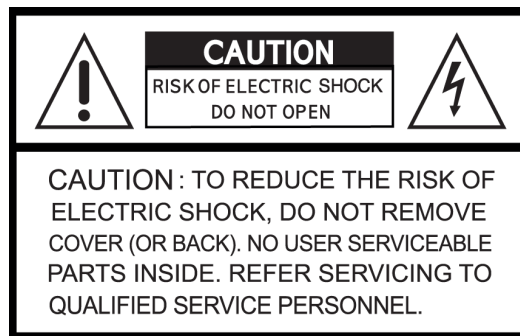# Dual-Way Motion Detector

User Manual

Introduction

Thank you for purchasing the KATHREIN Digital Systems GmbH dual-way motion detector. Please take the time to read the following safety and installation information carefully and attentively before using the dual-way motion detector. It is imperative to comply with these instructions in order to ensure the safe operation of the device. If you have any further questions, please contact your local retailer or KATHREIN Digital Systems GmbH directly. Your dual-way motion detector was developed and built with state-of-the-art technology and complies with European and German standards.

Please keep this manual safe to be able to answer possible questions in the future. The manual is an integral part of the product even in case it is resold to a third party.

Disclaimer

All technical details and descriptions in this manual were compiled with the greatest care. However, KATHREIN Digital Systems GmbH cannot entirely exclude mistakes in this manual. Therefore, we do not assume any legal responsibility or liability resulting from wrong information in this manual. Descriptions, technical illustrations and technical data are subject to change without notice according to technical progress. In addition, KATHREIN Digital Systems GmbH reserves the right to change the product and the manual without prior notice. We do not assume any guarantee with regard to the content of this document. We appreciate any comments on mistakes or inaccuracies which may help us to improve this product and this manual.

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        ┌──────────────────────────────────┐
        │  ⚠    ┌──────CAUTION──────┐    ⚡  │
        │       │ RISK OF ELECTRIC SHOCK │       │
        │       │     DO NOT OPEN    │       │
        │       └──────────────────┘       │
        ├──────────────────────────────────┤
        │ CAUTION : TO REDUCE THE RISK OF   │
        │ ELECTRIC SHOCK, DO NOT REMOVE     │
        │ COVER (OR BACK). NO USER SERVICEABLE │
        │ PARTS INSIDE. REFER SERVICING TO  │
        │ QUALIFIED SERVICE PERSONNEL.      │
        └──────────────────────────────────┘
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⚡ This symbol is intended to attract the user's attention to the potential risk of dangerous unprotected voltage inside the housing. This may lead to electric shock.

⚠ This symbol is intended to attract the user's attention to user and maintenance instructions in the manual and documents enclosed with the product.

WARNING:

TO MINIMISE THE RISK OF ELECTRIC SHOCK, YOU MUST NOT EXPOSE THIS PRODUCT TO WET AND MOIST CONDITIONS AT ANY TIME.

All KATHREIN Digital Systems GmbH products are lead-free and meet the requirements stated under the European Directive on the Restriction of Hazardous Substances (RoHS). This guarantees that the entire production process and the product itself are free of lead and of all listed hazardous substances.

This product was tested and complies with the regularities for a class of digital devices stated under FCC part 15. These limits were specified to provide reasonable protection against harmful exposure when operating the device in a commercial environment. This product generates, uses and may emit radio energy. It may in addition interfere with other radio communication systems if not installed or used according to this manual. Using the device in residential areas may cause disturbances to be possibly remedied at the user's expense.

Hereby KATHREIN Digital Systems GmbH declares that the dual-way motion detector FBM 100-2 (order number 2220000005, EAN 4021121548826) is in conformity with the relevant provisions of Directive 1999/5/EG.

Conformity:

The declaration of conformity is available at http://www.kathrein-ds.com in the download section of the respective product. Alternatively, you can request the declaration of conformity directly from us:
KATHREIN Digital Systems GmbH
Anton-Kathrein-Str. 1–3
83022 Rosenheim, Germany

Important Safety Information

The dual-way motion detector FBM 100-2 is equipped with a high-quality housing. However, please observe the following safety instructions:

- Operate the dual-way motion detector only with the provided batteries.
- Handle the dual-way motion detector with care, heavy vibration or bumps may damage the device.
- Do not expose the dual-way motion detector to direct sunlight or strong heat, e.g. heaters.
- Do not install the dual-way motion detector close to strong electric power lines or magnetic fields, as this may impair the transmission quality significantly.
- Do not install the dual-way motion detector directly on iron or aluminium surfaces, as this may impair the wireless transmission significantly. Use a non-conducting material to insulate the device from the installation surface.
- Do not install the dual-way motion detector in moist, very cold or very hot environments. Please observe the maximum humidity and temperature limits (-10 °C to +45 °C (14 °F to 113 °F), maximum 95% relative humidity).
- Persons (including children) with limited physical, sensory or mental abilities and/or lacking experience and/or knowledge must not use this product.
- Keep children away from the product and other connected electrical appliances at all times. The dual-way motion detector includes small parts they can swallow. Lay cables expertly so that they are neither bent nor otherwise damaged. Install the dual-way motion detector out of children's reach. Do not leave packaging materials unattended, as they may be dangerous for playing children.
- Use a damp cloth to clean the dual-way motion detector's surface, then dry it. Cleaning agents will damage the surface.

