

COMBINED VOLUMETRIC SECURITY DETECTOR

«Mirage»

Installation Guide

1 GENERAL INFORMATION

1.1 The combined volumetric security detector «Mirage» (hereinafter referred to as the Detector) is used to detect intrusion into the secured area and generate a subsequent alarm notification.

1.2 The detector has two detection channels: passive optoelectronic infrared (hereinafter referred to as IR) and active radio wave (hereinafter referred to as RW).

1.3 The detector can operate in one of two modes: combined (AND) or mixed (OR).

1.4 The detector detects an attempt of unauthorized access by opening the case by an amount that provides access to controls, connections, adjustments, indications and mounting elements. The detector generates an alarm notification when a person weighing from 50 to 70 kg, height from 165 to 180 cm with a speed from 0.3 to 3 m/s, along trajectories 3 m long, located at an angle of 45° to the axes of the sensitive zone of the IR channel in mixed mode. The detector is suitable for use in environmental conditions inside general purpose buildings (in retail or exhibition halls, catering or consumer service establishments, stairwells and landings, corridors, production areas and storage facilities).

1.5 The detector is powered from a secondary power source.

1.6 The detector is classified as a product for a specific purpose, continuous long-term use, aging, non-repairable and serviceable.

1.7 The detector is designed for continuous round-the-clock operation.

1.8 The noise immunity of the detector ensures the absence of false alarms when exposed to moving small animals, illumination, air currents, slow changes in background temperature, voltage pulses along the power supply circuit, electrostatic discharge, and electromagnetic fields in the VHF range.

1.9 The detector is not a source of any interference in relation to similar detectors, detectors of other types and purposes, as well as to household radio equipment.

1.10 The detector does not require licensing or registration of a radio frequency device.

1.11 The detector is equipped with:

- one three-color light indicator (red, green and blue) to monitor performance;
- a microswitch for detecting an attempt to open the case and optoelectronic relays, the output contacts of which are information outputs of the detector;
- operating mode switch;
- sensitivity adjusting switch for the RW channel.

2 DETECTOR FEATURES

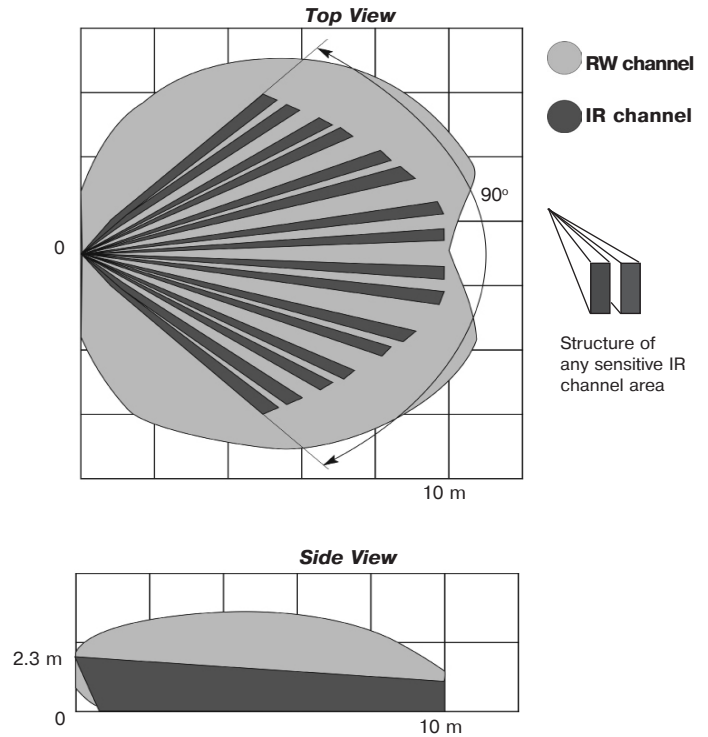
- sensitive element of the IR channel is double-area pyroelectric detector;
- spherical lens in the IR channel;
- protection against the penetration of insects inside the fire detector;
- selection of IR channel sensitivity;
- selection of pet weighing up to 10 kg immunity mode (via IR channel, in AND operating mode);
- thermal compensation via IR channel;
- sensitive element of the RW channel is a receiving-transmitting module with a printed antenna;
- adjustment of the RW channel range;
- selection of channels operating modes (AND/OR);
- volumetric detection area;
- digital signal processing;
- case opening control;
- LED indication can be turned off;
- bracket for proper positioning of the detector.

