**WIRELESS OUTDOOR
DUAL TECHNOLOGY MOTION DETECTOR**

AOD-200

Firmware version 1.0

WARNING

The device should be installed by qualified personnel.

Read carefully this manual before proceeding to installation.

Changes, modifications or repairs not authorized by the manufacturer shall void your rights under the warranty.

Rating plate of the device can be found on the rear side of the electronics module.

SATEL's goal is to continually upgrade the quality of its products, which may result in some changes of their technical specifications and firmware. The current information on the introduced modifications is available on our website.
Please visit us:
http://www.satel.eu

> **Hereby, SATEL sp. z o.o., declares that this detector is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC. The declaration of conformity may be consulted at www.satel.eu/ce**

The following symbols may be used in this manual:

i - note;

⚠   - caution.

The AOD-200 outdoor detector allows detection of motion in the protected area. The detector is designed for use as part of the ABAX two-way wireless system. This manual applies to the detector with electronics version 1.1 (or newer) and firmware version 1.0 (or newer). The detector is supported by:

- ACU-120 / ACU-270 controller with firmware version 5.02 (or newer),
- ARU-100 repeater with firmware version 2.02 2015-06-01 (or newer),
- INTEGRA 128-WRL control panel with firmware version of control panel 1.15 (or newer) and firmware version of processor used to operate ABAX system 3.05 (or newer).

1. Features

- Passive infrared (PIR) sensor and microwave sensor.
- Digital motion detection algorithm.
- Digital temperature compensation.
- Pet immunity up to 20 kg.
- Immunity to false alarms caused by moving but not changing their position objects (eg. branches of trees).
- Creep zone.
- Dusk sensor.
- Adjustable detection sensitivity of the sensors.
- Remote configuring.
- Three indicator LEDs used in test mode.
- Supervision of detector signal path.
- Battery status control.
- Tamper protection against cover removal and tearing enclosure from the wall.
- Weatherproof enclosure featuring a very high mechanical strength.

2. Description

The detector occupies two positions in the ABAX system (the first one: motion detector, the other one: dusk detector).

Alarms

The detector reports alarm in the following cases:

- the infrared sensor (PIR) and the microwave sensor detect motion within a time period shorter than 4 seconds. This alarm can only be reported in the active mode (see: "Operating modes").
- tamper switch has been opened (tamper alarm).

