UM18-2 Pro

Ultrasonic sensors

SICK
Sensor Intelligence.

Table of contents

1 General information

1.1 Information regarding the operating instructions

These operating instructions supplement the Quick start guide and contain additional information and detailed descriptions for using SICK AG's UM18-2 Pro ultrasonic sensors. These operating instructions are intended for specialists and electricians.

1.2 Explanation of symbols

Warnings

Warnings in these operating instructions are indicated by symbols. The warnings are introduced by signal words that indicate the extent of the danger.

These warnings must be observed at all times and care must be taken to avoid accidents, personal injury, and material damage.

DANGER!

... indicates a situation of imminent danger, which will lead to a fatality or serious injuries if not prevented.

WARNING!

... indicates a potentially dangerous situation, which may lead to a fatality or serious injuries if not prevented.

CAUTION!

... indicates a potentially dangerous situation, which may lead to minor/slight injuries if not prevented.

IMPORTANT!

... indicates a potentially harmful situation, which may lead to material damage if not prevented.

Tips and recommendations

NOTE!

... highlights useful tips and recommendations as well as information for efficient and trouble-free operation.

1.3   Limitation of liability

Applicable standards and regulations, the latest state of technological development and many years of knowledge and experience have all been taken into account when assembling the data and information contained in these operating instructions.

The manufacturer accepts no liability for damage caused by:

- Failing to observe the operating instructions
- Incorrect use
- Use by untrained personnel
- Unauthorized conversions
- Technical modifications
- Use of unauthorized spare parts/wearing parts.

With special variants, where optional extras have been ordered, or owing to the latest technical changes, the actual delivery may vary from the features and illustrations shown here.

1.4   Scope of delivery

The scope of delivery includes the following:

- UM18-2 Pro ultrasonic sensor
- Optional: Accessories ($\rightarrow$ Page 48, Chapter 12).

Supplied documentation:

- Quick start guide

1.5   Customer service

Do not hesitate to contact our customer service should you require any technical information.

Please refer to the back page of these operating instructions for your agent's contact details.

NOTE!

Before calling, make a note of all type label data such as type code, serial number etc. to ensure faster processing.

1.6   EU declaration of conformity

$\rightarrow$ You can download the EU declaration of conformity online from "www.sick.com/um18".

2 Safety

2.1 Correct use

The UM18-2 Pro is an ultrasonic sensor for non-contact detection of objects, animals, and persons.

SICK AG assumes no liability for losses or damage arising from the use of the product, either directly or indirectly. This applies in particular to use of the product that does not conform to its intended purpose and is neither described nor mentioned in this documentation.

2.2 Improper use

The UM18-2 Pro ultrasonic sensor does not constitute a safety component according to the EC Machinery Directive (2006/42/EC).

The UM18-2 Pro ultrasonic sensor must not be used in areas having a danger of explosions.

Any other use that is not described as correct use is prohibited.

Never install or connect accessories if their quantity and composition are not clearly specified, or if they have not been approved by SICK AG.

2.3 Requirements for skilled persons and operating personnel

⚠

WARNING

Risk of injury due to insufficient training!

Improper handling may result in considerable personal injury and material damage.

For this reason:

- All activities should always be performed only by designated persons.

These operating instructions list the training requirements for the various fields of activity, as follows:

- **Skilled personnel**
  Due to their specialist training, skills, and experience, as well as their knowledge of the relevant regulations, such persons are able to perform tasks delegated to them and detect any potential dangers on their own initiative.

- **Electricians**
  Due to their specialist training, skills, and experience, as well as their knowledge of the relevant standards and provisions, such persons are able to perform work on electrical systems and detect any potential dangers on their own initiative.
  In Germany, electricians must meet the specifications of the BGV A3 Work Safety Regulations (e.g. Master Electrician). Other relevant regulations applicable in other countries must be observed.

3 Identification

3.1 Type label

The ultrasonic sensor includes the following type label:
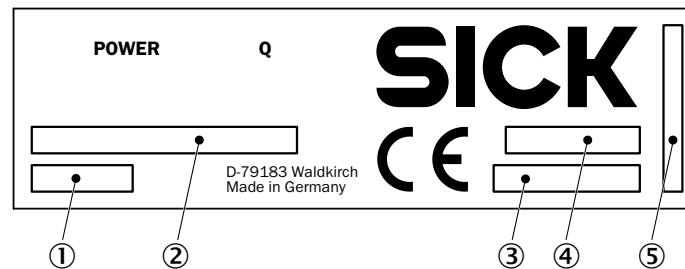
Fig. 1:   UM18-2 Pro type label

① *Order number*

② *Type designation*

③ *Information about output*

④ *Supply voltage*

⑤ *Serial number*

3.2 Type code

U	M	1	8	–	2	1	7	1	2	A	2	1	1
1	2	3	4		5	6	7	8	9	10	11	12	13

Position	Description
1 to 4	**Product family**
	UM18
5	**Generation**
	2 2. Generation
6	**Principle of operation**
	1 Scanning principle
7	**Detection range**
	7 20 mm ... 150 mm, 250 mm
	1 30 mm ... 250 mm, 350 mm
	2 65 mm ... 350 mm, 600 mm
	8 120 mm ... 1000 mm, 1300 mm
8 ... 9	**Connection and housing version**
	12 M12 plug, 5-pin, nickel-plated brass without display
10	**Output function**
	A 1x Push-pull switching output
	B 2x Push-pull switching output
	6 1x Analog output 4 mA ... 20 mA
	7 1x Analog output DC 0 V ... 10 V
11	**IO-Link**
	2 available
	1 not available
12	**Performance**
	1 Pro version
13	**Alignment**
	1 Straight
	2 Angled

Table 1:   *Type code, UM18-2 Pro ultrasonic sensors*

4 Structure and function

4.1 Structure and status indicators
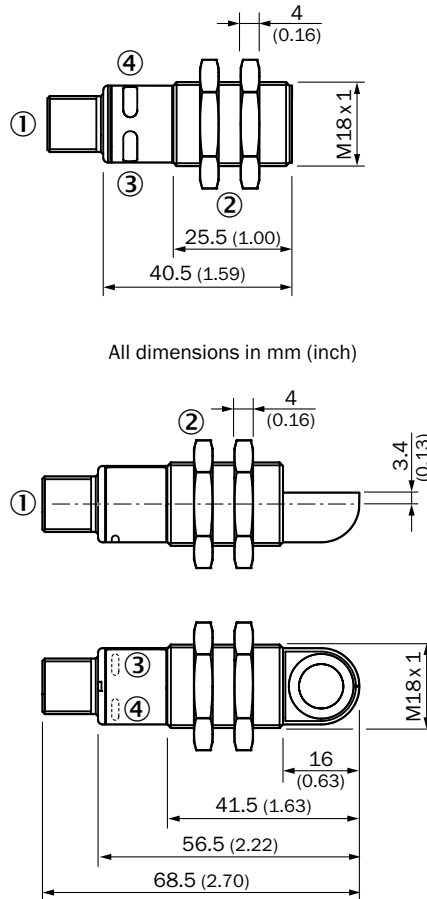
All dimensions in mm (inch)

Fig. 2: *Structure: top "UM18-2xxxxxxx1 ultrasonic sensor"*
bottom "UM18-2xxxxxxx2 ultrasonic sensor"

① *Connection*

② *Mounting nuts, width across 24 mm*

③ *Supply voltage active LED status indicator (green)*

④ *Switching/analog output LED status indicator (orange)*

Status indicators (LEDs)

Status display	Description
Green	Supply voltage
	• Green LED: Supply voltage on
	• LED off: Supply voltage off
Orange	Switching/analog output
	• LED orange: Switching output active/measured value within analog output scaling
	• LED off: Switching output inactive/measured value outside analog output scaling

Table 2: *Status indicators (LEDs)*

4.2 Function

The UM18-2 Pro is an ultrasonic sensor for performing non-contact distance measurement or detection of objects, animals, and persons.

The circuit variations have the following operation modes: Distance to Object (DtO), Window (Wnd), and Object between Sensor and Background (ObSB). The measured distance value is transferred cyclically over an IO-Link interface.

Depending on the model, the analog versions output a voltage or current value corresponding to the measured distance value and the scaling on the customer side.

5 Mounting

5.1 Mounting the ultrasonic sensor

NOTE!

Distance measurement is not possible within the blind zone of the ultrasonic sensor. → See Page 42, Chapter 11.2.

NOTE!

→ For mounting accessories, see Internet "www.sick.com/um18", Accessories.

