

Ultraschallsensor UC4 mit Schaltausgang oder Analogausgang Betriebsanleitung

SICK

8012194/Z533/2016-10/8M_KOD

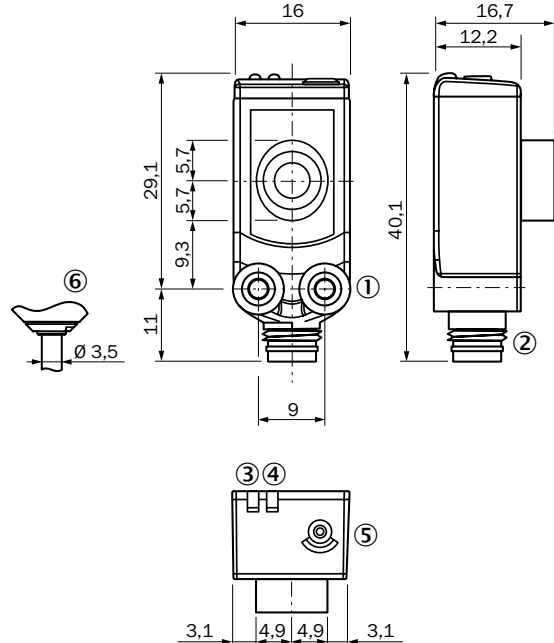
UC4

Australia Phone +61 3 9457 0600
Austria Phone +43 22 36 62 28 8-0
Belgium/Luxembourg Phone +32 2 466 55 66
Brazil Phone +55 11 3215-4900
Canada Phone +1 905 771 14 44
Czech Republic Phone +420 2 57 91 18 50
Chile Phone +56 2 2274 7430
China Phone +86 20 2882 3600
Denmark Phone +45 45 82 64 00
Finland Phone +358 9-2515 800
France Phone +33 1 64 62 35 00
Germany Phone +49 211 5301-301
Hong Kong Phone +852 2153 6300
Hungary Phone +36 1 371 2680
India Phone +91 22 4033 8333
Israel Phone +972 4 6881000
Italy Phone +39 02 274341
Japan Phone +81 3 5309 2112
Malaysia Phone +6 03 8080 7425
Mexico Phone +52 472 748 9451
Netherlands Phone +31 30 2044 000

New Zealand Phone +64 9 415 0459
Norway Phone +47 67 81 50 00
Poland Phone +48 22 539 41 00
Romania Phone +40 356 171 120
Russia Phone +7 495 775 05 30
Singapore Phone +65 6744 3732
Slovakia Phone +421 482 901201
Slovenia Phone +386 591 788 49
South Africa Phone +27 11 472 3733
South Korea Phone +82 2 786 6321
Spain Phone +34 93 480 31 00
Sweden Phone +46 10 110 10 00
Switzerland Phone +41 41 619 29 39
Taiwan Phone +886 2 2375-6288
Thailand Phone +66 2645 0009
Turkey Phone +90 216 528 50 00
United Arab Emirates Phone +971 4 88 65 878
United Kingdom Phone +44 1727 831121
USA Phone +1 800 325 7425
Vietnam Phone +84 945452999

Subject to change without notice
Irrtümer und Änderungen vorbehalten

A Abmessungen

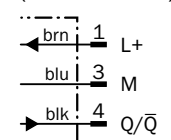


- 1 Befestigungsgewinde M3
- 2 Anschluss
- 3 LED Statusanzeige Schaltausgang / Analogausgang (orange)
- 4 LED Statusanzeige Versorgungsspannung aktiv (grün)
- 5 Teach-in-Taste
- 6 Variante mit 300 mm Anschlussleitung und Stecker, M8, 3-polig

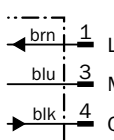
B Elektrischer Anschluss

Stecker, M8, 3-polig

UC4-11341
UC4-11345
UC4-13341
UC4-13345
(UC4-13341S01)
(UC4-13345S02)