Dusk sensor

Figure 1 shows the way the dusk sensor operates. On the timeline the T time delay is presented (in operating mode T=15 min, in configuring mode T=3 s). Illustrated with the letter H light intensity hysteresis and time delay make the sensor immune to short and accidental changes of light intensity. Table 1 presents light intensity values for four detection thresholds. For description of how to configure the sensor, please refer to the ACU-120 / ACU-270 controller manual or to the programming manual of INTEGRA / VERSA / VERSA IP / VERSA Plus control panel.
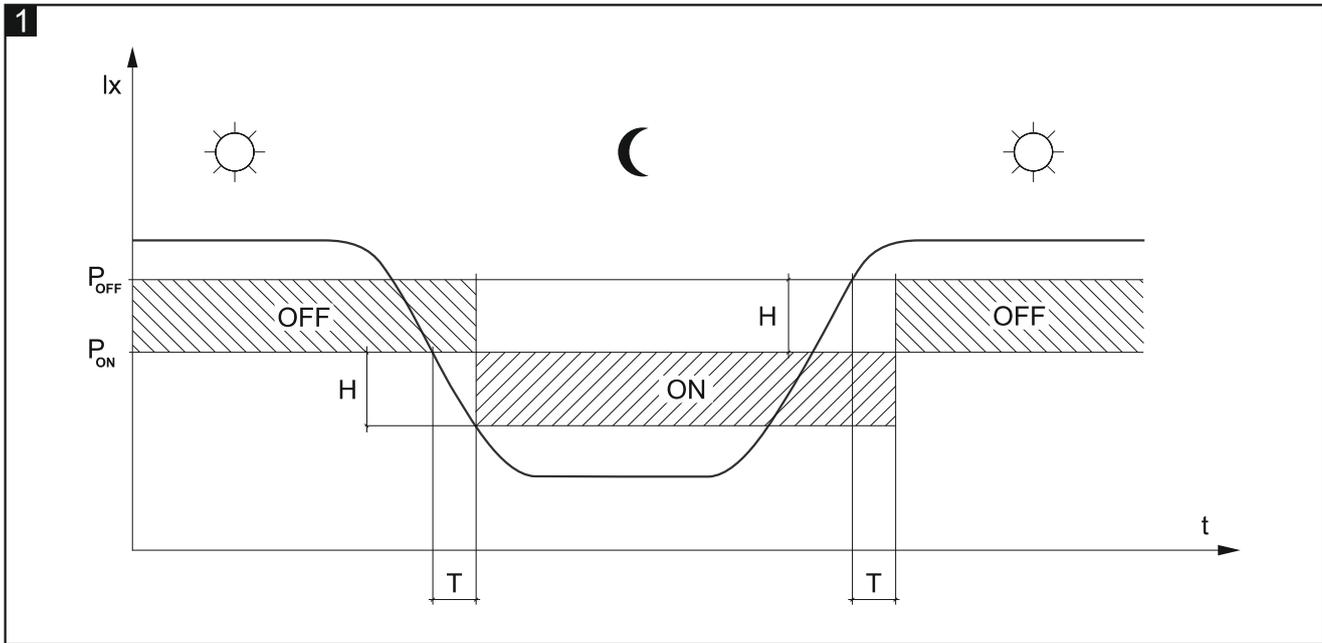
Detection threshold	Light intensity [lx]	
	Turning on [P_{ON}]	Turning off [P_{OFF}]
1	5	10
2	10	20
3	30	50
4	40	70

Table 1

Operating modes

The detector operating mode has an effect on operation of the motion sensors. Switching between the operating modes is done remotely.

Active mode – motion detection alarm or tamper alarm can be triggered. The microwave sensor activates after motion is detected by the infrared sensor.

Passive mode – tamper alarm only can be triggered. The microwave sensor is inactive. During polling, the detector indicates whether motion has been detected by the infrared sensor. The passive mode prolongs the battery life.

The alarm information is sent instantly.

Test mode

If you want to test the detector, you can remotely start the test mode. When in the test mode, the detector LEDs are working. Time delay for the dusk sensor in test mode is 3 seconds.

LEDs

The LEDs are working for 2 minutes after inserting the battery, as well as in the test mode. During detector startup, all LEDs are blinking alternately for about 40 seconds. The LEDs indicate:

- polling – a short flash of the red LED (80 milliseconds),
- motion detection by the microwave sensor – the green LED is ON for 4 seconds,
- motion detection by the PIR sensor – the yellow LED is ON for 4 seconds,

- alarm – the red LED is ON for 2 seconds.

Supervision of detector signal path

In case of signal path failure, the detector sends information about alarm during each transmission (constant violation).

Battery status control

When the battery voltage is below 2.75 V, information about low battery is sent during each transmission.

3. Electronics module

1. TMP terminals – tamper input (NC).
2. pins to enable /disable the tamper input. If no additional tamper switch is connected to the TMP terminals, jumper should be placed across the pins.
3. CR123A lithium battery.
4. microwave sensor.
5. green LED.
6. red LED.
7. yellow LED.

i *The LEDs are working for 2 minutes after battery is inserted, as well as in the test mode (see: "Test mode").*

During detector startup, all LEDs are blinking alternately for about 40 seconds.