Malfunctions and Defects

If you notice any kind of defect, remove the batteries from the dual-way motion detector FBM 100-2 and contact your retailer or KATHREIN Digital Systems GmbH directly. Any further usage of the system may lead to fire or electric shock!

Intended Use

The KATHREIN Digital Systems GmbH dual-way motion detector detects changes in the temperature field and microwave field. It alerts you if it is triggered by any kind of movement. Install the dual-way motion detector indoors only. Any other use than that described in this manual is not permitted and will void any warranty or guarantee as well as liability claims. The same applies if the device is modified or retrofitted.

Disposal

Do not dispose of the device with domestic waste!

This product complies with the EU Directive on waste electrical and electronic equipment (WEEE) and therefore must not be disposed of with domestic waste. Dispose of the device via your local collection point for waste electronic equipment!

This product contains software programs subject to the GPL free software license.

This product contains software that was developed by third parties and/or software subject to the GNU General Public License (GPL) and/or the GNU Lesser General Public License (LGPL). We will send you the source code of these programs on request. The GPL and/or LGPL code used and offered in this product is EXCLUSIVE OF ANY GUARANTEE WHATSOEVER and is subject to the copyright of one or several authors. For further details, please refer to the GPL and/or LGPL code of this product and to the terms of use of GPL and LGPL.

You can read the complete license text at http://www.gnu.org/licenses/gpl-2.0.html. For an unofficial German translation, please go to

http://www.gnu.de/documents/gpl.de.html.

Dual-Way Motion Detector FBM 100-2

Product description:
The dual-way motion detector prevents false alarms due to a double motion detection method – PIR and microwave detection. An alarm is only triggered if both methods detect a motion.

The FBM 100-2 has a front and a back. The main board is located on the front panel and can be used to make various settings/adjustments. The back can be attached to either flat surfaces or corners using one of the two brackets supplied. Open the sensor by pressing a tool (e.g. a screwdriver) into the plastic notch at the bottom.

Sensor data:
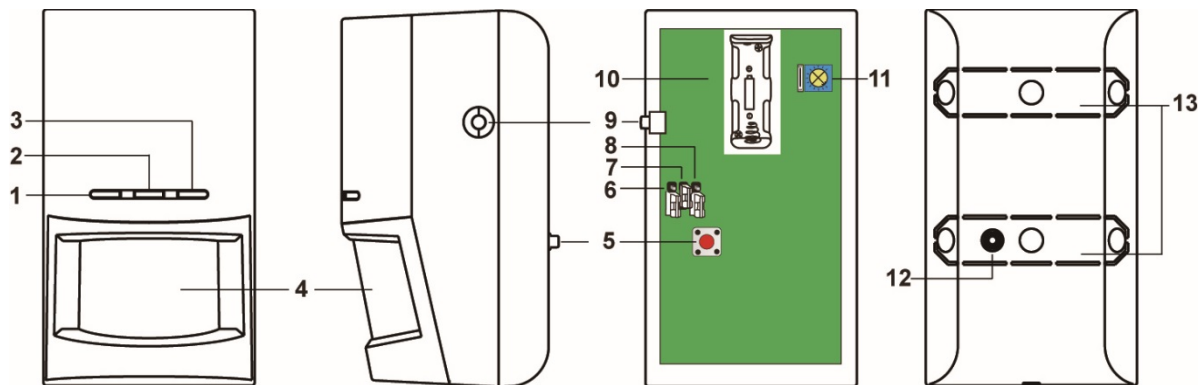|	
Dimensions (without mount):	6,33 x 11,25 x 6,2 cm (2.49 x 4.29 x 2.44 in)
Weight:	141 g (0.31 lbs)
Place of installation:	Only indoors (walls and corners)
Operating temperatures:	-10 °C to +45 °C (14 °F to 113 °F)
Humidity:	Maximum 95% (non-condensing)
Microwave frequency:	10.525 GHz
Radio frequency:	868.6375 MHz

1. **IR motion detection LED (green)**
   In test mode, the LED lights up with every motion detected by the IR sensor.

2. **Microwave detection LED (blue)**
   In test mode, the LED lights up with every motion detected by the microwave sensor.

3. **Transmitter LED (red)**
   The LED flashes upon every transmission in test mode, in case of a low battery, and if the tamper contact is opened.

4. **Sensor**

5. **Tamper contact**

6. **JP 1**
   Jumper 1 is reserved. (No function).

7. **Activate/deactivate supervisor jumper switch 2 (JP2)**

	Jumper On		Jumper Off
	The jumper bridges the two pins.		The jumper is removed or is on one pin only.

   The supervisor mode is deactivated with Jumper 2 set to **ON**.
   The supervisor mode is activated with Jumper 2 set to **OFF (default setting)**.

