

DT93

**Indoor long-range dual technology detector
for intrusion detection systems**



Addressee for this information: User | Installer



1 DESCRIPTION

DT93 is a dual-technology detector.

The device features two sections working in AND mode.

Infrared section (IR): digital PIR sensor with temperature compensation and lens with white light protection.

Microwave section (MW): 10.525GHz DRO planar antenna with built-in LNA amplifier.

For side-by-side mounting, differentiated frequencies can be used.

The detector long range (up to 23 m) makes it suitable to protect large-size indoor locations.

The device features the anti-blinding, anti-masking, anti-sneak functions.

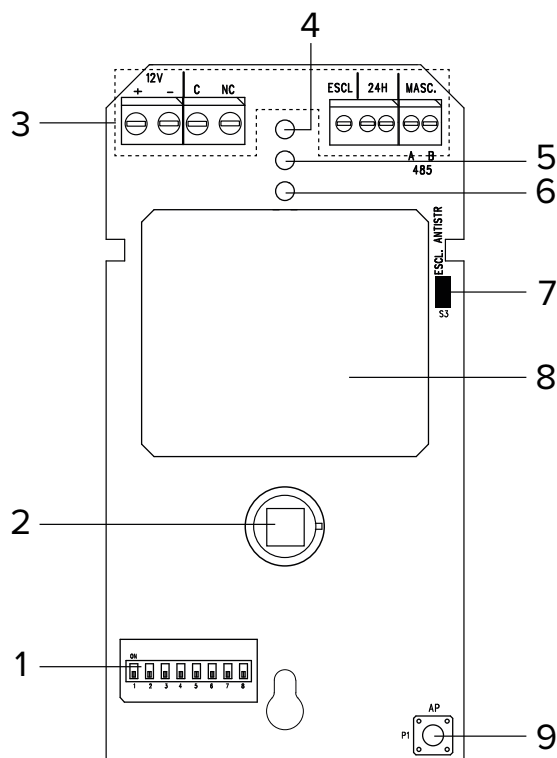
LEDs indicate device working activity.

DT93 can be set with board dip switch.

Optional joint available.

DT93 is certified IMQ - Security Systems.

2 PCB



- 1 Dip switches
- 2 PIR sensor
- 3 Terminal board
- 4 Blue LED
- 5 Red LED
- 6 Green LED
- 7 Jumper to exclude protection against removal
- 8 MW antenna
- 9 Tamper button

3 TECHNICAL DATA



Model		DT93	
Identification			
Use	indoor		
Technology	IR + MW		
Coverage type	Volumetric		
IR section			
PIR sensors number	1		
Max range	23		m
Pulse count	5		s
Opening	94°		°
No. of IR sensitive zones	20 zones on 4 levels, 3 creep zones on one level		
MW section			
MW max range	23		m
Pulse count	5		s
Standard TX frequency	10.525		GHz
Differentiated TX frequency	10.587		GHz
MW horizontal coverage	90°		°
MW vertical coverage	30°		°
Max power output	13		dBm
General features			
Operating voltage	Power supply	12	V
	Minimum power supply	7.5	V
	Power fault detection threshold	7.5	V
Consumption at power voltage	Idle mode	52	mA
	Alarm mode	53.0	mA
	MW excluded mode	18	mA
Operating times	Power-on stand-by	20	s
	Pre-alarm time	10	s
Working temperature	-10 / +55		°C
Humidity	93%		
Protection class	IP3X		
Certification	IMQ-Security Systems EN50131-2-4: grade 3, environmental class II (1)		
Dimensions and weight	W72 × H138 × D56, 150 g (only detector body)		

(1) grade 1 if the optional joint is used

Parts supplied

Screws, dowels, S4 screw and dowel for microswitch against removal, sloped bracket, technical manual.

Optional accessories

SND3D joint.

4 BEFORE INSTALLATION



General warnings are at the end of this manual.

Before installing the product, please read the following indications carefully.