8. dusk sensor.
9. dual element pyrosensor. **Do not touch the pyroelectric sensor, so as not to soil it.**
10. tamper switch activated by cover removal.
11. fixing screw holes.
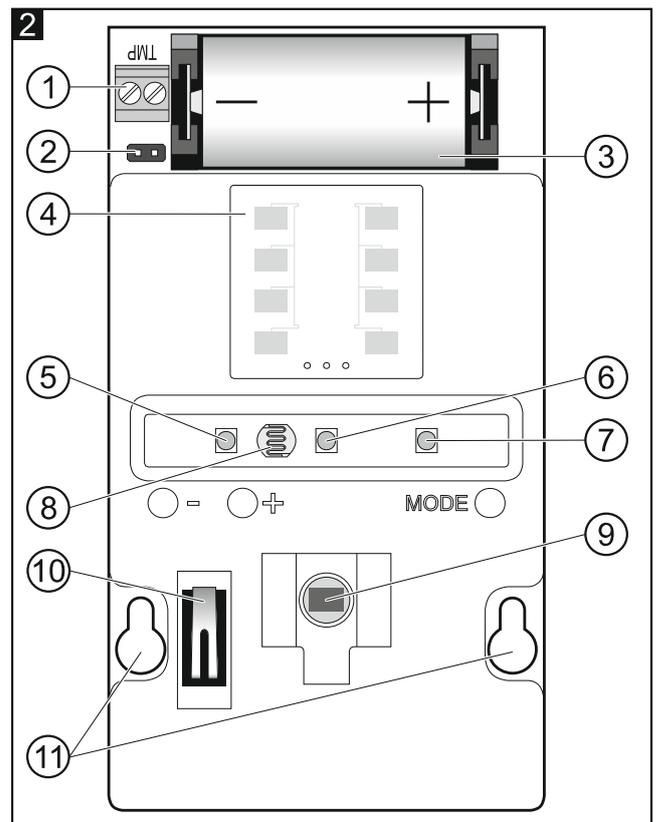
On the other side of the electronic board is a tamper switch activated by removing the detector from the wall.

i *When mounting the detector on the angle or ball bracket, it is recommended to install additional tamper switch.*

4. Installation

⚠️ **There is a danger of battery explosion when using a different battery than recommended by the manufacturer, or handling the battery improperly.**

Be particularly careful during installation and replacement of the battery. The manufacturer is not liable for the consequences of incorrect installation of the battery.

The used batteries must not be discarded, but should be disposed of in accordance with the existing rules for environment protection.

If the detector is to be pet immune, it should be mounted at 2.4 m height with no vertical tilt. It is especially important when mounting on a ball bracket.