8. **Activate/deactivate microwave test jumper switch 3 (JP3)**
   - The PIR/microwave sensor is in microwave test mode with jumper 3 set to **ON** (see **microwave test mode below**).
   - The microwave test mode is deactivated with Jumper 3 set to **OFF (default setting)**.

9. **Learn/test button**
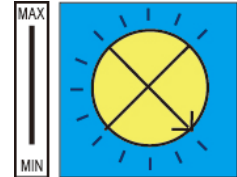   Press this button to add the PIR/microwave sensor to the alarm panel or to start the three-minute test mode.

10. **Battery compartment**
    A 3 V Lithium battery is required – model 1 CR123A.

11. **Microwave range controller**
    The arrow indicates the selected detection range:
    - Turn the arrow **clockwise** to increase the detection range (maximum 0–15 m)
    - Turn the arrow **counterclockwise** to reduce the detection range (minimum 0–5 m)
    - The default setting is **minimum**.

12. **Tamper contact**
    The tamper contact presses against the mount on the back. If the PIR/microwave motion detector is properly mounted, the tamper contact is closed. As soon as the tamper contact opens, the sensor transmits a tamper alarm to the alarm panel and the transmitter LED lights up.

13. **Installation notch / rated break point**
    The PIR/microwave sensor has two predetermined break points intended to break upon attempted tampering and to trigger the tamper alarm. They are located at the notches for the screws and will break if someone attempts to manipulate the dual way motion detector.

Battery:
If you need to change the battery, be aware that upon opening the dual way motion detector a tamper alarm might be triggered (depends upon your settings). After you have removed the empty batteries, press the learn button two times in order to discharge any residual current. Then insert the new batteries.

Putting the dual-way motion detector FBM 100-2 into operation

1. Open the detector, insert the provided battery and close the detector again.
2. The device starts. This process takes about 30 seconds. Wait until the LEDs stop flashing and avoid triggering the detector during that time!
3. Open the configuration menu of the alarm panel and then the menu "Sensors" → "Add". Press "Start".
4. Press the Learn button of the detector once. The menu should list the PIR/microwave motion detector after a short while. Press "Add" to complete the connection process.
5. Start the range mode of the alarm panel to check whether the motion detector is in range at the intended location.
6. For that purpose, take the motion detector to the intended place of installation and press the learn button of the motion detector. The menu of the alarm panel indicates the signal strength. The higher the indicated number the better the reception (1–9).

Range test:

To test the signal strength at the desired installation location, perform a range test.

1. Open the alarm panel menu "Sensors" → "Range" and press "Start".
2. Press the Learn button of the dual-way motion detector.
3. The sensor and the signal strength should be indicated. The higher the indicated number the better the reception (1–9).
4. Click "Stop" to end the test.

Please note:

If there is no signal at the installation location or the signal strength is below 4 or frequently falls below this level (signal fluctuations of 2 to 3 are normal), we recommend using a repeater to improve the signal.

Motion detection:

- An alarm is only triggered if the PIR and the microwave sensor detect a motion.
- If the range controller is set to maximum, the detection range is about 15 meters, provided the motion detector is installed at a height of 1.9 to 2.0 meters (vertical to the wall).
- If the range controller is set to minimum, the detection range is about 3 to 5 meters, provided the motion detector is installed at a height of 1.9 to 2.0 meters (vertical to the wall).
- Directly underneath the dual way motion detector is a blind spot. We advise to use two motion detectors in order to secure this spot as well.

Test mode:

By pressing the learn button for a few seconds, you can start the test mode of the PIR/microwave motion detector. The standby mode is disabled while the test mode runs. The respective LED will light up with every motion detected.

Microwave test mode:

To adjust the optimal sensitivity/range of the microwave sensor, you can start the test mode exclusively for the microwave detection. For that purpose, set jumper 3 (JP3) to ON.

While the microwave test mode is enabled, the microwave LED lights up for 0.5 seconds upon every detected motion. Any further detection extends the duration by 0.5 seconds.

Installation:

You can install the PIR/ microwave motion detector on flat surfaces as well as in corners:

- **Mounting on flat surface:**
  To mount the detector on a flat surface, use the mount with the swivel ball head. Use the screw at the top to lock the mount in place.

- **Mounting using the corner mount:**
  To mount the detector in a corner, use the provided corner mount.

Note:

- The dual-way motion detector is **not** pet immune!
- The LEDs (on the front) and the single mounting hook (on the back) must point upwards for the installation.
- First, install the respective mount to the intended place of installation.
- Then attach the dual-way motion detector to the respective mount. The mounting hooks need to lock in place on the back of the motion detector.
- The horizontal angle of the dual-way motion detector is 110°.
- For optimal motion detection, we recommend installing the PIR/microwave motion detector at a height of 1.9 to 2.0 meters (6.23 to 6.56 feet) with the back vertical to the wall.
- Do not install the motion detector within the detection range of other detectors (e.g. motion detectors with light).
- Do not expose the motion detector to direct sunlight.
- Do not install the motion detector close to heaters or air conditioning devices.
- Unless in test mode, the motion detector is able to detect a motion **every three minutes** (irrespective of the alarm panel's status).

For your notes

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