3 TECHNICAL SPECIFICATION

Table 1

Parameter	Value
Maximum operating detection range	10 m
Power supply voltage	9...15 V
Current consumption	70 mA
Frequency on RW channel	24050...24250 MHz
Duration of alarm notification	2 s
Detectable speed range	from 0.3 to 3 m/s
Protection class	IP41
Overall dimensions	126x70x55 mm
Weight	110 g
Average service life	8 years
Operational conditions	
Operating temperature range	-30 ...+55 °C
Relative humidity at +25 °C without condensation	98 %

4 DETECTION AREA DIAGRAM



Picture 1 – Combined diagram of IR and RF channels detection areas

5 CONTENTS OF THE KIT

Table 2

Name	Qty
Combined volumetric security detector «Mirage»	1 pc.
Bracket	1 pc.
Screw 3-3x30.016	2 pcs.
Nylon dowel NAT 5x25 SORMAT	2 pcs.
Installation guide for the «Mirage»	1 copy

6 FIELD OF APPLICATION

It is recommended to use the combined mode of operation of the detector when installing it in shops, offices and museums, however the mixed mode is preferable when installing it in weapons rooms, depositories, etc.

7 CHOOSING THE PLACE OF INSTALLATION

7.1 The following is not recommended when installing a detector:

- to point the detector at doors, windows, non-permanent partitions, behind which the movement of people and machinery is possible,
- to point the detector at fans or plastic water supply pipes, which can create a reflected interference of RW signal during operation;
- the presence of fluorescent lamps on during the security period;
- when installing the detector near large metal surfaces or structures, it should be considered that they can reflect RW energy to unexpected places and significantly distort the detection zone. This can lead, on the one hand, to the formation of «dead» zones inside the protected premises, and on the other hand, cause a false alarm of the detector as a result of its reaction to moving objects outside the secured area;

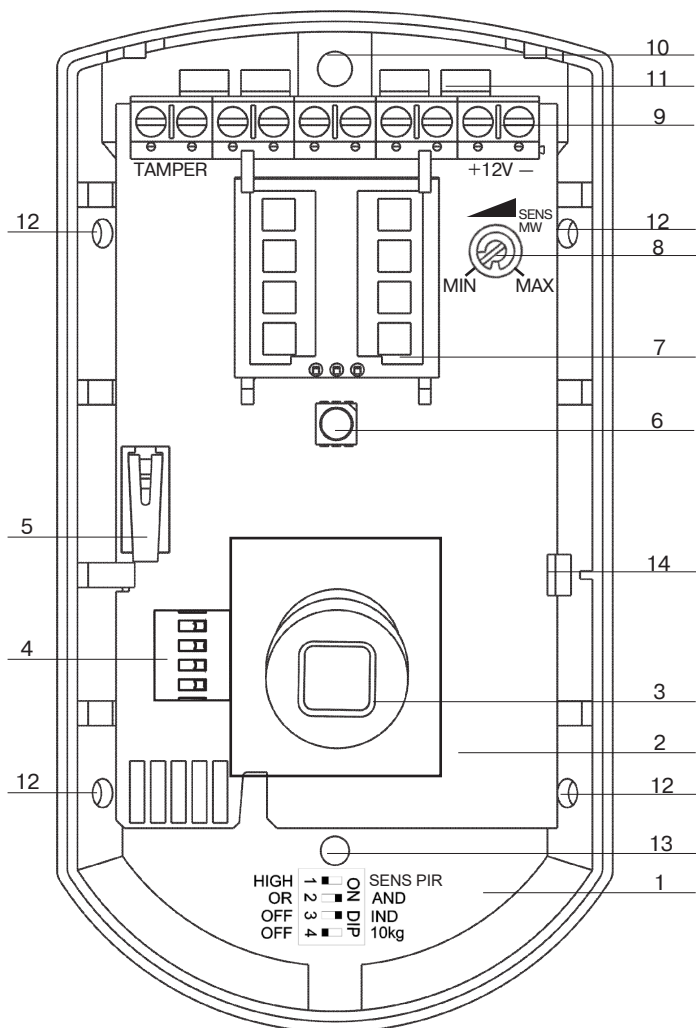
7.2 When installing the detector, the following recommendations should be considered:

