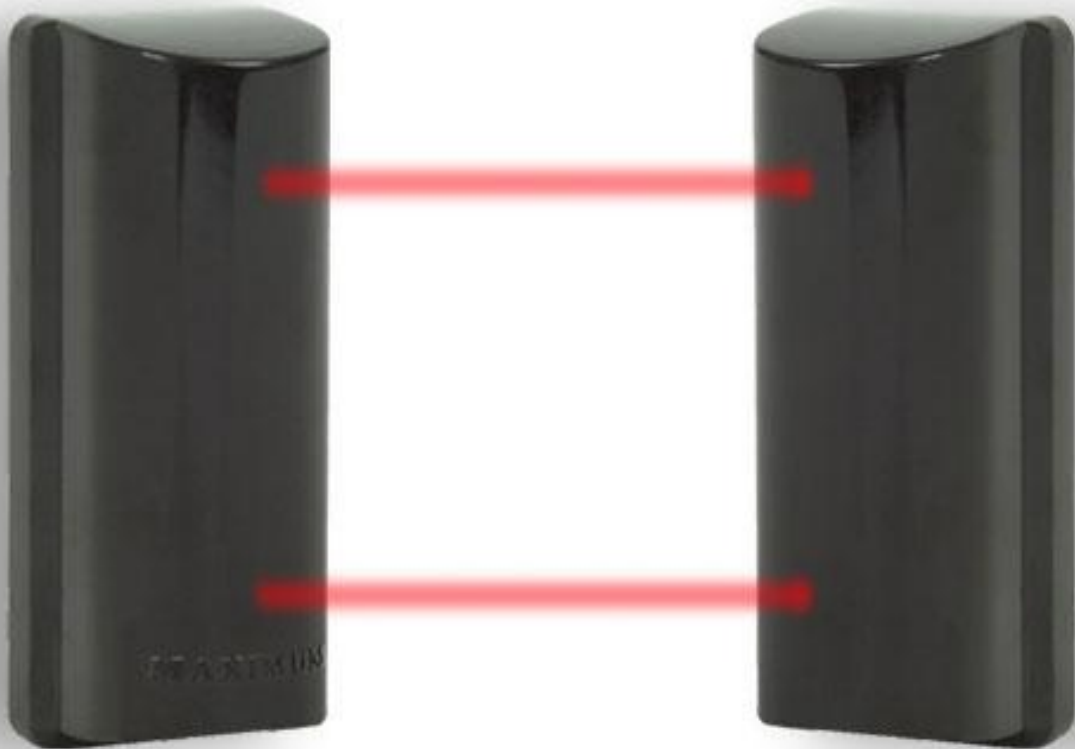


**Installation & Operating Manual**

**ACTIVE**

**Dual-beam Outdoor/Indoor Synchronized Active Infrared Detector**



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## Installation & Operating Manual

# ACTIVE

## Dual-beam Outdoor/Indoor Synchronized Active Infrared Detector

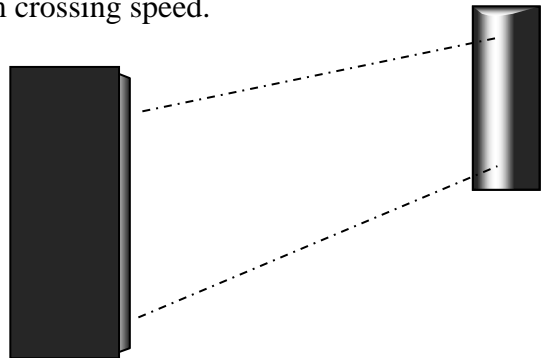
We thank you for choosing a product of **MAXIMUM (1984) LTD.**

Based on more than 40 years experience in R&D and in production of advanced security systems, we are proud to introduce the most reliable and sophisticated active infrared detector in the world.

To ensure proper operation and maximum use of all its advantages, please read all parts of this installation and operating manual, and follow the step-by-step instructions.

