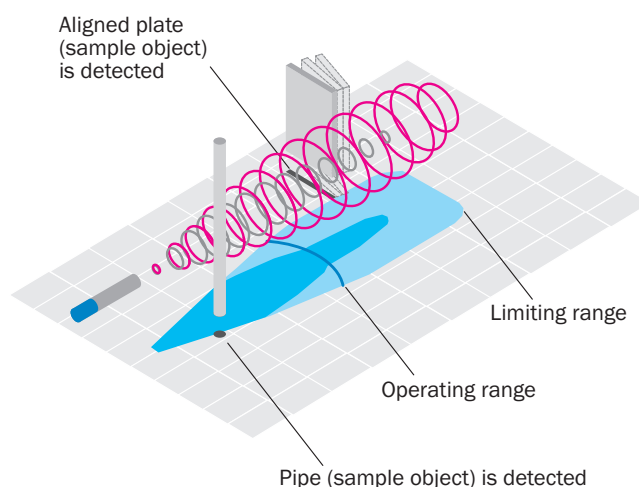
Scanning range of ultrasonic sensors

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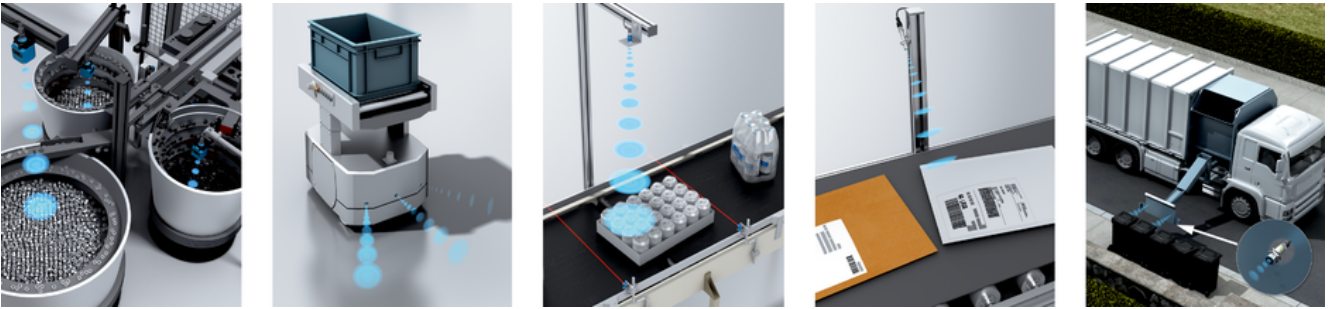
SICK ultrasonic sensors show their strengths in the contact-free detection of objects in all imaginable applications. These all-rounders reliably and precisely master all automation requirements on your processes.

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.
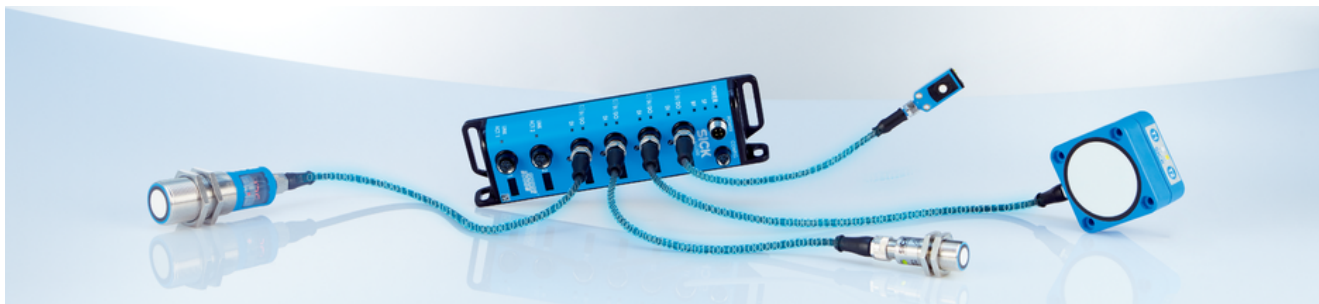
Your advantages at a glance
- Sensor integration at fieldbus level offers integrated communication to increase system productivity
- Easy device replacement with automatic parameterization increases machine availability
- Interference-proof signal transmission increases system reliability
- Automatic 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.
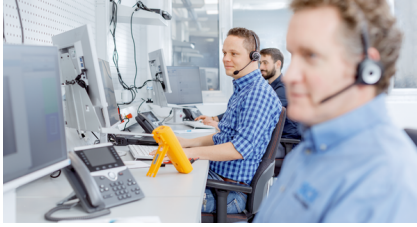
Consulting and design
Application-specific advice on the product, its integration and the application itself.