UC4-1334A
UC4-1354A



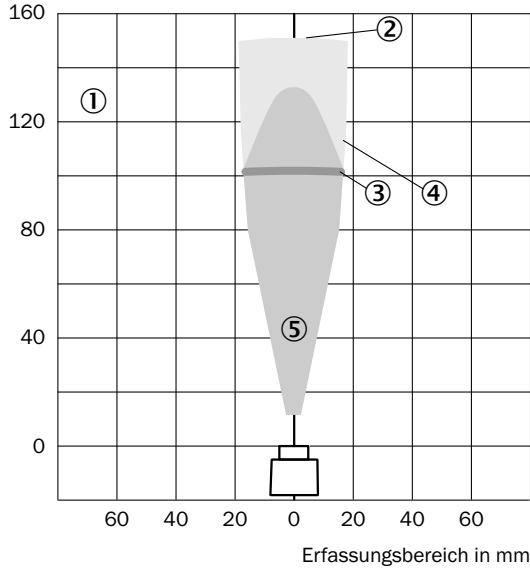
UC4-13346
UC4-13347



C Erfassungsbereich

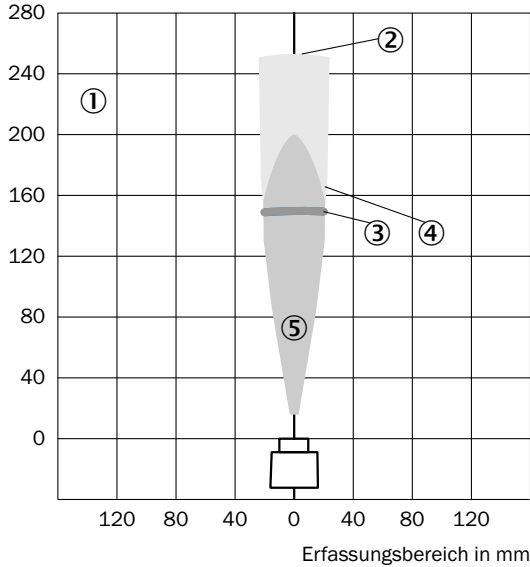
UC4-11xxx

Erfassungsbereich in mm



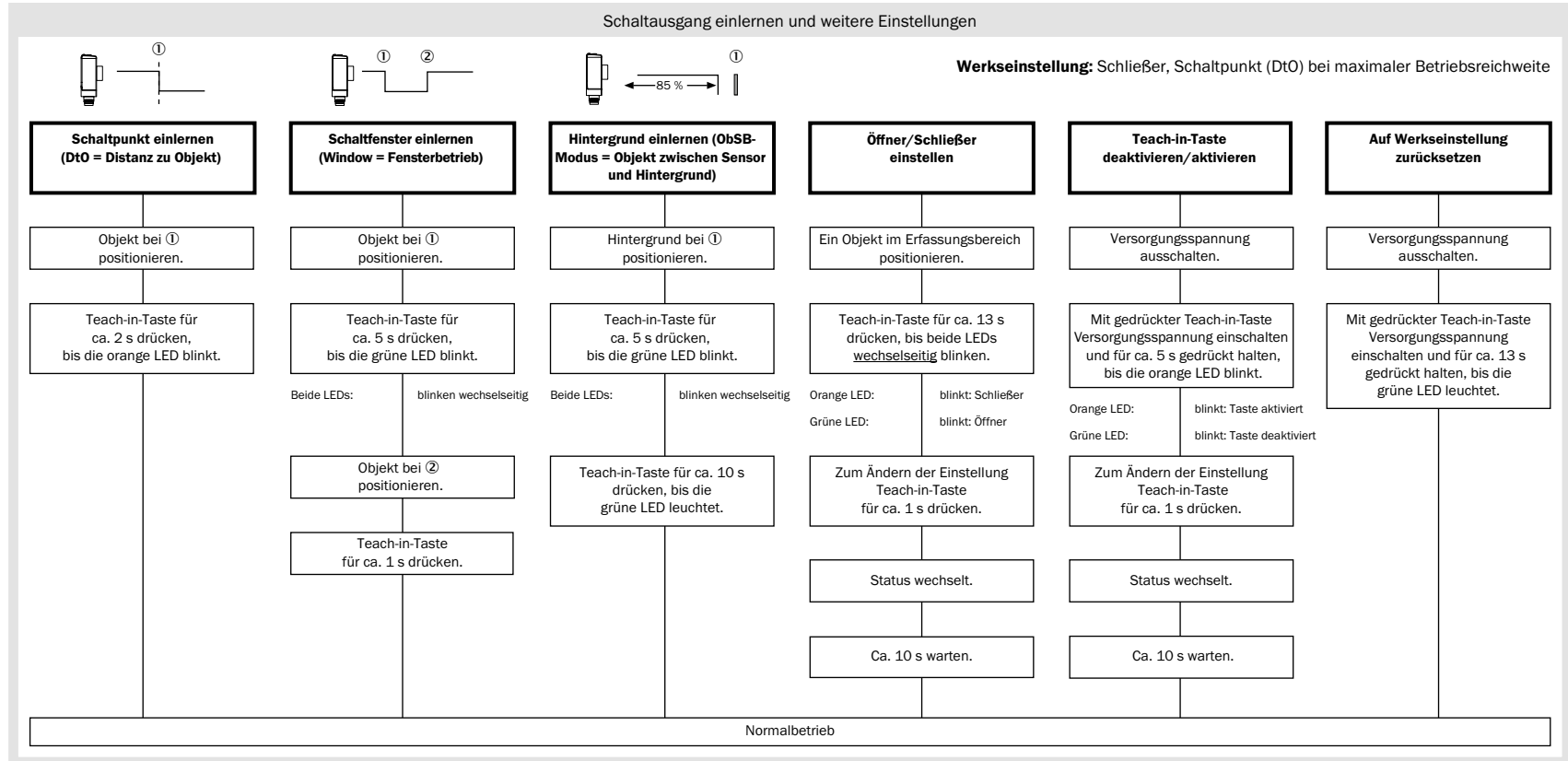
UC4-13xxx

Erfassungsbereich in mm