1. Select the mounting location for the ultrasonic sensor according to the requirement. Keep in mind the specifications in the technical data, such as the detection range. → For dimensions, see Page 41, Chapter 11.1. → For detection range, see Page 46, Chapter 11.9.

2. Insert the ultrasonic sensor through the hole in the mounting bracket.

3. Tighten mounting nuts using a maximum torque of 15 Nm.

5.2 Smooth object surfaces

For smooth object surfaces, we recommend an angle of 90° ± 3° between the sensor axis and the object surface. A larger angle is possible for rough surfaces.
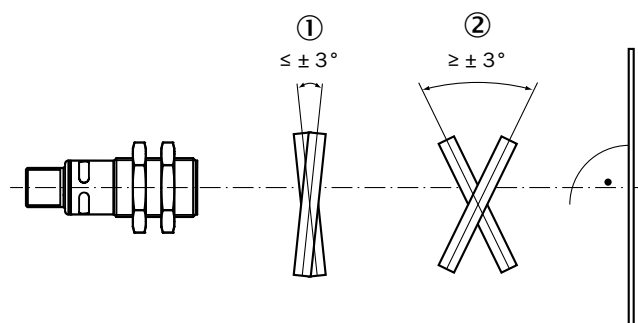
Fig. 3: *Alignment of the sensor for smooth and rough object surfaces*

① *Alignment for smooth object surfaces*
② *Alignment for rough object surfaces*

5.3 Mounting multiple ultrasonic sensors

5.3.1 Minimum mounting distances

If you would like to operate multiple ultrasonic sensors and the mounting distance is lower than the value specified in Table 3 (page 16), we recommend using synchronization or multiplex mode. Synchronization or multiplex mode avoids mutual interference between the sensors.
→ For synchronization mode, see Page 16, Chapter 5.3.2.
→ For multiplex mode, see Page 17, Chapter 5.3.3.

Minimum mounting distances without synchronization mode or multiplex mode

Ultrasonic sensor	Minimum distance for parallel mounting	Minimum distance when devices are mounted opposite one another
UM18-217x	> 250 mm	> 1300 mm
UM18-211x	> 350 mm	> 2500 mm
UM18-212x	> 400 mm	> 2500 mm
UM18-218x	> 700 mm	> 4000 mm

Table 3: Minimum mounting distances without synchronization mode or multiplex mode

5.3.2 Synchronization mode

NOTE!!

The synchronization mode is not available in IO-Link mode.

Description of synchronization mode Synchronization mode begins automatically as soon as the sensors are interconnected via PIN 5 (MF).

The sensors measure simultaneously in synchronization mode.
This operating mode prevents unwanted mutual interference since measurements from different times are not incorrectly compared with one another. The sensors can therefore be mounted without taking into account mounting distances.

The acoustic pulses of a sensor deflected by an object can still be analyzed by neighboring sensors. This makes it possible to implement more reliable and simultaneous monitoring of large areas with synchronization mode, but without position detection of the recorded objects.

The detection zone is enlarged to a size which covers all synchronized sensors. A maximum of 20 sensors of type UM18-2 Pro can be connected, and they can also be combined with synchronizable SICK ultrasonic sensors from other product families.

The response time of the overall system is determined by the sensor with the highest response time.

Synchronization mode structure and operating principle

PIN 5

t
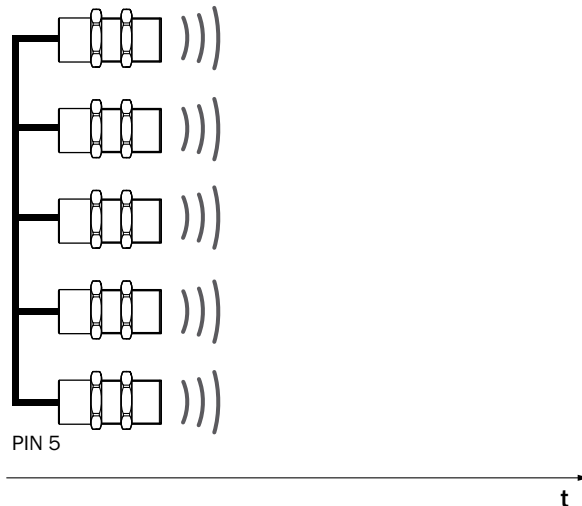
Fig. 4:   Synchronization mode

5.3.3   Multiplex mode

> **NOTE!!**
>
> *The multipex mode is not available in IO-Link mode.*

Description of multiplex mode

To change to multiplex mode, sensors must be interconnected via PIN 5 (MF) and different addresses must be assigned to them using the Connect+ software.

In multiplex mode, all sensors measure in alternation in a defined sequence. This operating mode prevents unwanted mutual interference since measurements from different times cannot be incorrectly compared with one another. The sensors can therefore be mounted without taking into account mounting distances.

Thanks to alternating measurement, the monitoring of large areas is possible with additional position detection of recorded objects.

The detection zone is enlarged to a size which covers all connected sensors. A maximum of 20 sensors of type UM18-2 Pro can be connected, and they can also be combined with synchronizable SICK ultrasonic sensors from other product families.

Since measurement by the sensors is done in alternation, the response time of the total system is increased in accordance with the "overall response time" formula.

> **NOTE!**
>
> *For multiplex mode, you must assign a unique address to the sensors. The "Connect + Adapter" and the associated software is required for this (order no. 6037782)*

Overall response time

$$\text{Response time}_{overall} = 4 \cdot [(1.1 \text{ ms} \cdot n) + 0.75 \text{ ms} \cdot (1 + 2 + \dots + n)] + \text{sum of the response times of all connected sensors}$$

n: Number of connected sensors

Multiplex mode structure and operating principle

Fig. 5:   Multiplex mode

© SICK AG • Subject to change without notice • 8014865/ZUJ3/2018-11-29
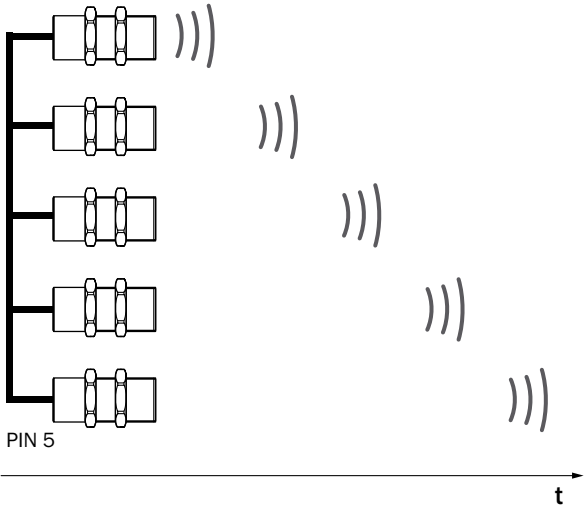
6 Electrical connection

6.1 Safety

Incorrect supply voltage

IMPORTANT!

Equipment damage due to incorrect supply voltage!

An incorrect supply voltage may result in damage to the equipment.

For this reason:

- Operate the ultrasonic sensor using only a protected low voltage and safe electrical insulation as per Protection Class III.

Working with live parts

IMPORTANT!

Equipment damage or unpredictable operation due to working with live parts!

Working with live parts may result in unpredictable operation.

For this reason:

- Carry out wiring work only when the power is off.
- Connect and disconnect cable connections only when the power is off.

6.2 Wiring notes

IMPORTANT!

Faults due to incorrect wiring!

Incorrect wiring may result in operational faults.

For this reason:

- Follow the wiring notes precisely.

NOTE!

We recommend using preassembled cables for the wiring. → For preassembled cables, see Internet "www.sick.com/um18", Accessories.

All electrical connections of the ultrasonic sensor are configured as M12 round connectors.

The IP 67 protection class is only achieved using screwed plug connectors or cover caps.

By using suitable cable entries and wiring, you can avoid interference from devices such as switching power supplies, motors, clocked drives, and contactors.

• Lay cables as far away as possible from cables having a high level of radiated emission. If needed, employ additional measures such as shielding plates.

• Do not lay cables parallel to other cables, particularly devices with a high level of radiated emission, such as frequency converters.

• Do not lay cables parallel to energy cables.

