Model Number

3RX4000-PF

PC interface

Function

With this PC interface and the corresponding software, you can adapt ultrasonic sensors of a specific series to the requirements of your application. It is also possible to configure multiple sensors simultaneously. The start and end of the detection range of a sensor can be stored and copied to other sensors at the press of a button.

Matching system components

SONPROG
Configuration software for ultrasonic sensors

Technical data

Electrical specifications		
Operating voltage	U_B	100 ... 240 V AC / 24 V DC
System requirements		
Hardware requirements		VGA , Serial interface RS 232
Ambient conditions		
Ambient temperature		-25 ... 70 °C (-13 ... 158 °F)
Storage temperature		-40 ... 85 °C (-40 ... 185 °F)
Mechanical specifications		
Mass		200 g
Dimensions		125 mm x 65 mm x 30 mm (l x w x h)

Description

General

The following parameters can be set for any suitable ultrasonic sensor:

- Start and end of the switching area
- Switching hysteresis
- Switching element function (NC or NO contact)
- Switching frequency
- Start and end of the analog characteristic
- Analog characteristic rising or falling
- End of the unusable area
- End of the sensing range
- Averaging
- Dampening

The following device functions can also be set:

- Multiplex function
- Temperature compensation
- Operating mode (diffuse mode sensor or retroreflective sensor)
- Level mode

The programmed values are saved in the non-volatile memory of the sensor and remain intact even without a connected interface or when the power supply is interrupted. The programmed values can be printed out for the plant documentation and saved on mass storage media. They are therefore available immediately for series applications or when replacing a sensor.

Delivery package

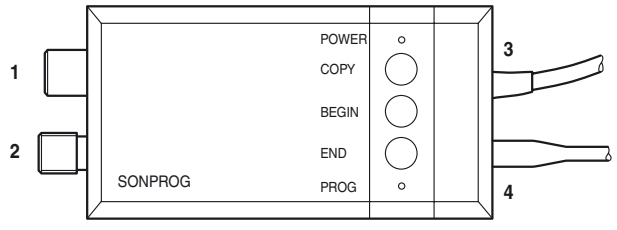
- PC interface with RS 232 cable.
- Extension cable with M12 male and female connectors.
- CD with “SONPROG for Windows”, multilingual.
- Power supply 230 V/115 V AC to 24 V DC.

Installing the software

The SONPROG PC software is installed by running the file “setup.exe” found on the enclosed CD. The SONPROG software is also available for download at http://www.pepperl-fuchs.com.

Connection

1. Connect the sensor to be programmed using the enclosed M12 extension cable to connection 1 of the interface.
2. Connect line 3, which is fixed to the interface, to the serial RS 232 interface (COM 1 or COM 2 of your PC). If the PC does not have a 9-pin SUB-D connector, any commercially available adapter can be used. If your PC does not have a serial RS 232 interface, you can connect the interface to a free USB port using a corresponding interface converter (see Accessories).
3. The power supply of the interface is provided either via the normal connecting cable of the sensor coming from the controller at connection 2 or via the enclosed plug-in power supply at connection 4.



Function keys

A detailed description of the function keys can be found in the file “ftasten.doc”.

COPY	Copy function. Copies settings from one sensor to other sensors.
BEGIN	Teaches in “Start switching area” and “Start analog value”.
END	Teaches in “End switching area” and “End analog value”.

Display LEDs

POWER	LED green, indicates supply voltage

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PROG LED red, status LED for function keys. Flashing LED indicates an error

Parameters

Switching area

The parameters “Start switching area” and “End switching area” define a window within the sensing range of the sensor. An object within the switching area activates the switching output (with NO function) If there is no object in the switching area, the output is inactive.

Hysteresis

With the variable hysteresis, the switch-on and switch-off points can extend to the limits of the switching area. This prevents possible fluttering of the switching output and provides an effective means of handling level tasks.

Switching element function

The switching output function set upon delivery of the sensor can be changed, e.g. NO to NC function.

Switching frequency

The sensor can be switched between normal switching frequency (see Technical Data) and fast switching frequency (triple value).

A sensor with fast switching frequency set has reduced noise immunity.

Analog distance measurement

Sensors with analog output can measure the distance to an object. The object distance is converted into a proportional analog signal (0 ... 10 V, 0 ... 20 mA or 4 ... 20 mA).

Unusable area

An object to be detected must not be in the unusable area. The unusable area is calculated from the time an ultrasonic sensor needs to switch from transmitter mode to receiver mode. Increasing the unusable area makes it possible to hide interfering objects at close range. The noise echo coming from such an object is suppressed by extending the unusable area and detection of the desired object is thus possible. Extension of the unusable area can lead to a reduction in the sensing range of the sensor. However, for effective noise echo suppression from close range, the noise echo must not be strong enough to produce multiple echoes. Multiple echoes would give the impression of a virtual object at a longer distance due to the area between the sensor and object to be suppressed being covered several times. This type of error cannot occur in normal operation mode, as only the first incoming echo is accepted as valid.

Sensing range

Reducing the sensing range can increase the resolution of the analog output. With very large sensing ranges, some values cannot be set in millimeter increments.

Averaging

Invalid reflection conditions or moving objects (e.g. moving liquids and bulk goods on conveyor belts) can lead to permanent changes in measured values and therefore unstable output states. You have the option of averaging up to 255 individual measurements. Signal failures (no object in the sensing range) are ignored when averaging. After each measurement, a new output value is provided immediately from the new measured value and corresponding number of old measured values. This does not extend the response time of the sensor. A delay only occurs at the end of the measurement if the object is removed from the sensing range. This delay corresponds to the measuring cycle time multiplied by the number of averages set.

Dampening

The sensitivity of the receiver amplifier is reduced by dampening. Low-reflective objects from the boundary region of the projection cone are suppressed. This results in the projection cone being electronically reduced. The values that can be set for dampening range from 0 (no dampening) to 7 (maximum dampening).

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