### **1. FEATURES**

- \* Effective range of up to 200 meters (depending on model).
- \* An option to synchronize the infrared communication between the transmitter and the receiver, to prevent attempts to “trick ” the receiver part by means of a foreign IR transmitter.  
(In this serial, just in installations with at least 15-meter distance between the transmitter and the receiver).
- \* Special output that alerts one to reduced electronic eye contact between system parts (due to rain, snow, fog, heavy dust, etc.).
- \* Internal vertical and horizontal adjustment in both parts of the system.
- \* Precise alignment of system parts by internal electronic display in the receiver, or externally by connecting a Voltmeter.
- \* Detection sensitivity adjustment, by calibration of beam crossing speed.
- \* Changeover alarm relay (*N.C. or N.O.*).
- \* Waterproof and all-weather resistant.
- \* Excellent protection against light.
- \* Easy and fast installation.



## **2. INTRODUCTION**

### **What is ACTIVE ?**

**ACTIVE** is a dual-beam outdoor/indoor active infrared detection system, with an effective range of up to 200 meters (depending on the model).

### **How does it work ?**

**ACTIVE** consists of two parts, a transmitter that emits two parallel infrared beams and its receiver that should be installed exactly opposite.

The crossing of the two infrared beams activates the changeover relay on the receiver side.

If there is a reduction in the quality of electronic eye contact between the two parts of the system (due to fog, rain, snow, etc.), an alert will be signaled by means of a different, “open collector” output.

### **Invincible**

**ACTIVE** is waterproof and all-weather resistant, with excellent protection against light, with possible sensitivity adjustment (by calibration of beam crossing speed).

To prevent any attempt to neutralize (“trick”) the receiver side by means of a foreign IR transmitter, there is an option to synchronize the infrared communication between the transmitter and the receiver.

(In this serial, just in installations with at least 15-meter distance between the transmitter and the receiver).

### **Quick and easy installation requiring no external calibration device**

**ACTIVE** may be mounted, quickly and easily, on walls or poles.

A successful installation of an active infrared detection system is when its two parts (infrared transmitter and its receiver) are perfectly aligned.

In order to ensure optimum installation, **ACTIVE** detection system equipped with built-in tools, which allow an accurate alignment between its two parts- in the following manner:

1. In each part of the system, the internal unit is adjustable vertically and horizontally.
2. The receiver part consists of a built-in scale, which displays the strength of signal received from the transmitter.

The higher the signal strength, the better the alignment.

(Alternatively, it is possible to read the received signal strength by connecting a Voltmeter to the “*TEST POINTS*” in the receiver.

### **Reliability**

The **ACTIVE** detection system is designed to work in the most difficult environmental conditions while maintaining an unprecedented level of security against false alarms.

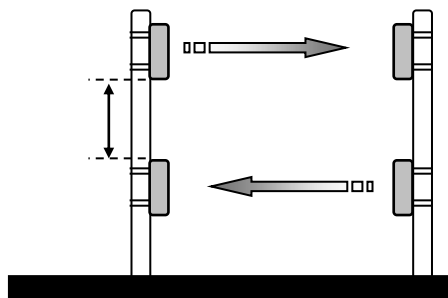
### **3. INSTALLATION**

#### **3.1. Selecting location for installation of detection system parts (transmitter/receiver)**

- 3.1.1. Place both parts of the system exactly opposite one another at the same height (horizontally).
- 3.1.2. Each of the system's parts should be installed on a firm and inflexible surface.
- 3.1.3. As much as possible, avoid installing the receiver in a place that may be exposed to direct sunlight. If it is not possible to avoid this exposure, the receiver should be calibrated according to the instructions in paragraph 7.
- 3.1.4. Place the two parts of the system in such a way that there is electronic eye contact between them, and avoid places where an object may move and obstruct eye contact in the future – for example near a tree, bush or a washing-line hung with clothes.
- 3.1.5. The distance between the two parts of the system should not exceed the range recommended for the specific model in use:

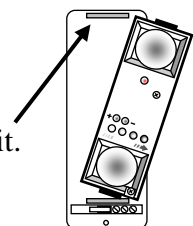
<b><i>MODEL</i></b>	<b><i>Indoor range</i></b>	<b><i>Outdoor range</i></b>
<b><i>ACTIVE-20</i></b>	<i>20 meters</i>	<i>20 meters</i>
<b><i>ACTIVE-50</i></b>	<i>50 meters</i>	<i>30 meters</i>
<b><i>ACTIVE-100</i></b>	<i>100 meters</i>	<i>80 meters</i>
<b><i>ACTIVE-200</i></b>	<i>200 meters</i>	<i>150 meters</i>

- 3.1.6. When more than one detection system is installed (one above the other), a space of at least 50cm should be left between them. Likewise, care must be taken to switch the location of the additional transmitter and the receiver so that each is located on the opposite side of its counterpart in the other system.