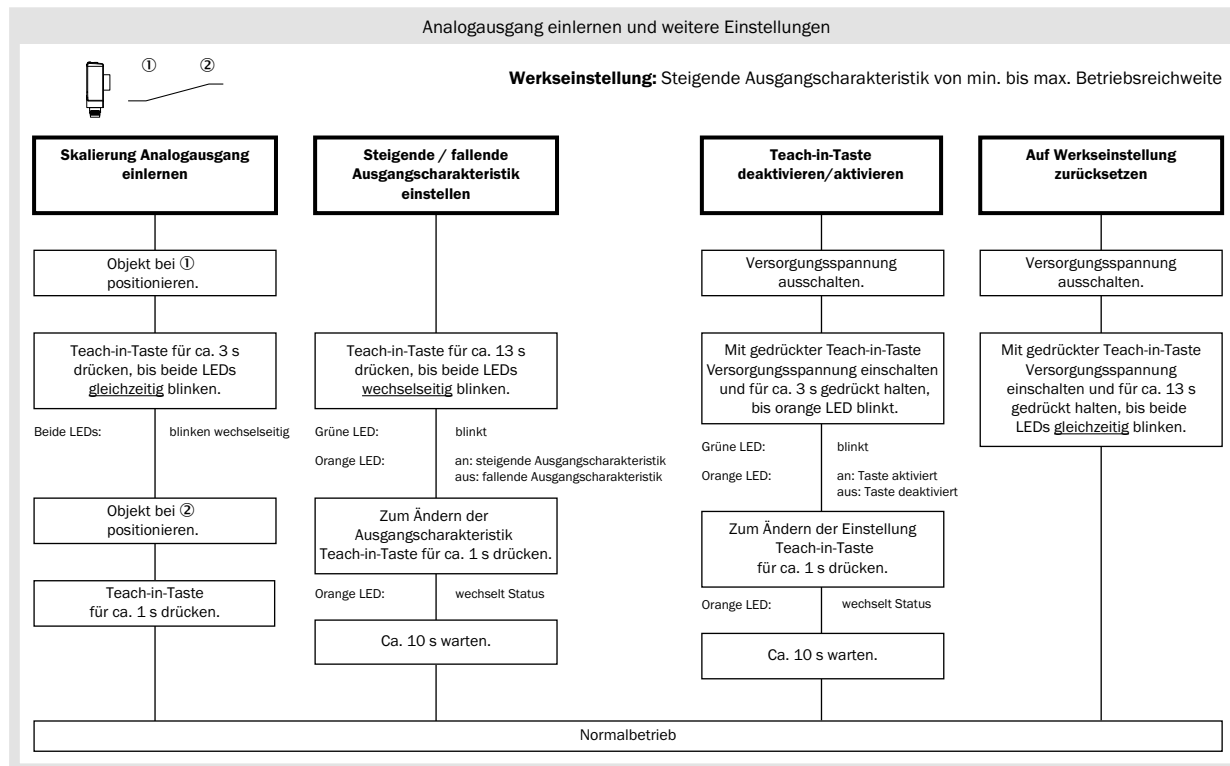


- 1 Erfassungsbereich abhängig von Reflexionseigenschaften, Größe und Ausrichtung des Objekts
- 2 Grenzreichweite
- 3 Betriebsreichweite
- 4 Beispielobjekt: Ausgerichtete Platte 100 mm x 100 mm
- 5 Beispielobjekt: Rundstab mit Durchmesser von 10 mm

