Translation of the original instructions

1 Safety Instructions

Read these operating instructions thoroughly before putting the device into operation and keep them for future reference. This product is designed to be mounted above an overhead pedestrian door. Do not use this product other than for its specified application. Only trained and qualified personnel may install and initialize the device. Failure to follow these safety precautions may cause damage to sensor or objects, serious personal injury, or death. It is the responsibility of the equipment installer to carry out a risk assessment and to install the system, in compliance with applicable local, national and international regulations, safety standards, codes and laws as well as the Machinery Directive 2006/42/EC, should this apply. Always consider the safety functions of your applications as a whole, never just in relation to one individual section of the system. The sensor should only be operated from a safety extra low voltage (SELV) system with safe electrical separation according to EN 61558. The wiring must be protected against mechanical damage. Avoid touching any electronic components.

2 Description of the Sensor

<table>
<thead>
<tr>
<th>Article</th>
<th>Direction recognition (ES = energy saving)</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Merkur 2 ES</td>
<td>Yes (can be deactivated)</td>
<td>Plug-in screw terminal</td>
</tr>
<tr>
<td>Merkur 2 ES.C</td>
<td>Yes (can be deactivated)</td>
<td>RJ connector</td>
</tr>
<tr>
<td>Merkur 2</td>
<td>No</td>
<td>Plug-in screw terminal</td>
</tr>
<tr>
<td>Merkur 2 C</td>
<td>No</td>
<td>RJ connector</td>
</tr>
</tbody>
</table>

3 Installation

3.1 Installation instructions

- The sensor must be mounted on a flat surface (avoid vibrations)
- The sensor must be protected from rain and snow
- Objects (e.g. plants, flags, fans etc.) must not extend into the detection area
- The sensor must not be obscured by covers/signs
- Fluorescent tubes should not be placed in the immediate vicinity of the detection area

4 Displays on the Sensor

Start-up phase

<table>
<thead>
<tr>
<th>Red LED</th>
<th>Lights up during startup for 3 s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green LED</td>
<td>Afterwards, the green LED flashes a few times and indicates the software version (the sensor is already functional and programmable)</td>
</tr>
</tbody>
</table>

Configuration

| Green LED        | Indicates parameter or parameter level through frequency of flashing (with key configuration) |
|------------------|---------------------------------------------|--------------------------------|
|                  | Flashes briefly:                           |                              |
|                  | When key configuration mode is exited      |                              |
|                  | When the sensor has received the command from the remote control |

Operation

<table>
<thead>
<tr>
<th>LED red</th>
<th>Lights up in the event of detection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green LED</td>
<td>Lights up when SMD is active</td>
</tr>
</tbody>
</table>
5 Sensor Configuration

The sensor can be configured in two ways:

→ With keys on the sensor (basic settings)
→ With the remote control (complete setting options)

5.1 Configuration with keys

### General procedure

1. Keep [>] and [<] pressed for a corresponding length of time, every 2 s the green LED will flash once
2. Frequency of the flashing green LED (1–9 times) indicates current parameter level
3. The parameter level can be decreased or increased with [>] and [<] respectively
4. Press [>] and [<] briefly to exit the programming mode (settings are saved)

### Changing the field size: Press [>] and [<] for 2 s

<table>
<thead>
<tr>
<th>Level</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>small</td>
<td>1, 2, 3</td>
</tr>
<tr>
<td>medium</td>
<td>4, 5, 6*</td>
</tr>
<tr>
<td>large</td>
<td>7, 8, 9</td>
</tr>
</tbody>
</table>

### Changing the functionality: Press [>] and [<] for 4 s

For Merkur version with direction recognition

<table>
<thead>
<tr>
<th>Level</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1*</td>
<td>forwards, mounting height standard</td>
</tr>
<tr>
<td>2</td>
<td>forwards, mounting height high</td>
</tr>
<tr>
<td>3</td>
<td>backwards, mounting height standard</td>
</tr>
<tr>
<td>4</td>
<td>backwards, mounting height high</td>
</tr>
<tr>
<td>5</td>
<td>direction recognition OFF, mounting height standard</td>
</tr>
<tr>
<td>6</td>
<td>direction recognition OFF, mounting height high</td>
</tr>
<tr>
<td>7</td>
<td>forwards + MTO, mounting height standard (MTO, see chap. 7)</td>
</tr>
<tr>
<td>8</td>
<td>forwards + MTO, mounting height high (MTO, see chap. 7)</td>
</tr>
</tbody>
</table>