#### **3.2. Mounting the parts of the detection system (Transmitter/Receiver)**

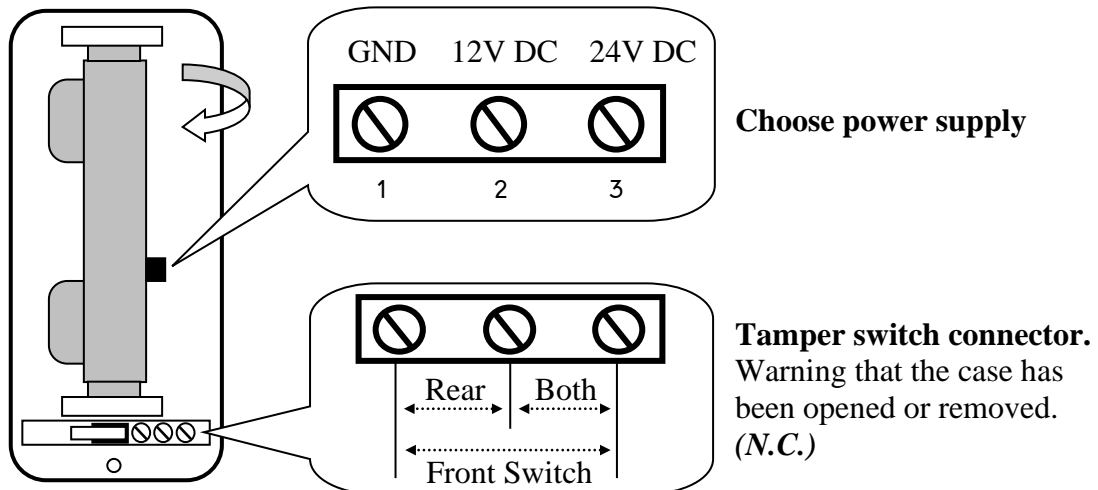
- 3.2.1. Open the case by loosening the screw at the bottom.
- 3.2.2. Take out the internal unit by slightly lifting the upper arm support that holds it.
- 3.2.3. Punch out a cable entry hole on the back panel, using a screwdriver.
- 3.2.4. If needed, open the cable outlet on the upper side of the back panel.
- 3.2.5. Pass a short part of the cable (about 20cm) through the cable hole and mount the back panel with all of the four screws provided.  
If necessary, use the enclosed “drilling diagram” to mark the holes.
- 3.2.6. Seal the remaining space between the cable and the hole through which it passes, using silicon glue (RTV).
- 3.2.7. Return the internal unit to its original place, between the two support arms that hold it.



3.2.9. What remains now is to connect the wires to the detection system parts (transmitter/receiver) as detailed below:

#### 4. WIRING THE TRANSMITTER

4.1. The main wiring terminals are located on the back of the internal unit and are accessible by turning the unit horizontally.



4.2. **Connect a power supply** of 12V DC between terminal No. 2 (+) and terminal No. 1 (-) *GND*. If you wish to use a power source of more than 12V DC (up to 24V DC), connect it between terminal No. 3 (+) and terminal No. 1 (-) *GND*.

The transmitter is now active and permanently emits two infrared beams.