D Sensoren mit Schaltausgang



E Sensoren mit Analogausgang



F Technische Daten

DE	UC4-11341	UC4-11345	UC4-13341	UC4-13345	UC4-13341S01	UC4-13345S02	UC4-1334A	UC4-1354A	UC4-13346	UC4-13347
Betriebsreichweite ¹⁾	13 mm ... 100 mm		13 mm ... 150 mm		13 mm ... 150 mm		13 mm ... 150 mm		20 ... 150 mm	
Grenzreichweite	150 mm		250 mm		250 mm		250 mm		250 mm	
Ultraschallfrequenz (typisch)	380 kHz		380 kHz		380 kHz		380 kHz		380 kHz	
Hysterese	2 mm		2 mm		2 mm		2 mm		-	
Auflösung	≥ 0,1 mm		≥ 0,1 mm		≥ 0,1 mm		≥ 0,1 mm		≥ 0,1 mm	
Reproduzierbarkeit	± 0,15 % bezogen auf den aktuellen Messwert		± 0,15 % bezogen auf den aktuellen Messwert		± 0,15 % bezogen auf den aktuellen Messwert		± 0,15 % bezogen auf den aktuellen Messwert		± 0,15 % bezogen auf den aktuellen Messwert	
Genauigkeit	≤ 0,17 %/K		± 1 % bezogen auf den aktuellen Messwert		≤ 0,17 %/K		± 1 % bezogen auf den aktuellen Messwert		± 1 % bezogen auf den aktuellen Messwert	
Versorgungsspannung U _v ²⁾	DC 15 ... 30 V		DC 15 ... 30 V		DC 15 ... 30 V		DC 15 ... 30 V		DC 15 ... 30 V	
Leistungsaufnahme (ohne Last)	≤ 0,75 W		≤ 0,75 W		≤ 0,9 W		≤ 0,75 W		≤ 0,75 W	
Gehäusematerial	ABS-Kunststoff; Ultraschallwandler: Polyurethanschaum, Epoxydharz mit Glasanteilen									
Schutzart nach EN 60529	IP 67		IP 67		IP 67		IP 67		IP 67	
Schutzklasse	III		III		III		III		III	
Anschlussart	Stecker, M8, 3-polig		Stecker, M8, 3-polig		Stecker, M8, 3-polig		Stecker, M8, 3-polig		Stecker, M8, 3-polig	
							Variante mit 300 mm Anschlussleitung und Stecker, M8, 3-polig			
Umgebungstemperatur ³⁾	Betrieb: -25 °C ... +70 °C; Lager: -40 °C ... +85 °C									
Gewicht	10 g		10 g		10 g		10 g		10 g	
Analogausgang	nicht verfügbar		nicht verfügbar		nicht verfügbar		nicht verfügbar		4 mA ... 20 mA; RL ≤ 500 Ω 0 V ... 10 V; RL ≥ 100 kΩ	
Schaltausgang	1 x PNP (200 mA) ^{4),5)}		1 x PNP (200 mA) ^{4),5)}		1 x PNP (200 mA) ^{4),5)}		1 x PNP (200 mA) ^{4),5)}		nicht verfügbar	
Ausgabezeit	8 ms		8 ms		8 ms		8 ms		8 ms	
Schaltfrequenz	30 Hz		30 Hz		100 Hz		30 Hz		-	
Ansprechzeit	24 ms		24 ms		10 ms		24 ms		24 ms ⁷⁾	
Initialisierungszeit	< 300 ms		< 300 ms		< 300 ms		< 300 ms		< 300 ms	
Temperaturkompensation	Nein		Ja		Nein		Ja		Ja	

¹⁾ Einlernen ab 21 mm

²⁾ Grenzwerte, verpolischer Betrieb in kurzschlussgeschütztem Netz max. 8 A

³⁾ Bei Betriebstemperaturen > 50 °C, ist der UC4 mit der Rückseite flächig an eine Halterung zu montieren.

⁴⁾ Ausgang Q kurzschlussgeschützt

⁵⁾ PNP: HIGH = U_v - (2 V); LOW = 0 V / NPN: HIGH ≤ 2 V; LOW = U_v

⁶⁾ Gegentakt PNP / NPN: HIGH = U_v - (< 3 V); LOW = < 3 V

⁷⁾ Die nachgelagerte Glättung des Analogsignals kann die Ansprechzeit applikationsbedingt um bis zu 200 % verlängern

Ultrasonic sensor UC4 with switching output or analog output Operating Instructions

Safety notes

- Read the Operating Instructions before commissioning.
- Connection, mounting and setting must be performed by qualified personnel.
- Protect devices from moisture and contamination during commissioning.
- No safety component pursuant to EU directive.

Intended use

The UC4 are ultrasonic sensors used for contact-free detecting of objects, animals and persons.

Notes

- To ensure the teach-in button functions correctly, press the teach-in button in the center at a right angle.
- Below the operating range of the ultrasonic sensor UC4, distance measurement is not possible.
- During normal operation, an orange LED lights up to signal that the switching output is active (in the case of sensors with a switching output) or that an object is in the scaling area (in the case of sensors with an analog output).
- Some of the UC4 sensors have an internal temperature compensation function. Due to the sensor heating up, the temperature compensation function will reach its optimal working point after approximately 1 min. 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.
- UC4-13x4A-sensors are IO-link-capable according to specification V1.1. A description of IO-Link functions and the latest IODD for these sensors are available at www.sick.com/UC4.

Mounting distances

If you want to operate several ultrasonic sensors, you must comply with the following mounting distances.