4.1 General considerations

- Make sure the device operating field is free and devoid of zones darkened by obstacles.
- Adjust microwave range so that it does not extend beyond glazing or plastic curtains. If necessary, set the range to the minimum and disable anti-sneak function.
- Do not install the device near swaying or vibrating metal objects (ex. fridge/refrigerators groups, window blinds, metal roller shutters).
- Avoid installation near heat sources or drafts.
- Do not touch PIR sensor silicon filter.
- Two or more detectors (not necessarily all DT93) operating at the same frequency must be installed at a distance of at least 25 metres between each other.
- In case of installation of DT93 and another detector at a distance of less than 25 m between each other, one of the two must be a differentiated-frequency model.
- The detector's MW section can detect moving objects even from long distances: adapt the range to the location to be monitored, especially in case of use in wide locations where there are large metal objects (metal shelving, metal gates etc.).

The electronic board of the detector may be damaged by electrostatic discharges. The installer must completely avoid any presence of electrostatic discharges.

4.2 Definition of installation position

The detector must be installed at an height of at least 2.1 m.

Mounting at heights lower than 2.1 m is not allowed.

It is mandatory to use:

- the sloped bracket for installation at 2.1 m height;
- the optional joint for installation at heights higher than 2.1 m.

Small changes in height or tilt might significantly alter the detector range. Follow the instructions listed in the mounting procedure thoroughly (chapter 5 p. 3).

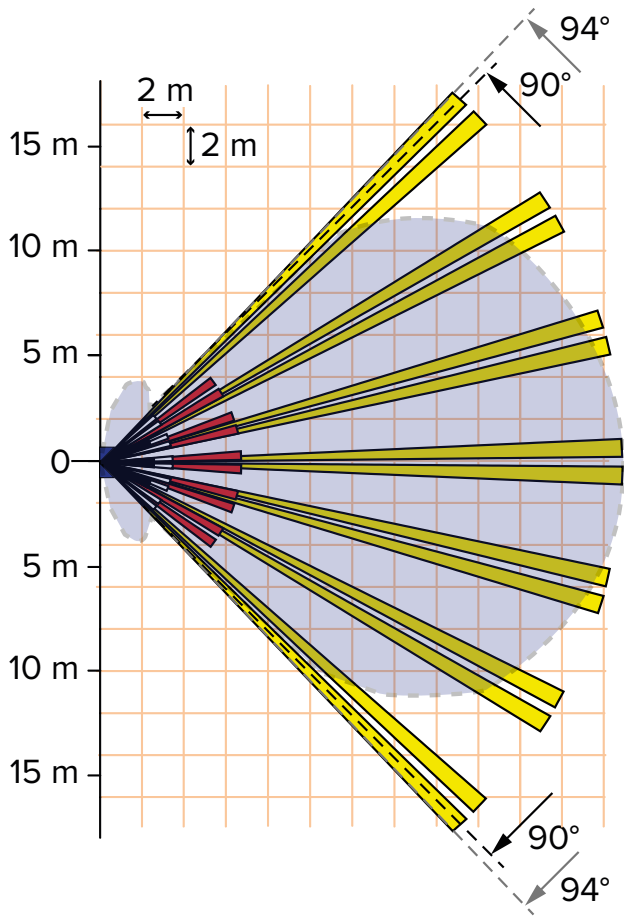
The following diagrams refer to detectors mounted at 2.1 m height.

Range: 23 m (± 2 m)