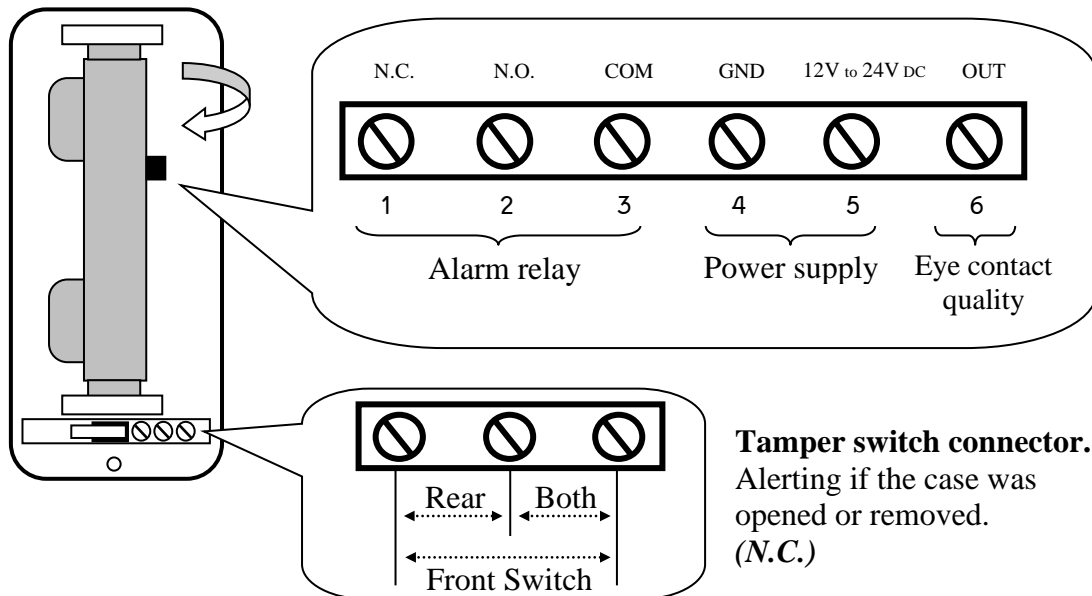
To indicate that the device is functioning normally, the “*TEST LED*” will be continuously flashing.

4.3. **Connect the wires for the Tamper switches** to the connector located on the bottom part of the back panel.

There are two switches – one guards against the case being opened and the other against removal of the device. It is recommended to use both of the switches, which are connected in a series. These two switches are normally in a closed position (*N.C.*) as long as the case is closed and mounted in its place.

## 5. WIRING THE RECEIVER

5.1. The main wiring terminals are located on the back of the internal unit and are accessible by turning the unit horizontally.



### 5.2. Power supply input

- \* Terminal No.5 (+) from 12V DC to 24V DC.
- \* Terminal No.4 (-) *GND*.

### 5.3. Alarm relay output- represented in two ways:

- \* Terminal No.1; *Normally Closed (N.C.)*.
- \* Terminal No.2; *Normally Open (N.O.)*.
- \* Terminal No.3; *Common (COM)*.

### 5.4. Output for indicating of Rain/Snow/Fog/Heavy dust

- \* Terminal No.6; This is an Open Collector output with no potential in a proper operation. If there is a significant reduction in electronic eye contact between the transmitter and receiver (due to rain, snow, fog, heavy dust, etc.) this terminal will provide *Ground ("0" logic)* until the eye contact quality returns to normal.

Thus, if an alarm warning is received (terminal No.1 or 2), at the time *Ground ("0" logic)* was provided by terminal No.6, this may indicate a gradual reduction in the quality of electronic eye contact between the two parts of the system, and not necessarily the crossing of the beam by a certain object.

### 5.5. Connect the Tamper Switch wires to the connector located on the bottom part of the back panel in the same way the transmitter was connected.(Section 4.3.)

There are two switches, one protect against opening of the case and the other against removal of the device. It is recommended to use both of the switches that are connected between them serially. These two switches are in the *Normally Closed* position (*N.C.*) as long as the case is closed and mounted in its original place.