For Merkur version without direction recognition

<table>
<thead>
<tr>
<th>Level</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1*</td>
<td>mounting height standard</td>
</tr>
<tr>
<td>2</td>
<td>mounting height high</td>
</tr>
</tbody>
</table>

### Changing the field geometry: Press [>] and [<] for 6 s

<table>
<thead>
<tr>
<th>Level</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>narrow field</td>
</tr>
<tr>
<td>2*</td>
<td>wide field</td>
</tr>
</tbody>
</table>

### Restore factory settings: Press [>] and [<] for 8 s

**Example**

Changing the functionality from level 6 to level 2:

1. Keep [>] and [<] pressed for 4 s, the green LED blinks once after 2 s, once again after 4 s
2. Green LED flashes 6 times and thereby indicates the current parameter level
3. Press the key [>] four times in a row to decrease the parameter level (green LED flashes twice and indicates the new parameter level)
4. Press [>] and [<] at the same time

**Note:**

If no key is actuated for 25 s, the programming mode is automatically exited – however the sensor is still in the configuration mode. The settings made up to that point are saved.

5.1.1 Status query with keys

The status query is to find out what parameters have been set.

### Parameter | Step 1 | Step 2
--- | --- | ---
Field size | Press [<] briefly | Frequency of the flashing green LED (1–9 times) indicates the current parameter level
Functionality | Press [>] briefly | |
Field geometry | Press [<] and [>] at the same time | |

### Setting / changing parameters

After the connection has been successfully established, the parameters of the sensor can be changed.

- **G** and one of the keys 1 to 4 light up: Connection successfully established
- **G flashes:** Connection not established
  → Activate configuration mode
  → Hold remote control closer to the sensor and point directly at it
  → Check batteries in remote control
- **No keys light up:** Check/replace batteries in remote control

**Note:**

If no entry is made for 30 s, the connection is ended. The settings made up to that point are saved.

5.2 Configuration with remote control

5.2.1 Sensor addressing

Each sensor can be assigned an address (1*, 2, 3 or 4). Different addresses are necessary when several sensors are within the range of a remote control.

### Mode of operation

**Activation:**

→ Automatically after the sensor is connected to the supply voltage or
→ Briefly disconnect the sensor from the supply voltage or
→ Press either key [>] or [<] on the sensor

**Exiting:**

→ Press key [2] + [3] combination or
→ Automatically after 30 min.

**Establishing the connection**

**Without addressing:**

1. Press the [Start] key
2. Press either key [>] or [<] on the sensor
3. Keep [>] and [<] pressed for 4 s, the green LED blinks once after 2 s,
4. Press the corresponding numerical key (1 to 8)

**With addressing:**

1. Cover the IR interface of the remote control with your hand
3. Release the IR interface (remove hand)
4. Press the corresponding numerical key (1 to 8)

→ **G** and one of the keys 1 to 4 light up: Connection successfully established
→ **G** flashes: Connection not established
  → Activate configuration mode
  → Hold remote control closer to the sensor and point directly at it
  → Check batteries in remote control
→ **No keys light up:** Check/replace batteries in remote control

**Note:**

If no entry is made for 30 s, the connection is ended. The settings made up to that point are saved.

### 5.2.3 Setting / changing parameters

After the connection has been successfully established, the parameters of the sensor can be changed.