	Parallel	Opposite
UC4	> 250 mm	> 1300 mm

Commissioning

For instructions, see:

- Progress diagram **D** for sensors with switching output
- Progress diagram **E** for sensors with analog output

Sensors with switching output

- For sensors with a switching output, there are three operating modes plus the option of setting the output to be "normally closed" or "normally open". See progress diagram **D**.
- Operation with one switching point (DtO)
- The output is set when the object is located below the taught-in switching point.
- Window operation
- The switching point is inactive, when the object is located within the taught-in window.
- Object between sensor and background (ObSB)
- The output is set when the object is between the sensor and a fixed reflector. The object to be recorded may be in the area of 0 ... 85 % of the taught-in distance.

Sensors with analog output

See progress diagram **E**.

- Teach-in scaling (4 mA ... 20 mA or 0 V ... 10 V)
- When the sensor-far scaling limit is taught in before the sensor-near scaling limit, the scaling limits are exchanged internally.
- When a scaling of less than 1 mm is taught in, both LEDs will flash quickly together for 3 s to indicate an error. The old scaling limits are retained.

Further settings for all sensors

- Deactivate/activate teach-in button
- Reset to factory setting

See progress diagram **D** for sensors with switching output. See progress diagram **E** for sensors with analog output.

Maintenance

SICK sensors are maintenance-free. We recommend to regularly

- clean the optical surfaces carefully with water,
- check screw and plug connections.

SICK

8012194/Z533/2016-10/8M_KOD

UC4

Australia
Phone +61 3 9457 0600

Austria
Phone +43 22 38 62 28 8-0

Belgium/Luxembourg
Phone +32 2 466 55 66

Brazil
Phone +55 11 3215-4900

Canada
Phone +1 905 771 14 44

Czech Republic
Phone +420 2 57 91 18 50

Chile
Phone +56 2 2274 7430

China
Phone +86 20 2882 3600

Denmark
Phone +45 45 82 64 00

Finland
Phone +358 9-2515 800

France
Phone +33 1 64 62 35 00

Germany
Phone +49 211 5301-301

Hong Kong
Phone +852 2153 6300

Hungary
Phone +36 1 371 2680

India
Phone +91 22 4033 8333

Israel
Phone +972 4 6881000

Italy
Phone +39 02 274341

Japan
Phone +81 3 5309 2112

Malaysia
Phone +6 03 8080 7425

Mexico
Phone +52 472 748 9451

Netherlands
Phone +31 30 2044 000

New Zealand
Phone +64 9 415 0459

Norway
Phone +47 67 81 50 00

Poland
Phone +48 22 539 41 00

Romania
Phone +40 356 171 120

Russia
Phone +7 495 775 05 30

Singapore
Phone +65 6744 3732

Slovakia
Phone +421 482 901201

Slovenia
Phone +386 591 788 49

South Africa
Phone +27 11 472 3733

South Korea
Phone +82 2 786 6321

Spain
Phone +34 93 480 31 00

Sweden
Phone +46 10 110 10 00

Switzerland
Phone +41 41 619 29 39

Taiwan
Phone +886 2 2375-6288

Thailand
Phone +66 2645 0009

Turkey
Phone +90 216 528 50 00

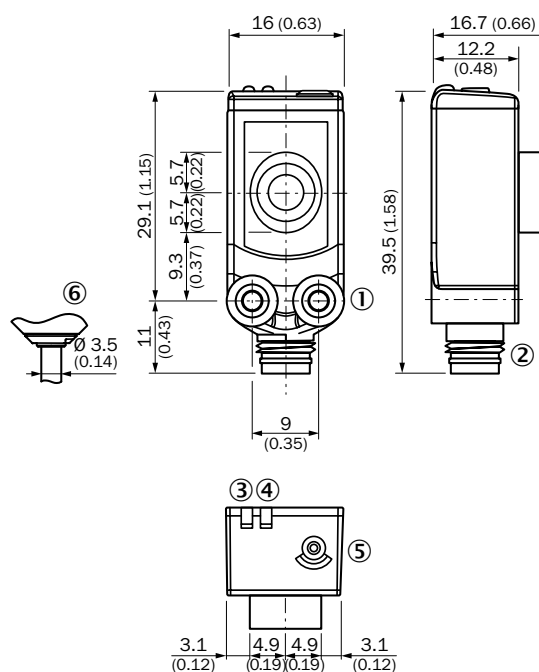
United Arab Emirates
Phone +971 4 88 65 878