## 6. Calibration of the receiver for synchronized communication with the transmitter

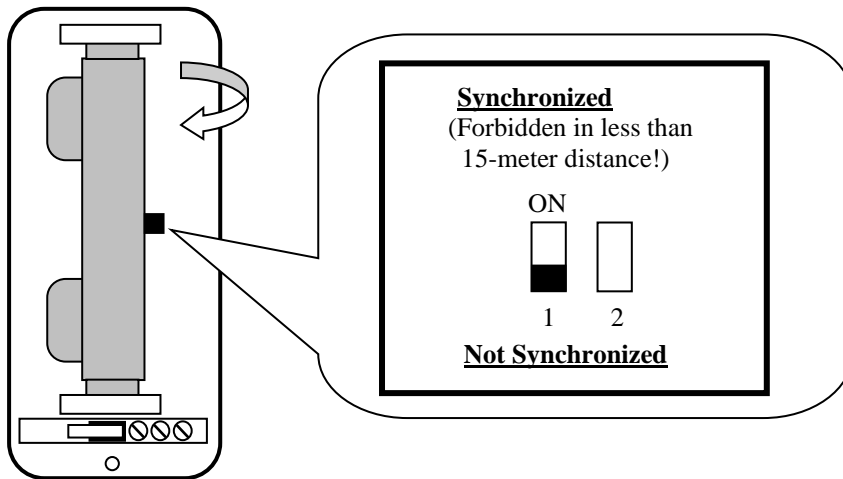
To prevent any attempt to neutralize (“trick”) the receiver side by means of a foreign IR transmitter, There is an option to synchronize the infrared communication between the transmitter and the receiver.

### **WARNING!**

In this serial, the calibration for synchronized communication is forbidden in installations where the distance between the transmitter and its receiver is less than 15 meters.

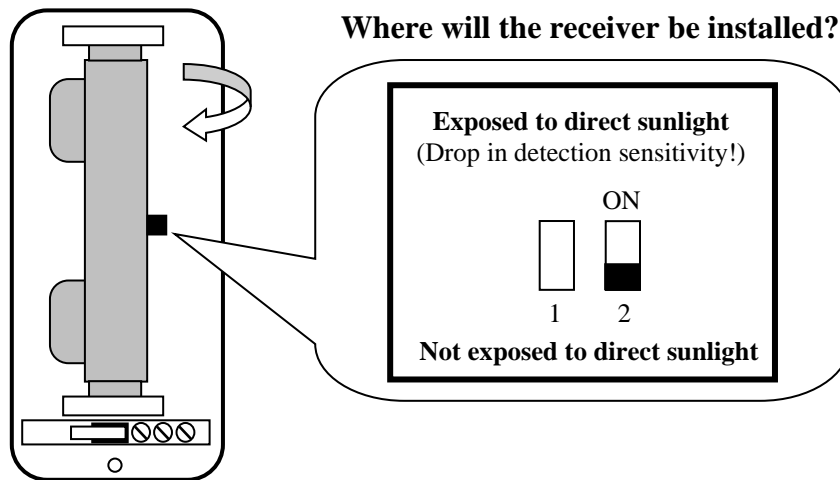
If a receiver will be calibrated for synchronized communication with its transmitter, while the distance between them is less than 15 meters- false alarms may occur.

The calibration is performed by means of the *DIP switch* No.1 located on the back of the internal unit, in the center. Access is possible by rotating the internal unit horizontally.

