

SILVER

DIGITAL DUAL MOTION DETECTOR



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A microwave (MW) sensor and a dual pyroelectric (PIR) element are used in construction of the SILVER digital dual motion detector. The detector is characterized by high sensitivity, combined with high immunity to interference and false alarms. It is capable to detect an intruder masked against the infrared sensor. The antimasking function, which is performed by the microwave path, protects the detector against masking attempts. An advanced signal processor with high-resolution transducer is applied in the detector. Due to a digital temperature compensation feature, operation is possible within a wide range of temperatures. Other advantages of the detector include alarm memory and the option to run a special test mode, which makes it possible to individually check the microwave (MW) or infrared (PIR) path.

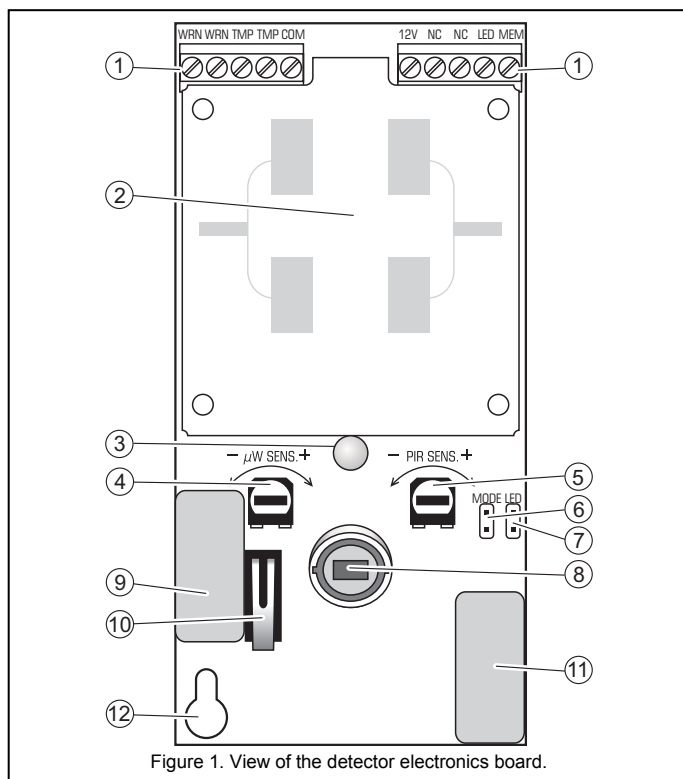


Figure 1. View of the detector electronics board.

Explanations for Figure 1:

1 – terminals:

WRN – antimasking relay (NC).

TMP – tamper contact.

COM – common ground.

12V – power supply input.

NC – alarm relay (NC).

LED – the input enables the LED indicator to be remotely switched ON/OFF, if the jumper is removed from the LED pins. The LED will signal violations, when the LED input is short-circuited to the common ground. For control of the input, you can use the OC type output of the control panel, programmed e.g. as SERVICE MODE INDICATOR or BI SWITCH.

MEM – the alarm memory control input. It is required that the OC type output of the alarm control panel, programmed as ARMED STATUS INDICATOR be connected to the input. When the input is shorted to the ground and the detector registers a motion, thus triggering the alarm, the LED blinking will signal the alarm memory. The alarm memory signaling will continue until the input is shorted to the ground again. Cut-off of the input from the ground (disarming) will not erase of the alarm memory.

2 – microwave sensor

3 – two-color LED indicator. It lights red for approx. 2 seconds after activation of the alarm relay (opening of NC contacts). It lights green for approx. 2 seconds after movement is registered by the microwave or infrared path. Red blinking LED indicates the alarm memory. (The information refers to the operating mode. See also the SPECIAL TEST MODE).

- 4 – potentiometer for sensitivity control of the microwave path.
- 5 – potentiometer for sensitivity control of the infrared path.
- 6 – MODE pins. If the jumper is removed, the detector will operate in the advanced mode.
- 7 – LED pins. Setting the jumper will activate signaling by means of the LED, irrespective of the LED input status.
- 8 – pyroelectric element.
- 9 – antimasking relay (NC type). The relay contacts open for 5 seconds after detection of an attempt to mask the detector by means of an object reflecting microwave radiation and moving close in front of the detector (up to 10 - 20 centimeters).
- 10 – tamper contact.
- 11 – alarm relay (NC type). Having generated an alarm, the relay contacts open for 2 seconds (in the special test mode after violation of a selected sensor).
- 12 – mounting screw hole.

For 30 seconds after power-up, the detector remains in the **starting state**, which is signaled by the LED indicator which is alternately blinking green and red. During that time the detector can be switched over to the special test mode. Only after 30 seconds have elapsed, the detector will enter the ready state.