- Install the detector at the recommended height (Fig. 3-I).
- If traffic nearby or objects moving out of the protected area cause an alarm, move the detector slightly downwards or reduce the detector sensitivity (Fig. 3-II).
- Install the detector so that the expected movement of an intruder will be across the coverage pattern (Fig. 3-III).
- Don't install the detector closer than 3 meters from the moving objects (eg. tree branches, bushes, laundry etc.) (Fig. 3-IV).
- Don't direct the detector on reflective surfaces or on fans or a heat sources (Fig. 3-V).
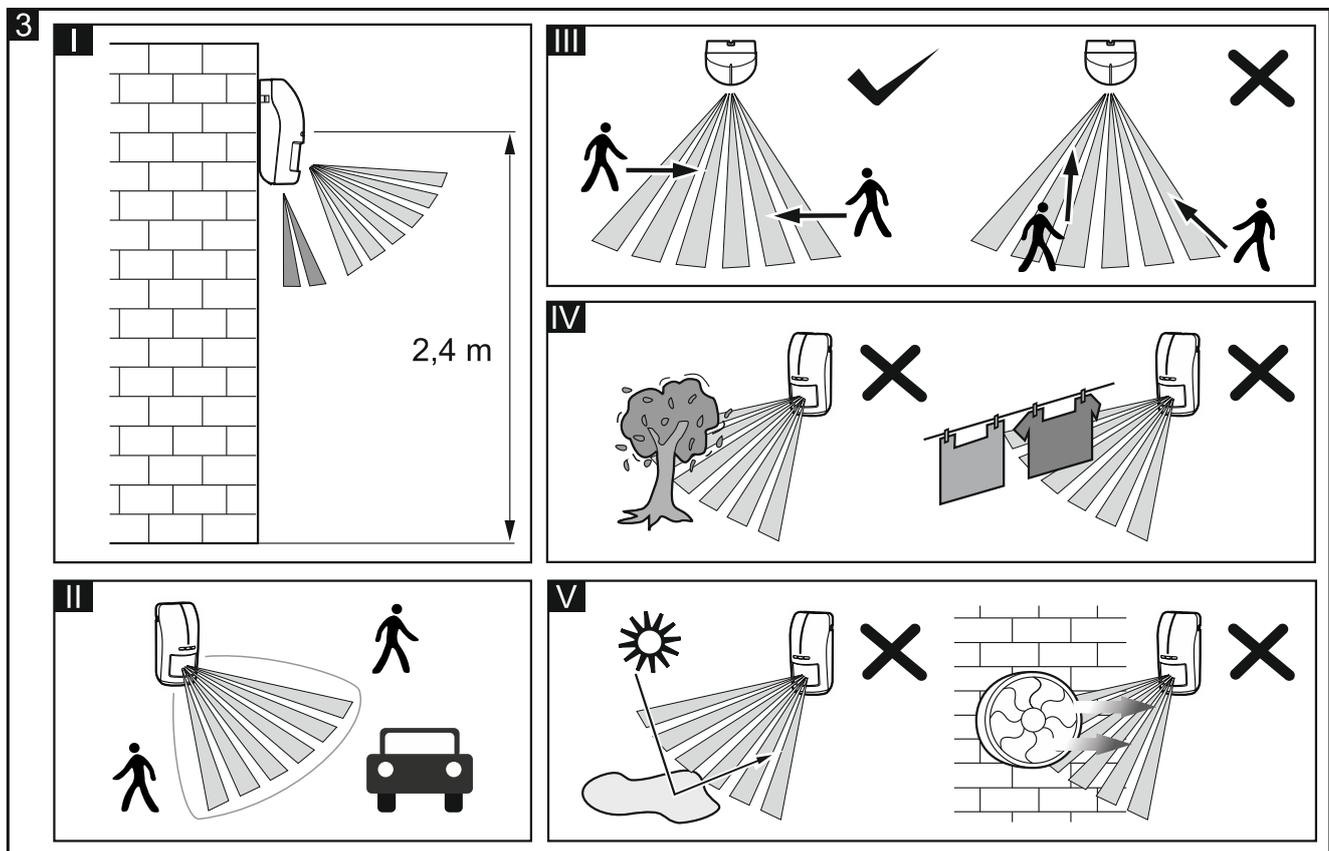
If tamper switch wires are to be run into the enclosure, it is advisable to put them in heat shrink tube. It reduces the risk of getting water into the enclosure.

1. Remove the front cover (Fig. 4).
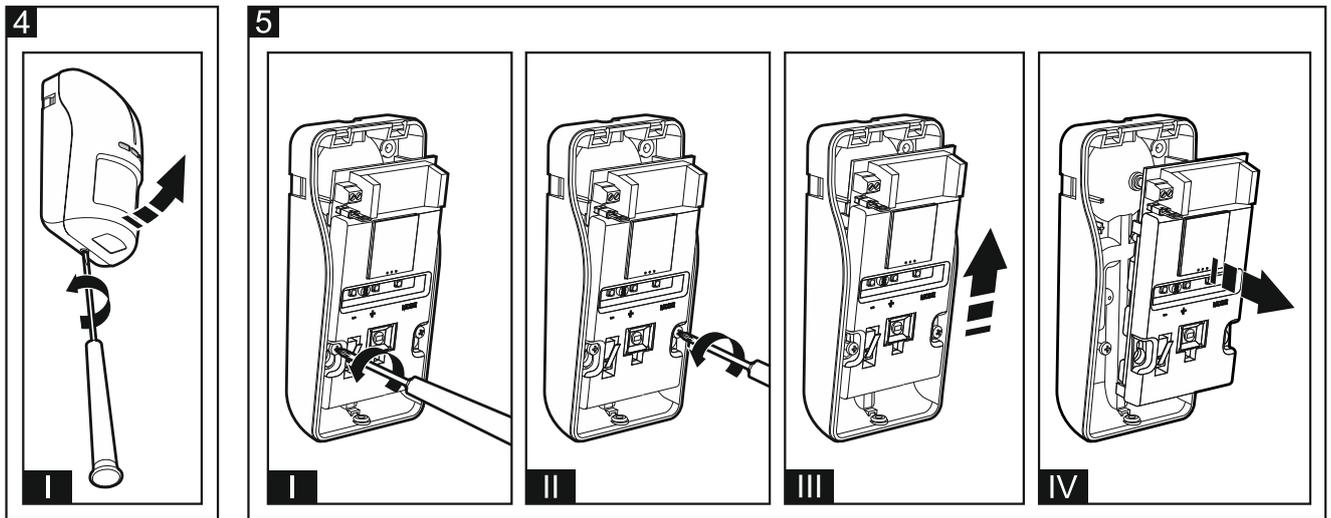
2. Install the battery and secure it with the clip you will find in the package.