6.3 Connecting the ultrasonic sensor electrically

1. Ensure that there is no voltage.

2. Connect the ultrasonic sensor according to the connection diagram.

6.4 Connection diagrams

> *NOTE!*
>
> *The lead colors specified in Sections 6.4.1 and 6.4.2 apply to SICK AG's preassembled cables. The lead colors may vary for preassembled cables from other manufacturers.*
> *→ For preassembled cables, see Internet "www.sick.com/en/um18", Accessories.*

6.4.1 Ultrasonic sensors with switching outputs

UM18-21xxxAxxx
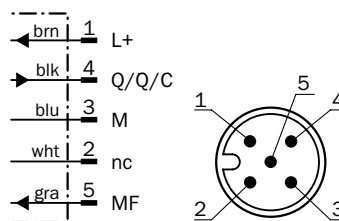
Fig. 6: UM18-21xxxAxxx connection diagram, M12 plug, 5-pin, A-coded

Contact	Marking	Wire color	Description
1	L+	Brown	Supply voltage: → See Page 43, Chapter 11.3.
2	Nc	White	Not assigned
3	M	Blue	Supply voltage: 0 V
4	Q/Q̄/C	Black	Switching output / IO-Link communication
5	MF	Gray	Multifunction input/output for • External teach-in • Synchronization mode/multiplex mode • Connect+ communication

Table 4: Description of UM18-21xxxAxxx plug

6.4.2 Ultrasonic sensors with analog outputs

**UM18-21xxx6xxx,
UM18-21xxx7xxx**
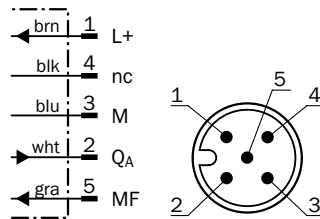
*Fig. 7:   UM18-21xxx6xxx (4 … 20 mA) and UM18-21xxx7xxx (0 … 10 V)
connection diagram, M12 plug, 5-pin, A-coded*

Contact	Marking	Wire color	Description
1	L+	Brown	Supply voltage: → See Page 43, Chapter 11.3.
2	Q_A	White	Analog output
3	M	Blue	Supply voltage: 0 V
4	Nc	Black	Not assigned
5	MF	Gray	Multifunction input/output for • External teach • Synchronization mode/multiplex mode • Connect+ communication

Table 5:   Description of UM18-21xxx6xxx and UM18-21xxx7xxx plugs

7 Commissioning

7.1 Ultrasonic sensors with switching outputs

→ For a graphical overview of the various setup options,
see Page 49, Chapter 13.1 and Page 50, Chapter 13.3.

7.1.1 Teach-in the switching point – method A

Distance to object (DtO)

In method A, the switching output is set when the object is located within the taught-in switching range. The orange LED lights up when the switching output is active.

Fig. 8:   Teach-in the switching point – method A

①   *Switching point*

1. Position object at ①.

2. Apply "L+" to "MF" for approximately 3 seconds until both LEDs flash simultaneously.

3. When both LEDs flash alternately, apply "L+" for approximately 1 second to "MF".

▶ The ultrasonic sensor's switching point has been taught-in.
The ultrasonic sensor is in normal operational mode.

Configure the switching output as normally closed or normally open.
→ See Page 25, Chapter 7.1.5.

7.1.2 Teach-in the switching point – method B

Distance to object (DtO)

In method B, the switching output is set when the object is located within the taught-in switching range plus 8 %. The orange LED lights up when the switching output is active.
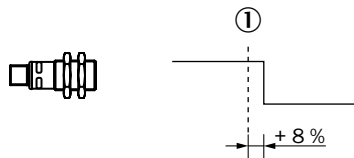
Fig. 9:   Teach-in the switching point – Method B

①   *Switching point*

1. Position object at ①.

2. Apply "L+" to "MF" for approximately 3 seconds until both LEDs flash simultaneously.

3. When both LEDs flash alternately, apply "L+" to "MF" for approximately 3 seconds until both LEDs again flash alternately.

▶ The ultrasonic sensor's switching point has been taught-in.
   The ultrasonic sensor is in normal operational mode.

Configure the switching output as normally closed or normally open.
→ See Page 25, Chapter 7.1.5.

7.1.3   Teach-in the window

Window

The switching output is set when the object is located within the window. The orange LED lights up when the switching output is active.
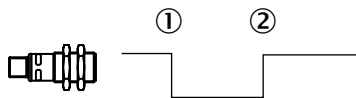
Fig. 10: Teach-in the window

① *Switching point* ①
② *Switching point* ②

1. Position object at ①.

2. Apply "L+" to "MF" for approximately 3 seconds until both LEDs flash simultaneously.

3. When both LEDs flash alternately, position object at ②.

4. Apply "L+" to "MF" for approximately 1 second.

▶ The ultrasonic sensor's switching point has been taught-in.
   The ultrasonic sensor is in normal operational mode.

Configure the switching output as normally closed or normally open.
→ See Page 25, Chapter 7.1.5.

7.1.4   Teach-in the background

Object between Sensor and Background (ObSB)

The output is set when the object is located between the sensor and a fixed background. The orange LED lights up when the switching output is active. Even at changing ambient conditions the object is detected in the range of 0 % … 85 % of the taught-in distance.
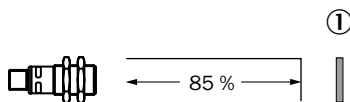
Fig. 11: Teach-in the background

① *Background*

1. Position object at ①.

2. Apply "L+" to "MF" for approximately 3 seconds until both LEDs flash simultaneously.

3. When both LEDs flash alternately, apply "L+" to "MF" for approximately 10 seconds until both LEDs stop flashing.

▶ The ultrasonic sensor's switching point has been taught-in.
   The ultrasonic sensor is in normal operational mode.

Configure the switching output as normally closed or normally open.
→ See Page 25, Chapter 7.1.5.

7.1.5 Configuring as normally open or normally closed

Factory setting: normally open

1. Apply "L+" to "MF" for approximately 13 seconds until both LEDs flash alternately.

2. The green LED flashes. The orange LED indicates the current setting:

   • On: normally open

   • Off: normally closed

3. To change the setting, apply "L+" to "MF" for approximately 1 second. The orange LED changes its status.

4. After configuring, wait approximately 10 seconds until the green LED stops flashing.

▶ The setting has been applied. The ultrasonic sensor is in normal operational mode.

7.2 Ultrasonic sensors with an analog output

→ For a graphical overview of the various setup options,
   see Page 49, Chapter 13.2 and Page 50, Chapter 13.3.

7.2.1 Configuring the scaling of the analog output

The orange LED lights up when the object is located within the configured scaling.

The minimum distance between the two scaling limits is 1 mm. A failed teach-in is indicated by the simultaneous rapid flashing of both LEDs. The original settings are retained.
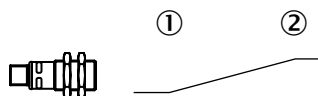
Fig. 12: Teach-in the analog output

① *Scaling limit near the sensor*

② *Scaling limit away from the sensor*

1. Position object at ①.

2. Apply "L+" to "MF" for approximately 3 seconds until both LEDs flash simultaneously.

3. When both LEDs flash alternately, position object at ②.

4. Apply "L+" to "MF" for approximately 1 second.

▶ The analog output has been taught-in. The ultrasonic sensor is in normal operational mode.

NOTE!

You can teach-in the limit near the sensor or the limit away from the sensor first. You can teach-in the output characteristics afterwards. → See the following section.

7.2.2 Configuring the rising or falling output characteristic curve

Factory setting: "Rising output characteristic curve"

1. Apply "L+" to "MF" for approximately 13 seconds until both LEDs flash alternately.

2. The green LED flashes. The orange LED indicates the current setting:

   • On: Rising output characteristic curve

   • Off: Falling output characteristic curve

3. To change the setting, apply "L+" to "MF" for approximately 1 second. The orange LED changes its status.

4. After configuring, wait approximately 10 seconds until the green LED stops flashing.

▶ The setting has been applied. The ultrasonic sensor is in normal operational mode.

7.3 Additional settings for all sensor models

7.3.1 Switching between teach-in and synchronization/multiplex mode

---

NOTE!

The teach-in functionality is deactivated when synchronization/multiplex mode is activated.

For synchronization/multiplex mode, the ultrasonic sensors must be interconnected via the "MF" input (pin 5). You can operate a maximum of 20 UM18-2 Pro sensors in synchronization/multiplex mode.

