







Model Number

UC500-30GM70-IE2R2-K-V15

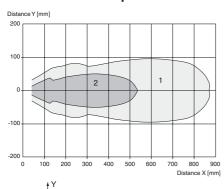
Ultrasonic diffuse sensor with separate transducer

Features

- Analog output 4 ... 20 mA
- · 1 switch output
- · Synchronization options
- Temperature compensation
- Can be parameterized via the ULT-RA-PROG-IR software and interface (accessories)

Diagrams

Characteristic response curve



Curve 1: flat surface 100 mm x 100 mm Curve 2: round bar, Ø 25 mm

Technical data

General Specifications	
Sensing range	45 500 mm
Adjustment range	50 500 mm
Unusable area	0 45 mm
Standard target plate	100 mm x 100 mm
Transducer frequency	approx. 300 kHz
Response delay	< 60 ms

Nominal ratings

Temperature drift $\leq \pm 1.5$ % of full-scale value

Time delay before availability $t_v \le 85 \text{ ms}$

Limit data

Permissible cable length max. 300 m

Indicators/operating means

LED yellow switching state switch output

LED green/yellow yellow: object in evaluation range

green: Teach-In
Potentiometer switch output adjustable

Electrical specifications

 $\begin{array}{ll} \mbox{Rated operating voltage U_e} & \mbox{24 V DC} \\ \mbox{Operating voltage U_B} & \mbox{20 ... 30 V DC (including ripple)} \end{array}$

Ripple \leq 10 % No-load supply current I₀ \leq 50 mA

Interface
Interface type Infrared

Mode point-to-point connection

Input/Output

Input/output type 1 synchronization connection, bidirectional (Factory setting: synchronized mode) / Teach-In input

 $\begin{array}{ll} \text{0 Level} & \leq 3 \text{ V} \\ \text{1 Level} & \geq 15 \text{ V} \\ \text{Input impedance} & \text{typ. } 900 \ \Omega \\ \text{Number of sensors} & \text{max. } 10 \end{array}$

Switching output

Output type 1 switch output PNP, NO (NC contact programmable)
Default setting 50 ... 500 mm (adjustable via potentiometer)

Repeat accuracy ± 0.5 mm

Operating current I_L 300 mA , short-circuit/overload protected Switching frequency ≤ 5 Hz

Switching frequency ≤ 5 Hz
Switching hysteresis 5 mm (programmable)

Voltage drop \leq 3 V

Off-state current ≤ 10 μA

Analog output

Output type 1 current output 4 ... 20 mA , ascending/descending

programmable

Default setting rising slope; evaluation limit A1: 50 mm; evaluation limit A2:

500 mm

Load resistor $\leq 500 \Omega$

Ambient conditions

Ambient temperature $-25 \dots 70 \,^{\circ}\text{C} \, (-13 \dots 158 \,^{\circ}\text{F})$ Storage temperature $-40 \dots 85 \,^{\circ}\text{C} \, (-40 \dots 185 \,^{\circ}\text{F})$ Shock resistance $30 \, \text{g} \, , 11 \,^{\circ}\text{ms}$ period

Vibration resistance 10 ... 55 Hz , Amplitude ± 1 mm

Mechanical specifications

Connection type Connector M12 x 1 , 5-pin

Protection degree IP65

Material

Housing brass, nickel-plated

Cable PVC

Transducer epoxy resin/hollow glass sphere mixture; polyurethane foam Installation position any position

Mass 190 g

Construction type Cylindrical

Construction type Cylindri Cable length 165 cm

directives
Standard conformity

Compliance with standards and

Standards EN 60947-5-2:2007

Standards EN 60947-5-2:2007 IEC 60947-5-2:2007

Approvals and certificates

UL approval cULus Listed, General Purpose CSA approval cCSAus Listed, General Purpose

CCC approval / marking not required for products rated

≤36 V



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Dimensions

74.4 10.5 88.5 3.3

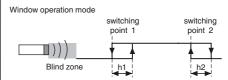
Additional Information

Analog output operating mode

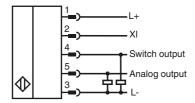
Rising ramp



Switching output operating mode



Electrical Connection



Pinout



Wire colors in accordance with EN 60947-5-2

1	BN	(brown
2	WH	(white)
3	BU	(blue)
4	BK	(black)
5	GY	(gray)

Accessories

BF 30

Mounting flange, 30 mm

BF 5-30

Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm

V15-G-2M-PUR

Female cordset, M12, 5-pin, PUR cable

V15-W-2M-PUR

Female cordset, M12, 5-pin, PUR cable

UC-18/30GM-IR

Interface cable

ULTRA-PROG-IR

Configuration software for ultrasonic sensors

BF 18

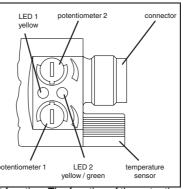
Mounting flange, 18 mm

Description of Sensor Functions

Displays and Controls

The sensor has two potentiometers and two display LEDs.