3. Add the detector to the wireless system (see the ACU-120 / ACU-270 controller manual or the INTEGRA 128-WRL / VERSA / VERSA Plus / VERSA IP control panel installer manual). The sticker with 7-digit serial number which shall be entered when registering the detector in the system can be found on the electronics board.

4. Replace the cover.

5. Fasten the detector temporarily at the place of its future installation.

6. Check the level of signal received from the detector by the ACU-120 / ACU-270 controller or the INTEGRA 128-WRL control panel. If the signal level is lower than 40%, select another place for installation. Sometimes, it is sufficient to shift the device ten or twenty centimeters to obtain a considerable improvement in the signal quality.

7. Remove the front cover (Fig. 4).

8. Remove the electronics module (Fig. 5).

9. If the detector is to be mounted on angle bracket or ball bracket, make a hole in the enclosure base for the additional tamper switch cables.

10. Mount the enclosure base to the wall, to the angle bracket (see: "Angle bracket mounting") or to the ball bracket (see: "Ball bracket mounting"). Use screw anchors suitable for the mounting surface (concrete wall, drywall, etc.). The screw anchors should guarantee required mechanical strength. In Figure 6 possible ways of mounting the detector are shown.

11. Having secured the detector, mount the electronics module and replace the cover.

12. Configure the detector settings:
    – sensitivity of PIR sensor,
    – sensitivity of microwave sensor,
    – sensitivity of dusk sensor (detection threshold).

    For description on how to configure the detector, refer to the ACU-120 / ACU-270 controller manual or the INTEGRA / VERSA / VERSA Plus / VERSA IP control panel programming manual.

i   *If the detector is to be pet immune, for the infrared and microwave sensors do not set the detection sensitivity higher than default.*

13. Start the test mode and check that the motion within the detector area will light up the LED. Fig. 11 shows: ▨ - the maximum coverage area, ▨ - creep zone.