United Kingdom
Phone +44 1727 831121

USA
Phone +1 800 325 7425

Vietnam
Phone +84 945452999

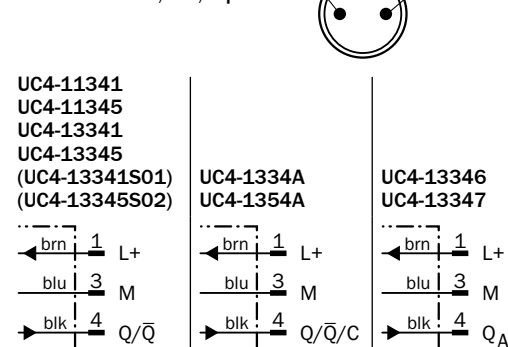
A Dimensions



- ① Threaded mounting hole M3
- ② Connection
- ③ LED status indicator switching output/ analog output (orange)
- ④ LED status indicator supply voltage active (green)
- ⑤ Teach-in button
- ⑥ Variant with 300 mm connecting cable and M8 male connector, 3-pin

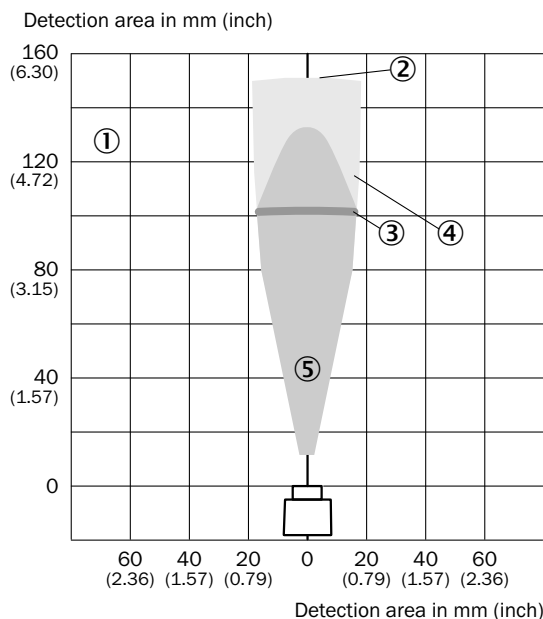
B Electrical connection

Male connector, M8, 3-pin

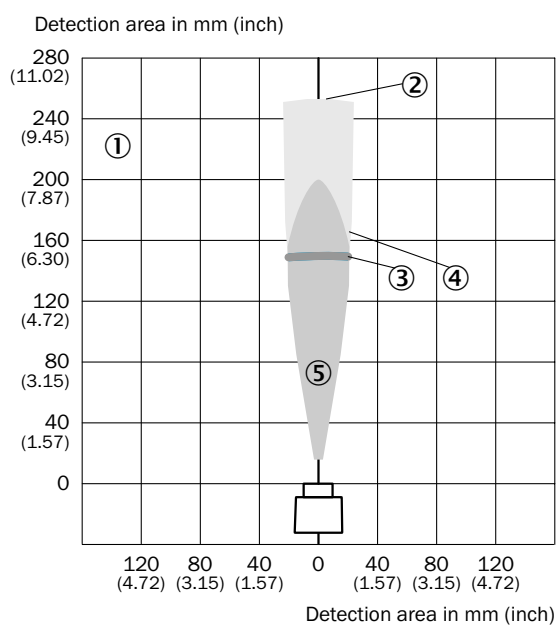


C Detection area

UC4-11xxx

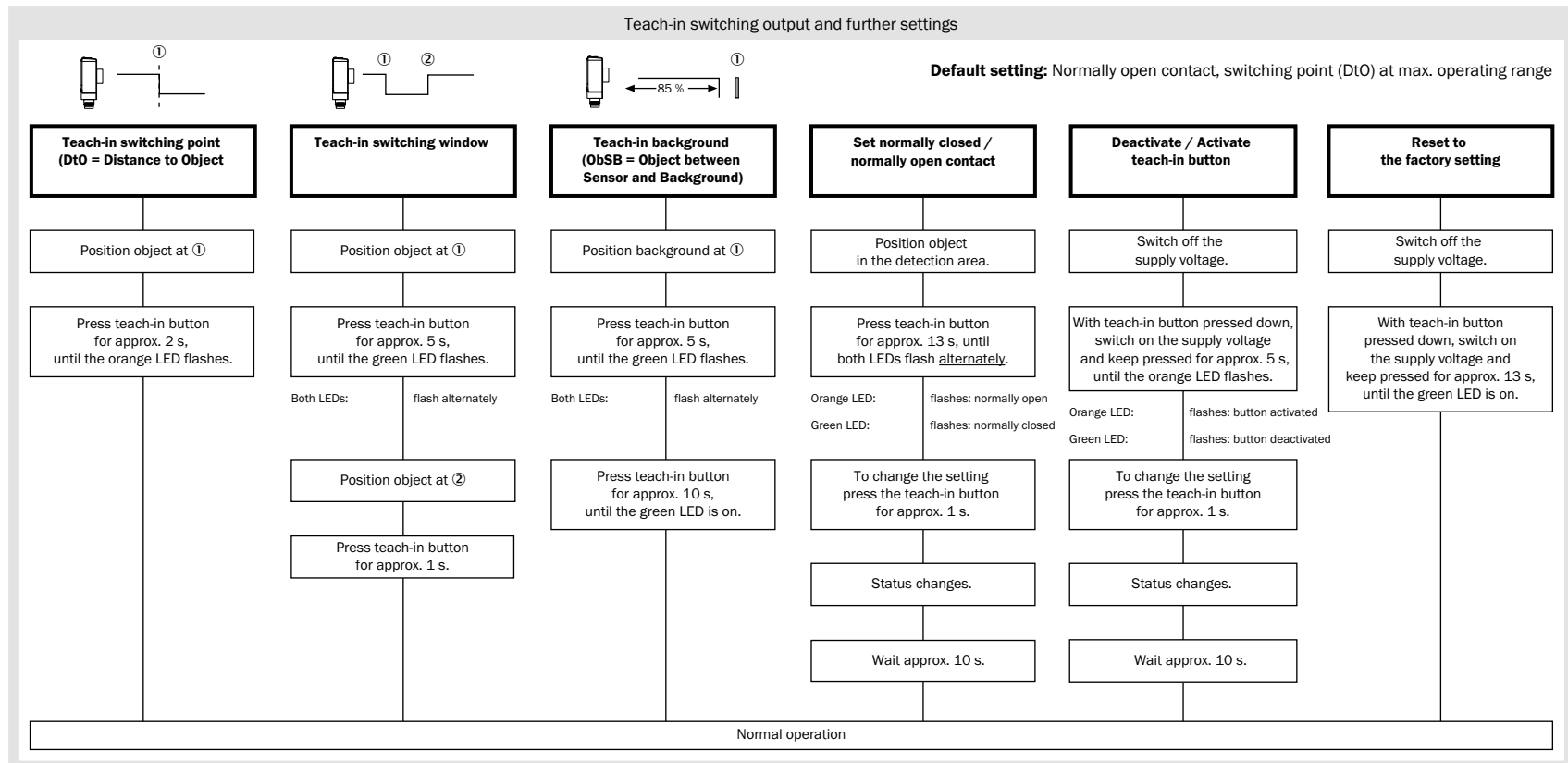


UC4-13xxx

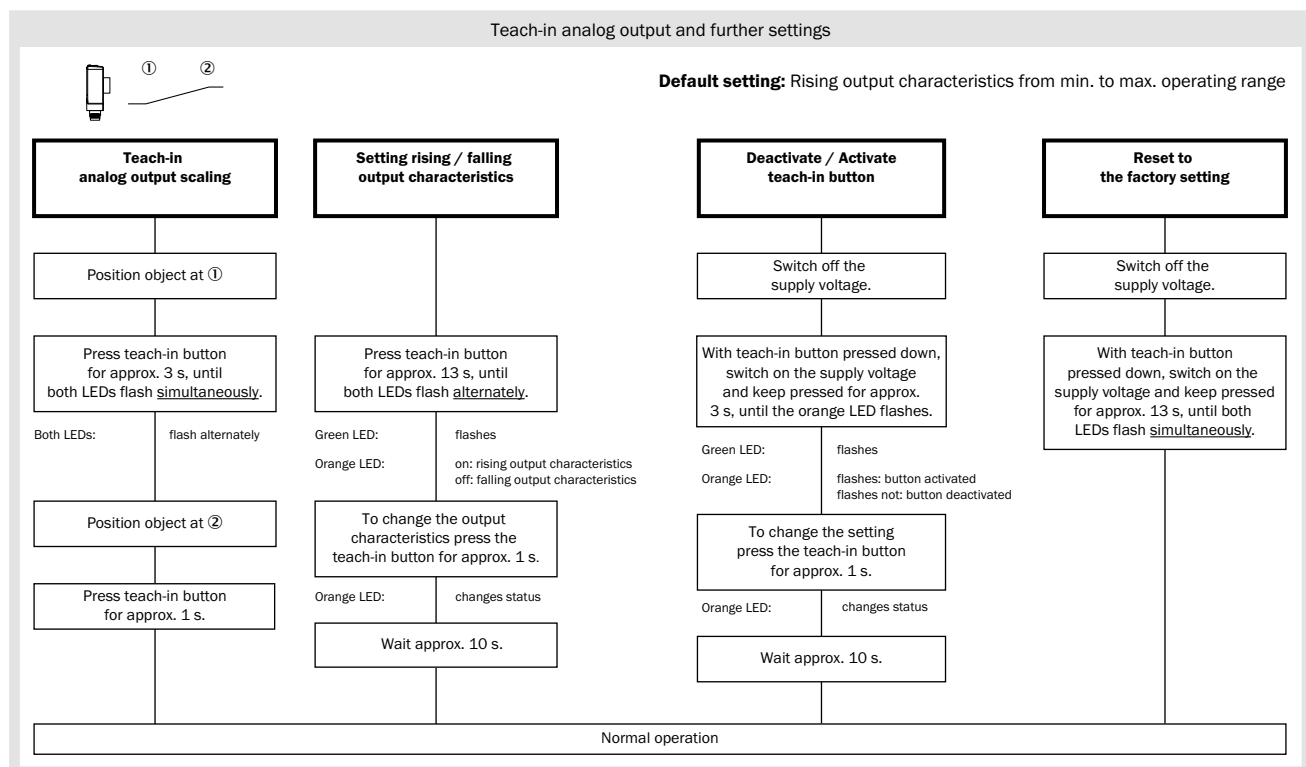


- ① Detection area depending on reflexion properties, size and alignment of the object
- ② Limiting range
- ③ Operating range
- ④ Example object: Aligned plate 100 mm x 100 mm
- ⑤ Example object: Pipe with diameter 10 mm

D Sensors with switching output



E Sensors with analog output



F Technical data

EN	UC4-11341	UC4-11345	UC4-13341	UC4-13345	UC4-13341S01	UC4-13345S02	UC4-1334A	UC4-1354A	UC4-13346	UC4-13347
Operating range ¹⁾	13 mm ... 100 mm		13 mm ... 150 mm		13 mm ... 150 mm		13 mm ... 150 mm		20 ... 150 mm	
Limiting range	150 mm		250 mm		250 mm		250 mm		250 mm	