- the detector is intended for use in enclosed spaces;
- the detector must be installed indoors on solid walls that are not subject to constant vibrations;
- the detector must be installed so as to exclude the possibility of accidental damage during any work performed in the area;
- the presence of furniture in the detection area that an animal can climb on can lead to a false alarm;
- in the room where the detector is installed, all windows, vents and doors must be tightly closed during the security period to prevent them from swaying during the detector operation time, which can lead to a false alarm. Structures that may sway due to drafts must be secured or removed;
- power and alarm cables should be located away from high voltage power cables;
- when mounting the detector without a bracket, the recommended installation height is 2.3 m from the floor. When using a bracket, the installation height of the detector is from 2.3 to 2.7 m, subject to setting the detection zone;

Attention! When choosing a location for installation the detector should not be placed within the detection zone of other detector of the same type.

8 DESIGN

ATTENTION! DO NOT TOUCH THE RW MODULE (7).



Picture 2 – View of the detector with removed cover

8.1 The detector consists of a case cover and a case base (1) with an installed printed circuit board (2).

The printed circuit board contains:

- IR receiver (3) with gasket;
- switch (4);
- case opening sensor (5);
- three-color LED indicator (6);
- RW module (7);
- sensitivity (range) regulator of the RW channel (8);
- terminal blocks (9).

8.2 The case base (1) has the following openings for installation:

- break-out hole (10) for attaching the base to the bracket;
- break-out holes (11) for inserting wires;
- break-out holes (12) for mounting the detector in the corner;
- break-out holes (13) for attaching the detector to the wall;
- board fastening clamp (14).

9 INSTALLATION

9.1 Remove the detector cover from the base (1) by using a screwdriver to press the cover lock located in the lower part of the detector base.

9.2 Remove the printed circuit board (2) from the base (1) by pressing the board fastening lock (14).

9.3 Drill holes in the base for the wires (11) and holes for attaching the detector to the wall or for mounting the detector in a corner (see Picture 2).

9.4 Having chosen the installation location, mark the holes for mounting the detector, taking into account the position of the holes in the base of the detector, drill holes in the wall (Picture 5).

9.5 Pass the wires through the holes (11) in the detector base (1), leaving the required length of wire inside the case to connect to the detector terminals and secure the base (1) with screws to the wall (in the corner).

9.6 When using a bracket:

- open the hole (10) for attaching the base to the bracket;
- insert the nut into the groove of the bracket sphere;
- untie the screw from the bracket sphere, align the square protrusion of the sphere with the corresponding groove in the upper part of the detector base, insert the screw into the hole (10) and fix without tightening;
- secure the assembled bracket with the base to the wall (or ceiling) with screws;
- place the base in the intended position and tighten the bracket screw so that the base is firmly attached to the bracket.

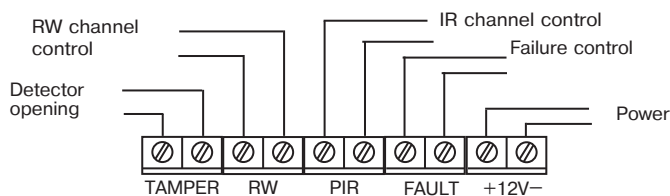
9.7 Install the printed circuit board (2) into the base of the detector, inserting the groove on the board into the protrusion on the base, then fix the board into place with the lock (14).

9.8 Close the case.

Note – The bracket body and detector base with opened mounting holes can be used as a template for marking the holes for drilling in the mounting surface

10 CONNECTING THE DETECTOR

10.1 The marked terminals (9) for connecting the detector are located at the top of the printed circuit board (Picture 3).