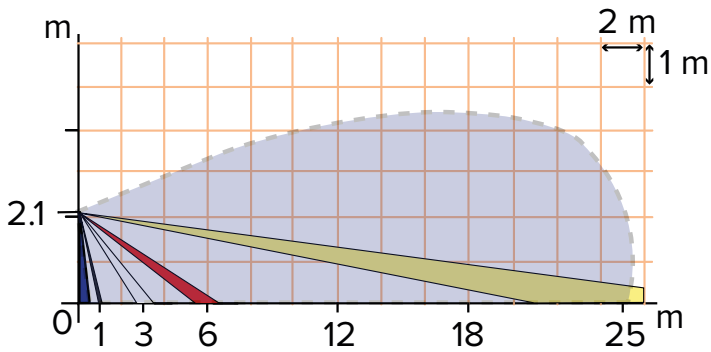
Coverage: volumetric

Beams arrangement: 20 zones on 4 levels, 3 under-crawl

Top view



Side view

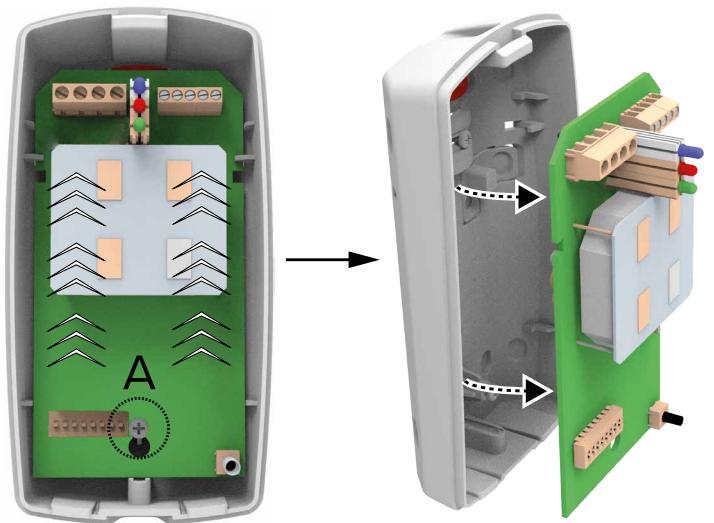


• **Opening the housing**



- loosen cover fixing screw
- insert the screwdriver flat tip between detector bottom and cover in the indicated areas
- gently leverage the cover up and remove it

• **Removing the electronic board**



Note: the board layout in the previous picture is merely indicative.

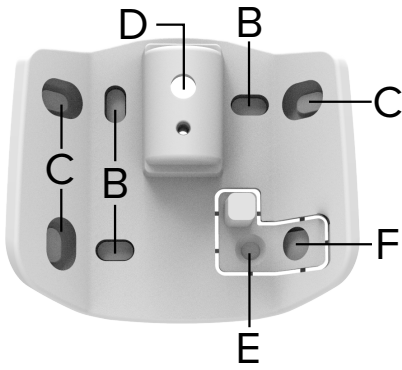
- loosen the screw A fixing the board to the base
- slide the board upwards
- remove the board

The detector's installation requires that you use either the 6-degree sloped bracket (supplied) or the optional joint. It is mandatory to use:

- the sloped bracket for installation at 2.1 m height;
- the optional joint for installation at heights higher than 2.1 m.

Read the relevant section.

• **Fixing the bracket**



- using a screwdriver, open the pre-drilled areas of the bracket suitable for mounting on flat surface (B) or on a corner (C)

- drill area D for cables passage
- feed the cable through the drilled hole

For protection against removal:

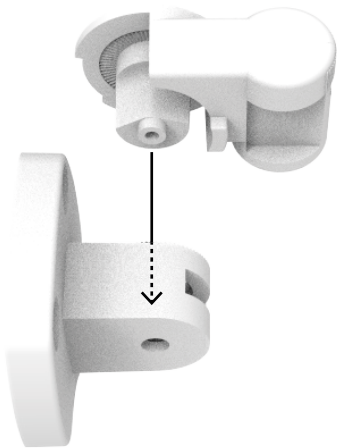
- in case of mounting on a flat surface, insert a screw with S4 dowel into the hole E
- in case of mounting on a corner, insert a screw with S4 dowel into the hole F

The bracket must be mounted at 2.1 m height.