14. End the test mode.
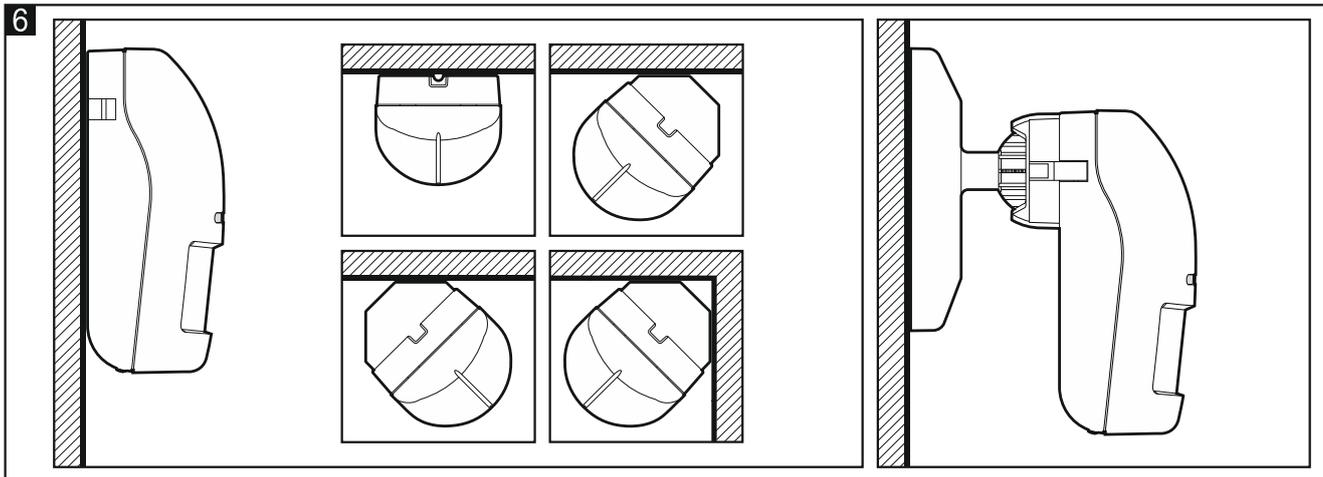
Angle bracket mounting

1. Attach extra tamper switch:
   – screw the holder to the tamper switch (Fig. 7-I),
   – screw the tamper unit to the enclosure base (Fig. 7-III).

i │ *Figure 7 shows mounting the tamper switch in one of two available positions. The place of tamper switch installing depends on the way of angle bracket mounting. If the tamper switch is to be installed in the other position, place tamper switch holder on the other side.*

2. Prepare openings in the bracket for screws.
3. Using wall plugs (screw anchors) and screws, fasten the bracket to the wall.
4. Run the tamper switch wires through the hole made in the enclosure base and connect them to the TMP terminals.
5. Using screws, fasten the enclosure base to the bracket (Fig. 9).
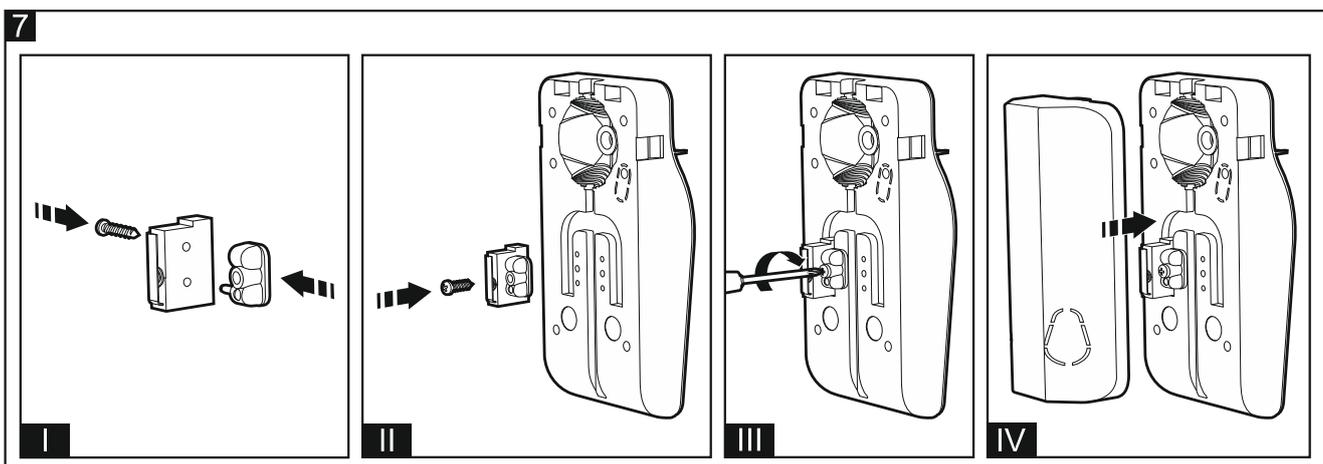
Ball bracket mounting

1. Attach extra tamper switch:
   – screw the holder to the tamper switch (Fig. 8-I),
   – put the unit making the surface bigger on the tamper switch (Fig. 8-I),
   – screw the tamper unit to the ball bracket (Fig. 8-III).
2. Run the cable through the opening in the handle of the bracket.

