UM18

Simple set up, perfect detection

ULTRASONIC SENSORS
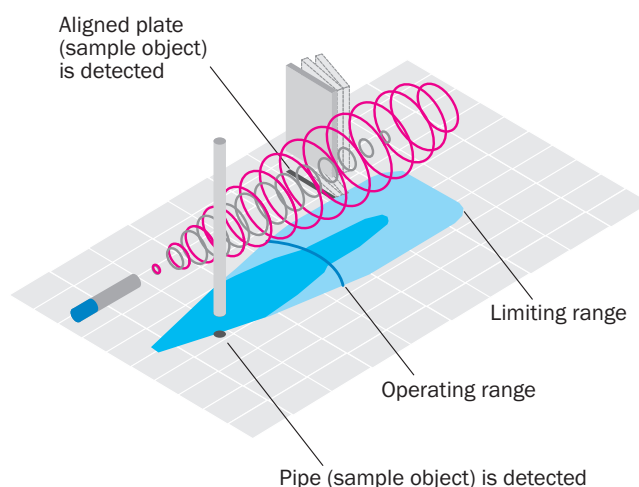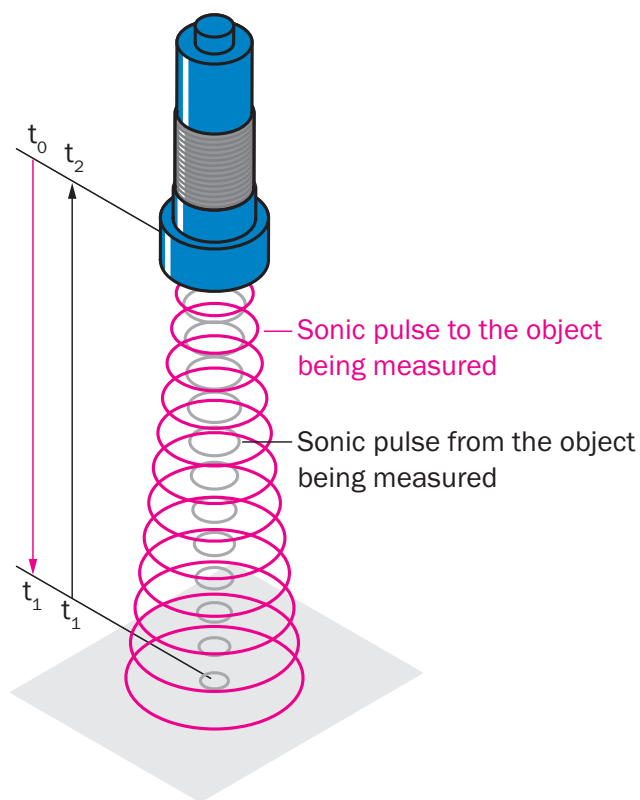
SICK
Sensor Intelligence.

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.

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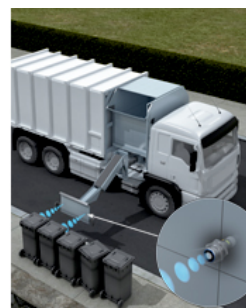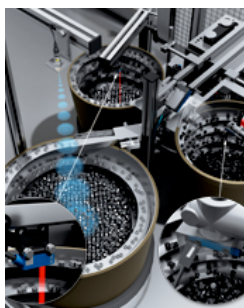
SICK ultrasonic sensors show their strengths in the contact-free detection of objects in all imaginable applications. These all-rounders reliably and precisely master all automation requirements on your processes.

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.
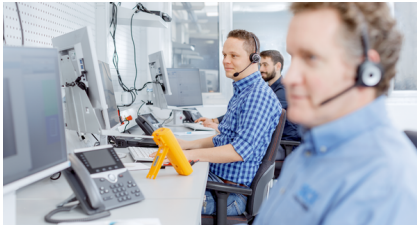
Consulting and design
Application-specific advice on the product, its integration and the application itself.