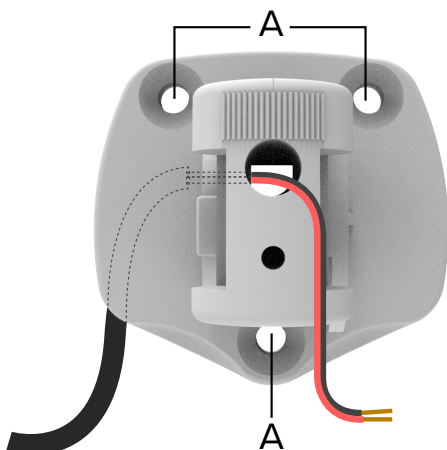
- fix the bracket to the surface using screws and dowels

• **Mounting of optional joint**

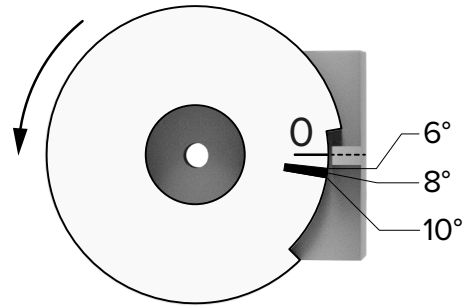
If necessary, install the optional joint:



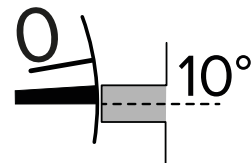
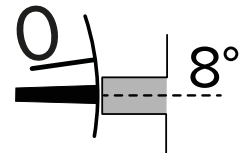
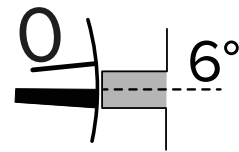
- assemble the joint



- remove the sheath from the end of the wires to connect to the terminal block
- feed the cable as illustrated
- fix the mounting plate to the wall using the supplied screws and inserts (use A holes)



- tilt the joint as needed



To adjust it, align the center of the plastic tooth:

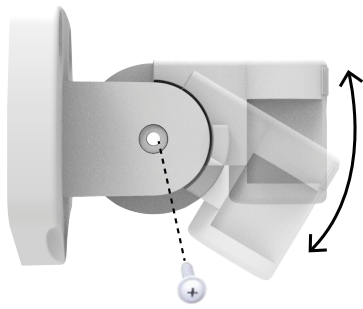
- with the upper edge of the notch to get 6° tilt;
- with the center of the notch to get 8° tilt;
- with the lower edge of the notch to get 10° tilt.

For information on the tilt angle to set according to the installation height, refer to the following table.

Installation height	Required tilt
2.1 m	6°
3 m	8°

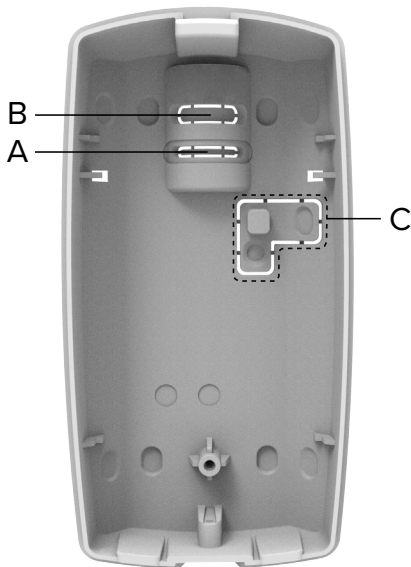
⚠ The height suggested to achieve the optimal coverage is 2.1 m. Installing the detector at greater heights might make the coverage below the detector less effective, if the tilt defined for the maximum range is kept.

⚠ Small changes in height or tilt might significantly alter the detector's range. In any case, we recommend checking the detector's actual range with tests to find the optimal tilt.