Ultrasonic frequency (typically)	380 kHz		380 kHz		380 kHz		380 kHz		380 kHz	
Hysteresis	2 mm		2 mm		2 mm		2 mm		-	
Resolution	≥ 0.1 mm		≥ 0.1 mm		≥ 0.1 mm		≥ 0.1 mm		≥ 0.1 mm	
Repeatability	± 0.15 % referring to current measurement value		± 0.15 % referring to current measurement value		± 0.15 % referring to current measurement value		± 0.15 % referring to current measurement value		± 0.15 % referring to current measurement value	
Accuracy	± 0.17 %/K		± 0.17 %/K		± 0.17 %/K		± 0.17 %/K		± 0.17 % referring to current measurement value	
Supply voltage V _s ²⁾	DC 15 ... 30 V		DC 15 ... 30 V		DC 15 ... 30 V		DC 15 ... 30 V		DC 15 ... 30 V	
Power consumption (without load)	≤ 0.75 W		≤ 0.75 W		≤ 0.9 W		≤ 0.75 W		≤ 0.75 W	
Housing material	ABS plastic; Ultrasonic transducer: Polyurethane foam, glass epoxy resin									
Enclosure rating as per EN 60529	IP 67		IP 67		IP 67		IP 67		IP 67	
Protection class	III		III		III		III		III	
Connection type	Male connector, M8, 3-pin		Male connector, M8, 3-pin		Male connector, M8, 3-pin		Male connector, M8, 3-pin	Variants with 300 mm connection cable and male connector, M8, 3-pin	Male connector, M8, 3-pin	
Ambient temperature ³⁾	Operation: -25 °C ... +70 °C; Storage: -40 °C ... +85 °C									