Factory setting: Teach-in

1. Switch off the supply voltage.

2. Apply "M" to "MF".

3. Switch on the supply voltage and wait approximately 3 seconds until both LEDs flash simultaneously.

4. The green LED flashes. The orange LED indicates the current setting:
   - On: Teach-in
   - Off: Synchronization/multiplex mode

5. To change the setting, apply "M" to "MF" for approximately 1 second. The orange LED changes its status.

6. After configuring, wait approximately 10 seconds until the green LED stops flashing.

▶ The setting has been applied. The ultrasonic sensor is in normal operational mode.

→ For additional information about synchronization/multiplex mode and the minimum mounting distances without synchronization/multiplex mode, see Page 16, Chapter 5.3.

7.3.2 Resetting the settings to the factory setting

1. Switch off the supply voltage.

2. Apply "M" to "MF".

3. Switch on the supply voltage and wait approximately 13 seconds until both LEDs stop flashing.

4. Before switching off the supply voltage, disconnect "M" from "MF" in order to apply the factory setting.

▶ All settings have been reset to the factory setting. The ultrasonic sensor is in normal operational mode.

7.4 Temperature compensation

The UM18-2 Pro sensors feature internal temperature compensation. Due to the sensor heating up, the temperature compensation function will reach its optimal working point after approximately one minute.

Temperature compensation is calibrated for standard mounting conditions, using an aluminum mounting bracket and mounting screws, at the factory. It is automatically and optimally calibrated to the individual installation situation when the sensor is cold and the switching output has been deactivated for approx. 30 min., or the analog output has been outputting a constant value of between 11 and 13 mA or 4.4. and 5.6 V for approx. 30 min. If the measured value changes over the course of these 30 min., the calibration process running in the background is aborted. The standard parameters or the parameters last calibrated are retained. This function is very helpful when the installation situation differs greatly from the standard mounting conditions (e.g. in the case of thermally insulated mounting) and a very high level of accuracy is required.

Temperature compensation can be switched off via "Connect+ Adapter," not temperature-compensated: 0.17 %/K

7.5   Measured value filter

Filter settings

The following filter settings can be selected for the UM18-2 Pro ultrasonic sensors using "Connect+ Adapter":

Filter F00 provides an unfiltered output for the measured values.
This mode is not permitted, as undesired EMC faults could result.

Decreasing distance values are checked by filters F01 and F02 only for plausibility and then output without any further conditions. After checking for plausibility, increasing distance values are tracked only if they do not exceed a specified tolerance range for the rate of increase. If the deviations are too great, they are classified as interference variables by the software and bridged for an adjustable holding time according to filter strength P.

Filter F01 provides interference protection against individual pulses such as EMC spikes in connection with protection against measured value jumps that are away from the sensor. The filter is suitable for bridging signal jumps.

Filter F02 provides interference protection against individual pulses such as EMC spikes in connection with protection against very brief measured value jumps away from the sensor. The filter reacts very quickly to measured values near the sensor and provides a smoothed output of measured values based on approximately arithmetic averaging. This filter is therefore especially suitable for smoothing fluctuating measured values. Smoothing according to the filter strength P.

Filter F03 and F04 do not include a plausibility check. Thereby they waive an interference protection against single interfering impulses and thus resulting measurement value jumps with direction to smaller (F03) or larger (F04) distance values. In return they react very quickly to measurement value changes in the preferred distance level (F03: near sensor; F04: away from sensor) and provide a smoothed output of measurement values in this distance level, according to filter strength P.

In the opposite direction an adjustable holding time as well as an averaging take effect, both operating according to filter strength P.

With filter F03 background reflections of unexpected objects are faded out. With filter F04 foreground reflections of unexpected objects (e.g. stirring tools) are faded out.

Filter overview

Filter feature		Plausibility check	Dwell time	Preferred distance level	Averaging
Functionality		Interference protection against individual pulses (EMC)	Bridging measured value jumps	Near sensor/away from sensor	"Smoothing" the output of measured values
Filter	F00 (No filter)	No	No	No preference	No
	F01 (Approximation filter)	Yes	Yes	Near sensor	No
	F02 (Average value filter)	Yes	Low	Near sensor	Yes
	F03 (Foreground filter)	No	Yes	Near sensor	Yes
	F04 (Background filter)	No	Yes	Away from sensor	Yes

Table 6:   Filter overview

Filter parameters

Filter type (F)	Filter strength (P)	Plausibility check	Holding time over x cycles	Preferred distance level	Averaging over x cycles
F00	–	No	No	No	No
F01	0 (factory setting)	Yes	4	Near sensor	No
	1	Yes	8	Near sensor	No
	2	Yes	12	Near sensor	No
	3	Yes	16	Near sensor	No
	4	Yes	20	Near sensor	No
	5	Yes	50	Near sensor	No
	6	Yes	100	Near sensor	No
	7	Yes	200	Near sensor	No
	8	Yes	500	Near sensor	No
	9	Yes	1000	Near sensor	No
F02	0	Yes	4	Near sensor	2
	1 (factory setting)	Yes	4	Near sensor	4
	2	Yes	8	Near sensor	6
	3	Yes	8	Near sensor	8
	4	Yes	8	Near sensor	10
	5	Yes	8	Near sensor	20
	6	Yes	8	Near sensor	32
	7	Yes	8	Near sensor	64
	8	Yes	8	Near sensor	128
	9	Yes	8	Near sensor	255
F03	0	Yes	4	Near sensor	1
	1	Yes	8	Near sensor	2
	2	Yes	12	Near sensor	3
	3	Yes	16	Near sensor	4
	4	Yes	20	Near sensor	8
	5	Yes	50	Near sensor	16
	6	Yes	100	Near sensor	32
	7	Yes	200	Near sensor	64
	8	Yes	500	Near sensor	128
	9	Yes	1000	Near sensor	255
F04	0	Ja	4	Away from sensor	1
	1	Ja	8	Away from sensor	2
	2	Ja	12	Away from sensor	3
	3	Ja	16	Away from sensor	4
	4	Ja	20	Away from sensor	8
	5	Ja	50	Away from sensor	16
	6	Ja	100	Away from sensor	32
	7	Ja	200	Away from sensor	64
	8	Ja	500	Away from sensor	128
	9	Ja	1000	Away from sensor	255

Table 7:   Filter parameters

Cycle time

The cycle time corresponds to the measuring interval of the respective sensor type.

UM18-217xxxxxx: 8 ms

UM18-211xxxxxx: 8 ms

UM18-212xxxxxx: 16 ms

UM18-218xxxxxx: 20 ms

Factory setting

- Sensors with switching output: filter type F01 and filter strength 0
- Sensors with analog output: filter type F02 and filter strength 1

Foreground suppression

Use foreground suppression to suppress stray reflections caused by objects in the vicinity of the sensor.

NOTE!

Interfering objects must not create multiple reflections.

The ultrasonic sensor must not be covered by interfering objects that affect the detection range.

8 IO-Link interface

The ultrasonic sensors with switching outputs are IO-Link-capable in accordance with the V1.1 specification.

You can download the specific sensor IO-Link device description online from "www.sick.com/um18".

NOTE!

If an ultrasonic sensor in SIO mode has been taught-in via teach-in or via a "Connect+ Adapter," we recommend resetting the sensor to its factory setting before configuration using IO-Link.

8.1 Physical layer

Description	Value
SIO mode (standard I/O mode)	Yes
Output rate	• UM18-217xxxxxx: 8 ms • UM18-211xxxxxx: 8 ms • UM18-212xxxxxx: 16 ms • UM18-218xxxxxx: 20 ms
Speed	COM2 (38.4 kBaud)
Process data width	16 bits (frame type 2.2)

Table 8: Physical layer

8.2 Process data

The process data for the UM18-2 Pro ultrasonic sensors has a data width of 16 bits.