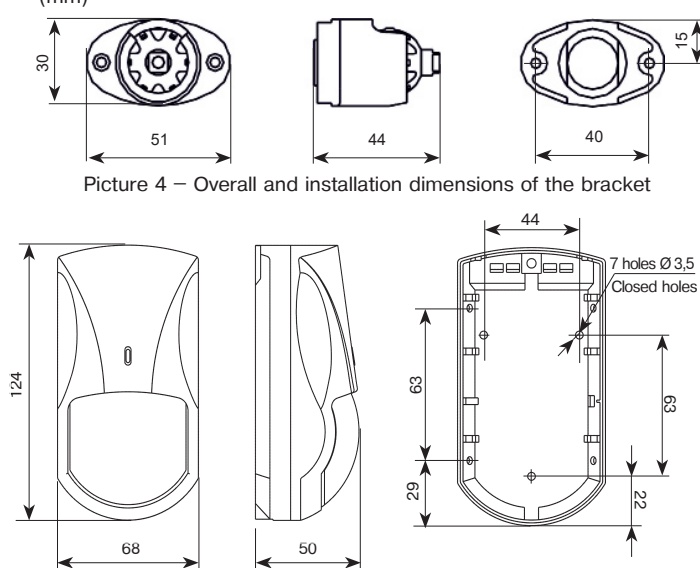


Picture 3 – Connection terminals

10.2 The connection of the detector to the control panel (hereinafter referred to as CP) should be carried out in accordance with the CP operating manual.

11 OVERALL AND INSTALLATION DIMENSIONS

(mm)



Picture 4 – Overall and installation dimensions of the bracket

Picture 5 – Overall and installation dimensions of the detector

12 LIGHT INDICATION

12.1 The LED on the front cover is used to indicate the status of the detector

12.2 The detector generates nine types of notifications in accordance with Table 3.

Table 3

Notification	Terminals status				Indication	Duration
	PIR	MW	TAMPER	FAULT		
«Technical readiness time»	open	open	-	-	red 1 Hz	up to 60 s
«Normal»	closed	closed	closed	closed	off	
«IR Alarm» (mixed mode)	open	closed	-	-	red ⁰⁾	at least 2 s
«RW Alarm» (mixed mode)	closed	open	-	-	blue ⁰⁾	at least 2 s
«IR+RW alarm» (combined mode)	open	open	-	-	red	at least 2 s
«Opening the case»	-	-	open	-	does not affect	until fixed
«No power supply»	open	open	open	open	off	until fixed
«The supplied voltage has dropped below (7.5 ± 0.3) V»	-	-	-	open	green/red	15 min ¹⁾
«Exceeding the permissible temperature»	-	-	-	open	green/blue	15 min ¹⁾

0) – when there is an alarm on two channels in mixed mode, red and blue alternate;

1) – notifications are generated after detecting that something impedes the normal operation of the detector, and continue for 15 minutes after having been fixed

- - does not affect the status of the relay

13 DETECTOR SETTINGS

13.1 The detector is configured by changing the position of the switches «1», «2», «3», «4» located in the middle part of the printed circuit board. See Table 4

Switch:

- «1» – changes the sensitivity of the IR channel,
- «2» – controls the operating mode of the channels (OR – mixed, AND – combined),
- «3» – turns on the indication,
- «4» – turns on/off pet immunity when the «AND» mode is turned on.

Note– in the «OR» mode the detector operates without pet immunity

13.2 The board provides a smooth regulation for the range of the RW channel (8).

13.3 Set the operating mode using switches.

Table 4

Mode	Switch	Switch position	
		ON	OFF
IR sensitivity	«1»	SENS PIR	HIGH
Channel mode	«2»	AND	OR
Indication	«3»	IND	OFF
Pet immunity 10kg*	«4»	10kg	OFF

* Animal resistance is only enabled in the combined mode

13.4 Set the **minimum** required range of the RW channel.

14 TURNING ON AND CHECKING THE DETECTOR

14.1 Supply power to the detector.

14.2 Immediately after turning on the power supply, the red, green, and blue LEDs turn on subsequently for 1 second, then the LED turns red alternately for 60 s and the detector self-tests (checking the supply voltage, ambient temperature), after which the detector goes into standby mode and becomes able to generate «IR Alarm», «RW Alarm», «IR+RW Alarm» notifications.

14.3 Alarm notification is generated by opening «PIR», «RW» contacts when the intruder enters the detection zone. To ensure the secrecy of the detector operation, alarm notification indication can be turned off by setting the switch «3» to OFF position.