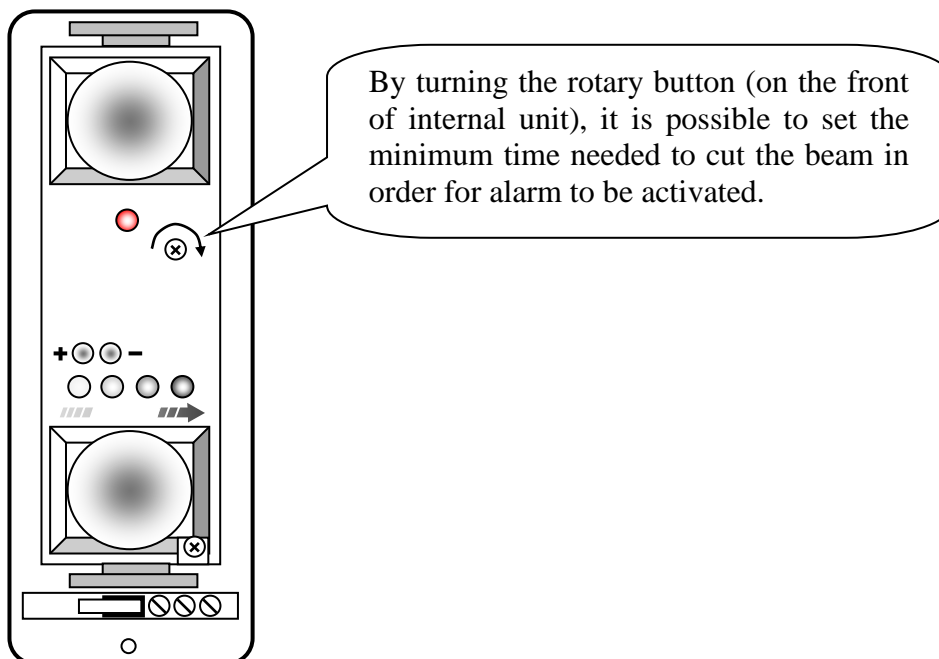


## **7. Calibration of the receiver for operating when front part is exposed to a direct sunlight**

The calibration is performed by means of the *DIP switch* No.2 located on the back of the internal unit, in the center. Access is possible by rotating the internal unit horizontally.



## **8. Calibration of beam-crossing speed (performed in the receiver)**



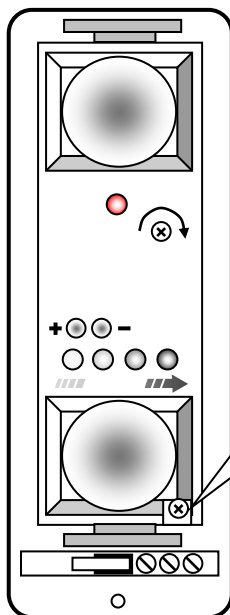
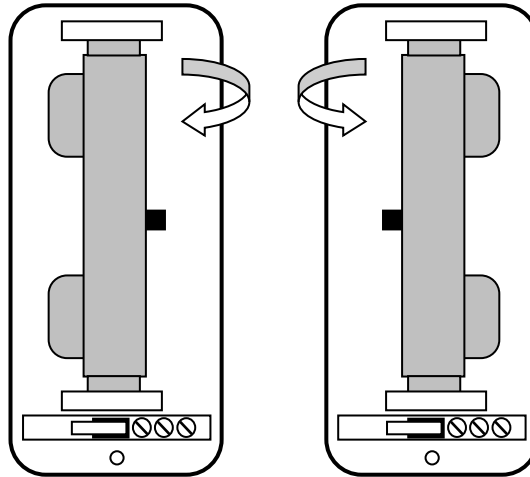
- 8.1. Adjust the speed of beam crossing according to environmental conditions and proceed with a "walking test."
  - 8.1.1. The beam-cut duration adjustment ranges from 50msec. to 500msec.
  - 8.1.2. The device, when it leaves the factory, is adjusted to 100msec.
  - 8.1.3. To detect high-speed beam crossing, adjust to a low value.
  - 8.1.4. To detect low-speed beam crossing, adjust to a high value (for example, if the system is installed on a window sill).
  - 8.1.5. Please pay attention! A very low value may increase the risk of false alarms, while a very high value will result in detecting of only very slow movement.



## 9. Precise alignment of the system's parts (Transmitter/Receiver) opposite one another

In the transmitter and the receiver as well, it is possible to adjust the angle of the internal unit deflection:

9.1. Horizontally – by turning it up to 90° to each side (manual rotation).



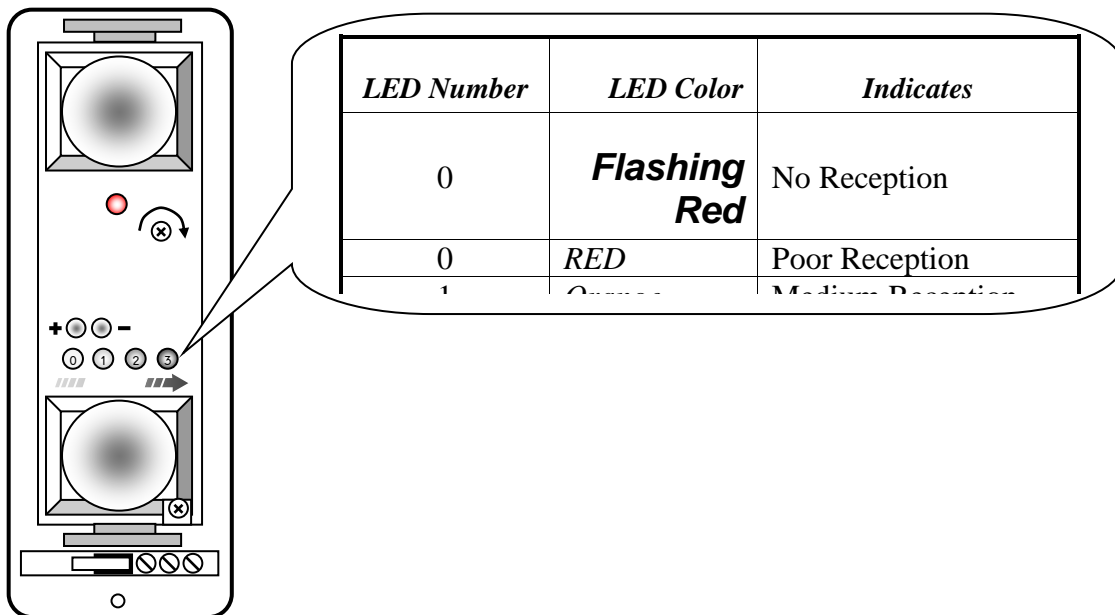
9.2. Vertical deflection adjustment (+/-5°)  
by turning the screw (use screwdriver) on  
bottom right-hand side:

**10. Quality control of alignment of detection system components (transmitter/receiver)**

Alignment may be checked in two ways:

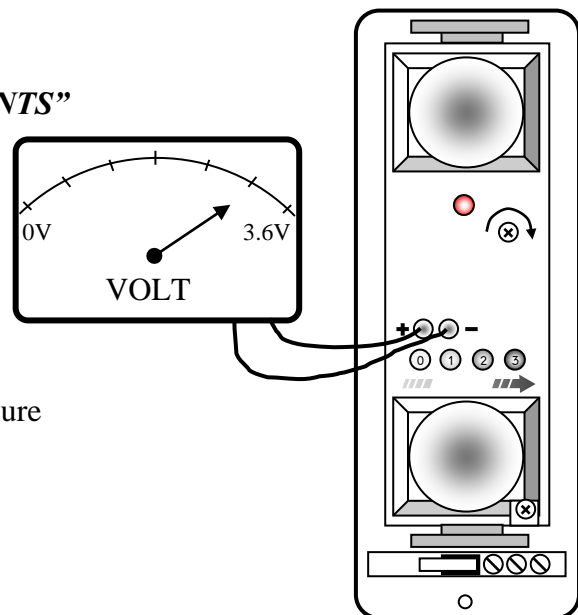
**10.1. By means of display of the colored and numbered LEDs which indicate the strength of the beams received from the transmitter.**

- 10.1.1. The higher the beam strength, the better the alignment.
- 10.1.2. This display will operate for about 30 minutes from the time the power supply is connected, or from time of switching any DIP switch (on the back of the internal unit) to a different position.
- 10.1.3. For proper functioning, at least “*Good reception*” (yellow LED, numbered 2) is desirable.



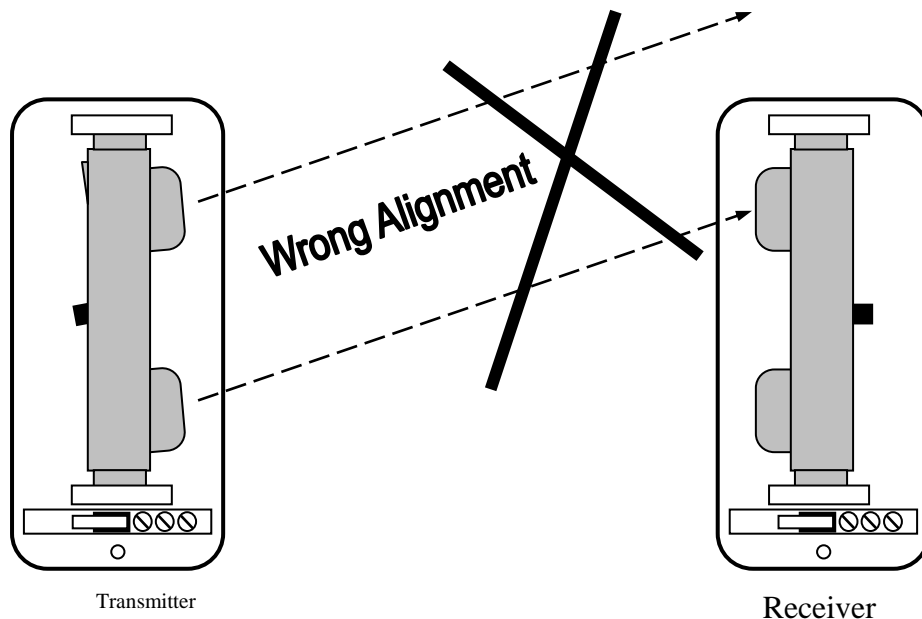
**10.2. By connecting a Voltmeter to the “TEST POINTS” located on the front of the internal unit.**