Description	Value
Access	Read
Data	2 bytes
Data type	UINT (unsigned integer)

Table 9: Process data

MSB															LSB
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Distance value (15-bit) with a resolution of 0.1 mm															Q

Table 10: Data format – process data, distance value, and switching output Q

8.3 Service data

8.3.1 IO-Link-specific

Index decimal (hex)	Description	Format	Access	Value range	Example	Remarks
16 (0x10)	Manufacturer name		R		SICK AG	→ See IO-Link specification.
17 (0x11)	Manufacturer text		R		www.sick.com	–
18 (0x12)	Product name		R		UM18-2	–
19 (0x13)	Product ID		R		UM18-21212A21	Sensor description
20 (0x14)	Product text		R		Ultrasonic sensor	–
22 (0x16)	Hardware version		R		5.0	–
23 (0x17)	Firmware version		R		1.0.42	–

Table 11: IO-Link-specific service data

8.3.2 SICK-specific UM18-21712A21_

Index decimal (hex)	Description	Format	Access	Value range	Example	Remarks
64 (0x40)	Switching point 1	UINT16	R/W	306 ... 3609 (21 ... 248 mm)	320 corresponds to 22 mm	Specify values as a multiple of the internal measurement value resolution (0.069 m).
65 (0x41)	Switchback point 1	UINT16	R/W	320 ... 3624 (22 ... 249 mm)		
71 (0x47)	Switching point 2	UINT16	R/W	335 ... 65512 [1] (23 ... 250 mm)		
72 (0x48)	Switchback point 2	UINT16	R/W	335 ... 65512 [1] (23 ... 250 mm)		
73 (0x49)	Foreground suppression	UINT8	R/W	0 ... 1878 (0 ... 129 mm)		
66 (0x42)	Switching output function	UINT8	R/W	• 00: normally closed • 02: normally open		–
67 (0x43)	Filter	UINT8	R/W	• 00: F00 [2] • 01: F01 • 02: F02		→ See also Page 29, Chapter 7.5.
68 (0x44)	Filter strength	UINT8	R/W	• 00: P00 • 01: P01 • 02: P02 • 03: P03 • 04: P04 • 05: P05 • 06: P06 • 07: P07 • 08: P08 • 09: P09		For the selected measured value filter, you can select a filter strength between 0 (weak filtering effect) and 9 (strong filtering effect).
74 (0x4A)	Teach via pin 5 in SIO mode	UINT8	R/W	• 00: deactivated • 16: activated		–

Teach

Index decimal (hex)	Description	Format	Access	Value range	Example	Remarks
02 (0x02)	TEACH	UINT	W	• 161: Method A • 162: Method B • 164: Two-way reflection barrier • 168: Reset to factory setting		A teach overwrites a function that has already been set with a newly selected function. If a teach is successful, the old value is retained. → See Page 23, Chapter 7.1 and Page 49, Chapter 13.1.

1) Window operation deactivated for values > 3638.

2) Operation with filter setting "F00" is not permitted, as EMC faults may occur in this case.

*Table 12: SICK-specific service data UM18-21712A21_*

8.3.3 SICK-specific UM18-21712A21_

Index decimal (hex)	Description	Format	Access	Value range	Example	Remarks
64 (0x40)	Switching point 1	UINT16	R/W	436 ... 5065 (30 ... 348 mm)	800 corresponds to 55 mm	
65 (0x41)	Switchback point 1	UINT16	R/W	451 ... 5080 (31 ... 349 mm)		Specify values as a multiple of the internal measurement value resolution (0.069 mm).
71 (0x47)	Switching point 2	UINT16	R/W	466 ... 65512 [1] (32 ... 350 mm)		
72 (0x48)	Switchback point 2	UINT16	R/W	451 ... 65512 [1] (31 ... 349 mm)		
73 (0x49)	Foreground suppression	UINT8	R/W	0 ... 3246 (0 ... 223 mm)		
66 (0x42)	Switching output function	UINT8	R/W	• 00: normally closed • 02: normally open		–
67 (0x43)	Filter	UINT8	R/W	• 00: F00 [2] • 01: F01 • 02: F02		→ See also Page 29, Chapter 7.5.
68 (0x44)	Filter strength	UINT8	R/W	• 00: P00 • 01: P01 • 02: P02 • 03: P03 • 04: P04 • 05: P05 • 06: P06 • 07: P07 • 08: P08 • 09: P09		For the selected measured value filter, you can select a filter strength between 0 (weak filtering effect) and 9 (strong filtering effect).
74 (0x4A)	Teach via pin 5 in SIO mode	UINT8	R/W	• 00: deactivated • 16: activated		–

Teach

Index decimal (hex)	Description	Access	Access	Value range	Example	Remarks
02 (0x02)	TEACH	UINT	W	• 161: Method A • 162: Method B • 164: Two-way reflection barrier • 168: Reset to factory setting		A teach overwrites a function that has already been set with a newly selected function. If a teach is not successful, the old value is retained. → See Page 23, Chapter 7.1 and Page 49, Chapter 13.1.

1) Window operation deactivated for values > 5094.

2) Operation with filter setting "F00" is not permitted, as EMC faults may occur in this case.

*Table 13: SICK-specific service data UM18-21112A21_*

8.3.4 SICK-specific UM18-21212A21_

Index decimal (hex)	Description	Format	Access	Value range	Example	Remarks
64 (0x40)	Switching point 1	UINT16	R/W	946 ... 8704 (65 ... 598 mm)	100 corresponds to 69 mm	Specify values as a multiple of the internal measurement value resolution (0.069 mm).
65 (0x41)	Switchback point 1	UINT16	R/W	961 ... 8718 (66 ... 599 mm)		
71 (0x47)	Switching point 2	UINT16	R/W	975 ... 65512 [1] (67 ... 600 mm)		
72 (0x48)	Switchback point 2	UINT16	R/W	961 ... 65512 [1] (66 ... 599 mm)		
73 (0x49)	Foreground suppression	UINT8	R/W	0 ... 4236 (0 ... 291 mm)		
66 (0x42)	Switching output function	UINT8	R/W	• 00: normally closed • 02: normally open		–
67 (0x43)	Filter	UINT8	R/W	• 00: F00 [2] • 01: F01 • 02: F02		→ See also Page 29, Chapter 7.5.
68 (0x44)	Filter strength	UINT8	R/W	• 00: P00 • 01: P01 • 02: P02 • 03: P03 • 04: P04 • 05: P05 • 06: P06 • 07: P07 • 08: P08 • 09: P09		For the selected measured value filter, you can select a filter strength between 0 (weak filtering effect) and 9 (strong filtering effect).
74 (0x4A)	Teach via pin 5 in SIO mode	UINT8	R/W	• 00: deactivated • 16: activated		–

Teach

Index decimal (hex)	Description	Format	Access	Value range	Example	Remarks
02 (0x02)	TEACH	UINT	W	• 161: Method A • 162: Method B • 164: Two-way reflection barrier • 168: Reset to factory setting		A teach overwrites a function that has already been set with a newly selected function. If a teach is not successful, the old value is retained. → See Page 23, Chapter 7.1 and Page 49, Chapter 13.1.

1) Window operation deactivated for values > 8733.

2) Operation with filter setting "F00" is not permitted, as EMC faults may occur in this case.

*Table 14: SICK-specific service data UM18-21212A21_*

8.3.5   SICK-specific UM18-21812A21_

Index decimal (hex)	Description	Format	Access	Value range	Example	Remarks
64 (0x40)	Switching point 1	UINT16	R/W	1747 … 18892 (120 … 1298 mm)	2000 corresponds to 138 mm	
65 (0x41)	Switchback point 1	UINT16	R/W	1761 … 18907 (121 … 1299 mm)		Specify values as a multiple of the internal measurement value resolution (0.069 mm).
71 (0x47)	Switching point 2	UINT16	R/W	1776 … 65512 [1] (122 … 1300 mm)		
72 (0x48)	Switchback point 2	UINT16	R/W	1761 … 65512 [1] (121 … 1299 mm)		
73 (0x49)	Foreground suppression	UINT8	R/W	0 … 12969 (0 … 891 mm)		
66 (0x42)	Switching output function	UINT8	R/W	• 00: normally closed • 02: normally open		–
67 (0x43)	Filter	UINT8	R/W	• 00: F00 [2] • 01: F01 • 02: F02		→ See also Page 29, Chapter 7.5.
68 (0x44)	Filter strength	UINT8	R/W	• 00: P00 • 01: P01 • 02: P02 • 03: P03 • 04: P04 • 05: P05 • 06: P06 • 07: P07 • 08: P08 • 09: P09		For the selected measured value filter, you can select a filter strength between 0 (weak filtering effect) and 9 (strong filtering effect).
74 (0x4A)	Teach via pin 5 in SIO mode	UINT8	R/W	• 00: deactivated • 16: activated		–

Teach

Index decimal (hex)	Description	Format	Access	Value range	Example	Remarks
02 (0x02)	TEACH	UINT	W	• 161: Method A • 162: Method B • 164: Two-way reflection barrier • 168: Reset to factory setting		A teach overwrites a function that has already been set with a newly selected function. If a teach is successful, the old value is retained. → See Page 23, Chapter 7.1 and Page 49, Chapter 13.1.

[1] Window operation at value.

[2] Operation with filter setting "F00" is not permitted, as EMC faults may occur in this case.