- **G** + [1] Keep the door open manually for 15 min. when making settings.
  Afterwards, the door will close if no object is in the detection area
- **G** + [2] Door closes when no object is in the detection area, afterwards standard operation
- **G** + [3] Configuration mode is ended, door closes when no object is in the detection area, afterwards standard operation

* Factory setting
**Enhanced functions**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Key code</th>
<th>Standard</th>
<th>Pavement</th>
<th>Retirement home</th>
<th>Entry hall</th>
<th>Supermarket</th>
<th>High mounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON, forwards</td>
<td>C+ D+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ON, forwards</td>
<td>C+ D+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OFF</td>
<td>C+ D+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OFF</td>
<td>C+ D+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>C+ D+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Narrow field</td>
<td>C+ D+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wide</td>
<td>C+ D+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Direction recognition**: Merkur 2 ES

- **Field size**: Merkur 2
- **Relay hold interval**: Merkur 2
- **Output signal**: Merkur 2
- **SMD function**: Merkur 2
- **Mounting height**: Merkur 2
- **Cross traffic**: Merkur 2
- **Interference suppression**: Merkur 2
- **SMD field size**: Merkur 2
- **Field geometry**: Merkur 2

**Configuration of individual parameters**

<table>
<thead>
<tr>
<th>Key code</th>
<th>Parameter</th>
<th>Level</th>
<th>Short description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Enhanced functions</td>
<td>1*–6</td>
<td>Predefined settings for standard applicants (see table)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Direction recognition</td>
<td>1 2 3 4</td>
<td>1: Off, 2: Backwards, 3: Forwards, 4: Forwards with MTO (see chap. 7)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F+ D+</td>
<td>Mounting height</td>
<td>2*</td>
<td>High (3–4 m) Standard (up to 3 m)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F+ D+</td>
<td>Field geometry</td>
<td>1 2*</td>
<td>Narrow field Wide field</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Field size</td>
<td>1 2 3 4</td>
<td>1: Small, 2: Medium, 3: Large</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F+ D+</td>
<td>Relay hold interval</td>
<td>1 2 3 4 5</td>
<td>1: 0.5 s, 2: 0.8 s, 3: 1.0 s, 4: 1.5 s, 5: 2.0 s</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F+ D+</td>
<td>Output signal</td>
<td>1 2*</td>
<td>1: Active, 2: Passive</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F+ D+</td>
<td>SMD function</td>
<td>1 2 3 4 5</td>
<td>1: Decreasing sensitivity, 2: 0.5 s, 3: 1.0 s, 4: 1.5 s, 5: 2.0 s</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F+ D+</td>
<td>SMD field size</td>
<td>1 2 3 4</td>
<td>1: Small, 2: Medium, 3: Large</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F+ D+</td>
<td>CTM (cross traffic masking)</td>
<td>1 2 3 4</td>
<td>1: Off, 2: Low, 3: Medium, 4: High</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F+ D+</td>
<td>Filter for interference suppression</td>
<td>1 2*</td>
<td>1: On, 2: Off</td>
</tr>
</tbody>
</table>

**Explanation of individual parameters**

- **Field size** / **Field geometry**: Depending on the field geometry (wide/narrow field), the field size can be set correspondingly.

**Narrow field**:

- Min. 0.7 x 0.6 m (WxD)
- Max. 2.7 x 1.7 m (WxD)

**Wide field**:

- Min. 1.1 x 0.6 m (WxD)
- Max. 4.7 x 1.7 m (WxD)

Specified values measured with mounting height 2.2 m and inclination angle 35°.

**SMD function**: SMD = Slow motion detection. Very small (quasi-static) movements are detected as soon as the sensor is activated. Only when no more movements are registered during the set monitoring period does the sensor relay the corresponding signal to the door controller. The sensitivity during this monitoring period can be set to decreasing or constant.

**SMD+:** Triggers the sensor when very slow movements occur. In this way, even objects < 5 cm (35° inclination angle) that are not detected with the normal detection area are reliably identified (retirement home setting). In order to prevent the door from being kept open too long, the SMD+ field is half as large as the detection area.

**SMD field size**: The SMD field sizes approximately correspond to those of the detection area, i.e. B+C+D+ = B+C+D+.

**Cross traffic masking CTM**: The CTM prevents a door from being inadvertently opened by people who only walk past it but do not want to enter.

**Status query with remote control**

The status query is to find out what parameters have been set. For this to take place, the connection to the sensor has to be established and the corresponding key code has to be entered. Next, a numerical key lights up that indicates the respective parameter level.