The detector is monitoring power supply voltage and availability of the signal path. In case of a voltage drop below 9V ($\pm 5\%$), lasting longer than 2 seconds, or detection of a fault in the signal path, the detector will signal a trouble by activating the alarm relay and a steady red light of the LED. The signaling continues as long as the trouble exists.

Operation modes

The SILVER detector can work in two modes: basic or advanced. In the advanced mode, the device is able to detect an intruder masked against the PIR sensor.

In the basic operating mode, the detector only generates an alarm when motion is detected by both sensors. The first system (infrared or MW) which detects a motion will activate a 3-second time interval during which the other sensor must also detect motion for the detector to generate an alarm signal. If the other sensor fails to confirm the alarm condition within 3 seconds of the motion being detected by the first sensor, the detector will generate no alarm.

In the advanced mode, the detector generates an alarm in the following cases:

- both sensors have registered a motion, as in the basic mode,
- the MW sensor has registered 16 violations in less than 15 minutes, but no motion has been detected by the PIR sensor,
- the MW sensor has been very strongly violated, while the PIR sensor - very weakly (the motion observed by the PIR sensor was so negligible that it failed to meet the violation criteria in the basic mode). Such a situation can happen when the intruder tries masking his presence against the PIR sensor.

Note: Remember to set suitable detection sensitivity of the microwave path: microwaves can penetrate e.g. gypsum wallboards, doors, etc., which can lead to generating false alarms.

Special test mode

When the detector is in the starting state, i.e. during 30 seconds of the power-up, it is possible to run the special test mode. It enables the range to be checked and the MW or PIR path sensitivity to be adjusted. When in the test mode, put the jumper on the LED pins, or short the LED input to the common ground, so that the LED can signal violations.

In order to test the MW path, put the jumper on the MODE pins prior to power-up. After the power-up, remove the jumper when the detector is in the starting state. Short green flashes of the LED every 3 seconds inform that the detector is in the MW path test mode. Violation of the MW sensor is signaled by green lighting of the LED with 2-second duration. Simultaneously, the alarm relay contacts are opening.

In order to test the PIR path, remove the jumper from the MODE pins prior to power-up. After the power-up, set the jumper when the detector is in the starting state. Short red flashes of the LED every 3 seconds inform that the detector is in the PIR path test mode. Violation of the PIR sensor is signaled by red lighting of the LED with 2-second duration. Simultaneously, the alarm relay contacts are opening.

The special test mode will quit automatically after 20 minutes.

Installation

The detector is designed for indoor installation. It can be mounted on the wall, either directly or on the included holder (mounting on the holder is recommended by the manufacturer).



It is advisable that you exercise particular care during installation so as not to soil or damage the pyroelectric element.

Remember during installation that the detector should not be directed towards heat sources or air-conditioning outlets, as well as objects exposed to strong solar radiation.

1. Open the housing as shown in Figure 2.

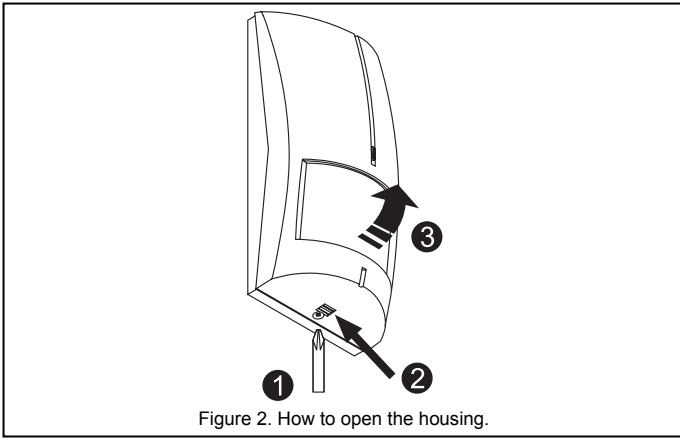


Figure 2. How to open the housing.

2. Remove the electronics board.
3. Make suitable holes for screws and cable in the rear housing panel.
4. Pass the cable through the prepared opening.
5. Secure the rear housing panel to the included holder or the wall.

Note: If the detector is installed at a height above 2.4m, it is recommended that the holder be used, and the detector be mounted in inclined position.

6. Fasten the electronics board.
7. Connect the wires to corresponding terminals.
8. Using potentiometers, determine the sensitivity of microwave / infrared path.
9. Close the detector housing.