*Table 15:   SICK-specific service data UM18-21812A21_*

8.4 Error Codes

→ For error codes, see IO-Link specification V1.1.

9 Cleaning and maintenance

9.1 Cleaning

IMPORTANT!

Equipment damage due to improper cleaning!

Improper cleaning may result in equipment damage.

For this reason:

- Never use cleaning agents containing aggressive substances.

- Never use pointed objects for cleaning.

9.2 Maintenance

The ultrasonic sensor requires the following maintenance work at regular intervals:

Interval	Maintenance work	To be performed by
Cleaning interval depends on ambient conditions and climate	Clean housing.	Specialist
Every 6 months	Check the screw connections and plug connections.	Specialist

Table 16: Maintenance schedule

10 Troubleshooting

10.1 Possible fault indicators

LEDs on the ultrasonic sensor	Possible causes	Troubleshooting
Green and orange LEDs flash at the same rate for 3 seconds.	Teach point is outside the permitted range.	Check teach distance and perform teach again.
	Teach failed, for example, due to interfering reflections or mounting distances that are too small when using multiple sensors.	• Check the sensor detection zone and keep free. If necessary, shield existing sources of interference. • When using multiple sensors, observe minimum mounting distances without synchronization mode and operate sensors in synchronization mode if necessary. → See Page 16, Chapter 5.3.2.
	Analog output only: Taught-in distance between the scaling limits is below 1 mm.	Repeat teach for window limits.

Table 17: Possible fault indicators

10.2 Disposal

Please observe the following when disposing of the removal sensor:

• Do not dispose of the device along with household waste.

• Dispose of the device according to the applicable regulations in your country.

© SICK AG • Subject to change without notice • 8014865/ZUJ3/2018-11-29

11 Technical data

NOTE!

You can download, save, and print the relevant online data sheet for your ultrasonic sensor, including technical data, dimensions, and connection diagrams, from "www.sick.com/UM18".

11.1 Dimensions
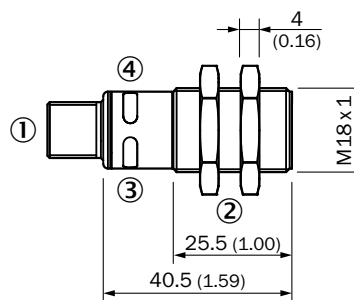
All dimensions in mm (inch)
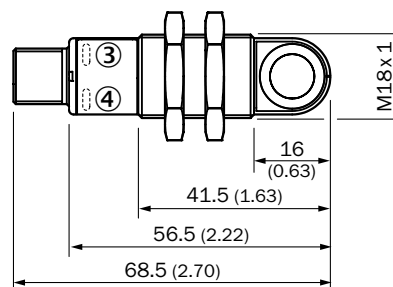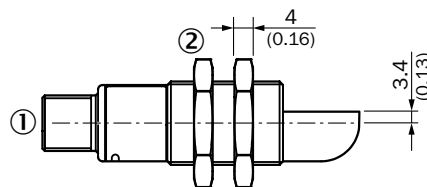
Fig. 13: Structure: top "UM18-2xxxxxxx1 ultrasonic sensor"
bottom "UM18-2xxxxxxx2 ultrasonic sensor"

① Connection

② Mounting nuts, width across 24 mm

③ Supply voltage active LED status indicator (green)

④ Switching/analog output LED status indicator (orange)

11.2 Optics/Performance

Detection areas (typical)	→ See Page 46, Chapter 11.9, ""Detection zone" diagrams".
Operating range	• UM18-217xxxxxx: 20 mm ... 150 mm • UM18-211xxxxxx: 30 mm ... 250 mm • UM18-212xxxxxx: 65 mm ... 350 mm • UM18-218xxxxxx: 120 mm ... 1000 mm
Limiting range	• UM18-217xxxxxx: 250 mm • UM18-211xxxxxx: 350 mm • UM18-212xxxxxx: 600 mm • UM18-218xxxxxx: 1300 mm
Accuracy	± 1 % in relation to the current measured value
Repeatability	± 0.15 % in relation to the current measured value
Temperature compensation	• Temperature drift compensated internally → See Page 28, Chapter 7.4. • Temperature compensation can be switched off via "Connect+ Adapter," not temperature-compensated: 0.17 %/K
Resolution	≥ 0.069 mm
Ultrasonic frequency	• UM18-217xxxxxx: 380 kHz • UM18-211xxxxxx: 320 kHz • UM18-212xxxxxx: 400 kHz • UM18-218xxxxxx: 200 kHz
Output time	• UM18-217xxxxxx: 8 ms • UM18-211xxxxxx: 8 ms • UM18-212xxxxxx: 16 ms • UM18-218xxxxxx: 20 ms
Initialization time	< 300 ms
Switching frequency	• UM18-217xxxxxx: 25 Hz • UM18-211xxxxxx: 25 Hz • UM18-212xxxxxx: 12 Hz • UM18-218xxxxxx: 10 Hz
Response time [1]	• UM18-217xxxxxx: 32 ms • UM18-211xxxxxx: 32 ms • UM18-212xxxxxx: 64 ms • UM18-218xxxxxx: 80 ms

[1] For sensors with analog output: depending on the application, subsequent smoothing of the analog signal may increase the response time by up to 200 %.

Table 18:   Performance data

11.3 Power supply

11.3.1 Sensors with switching outputs

Supply voltage V_s [1], sensors with switching output UM18-2xxxxxAxxx	• DC 15 … 30 V
Power consumption (without load)	< 1.2 W
Residual ripple	± 10 % within the acceptable supply voltage V_s

1) Limit values: Max. 8 A for operation in a short-circuit protected network.

Table 19:   Supply – sensors with switching outputs

11.3.2 Sensors with analog outputs

Supply voltage V_s [1], sensors with switching output UM18-2xxxxx7xx	DC 15 … 30 V DC
Supply voltage V_s [1], sensors with switching output UM18-2xxxxx6xx	• DC 10 … 30 V DC at RL ≤ 100 Ω • DC 20 … 30 V DC at RL ≥ 100 Ω
Circuit protection	V_s connections, reverse polarity protected
Power consumption (without load)	< 1.2 W
Residual ripple	± 10 % within the acceptable supply voltage V_s

1) Limit values: Max. 8 A for operation in a short-circuit protected network.

Table 20:   Supply – sensors with analog outputs

11.4 Inputs

Multifunction input MF	• Teach-in • Connect+ communication • Synchronization/multiplex mode

Table 21:   Inputs

11.5 Outputs

11.5.1 Sensors with switching outputs

Sensors with switching outputs	UM18-2xxxxAxxx
Switching output	• Push-pull: PNP/NPN • HIGH: V_s – (< 3 V), LOW: < 3 V • IO-Link

Hysteresis	• UM18-217xxxxxx: 2 mm
	• UM18-211xxxxxx: 3 mm
	• UM18-212xxxxxx: 5 mm
	• UM18-218xxxxxx: 20 mm
	Configurable via "Connect+ Adapter"
Circuit protection	Short-circuit protected
Maximum output current	< 100 mA

Table 22:   Outputs – sensors with switching outputs

11.5.2   Sensors with analog outputs

Sensors with analog outputs	• UM18-2xxxx6xxx: 4 mA ... 20 mA
	• UM18-2xxxx7xxx: DC 0 ... 10 V DC
Analog output UM18-2xxxx6xxx	• 4 mA ... 20 mA
	• RL ≤ 500 Ω, at V_s ≤ 20 V: max. load ≤ 100 Ω
	• Rising, falling characteristic curve, configurable
Analog output UM18-2xxxx7xxx	• DC 0 ... 10 V DC
	• RL ≥ 100 Ω
	• Rising, falling characteristic curve, configurable
Resolution	12 Bit
Circuit protection	UM18-2xxxxx6xx: Voltage output is short-circuit protected

Table 23:   Outputs – sensors with analog outputs

11.6   Interfaces

IO-Link	For sensors with switching outputs
Connect+	Configuration interface for communication via "Connect+ Adapter" accessories

Table 24:   Interfaces

11.7 Ambient conditions

Protection class	III
Electromagnetic compatibility [1]	EN 61000-6-2, EN 55011, Class A
	EN 60947-5-2/-3
Ambient temperature range	–25 °C … +70 °C
Storage temperature range	–40 °C … +85 °C
Enclosure rating	IP 67 according to EN 60529

1) Operation with filter setting "F00" is not permitted, as EMC faults may occur in this case.