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	20 mm ... 1,000 mm (depending on type)
Limiting range	250 mm ... 1,300 mm (depending on type)
Resolution	0.069 mm ... 0.2 mm (depending on type)
Repeatability	± 0.15 %
Response time	32 ms ... 80 ms 32 ms ... 80 ms [1]
Output time	8 ms ... 20 ms (depending on type)
Switching frequency	± 15 Hz 25 Hz 12 Hz 10 Hz
Analog output	4 mA ... 20 mA, ≤ 500 Ω [2] 0 V ... 10 V, ≥ 100,000 Ω 0 V ... 10 V, ≥ 100,000 Ω [1] (depending on type)
Digital output	
Type	PNP / NPN / push-pull: PNP/NPN (depending on type)
-	
IO-Link	✓ / IO-Link V1.0 / ✓ / IO-Link V1.1 (depending on type)
Enclosure rating	IP65 / IP67
Sending axis	Straight / angled (depending on type)

[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 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

Fields of application

- Detection, measurement and positioning of dark, shiny, and transparent materials
- Level regulation for liquids and bulk 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/UM18

- **Operating range, limiting range:** 30 mm … 250 mm, 350 mm
- **Connection type:** male connector, M12, 5-pin
- **Response time:** 32 ms

Digital output	Type of analog output	Communication interface	Communication Interface detail	Weight	Sending axis	Type	Part no.
1 x PNP	–	-	–	55 g	Straight	UM18-51111	6028965
2 x PNP	–	-	–	55 g	Straight	UM18-51112	6028964
2 x NPN	–	-	–	55 g	Straight	UM18-51114	6028973
1 x NPN	–	-	–	55 g	Straight	UM18-51115	6028974
1 x push-pull: PNP/NPN	–	IO-Link	IO-Link V1.0	25 g	Straight	UM18-21112A211	6048390
				30 g	Angled	UM18-21112A212	6048391
			IO-Link V1.1	25 g	Straight	UM18-21112B211	6066168
2 x push-pull: PNP/NPN	–	IO-Link	IO-Link V1.1	25 g	Straight	UM18-21112E211	6068441
1 x push-pull: PNP/NPN	–	IO-Link	IO-Link V1.1	30 g	Angled	UM18-21112B212	6066169
2 x push-pull: PNP/NPN	–	IO-Link	IO-Link V1.1	30 g	Angled	UM18-21112E212	6068442
–	Current output	-	–	55 g	Straight	UM18-11116	6029507
	Voltage output	-	–	55 g	Straight	UM18-11117	6029508
1 x push-pull: PNP/NPN	Voltage output	IO-Link	IO-Link V1.1	30 g	Angled	UM18-21112D212	6066173

- **Operating range, limiting range:** 20 mm … 150 mm, 250 mm
- **Connection type:** male connector, M12, 4-pin
- **Response time:** 32 ms
- **Communication interface:** -

Digital output	Weight	Sending axis	Type	Part no.
1 x NPN	15 g	Straight	UM18-217165101	6048410
	20 g	Angled	UM18-217165102	6048411
1 x PNP	15 g	Straight	UM18-217161101	6048408
	20 g	Angled	UM18-217161102	6048409

- **Operating range, limiting range:** 20 mm … 150 mm, 250 mm
- **Connection type:** male connector, M12, 4-pin
- **Response time:** 32 ms (Subsequent smoothing of the analog output, depending on the application, may increase the response time by up to 200 %.)
- **Communication interface:** -

Type of analog output	Weight	Sending axis	Type	Part no.
Current output	15 g	Straight	UM18-217166101	6072871
	20 g	Angled	UM18-217166102	6072872
Voltage output	15 g	Straight	UM18-217167101	6072873
	20 g	Angled	UM18-217167102	6072874

- **Operating range, limiting range:** 30 mm ... 250 mm, 350 mm
- **Connection type:** male connector, M12, 4-pin
- **Response time:** 32 ms
- **Communication interface:** -

Digital output	Weight	Sending axis	Type	Part no.
1 x NPN	15 g	Straight	UM18-211165101	6048414
	20 g	Angled	UM18-211165102	6048415
1 x PNP	15 g	Straight	UM18-211161101	6048412
	20 g	Angled	UM18-211161102	6048413

- **Operating range, limiting range:** 30 mm ... 250 mm, 350 mm
- **Connection type:** male connector, M12, 4-pin
- **Response time:** 32 ms (Subsequent smoothing of the analog output, depending on the application, may increase the response time by up to 200 %.)
- **Communication interface:** -