LED 1 (yellow)	On/off: Switching state of switching output Flashing: Error when setting the switching points (switching point 2 < switching point 1). This state only occurs in window function operating mode (2 switching points).	
LED 2 (yellow)	On/off: Object between evaluation limit A1 and evaluation limit A2 in the analog evaluation range.	
LED 2 (green)	approx. 500 ms on: Range limit taught in Off: Normal mode	
Potentiometer 1	Setting for switching point 1 of the switching output.	
Potentiometer 2	Setting for switching point 2 of the switching output	р



The potentiometer function described illustrates the default function. The function of the potentiometer can be altered using the ULTRA-PROG-IR software. As soon as a configuration has been changed, the potentiometer function selected using ULTRA-PROG-IR is activated.

Setting the Sensor Using the Potentiometers

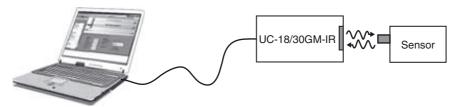
The sensor is equipped with two potentiometers. These potentiometers are assigned to the switching output by default. The switching output operates in window mode by default (2 switching points). Potentiometer 1 is used to set the near switching point of the switching window. Potentiometer 2 is used to set the distant switching point of the switching window.

Note:

The function of the potentiometer can be altered using the ULTRA-PROG-IR software. As soon as a configuration has been changed, the potentiometer function selected using ULTRA-PROG-IR is activated.

Parameterization via ULTRA-PROG-IR

In order to be able to set the sensor parameters and adjust the sensor to the respective application, the sensor is able to communicate with a PC via the integrated infrared interface. The UC-18/30GM-IR interface cable is required to allow communication via this method. This cable is connected to an unused USB port on the PC.



The ULTRA-PROG-IR parameterization software is also required for setting the sensor parameters. The ULTRA-PROG-IR software can be downloaded for free from the **www.pepperl-fuchs.com** website. The software allows all open parameters to be set, including:

- All trip points and switching hystereses
- Output modes and behaviors
- Delay times
- Settings and setting ranges of the potentiometer
- Settings for teach-in and synchronization
- Definition of blind zones
- Sensor modes and measurement methods
- Filtering measurement values

The following service functions are also available:

- Observing and recording measurement values
- Diagnosing interference reflections



Teach-in

The sensor is equipped with a function input (XI). In order to teach in a limit value, this sensor must be parameterized as the Teach-in input using the ULTRA-PROG-IR parameterization software. This parameterization software allows you to specify what limit value is taught in.

Note

The Teach-in function is not activated when the sensor is delivered.

Description of the Teach-in process:

- 1. Position an object at the required distance.
- 2. Connect the Teach-in input to L-.
 - The green LED lights up briefly after approx. 3 seconds. This indicates that the required distance has been successfully saved.
- 3. Disconnect the Teach-in input from L-.

Noto

If the Teach-in input remains connected to L-, the Teach-in process is repeated every 3 seconds.

Synchronization

The sensor features a function input (XI). Using the ULTRA-PROG-IR parameterization software, this function input can be configured as a synchronization input to suppress mutual interference from external ultrasonic signals. This is illustrated in the following description. If the synchronization input is not connected, the sensor operates with internally generated cycle pulses.

External synchronization

The sensor can be synchronized by applying external rectangular pulses. The pulse duration must be $\geq 100~\mu s$. Each rising pulse edge sends an individual ultrasonic pulse. If the signal at the synchronization input is high, the sensor reverts to the normal, unsynchronized operating mode. If a low signal is applied to the synchronization input, the sensor switches to standby. In this operating mode, the last recorded output statuses are retained.

Internal synchronization

Common mode operation

Up to ten sensors can be synchronized with each other. To do this, the synchronization inputs of the individual sensors are connected to each other. When configured in this state, all of the sensors send the ultrasonic signals together at the same time. The cycle rate corresponds to the cycle rate of the sensor with the lowest rate.

Multiplex mode

Up to ten sensors can work in multiplex mode; i.e. the sensors send their ultrasonic signals in succession. This prevents the sensor signals interfering with each other. In multiplex mode, the synchronization inputs of all sensors are connected to each other. An address must also be assigned to each sensor using the ULTRA-PROG-IR parameterization software, and the number of sensors to be synchronized must be determined. To start multiplex mode, all sensors are commissioned together by switching on the power supply.