Table 25:   Ambient conditions

11.8 Structural design

Dimensions	→ See Page 41, Chapter 11.1.
Weight	• Straight: 25 g
	• Angled: 30 g
Materials	• Housing: Nickel-plated brass
	• Ultrasonic transducer: polyurethane foam, glass epoxy resin
Connections	Plug M12, 5-pin
Display	• Green LED: operation
	• Orange LED: on when switching/analog output is active

Table 26:   Structural design

11.9   "Detection zone" diagrams

UM18-217

Detection area in mm (inch)
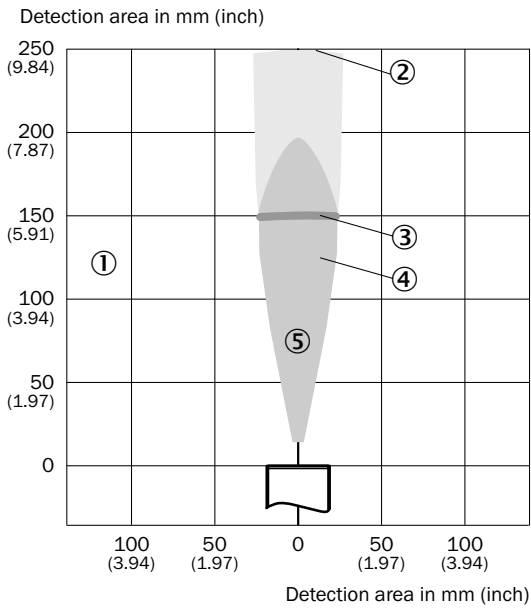
Fig. 14: "UM18-217" detection zone

① *Detection zone depends on reflection characteristics, 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: round bar with diameter 10 mm*

UM18-211

Detection area in mm (inch)
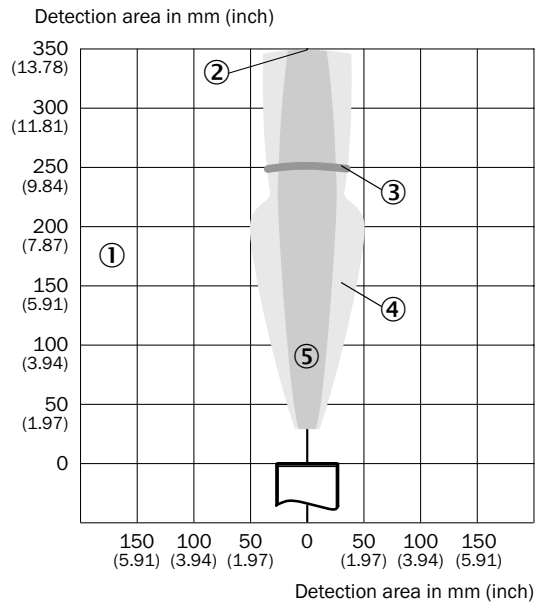
Fig. 15: "UM18-211" detection zone

① *Detection zone depends on reflection characteristics, 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: round bar with diameter 10 mm*

UM18-212

Detection area in mm (inch)
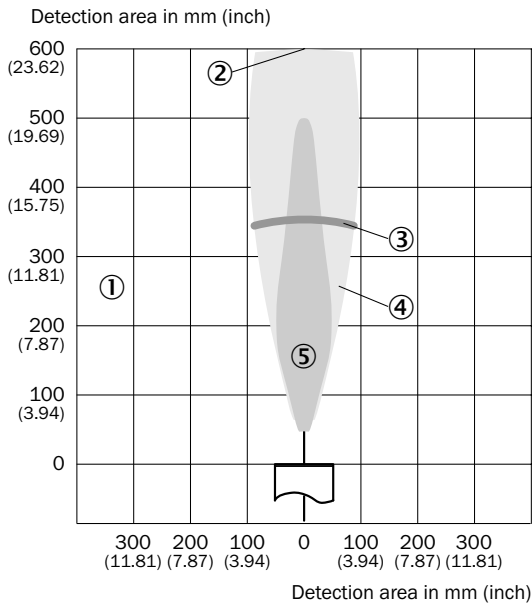
Fig. 16: "UM18-212" detection zone

① *Detection zone depends on reflection characteristics, 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: round bar with diameter 10 mm*

UM18-218

Detection area in mm (inch)
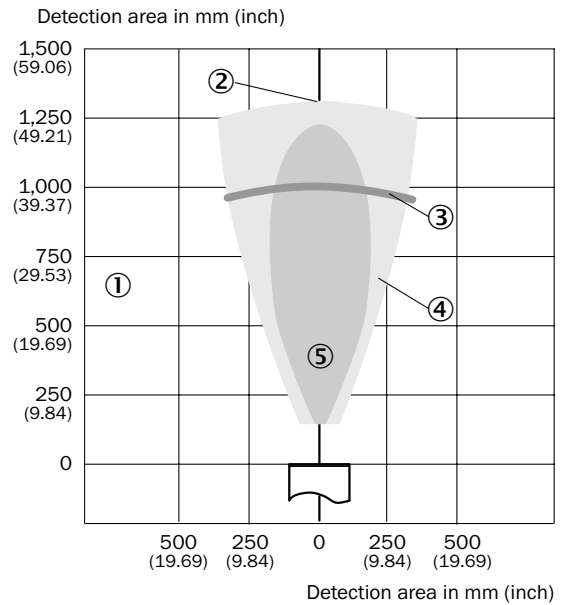
Fig. 17: "UM18-218" detection zone

① *Detection zone depends on reflection characteristics, 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: round bar with diameter 10 mm*

12 Accessories

NOTE!

For accessories, go to "www.sick.com/UM18", "Accessories".

12.1   "Connect+ Adapter" (CPA)

Description	"Connect+ Adapter" with associated software
	Programming tool including adapter, cable, and T-piece for USB (A/B)
Order No.	6037782

© SICK AG • Subject to change without notice • 8014865/ZUJ3/2018-11-29

13 Configuration Overview

13.1 Configuration overview for sensors with switching outputs

Teach-in switching output

Default setting: Normally open contact, switching point (DtO) at maximum operating range

Teach-in switching point (DtO= Distance to Object) – method A	Teach-in switching point (DtO= Distance to Object + 8%) – method B	Teach-in switching window	Teach-in background (ObSB mode = Object between Sensor and Background)	Set normally closed/ normally open contact
Position object at ①	Position object at ①	Position object at ①	Position background at ①	Apply L+ at MF for approx. 13 s until both LEDs flash <u>alternately</u>
Apply L+ at MF for approx. 3 s until both LEDs flash <u>simultaneously</u>	Apply L+ at MF for approx. 3 s until both LEDs flash <u>simultaneously</u>	Apply L+ at MF for approx. 3 s until both LEDs flash <u>simultaneously</u>	Apply L+ at MF for approx. 3 s until both LEDs flash <u>simultaneously</u>	Green LED: flashes / Orange LED: on: normally open off: normally closed
Both LEDs: flash alternately	Both LEDs: flash alternately	Both LEDs: flash alternately	Both LEDs: flash alternately	
		Position object at ②		To change the setting, apply L+ at MF for approx. 1 s
		Both LEDs: flash alternately		Orange LED: switches status
Apply L+ at MF for approx. 1 s	Apply L+ at MF for approx. 3 s until both LEDs flash again <u>alternately</u>	Apply L+ at MF for approx. 1 s	Apply L+ at MF for approx. 10 s until both LEDs <u>stop</u> flashing	Wait approx. 10 s
				Green LED: stops flashing