- 10.2.1. The higher the voltage reading, the higher the beam strength, and so the better the alignment.
- 10.2.2. The voltage reading in these points varies from 0V- for no reception to 3.6V DC- for very good reception.
- 10.2.3. For proper functioning, there should be a measure of at least 1V DC at these points.



## **11. Verification of dual-beam alignment of transmitter and receiver, rather than of one beam alone**

**X** Avoid alignment of only one beam, as illustrated below:



\* In order to avoid alignment of one beam only, make sure you get the same reception strength when covering alternately the upper lens and afterwards the lower one.

## **12. Close the case of the transmitter and the receiver and perform a “walk test”**

### **13. Types of warnings obtained from the receiver**

- 13.1. At a momentary crossing of the beams-** the alarm relay will activate for 2 seconds and the “*TEST LED*” control light will turn off during that time.
- 13.2. At crossing of the beams by an object that remains and permanently obscures** – As long an obstruction exists, the alarm relay will activate and the “*TEST LED*” control light will be turned off.
- 13.3. If there is a synchronization problem** (if someone is trying to neutralize/trick the receiver by using a foreign unrelated transmitter)- As long a foreign emission is received, the alarm relay will activate and the “*TEST LED*” control light will be turned off.
- 13.4. With detection of rain, snow, fog, heavy dust, etc. or with a reduction in quality of electronic eye contact between the two parts of the system.**  
Terminal No. 6, which is an Open Collector output with no potential in a proper operation, will provide *Ground* (“0” logic) until the quality of electronic eye contact returns to normal. Thus, if an alarm warning is received (terminal No.1 or 2), at time *Ground* (“0” logic) was provided by terminal No.6, this may indicate a gradual reduction in the electronic eye connection between the two parts of the system and not necessarily the crossing of the beams by a certain object.

# ACTIVE

## Dual-beam Outdoor/Indoor Synchronized Active Infrared Detector

### **SPECIFICATIONS**

#### Range

ACTIVE-200..... 200 m (660 ft) indoors; 150 m (495 ft) outdoors  
ACTIVE-100..... 100 m (330 ft) indoors; 80 m (264 ft) outdoors  
ACTIVE-50..... 50 m (165 ft) indoors; 30 m ( 99 ft) outdoors  
ACTIVE-20..... 20 m ( 66 ft) indoors; 20 m ( 66 ft) outdoors

Power supply... TX: 12V DC or 24V DC; RX: from 12V DC to 24V DC  
Current drain..... Tx=57 mA; Rx=30 mA (Max.)  
Alarm contacts.... Changeover relay (N.C. or N.O.) 0.5A/24V DC, Max.  
Tamper switch..... (N.C.) 0.5A/24V DC, Max.

Alarm time..... 2 Sec.  
Interruption time.....Adjustable 50 to 500 m.Sec.  
Internal alignment angle.....Vertical +/-5<sup>0</sup>, Horizontal +/-90<sup>0</sup>

Operating Temperature..... -20<sup>0</sup>C~ 70<sup>0</sup>C (-4<sup>0</sup>F ~ 158<sup>0</sup>F)  
Humidity withstand..... 95%



### ***Drilling Diagram***

If necessary, use this *drilling-diagram* in order to mark the holes for the back panels.