14.4 Checking the alarm zone and range of the detector radio channel.

14.4.1 In the display mode and switch 2 in the «OR» position, check the alarm zone and the range of the detector's radio channel.

ATTENTION! DETERMINING THE BOUNDARIES OF THE DETECTION ZONE SHOULD BE PERFORMED ONLY WITH THE TOP COVER OF THE DETECTOR CLOSED AND FIXED BY THE LATCH.

14.4.2 Take a place in the far part of the secured area and, without moving, make sure that the built-in indicator is not lit.

14.4.3 Start moving towards the detector, if the tester walked more than 3 m before the detector was triggered, this means that the detector range is lower than required. Then you need to increase it by rotating the range control clockwise.

14.4.4 Check that the detector range is set correctly in the previously selected direction. Conduct a walking check in different areas of the secured area and especially in places that are most vulnerable to an intruder entering the premises. If an alarm is not generated in these places, it is necessary to change the direction of the detector radiation. After setting up, carry out a walking check the places outside the protected area where the most possible movements can take place and make sure that an «RW Alarm» notification is not issued. Otherwise, it is necessary to change the direction of radio wave radiation or reduce the range of the detector by rotating the range control counterclockwise.

14.4.5 Check the influence of nearby objects: refrigerator, fan, fluorescent lamp, etc.

14.5 Checking the alarm zone and range of the detector's IR channel.

14.5.1 With the indication ON and switch 2 in the «OR» position, check the detector's IR channel operation.

14.5.2 Set the sensitivity to the «**HIGH**» position (main operating mode).

14.5.3 Start moving in the detection zone.

14.5.4 Each time after an alarm is issued, stop, wait until the indicator turns off, then wait another 8–10 s before continuing through the detection area.

An alarm notification is issued after 3–4 steps in the detection zone.

14.5.5 If the detector does not react to movement in the detection zone, it is necessary to change the position of the detection zone using a bracket (when installed on a wall, the angle of rotation of the detector on the bracket in the horizontal plane is $\pm 45^\circ$, in the vertical plane – at least 20°).

15 SELF-TESTING MODE

15.1 The detector automatically performs self-testing: checking of supply voltage and ambient temperature is performed. In the temperature range close to 30°C , the sensitivity threshold changes, which improves detection ability. If a negative self-test result is received (supply voltage drops below $(7.5 \pm 0.3)\text{V}$, temperature above the upper limit of the operating range), a corresponding notification is issued according to Table 3.

16 STORAGE AND TRANSPORTATION

16.1 The Detectors in their original packaging are resistant to:

- transport jolting with the acceleration up to 30 m/sec^2 at impact frequency range from 10 to 120 per minute or 15 000 strikes;
- ambient temperature range minus $50 \dots +55^\circ\text{C}$;
- relative air humidity $(95 \pm 3)\%$ at a temperature $+35^\circ\text{C}$.

16.2 The Detectors in original package may be transported by any means of transportation in closed vehicles over any distances in compliance with the existing shipping rules concerning the respective means of transportation.

16.3 After transportation under the conditions different to exploitation conditions the Detectors shall be ready to operate after a maximum of six hours.

16.4 During storage period lithium batteries should be removed from the holders or isolators should be installed.

Note: The storage premises should not contain any current-conducting dust, acid and alkali fumes, or corrosive or destroying insulation gases.

17 DISPOSAL INFORMATION

17.1 Disposal of the detector should be carried out taking into account the absence of toxic components in it.

17.2 The content of precious materials does not require accounting during storage, write-off and disposal.

17.3 The content of non-ferrous metals does not require consideration when decommissioning and further recycling of the detector.

18 MANUFACTURER WARRANTY

18.1 LLC NPP RIELTA guarantees that the Detector meets the requirements of technical specifications within 63 months from the date of manufacture, subject to the conditions of transportation, storage, installation and operation.

18.2 Warranty period of operation of the Detector is 60 months from the date of commissioning within the warranty period of storage.

18.3 If during the warranty period the Detector, which is subject to the rules of transportation, installation and operation, is found to be inconsistent with the requirements of the technical specifications, it is to be replaced or repaired by the manufacturer.

19 DATE OF MANUFACTURE

_____,
month, year