Normal operation mode

13.2 Configuration overview for sensors with analog outputs

Teach-in analog output

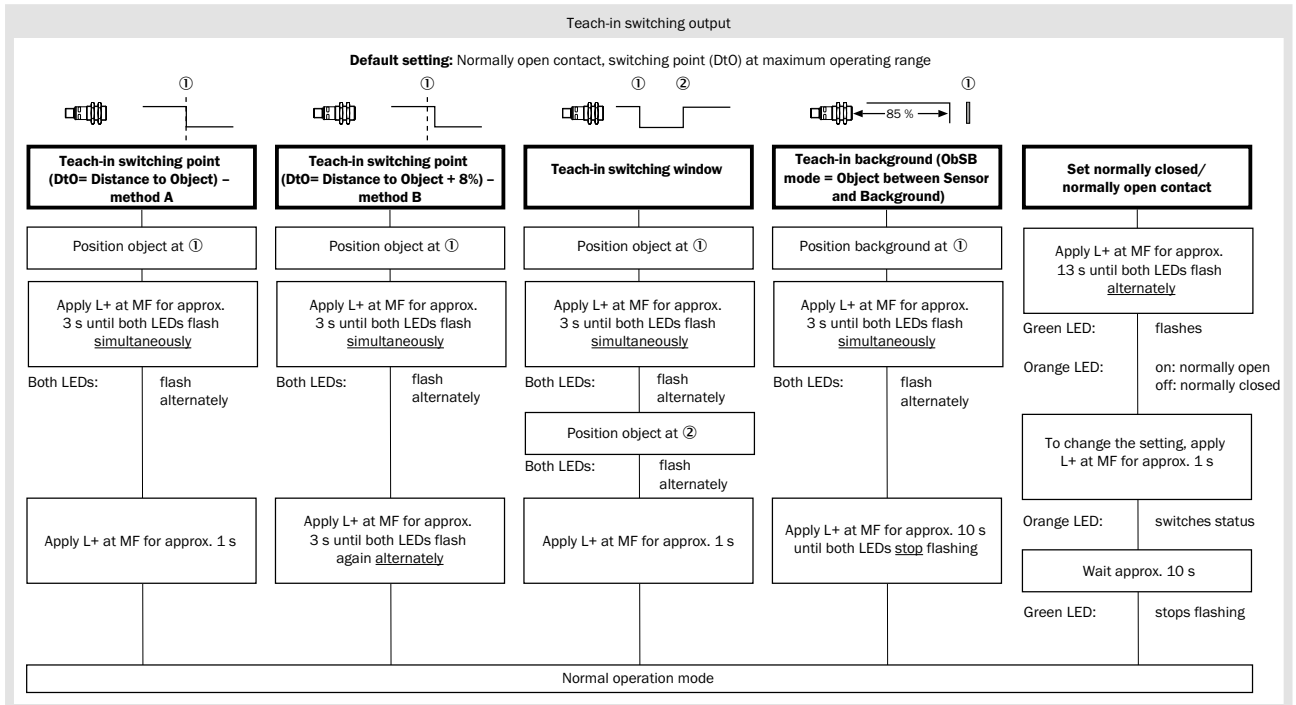| Teach-in analog output scaling	Set rising/falling output characteristics
	Default setting: Rising output characteristics from min. to max. operating range
Position object at ①	Apply L+ at MF for approx. 13 s until both LEDs flash <u>alternately</u>
Apply L+ at MF for approx. 3 s until both LEDs flash <u>simultaneously</u>	Green LED: flashes / Orange LED: on: rising, off: falling output characteristics
Both LEDs: flash alternately	
Position object at ②	To change the setting, apply L+ at MF for approx. 1 s
Both LEDs: flash alternately	Orange LED: switches status
Apply L+ at MF for approx. 1 s	Wait approx. 10 s
	Green LED: stops flashing

Normal operation mode

13.3 Additional settings for all sensors

```
                        Further settings


┌────────────────────────────┐   ┌────────────────────────────┐
│ Switching between teach-in  │   │  Reset to the factory      │
│ and synchronization/        │   │  setting                   │
│ multiplex mode              │   │                            │
└────────────────────────────┘   └────────────────────────────┘
              │                                 │
┌────────────────────────────┐   ┌────────────────────────────┐
│ Switch off the supply       │   │ Switch off the supply      │
│ voltage                     │   │ voltage                    │
└────────────────────────────┘   └────────────────────────────┘
              │                                 │
┌────────────────────────────┐   ┌────────────────────────────┐
│ Apply M at MF               │   │ Apply M at MF              │
└────────────────────────────┘   └────────────────────────────┘
              │                                 │
┌────────────────────────────┐   ┌────────────────────────────┐
│ Switch on the supply        │   │ Switch on the supply       │
│ voltage                     │   │ voltage                    │
└────────────────────────────┘   └────────────────────────────┘
              │                                 │
┌────────────────────────────┐   ┌────────────────────────────┐
│ Wait approx. 3 s until both │   │ Wait approx. 13 s until    │
│ LEDs flash simultaneously   │   │ both LEDs stop flashing    │
└────────────────────────────┘   └────────────────────────────┘
                                                │
 Green LED:     flashes            ┌────────────────────────────┐
 Orange LED:    on: teach-in       │ Before switching off the   │
                off: synchroniza-  │ supply voltage, disconnect │
                tion/multiplex     │ M from MF to apply the     │
                mode               │ factory setting            │
┌────────────────────────────┐    └────────────────────────────┘
│ To change the setting,      │                  │
│ apply M at MF for approx.   │                  │
│ 1 s                         │                  │
└────────────────────────────┘                  │
                                                 │
 Orange LED:    changes status                   │
┌────────────────────────────┐                   │
│ Wait approx. 10 s           │                   │
└────────────────────────────┘                   │
                                                 │
 Green LED:     stops flashing                    │
┌──────────────────────────────────────────────────────────────┐
│                  Normal operation mode                        │
└──────────────────────────────────────────────────────────────┘
```

Index

Australia
Phone +61 3 9457 0600
1800 334 802 – tollfree
E-Mail sales@sick.com.au

Austria
Phone +43 22 36 62 28 8-0
E-Mail office@sick.at

Belgium/Luxembourg
Phone +32 2 466 55 66
E-Mail info@sick.be

Brazil
Phone +55 11 3215-4900
E-Mail marketing@sick.com.br

Canada
Phone +1 905 771 14 44
E-Mail information@sick.com

Czech Republic
Phone +420 2 57 91 18 50
E-Mail sick@sick.cz

Chile
Phone +56 2 2274 7430
E-Mail info@schadler.com

China
Phone +86 20 2882 3600
E-Mail info.china@sick.net.cn

Denmark
Phone +45 45 82 64 00
E-Mail sick@sick.dk

Finland
Phone +358-9-2515 800
E-Mail sick@sick.fi

France
Phone +33 1 64 62 35 00
E-Mail info@sick.fr

Germany
Phone +49 211 5301-301
E-Mail info@sick.de

Hong Kong
Phone +852 2153 6300
E-Mail ghk@sick.com.hk

Hungary
Phone +36 1 371 2680
E-Mail office@sick.hu

India
Phone +91 22 6119 8900
E-Mail info@sick-india.com

Israel
Phone +972 4 6881000
E-Mail info@sick-sensors.com

Italy
Phone +39 02 274341
E-Mail info@sick.it

Japan
Phone +81 3 5309 2112
E-Mail support@sick.jp

Malaysia
Phone +6 03 8080 7425
E-Mail enquiry.my@sick.com

Mexico
Phone +52 (472) 748 9451
E-Mail mario.garcia@sick.com

Netherlands
Phone +31 30 2044 000
E-Mail info@sick.nl

New Zealand
Phone +64 9 415 0459
0800 222 278 – tollfree
E-Mail sales@sick.co.nz

Norway
Phone +47 67 81 50 00
E-Mail sick@sick.no

Poland
Phone +48 22 539 41 00
E-Mail info@sick.pl

Romania
Phone +40 356 171 120
E-Mail office@sick.ro

Russia
Phone +7 495 775 05 30
E-Mail info@sick.ru

Singapore
Phone +65 6744 3732
E-Mail sales.gsg@sick.com

Slovakia
Phone +421 482 901201
E-Mail mail@sick-sk.sk

Slovenia
Phone +386 591 788 49
E-Mail office@sick.si

South Africa
Phone +27 11 472 3733
E-Mail info@sickautomation.co.za

South Korea
Phone +82 2 786 6321
E-Mail info@sickkorea.net

Spain
Phone +34 93 480 31 00
E-Mail info@sick.es

Sweden
Phone +46 10 110 10 00
E-Mail info@sick.se

Switzerland
Phone +41 41 619 29 39
E-Mail contact@sick.ch

Taiwan
Phone +886 2 2375-6288
E-Mail sales@sick.com.tw

Thailand
Phone +66 2645 0009
E-Mail Ronnie.Lim@sick.com

Turkey
Phone +90 216 528 50 00
E-Mail info@sick.com.tr

United Arab Emirates
Phone +971 4 88 65 878
E-Mail info@sick.ae

United Kingdom
Phone +44 1727 831121
E-Mail info@sick.co.uk

USA
Phone +1 800 325 7425
E-Mail info@sick.com

Vietnam
Phone +84 945452999
E-Mail Ngo.Duy.Linh@sick.com

Further locations at www.sick.com

8014865/ZUI3/2018-11-29 · 8M_DR · (2018-11) · A4 4c int47

SICK

Sensor Intelligence.

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