3. Using wall plugs (screw anchors) and screws, fasten the ball bracket to the wall (Fig. 8-IV).

4. Run the tamper switch wires through the hole made in the enclosure base and connect them to the TMP terminals.

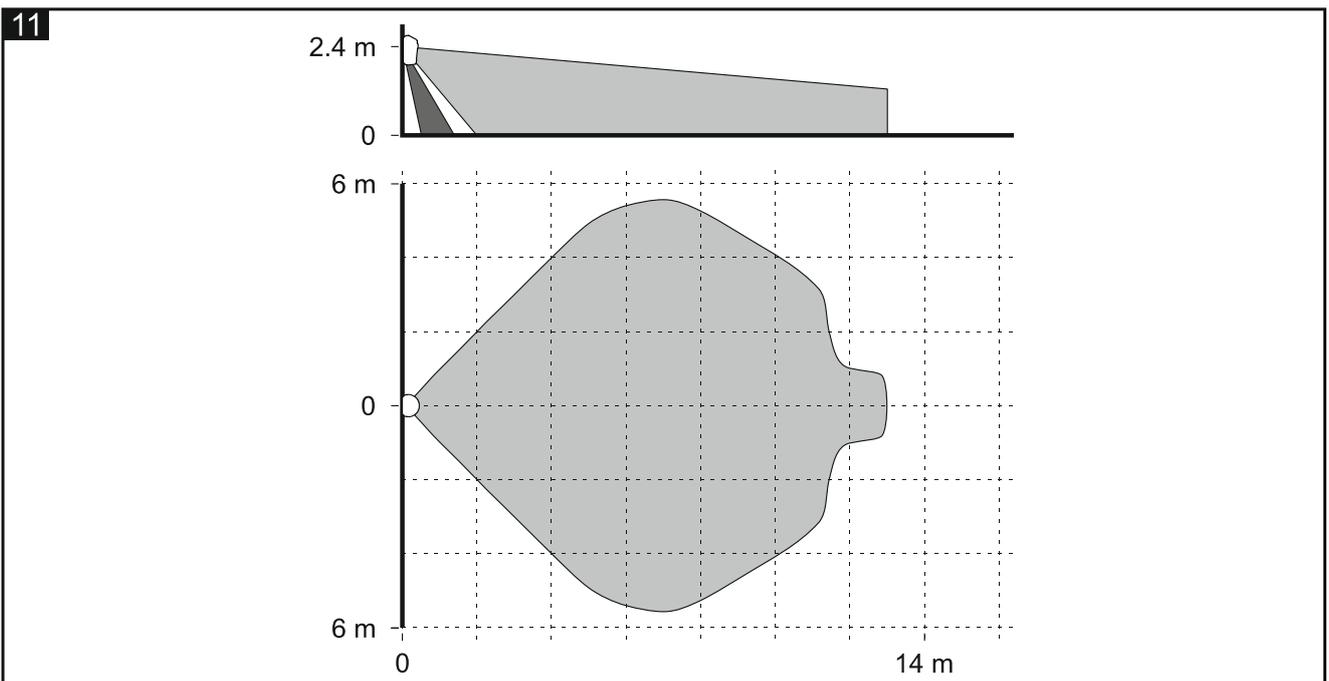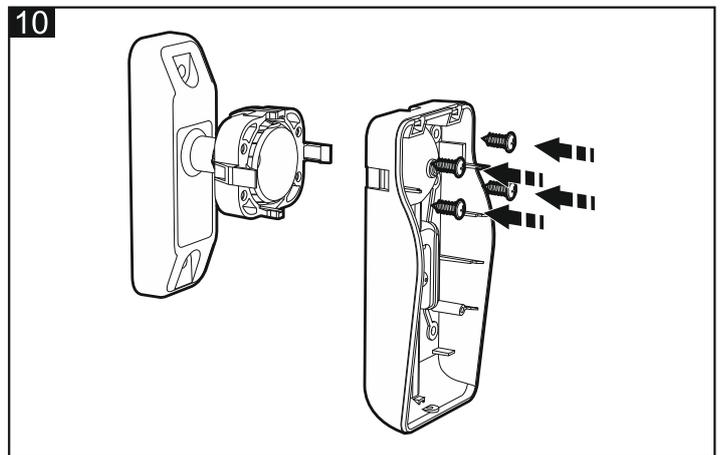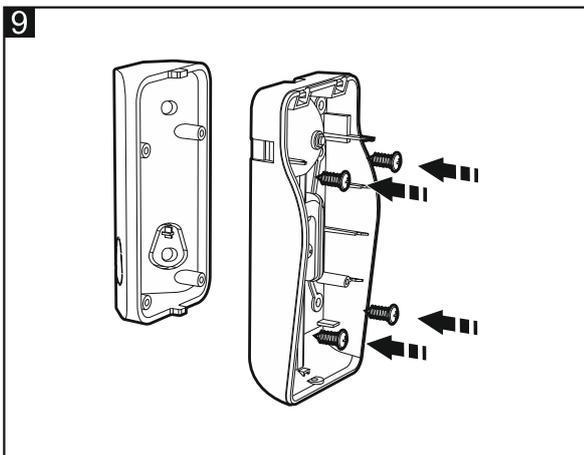5. Using screws, fasten the enclosure base to the ball bracket (Fig. 10).
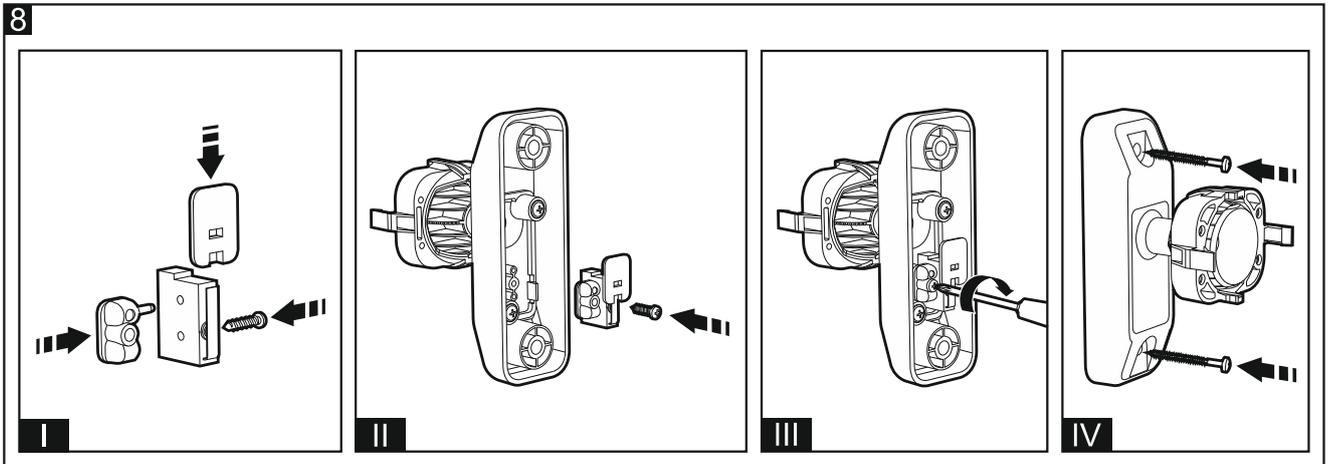
Connecting the additional tamper switch

The additional tamper switch is provided with three wires:
– black – common wire,
– blue – wire for NC circuit,
– grey – wire for NO circuit.

5. Specifications

Operating frequency band.. 868.0 MHz ÷ 868.6 MHz
Radio communication range (in open area) .... up to 500 m
Battery...CR123A 3 V
Battery life expectancy .... up to 2 years
Standby current consumption .... 70 µA
Maximum current consumption ....30 mA
Microwave frequency ....24.125 GHz
Detectable speed .... 0.3...3 m/s
Warm-up period .... 40 s
Recommended installation height ....2.4 m
Security grade...Grade 2
Standards complied with EN50131-1, EN50130-4, EN50130-5
IP code IP54
Environmental class according to EN50130-5 ....IIIa
Operating temperature range...-35...+55 °C
Maximum humidity ....93±3%
Dimensions .... 65 x 138 x 58 mm
Weight...182 g