Type of analog output	Weight	Sending axis	Type	Part no.
Current output	15 g	Straight	UM18-211166101	6072875
	20 g	Angled	UM18-211166102	6072876
Voltage output	15 g	Straight	UM18-211167101	6072877
	20 g	Angled	UM18-211167102	6072878

- **Operating range, limiting range:** 65 mm ... 350 mm, 600 mm
- **Connection type:** male connector, M12, 4-pin
- **Response time:** 64 ms
- **Communication interface:** -

Digital output	Weight	Sending axis	Type	Part no.
1 x NPN	15 g	Straight	UM18-212165101	6048418
	20 g	Angled	UM18-212165102	6048419
1 x PNP	15 g	Straight	UM18-212161101	6048416
	20 g	Angled	UM18-212161102	6048417

- **Operating range, limiting range:** 65 mm ... 350 mm, 600 mm
- **Connection type:** male connector, M12, 4-pin
- **Response time:** 64 ms (Subsequent smoothing of the analog output, depending on the application, may increase the response time by up to 200 %.)
- **Communication interface:** -

Type of analog output	Weight	Sending axis	Type	Part no.
Current output	15 g	Straight	UM18-212166101	6072879
	20 g	Angled	UM18-212166102	6072880
Voltage output	15 g	Straight	UM18-212167101	6072881
	20 g	Angled	UM18-212167102	6072882

- **Operating range, limiting range:** 120 mm ... 1,000 mm, 1,300 mm
- **Connection type:** male connector, M12, 4-pin
- **Response time:** 80 ms
- **Communication interface:** -

Digital output	Weight	Sending axis	Type	Part no.
1 x NPN	15 g	Straight	UM18-218165101	6048422
	20 g	Angled	UM18-218165102	6048423
1 x PNP	15 g	Straight	UM18-218161101	6048420
	20 g	Angled	UM18-218161102	6048421

- **Operating range, limiting range:** 120 mm ... 1,000 mm, 1,300 mm
- **Connection type:** male connector, M12, 4-pin
- **Response time:** 80 ms (Subsequent smoothing of the analog output, depending on the application, may increase the response time by up to 200 %.)
- **Communication interface:** -

Type of analog output	Weight	Sending axis	Type	Part no.
Current output	15 g	Straight	UM18-218166101	6072883
	20 g	Angled	UM18-218166102	6072884
Voltage output	15 g	Straight	UM18-218167101	6072885
	20 g	Angled	UM18-218167102	6072886

- **Operating range, limiting range:** 20 mm ... 150 mm, 250 mm
- **Connection type:** male connector, M12, 5-pin
- **Response time:** 32 ms
- **Communication interface:** IO-Link

Digital output	Communication Interface detail	Weight	Sending axis	Type	Part no.
1 x push-pull: PNP/NPN	IO-Link V1.0	25 g	Straight	UM18-21712A211	6048384
		30 g	Angled	UM18-21712A212	6048385
	IO-Link V1.1	25 g	Straight	UM18-21712B211	6066162
		30 g	Angled	UM18-21712B212	6066163
2 x push-pull: PNP/NPN	IO-Link V1.1	25 g	Straight	UM18-21712E211	6068439
		30 g	Angled	UM18-21712E212	6068440

- **Operating range, limiting range:** 20 mm ... 150 mm, 250 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 %.)

Digital output	Type of analog output	Communication interface	Communication Interface detail	Weight	Sending axis	Type	Part no.
–	Current output	-	–	25 g	Straight	UM18-217126111	6048386
				30 g	Angled	UM18-217126112	6048387
	Voltage output	-	–	25 g	Straight	UM18-217127111	6048388
				30 g	Angled	UM18-217127112	6048389

Digital output	Type of ana-log output	Communica-tion interface	Communi-cation Inter-face detail	Weight	Sending axis	Type	Part no.
1 x push-pull: PNP/NPN	Current output	IO-Link	IO-Link V1.1	25 g	Straight	UM18-21712C211	6066164
				30 g	Angled	UM18-21712C212	6066165
	Voltage output	IO-Link	IO-Link V1.1	25 g	Straight	UM18-21712D211	6066166
				30 g	Angled	UM18-21712D212	6066167

- **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 %.)

