Operating manual crm+ Ultrasonic Sensors with one analogue output


Set sensor parameters alternatively numerically using LED-display...

- Using the LinkControl adapter (optional accessoary) all TouchControl and additional sensor parameter settings may be made by a Windows-Software.
- Synchronisation
  - If the assembly distances shown in fig. 1 for two or more sensors are exceeded the integrated synchronisation should be used. Connect Sync/Com-channels (pin 5 at the units respective) of all sensors (10 maximum).
  - \[ \begin{align*}
  \text{CRM+1:} & \quad \pm 0.35 \text{ m} \\
  \text{CRM+2:} & \quad \pm 0.40 \text{ m} \\
  \text{CRM+3:} & \quad \pm 1.10 \text{ m} \\
  \text{CRM+4:} & \quad \pm 2.50 \text{ m} \\
  \text{CRM+5:} & \quad \pm 8.00 \text{ m} \\
  \text{CRM+6:} & \quad \pm 18.00 \text{ m} \\
  \text{CRM+7:} & \quad \pm 30.00 \text{ m} \\
  \end{align*} \]

- Assembly instructions
  - Use the Teach-in procedure to adjust the defined operating range.
  - If the assembly distances shown in fig. 1 for two or more sensors are exceeded the integrated synchronisation should be used. Connect Sync/Com-channels (pin 5 at the units respective) of all sensors (10 maximum).

- Start-up
  - crm+ sensors are delivered factory made with the following settings:
    - Rising analogue characteristic
    - Rising analogue characteristic
    - Measurement range set to maximum range

- Multiplex mode
  - The Add-on menu allows to assign an individual address »01« to »10« to each sensor connected via the Sync/Com-channel (Pin5). The sensors will be used as a parallel measurement unit for each of them. (To use synchronised mode all sensors must be set to address »00«.)

- Notes
  - As a result of the design the assembly of PEKK film and PTFE joint ring is not gas-proof.
  - The chemical resistance has to be tested experimentally if necessary.
  - crm+ sensors have internal temperature compensation. Because the sensors heat up on their own, the temperature compensation reaches its optimum working point after approx. 30 minutes of operation.
  - If an object is within the set window margins of the analogue output, then LED D1 lights up green, if the object is outside the window margins, then LED D1 lights up red.
  - The load put to the analogue output is detected automatically when turning supply voltage on.
  - During normal mode operation, the measured distance value is displayed on the LED-indicator in mm (up to 999 mm) or cm (from 100 cm). Scale switches automatically and is indicated by a point on top of the digits. Alternatively a percentage scale may be set in the add-on menu.
  - In this connection 0% and 100% correspond to the set window margins of the analogue output.

- Operation
  - If no objects are placed within the detection zone the LED-indicator shows »00«. If no objects are placed within the detection zone the LED-indicator shows »00«.
  - If no push-buttons are pressed for 20 seconds during parameter setting mode the made changes are stored and the sensor returns to normal mode operation.

- Show parameters
  - Tapping push-button T1 shortly during normal mode operation shows »PAr« on the LED-display. Each time you tap push-button T1 the actual settings of the analogue output are shown.
**Useful additional functions in Add-on menu (for experienced users only, settings not required for standard applications)**

**Start here**

<table>
<thead>
<tr>
<th>Add-on</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>Key lock and factory setting</td>
</tr>
<tr>
<td>T2</td>
<td>Activate/deactivate TouchControl</td>
</tr>
<tr>
<td></td>
<td>Turn supply voltage OFF</td>
</tr>
<tr>
<td></td>
<td>Turn supply voltage ON</td>
</tr>
<tr>
<td></td>
<td>While pressing T1 turn supply voltage ON for ca. 15 s until &quot;E05/ST&quot; is displayed</td>
</tr>
<tr>
<td></td>
<td>To activate or deactivate press T1</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td>To activate or deactivate press T1</td>
</tr>
</tbody>
</table>

**Teach-in analogue output**

**Normal mode operation**

**Press T1 and T2 simultaneously for about 13 s until »Add« is shown in the LED-display**

**Note**

Changes in the Add-on menu may impair the sensor function. A6, A7, A8, A10, A11, A12 have influence on the response time of the sensor.

**Low power mode**

- C01: Display bright
- C02: Display dimmed
- C03: Display off

**Display mode**

- T1: Display in %, 100%
- T2: Display in mm or.

**Choose current/voltage output**

- T1: Current measuring value
- T2: Current measuring value

**Measurement filter**

- F00: No filter
- F01: Standard filter
- F02: Average filter
- F03: Foreground filter
- F04: Background filter

**Filter strength**

- T1: Minimum value: blind zone
- T2: Maximum value: nearwindow limit

**Response time**

- T1: Delay in seconds between the detection of an object and the output of the measured distance in case of absense as on-delay.
- T2: 0 s (no delay) up to 20 s response time

**Response time suppression**

- T1: Foreground suppression
- T2: Multiplex mode device addressing

**Multiplex mode highest address**

- T1: Multiplex mode
- T2: Measurement range

**Calibration display**

- T1: Put plane reflector vertically disposed in front of sensor.
- T2: Affects the size of the detection zone.

**Detection zone sensitivity**

- T1: »E01«: High
- T2: »E02«: Standard
- T3: »E03«: Slight

**Detection zone»**

- T1: Normal mode operation
### Technical Data

#### Analogue Output

<table>
<thead>
<tr>
<th>Area</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 x 500 mm</td>
<td>0.025 mm to 0.1 mm, depending on the analogue window</td>
</tr>
</tbody>
</table>

#### Resolution

- Plate (500 x 500 mm)
- 0.025 mm to 0.1 mm, depending on the analogue window

#### Detection Zones

- **Blind Zone**: 0 to 30 mm
- **Operating Range**: 250 mm
- **Maximum Range**: 400 mm
- **Angle of Beam Spread**: 320 kHz
- **Resolution**: 0.025 mm to 0.1 mm, depending on the analogue window

#### Analogue Windows

- **Plate**: 10 cm
- **Round Bar Ø27 mm**: 10 cm

#### Operating Voltage

- **U**: 9 V to 30 V DC, short-circuit-proof
- **B**: 80 mA

#### Class of Protection to EN 60529

- **IP 67**

#### Housing

- Stainless steel 1.4571, plastic parts: PBT, TPU;
- Ultrasonic transducer: PEEK film, PTFE
- Epoxy resin with glass content

#### Controls

- 2 push-buttons (TouchControl)

#### Housing Information

- **Housing**: Stainless steel 1.4571, plastic parts: PBT, TPU;
- Ultrasonic transducer: PEEK film, PTFE
- Epoxy resin with glass content

#### Technical Specifications

- **Order No.**
  - crm+25/IU/TC/E
  - crm+35/IU/TC/E
  - crm+340/IU/TC/E
  - crm+600/IU/TC/E

#### Electrical Specifications

- **Current Output**: 4 to 20 mA
- **Voltage Output**: 0 to 10 V

#### Operating Temperature

- **-40°C to +85°C**

#### Storage Temperature

- **-40°C to +45°C**

#### Response Time

- **32 ms**

#### Weight

- **150 g**

#### Technical Changes

The content of this document is subject to technical changes. Specifications in this document are presented in a descriptive way only. They do not warrant any product features.