Weight	10 g		10 g		10 g		10 g		10 g	
Analog output	Not available		Not available		Not available		Not available		4 mA ... 20 mA; RL ≤ 500 Ω 0 V ... 10 V; RL ≥ 100 kΩ	
Switching output	1 x PNP (200 mA) ^{4), 5)}	1 x NPN (200 mA) ^{4), 5)}	1 x PNP (200 mA) ^{4), 5)}	1 x NPN (200 mA) ^{4), 5)}	1 x PNP (200 mA) ^{4), 5)}	1 x NPN (200 mA) ^{4), 5)}	Push-pull: PNP / NPN (100 mA); IO-Link ^{4), 6)}		Not available	
Output time	8 ms		8 ms		5 ms		8 ms		8 ms	
Switching frequency	30 Hz		30 Hz		100 Hz		30 Hz		-	
Response time	24 ms		24 ms		10 ms		24 ms		24 ms ⁷⁾	
Initialization time	< 300 ms		< 300 ms		< 300 ms		< 300 ms		< 300 ms	
Temperature compensation	No		Yes		No		Yes		Yes	

¹⁾ Teach-in from 21 mm

²⁾ Limit values, reverse-polarity protected, operation in short-circuit protected network, max. 8 A.

³⁾ At operating temperatures of > 50 °C, the rear side of the UC4 must be installed with its surface flat against a bracket.

⁴⁾ Output Q, short-circuit protected

⁵⁾ PNP: HIGH = U_s - (2 V); LOW = 0 V / NPN: HIGH ≤ 2 V; LOW = V_s

⁶⁾ Push-pull PNP / NPN: HIGH = U_s - (< 3 V); LOW = < 3 V

⁷⁾ Subsequent smoothing of the analog signal, depending on the application, may increase the response time by up to 200 %