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	13 mm ... 150 mm [1] (depending on type)
	Limiting range	150 mm / 250 mm (depending on type)
Resolution		≥ 0.1 mm
Repeatability		± 0.15 %
Response time		10 ms ... 24 ms
		24 ms [2]
Output time		5 ms ... 8 ms (depending on type)
Switching frequency		30 Hz / 100 Hz (depending on type)
Analog output		4 mA ... 20 mA, ≤ 500 Ω [3] 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
Ambient temperature, operation		–25 °C ... +70 °C [4]

[1] Teach-in from 21 mm.

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

[3] For 4 mA ... 20 mA and V_s ≤ 20 V max. load ≤ 100 Ω.

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

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

Fields of application

Detection, measurement, and positioning of dark, shiny, and transparent materials
Level control for fluid and bulk materials of every shape and color
Diameter check for metal, paper, and plastic coils
Continuous detection of fabrics and wire grids
Detection of very fast objects
Outdoor applications

Ordering information

Other models and accessories ➜ www.sick.com/UC4

- **Communication interface:** -
- **Operating range, limiting range:** 13 mm ... 100 mm, 150 mm (Teach-in from 21 mm.)
- **Connection type:** male connector, M8, 3-pin
- **Sending axis:** straight

Response time	Digital output	Type	Part no.
24 ms	1 x NPN	UC4-11345	6034668
	1 x PNP	UC4-11341	6034667

- **Communication interface:** -
- **Operating range, limiting range:** 13 mm ... 150 mm, 250 mm (Teach-in from 21 mm.)
- **Connection type:** male connector, M8, 3-pin
- **Sending axis:** straight

Response time	Digital output	Type	Part no.
10 ms	1 x NPN	UC4-13345S02	6049510
	1 x PNP	UC4-13341S01	6049509
24 ms	1 x NPN	UC4-13345	6034670
	1 x PNP	UC4-13341	6034669

- **Communication interface:** -
- **Operating range, limiting range:** 20 mm ... 150 mm, 250 mm (Teach-in from 21 mm.)
- **Connection type:** male connector, M8, 3-pin
- **Sending axis:** straight

Response time	Type of analog output	Type	Part no.
24 ms [1]	Current output	UC4-13346	6054708
	Voltage output	UC4-13347	6054709

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

- **Communication interface:** IO-Link
- **Operating range, limiting range:** 13 mm ... 150 mm, 250 mm (Teach-in from 21 mm.)
- **Connection type:** male connector, M8, 3-pin
- **Sending axis:** straight

Response time	Digital output	Communication Interface detail	Type	Part no.
24 ms	1 x push-pull: PNP/NPN	IO-Link V1.1	UC4-1334B	6068454

- **Communication interface:** IO-Link
- **Operating range, limiting range:** 13 mm ... 150 mm, 250 mm (Teach-in from 21 mm.)
- **Connection type:** male connector, M8, 4-pin
- **Sending axis:** straight

Response time	Digital output	Communication Interface detail	Type	Part no.
24 ms	1 x push-pull: PNP/NPN	IO-Link V1.1	UC4-1344B	6063575

UC4

- **Communication interface:** IO-Link
- **Operating range, limiting range:** 13 mm ... 150 mm, 250 mm (Teach-in from 21 mm.)
- **Connection type:** cable with male connector (100 mm), M8, 3-pin
- **Sending axis:** straight

Response time	Digital output	Communication Interface detail	Type	Part no.
24 ms	1 x push-pull: PNP/NPN	IO-Link V1.1	UC4-1354B	6063576

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

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