Digital output	Type of ana-log output	Communica-tion interface	Communi-cation Inter-face detail	Weight	Sending axis	Type	Part no.
–	Current output	-	–	25 g	Straight	UM18-211126111	6048392
				30 g	Angled	UM18-211126112	6048393
	Voltage output	-	–	25 g	Straight	UM18-211127111	6048394
				30 g	Angled	UM18-211127112	6048395
1 x push-pull: PNP/NPN	Current output	IO-Link	IO-Link V1.1	25 g	Straight	UM18-21112C211	6066170
				30 g	Angled	UM18-21112C212	6066171
	Voltage output	IO-Link	IO-Link V1.1	25 g	Straight	UM18-21112D211	6066172

- **Operating range, limiting range:** 65 mm ... 350 mm, 600 mm
- **Connection type:** male connector, M12, 5-pin
- **Response time:** 64 ms
- **Communication interface:** IO-Link

Digital output	Communication Interface detail	Weight	Sending axis	Type	Part no.
1 x push-pull: PNP/NPN	IO-Link V1.0	25 g	Straight	UM18-21212A211	6048396
		30 g	Angled	UM18-21212A212	6048397
	IO-Link V1.1	25 g	Straight	UM18-21212B211	6066174
		30 g	Angled	UM18-21212B212	6066175
2 x push-pull: PNP/NPN	IO-Link V1.1	25 g	Straight	UM18-21212E211	6068443
		30 g	Angled	UM18-21212E212	6068444

- **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 %.)

Digital output	Type of ana-log output	Communica-tion interface	Communi-cation Inter-face detail	Weight	Sending axis	Type	Part no.
–	Current output	-	–	25 g	Straight	UM18-212126111	6048398
				30 g	Angled	UM18-212126112	6048399
	Voltage output	-	–	25 g	Straight	UM18-212127111	6048400
				30 g	Angled	UM18-212127112	6048401
1 x push-pull: PNP/NPN	Current output	IO-Link	IO-Link V1.1	25 g	Straight	UM18-21212C211	6066176
				30 g	Angled	UM18-21212C212	6066177
	Voltage output	IO-Link	IO-Link V1.1	25 g	Straight	UM18-21212D211	6066178
				30 g	Angled	UM18-21212D212	6066179

- **Operating range, limiting range:** 120 mm … 1,000 mm, 1,300 mm
- **Connection type:** male connector, M12, 5-pin
- **Response time:** 80 ms

Digital output	Type of ana-log output	Communica-tion interface	Communi-cation Inter-face detail	Weight	Sending axis	Type	Part no.
–	Voltage output	-	–	30 g	Angled	UM18-218127112	6048407
1 x push-pull: PNP/NPN	–	IO-Link	IO-Link V1.0	25 g	Straight	UM18-21812A211	6048402
				30 g	Angled	UM18-21812A212	6048403
			IO-Link V1.1	25 g	Straight	UM18-21812B211	6066180
				30 g	Angled	UM18-21812B212	6066181
	Voltage output	IO-Link	IO-Link V1.1	30 g	Angled	UM18-21812D212	6066185
2 x push-pull: PNP/NPN	–	IO-Link	IO-Link V1.1	25 g	Straight	UM18-21812E211	6068445
				30 g	Angled	UM18-21812E212	6068446

- **Operating range, limiting range:** 120 mm … 1,000 mm, 1,300 mm
- **Connection type:** male connector, M12, 5-pin
- **Response time:** 80 ms (Subsequent smoothing of the analog output, depending on the application, may increase the response time by up to 200 %.)

Digital output	Type of ana-log output	Communica-tion interface	Communi-cation Inter-face detail	Weight	Sending axis	Type	Part no.
–	Current output	-	–	25 g	Straight	UM18-218126111	6048404
				30 g	Angled	UM18-218126112	6048405
	Voltage output	-	–	25 g	Straight	UM18-218127111	6048406
1 x push-pull: PNP/NPN	Current output	IO-Link	IO-Link V1.1	25 g	Straight	UM18-21812C211	6066182
				30 g	Angled	UM18-21812C212	6066183
	Voltage output	IO-Link	IO-Link V1.1	25 g	Straight	UM18-21812D211	6066184

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:

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