* Factory setting
6  **Mechanical Settings of the Microwave Field**

### 6.1  Tilting the microwave module

- **Symptom:** Door reverses
  - **Possible cause:** Sensor sees door
  - **Remedy:** Change the inclination angle of the radar module

- **Symptom:** Door reverses
  - **Possible cause:** Sensor sees swing door
  - **Remedy:** Install sensor higher and if possible directly above the door hinge

- **Symptom:** Door opens inadvertently
  - **Possible cause:** Interference source affects microwave field (e.g. fluorescent tubes)
  - **Remedy:** Activate the interference suppression filter

- **Symptom:** Door does not open – sporadic non-detection of an individual
  - **Possible cause:** Large group of persons approaching
  - **Remedy:** Activate the special filter function MTO (Mass Traffic Optimisation)

- **Symptom:** Late detection or non-detection of persons
  - **Possible cause:** Field too small
  - **Remedy:** Check field size

- **Symptom:** Late detection or non-detection of persons
  - **Possible cause:** Installation too high
  - **Remedy:** Activate high mounting height

Refer to chapter:
- 6.1.1
- 5.2.3
- 6.1.1
- 5.2.3
- 6.1.1
- 5.2.3
- 5.2.3
- 5.2.3

### 6.2  Swivelling the microwave module

- **Symptom:** Door reverses
  - **Possible cause:** Sensor sees door
  - **Remedy:** Change the inclination angle of the radar module

- **Symptom:** Door reverses
  - **Possible cause:** Sensor sees swing door
  - **Remedy:** Install sensor higher and if possible directly above the door hinge

- **Symptom:** Door opens inadvertently
  - **Possible cause:** Interference source affects microwave field (e.g. fluorescent tubes)
  - **Remedy:** Activate the interference suppression filter

- **Symptom:** Door does not open – sporadic non-detection of an individual
  - **Possible cause:** Large group of persons approaching
  - **Remedy:** Activate the special filter function MTO (Mass Traffic Optimisation)

- **Symptom:** Late detection or non-detection of persons
  - **Possible cause:** Field too small
  - **Remedy:** Check field size

- **Symptom:** Late detection or non-detection of persons
  - **Possible cause:** Installation too high
  - **Remedy:** Activate high mounting height

Refer to chapter:
- 6.1.1
- 5.2.3
- 6.1.1
- 5.2.3
- 6.1.1
- 5.2.3
- 5.2.3
- 5.2.3

### 8  Technical Data

**Technology**

- **Transmitting frequency:** 24.125 GHz
- **Transmitting power:** < 20 dBm
- **Operating voltage:** 12–38 V DC / 12–28 V AC, 50 Hz
- **Operating current:** approx. 50 mA at 24 V DC, 24° C
- **Temperature range:** -20° C to + 60° C
- **Air humidity:** max. 80% relative, non-condensing
- **Mounting height:** max. 4 m
- **Relay output:** Potential-free changeover contact
- **Switching voltage:** max. 48 V AC/DC

**Switching current**

<table>
<thead>
<tr>
<th>Switching capacity</th>
<th>max. 0.5 A AC / max. 1 A DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>max. 60 VA / max. 30 W</td>
<td></td>
</tr>
</tbody>
</table>

**Housing**

- **Cover:** PC; floor plate: ABS
- **Dimensions (W x H x D):** 176 x 62 x 52 mm
- **Weight:** 150 g (without cable)
- **Protection class (EN 60529):** IP54
- **Min. detection speed:** 5 cm/s (in sensor axis)
- **< 5 cm/s with SMD+ (inclination angle 35°)
- **Cable length:** 3 m

### 9  EU Declaration of Conformity

See attachment

### 10  WEEE

Devices with this symbol must be treated separately during disposal. This must be done in accordance with the laws of the respective countries for environmentally sound disposal, processing and recycling of electrical and electronic equipment.

### 11  FCC approval

This device meets the requirements of Part 15 of the FCC regulations and the RSS-210 standard of Industry Canada.

**Warning:** Changes or modifications made to this device may void the FCC authorisation to operate this device.

### 12  Contact

**BBC Bircher Smart Access, BBC Bircher AG, Wiesengasse 20, CH-8222 Beringen, www.bircher.com**

Designed in Switzerland / Made in Bulgaria