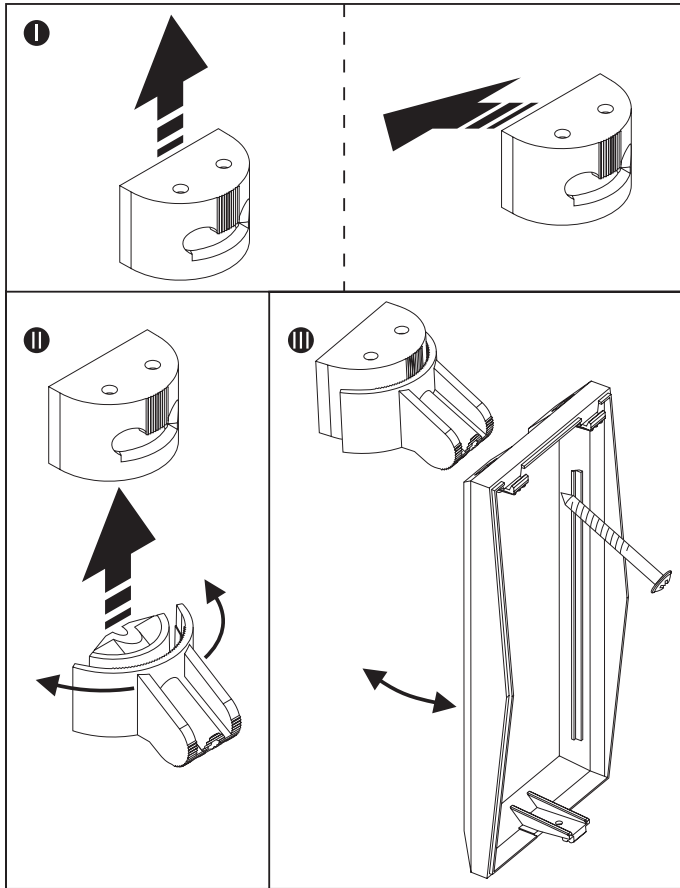


Figure 3. Mounting the detector on holder.

Start-up

1. Turn power supply on (the LED will start blinking, which indicates the starting state).
2. When the detector enters the ready state (the LED stops blinking), carry out a test for the detector range, i.e. check that a movement within the supervised area will activate the alarm relay or cause the LED light red.

Note: For a precise range determination and sensitivity adjustment of the MW and/or PIR sensor, launch the special test mode.

3. Change the detector sensitivity, if necessary.

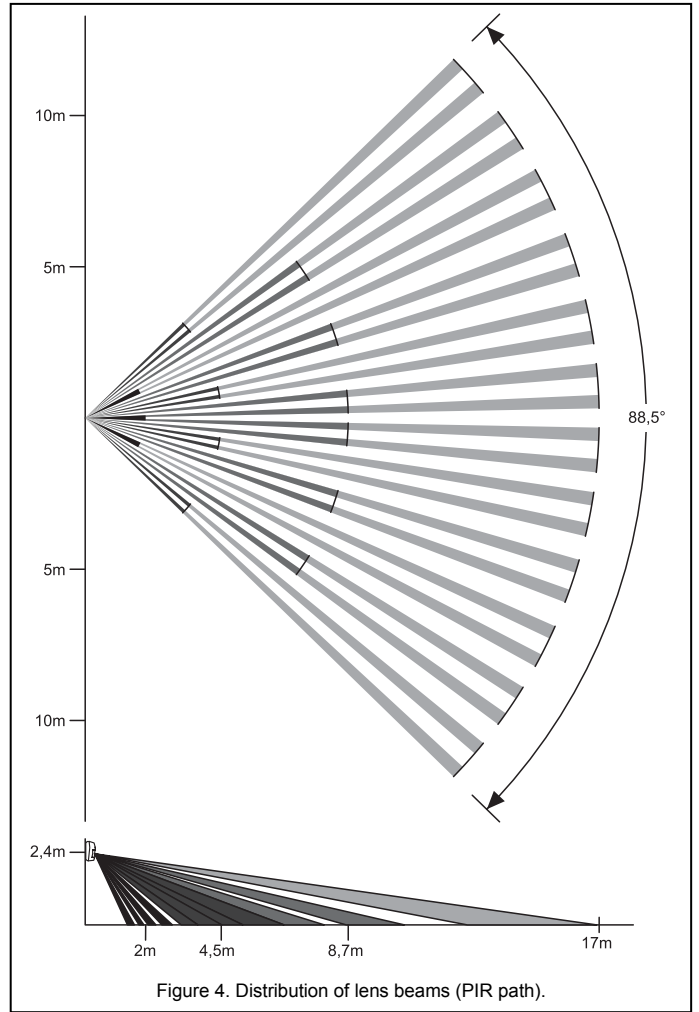


Figure 4. Distribution of lens beams (PIR path).

Note: Effective range of the PIR sensor may differ from that shown in the drawing.

Technical data

Nominal supply voltage ($\pm 15\%$)	12V DC
Average current consumption ($\pm 10\%$)	16mA
MW head working frequency	10.525GHz
Signaling time, alarm	2s
Signaling time, masking attempt	5s
Operating temperature range	-10...+55°C
Detectable motion speed	up to 3 m/s
Dimensions	62x136x49mm
Recommended installation height	2.4m

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