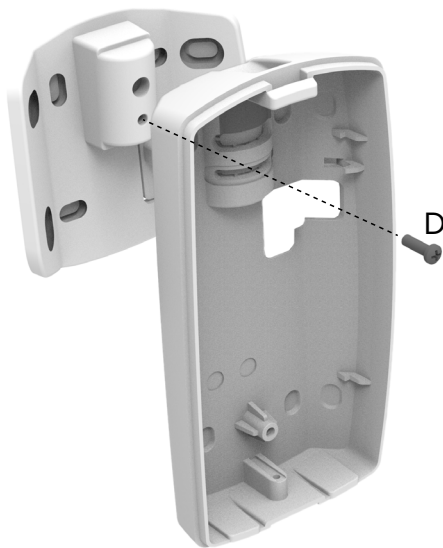


– fix the joint to the mounting plate using a pan head screw

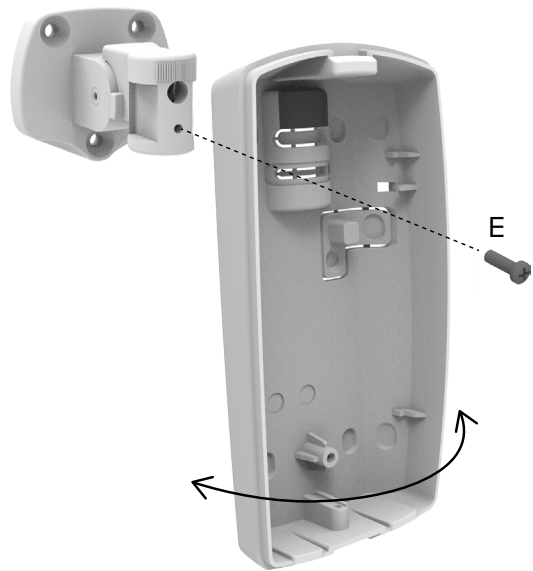
• **Base wall mount**



- using a screwdriver, open the pre-drilled area A for fixing
 - using a screwdriver, open the pre-drilled area B for cable passage
 - feed the cable through the drilled hole
- If you are using the bracket:
- remove the plate for protection against removal (C) from the detector base



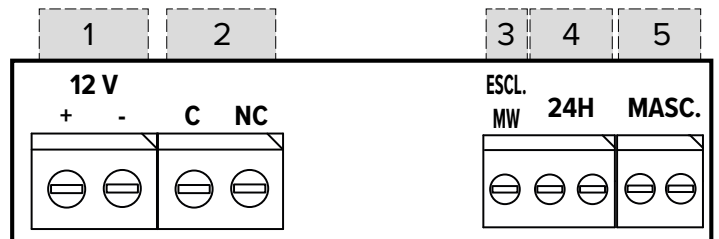
- fix the base to the bracket using the suitable screw (D)
- With optional joint:



- rotate the base on the joint as needed
- fix the base to the joint using the supplied screw (E)

• **Wirings**

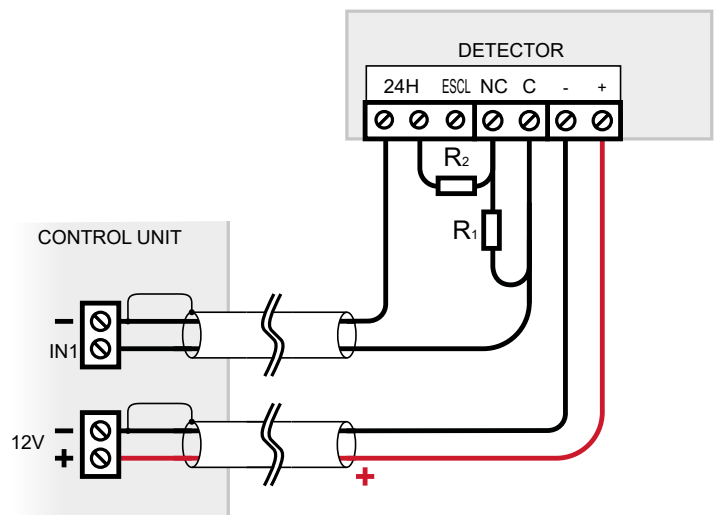
Detector terminal board:



- 1 Power supply (+12 V)
- 2 Alarm relay output C-NC (with 10 Ω resistor and 100 mA voltage)
- 3 Activate LED / MW section exclusion
- 4 Tamper output (NC)
- 5 Fault/masking output

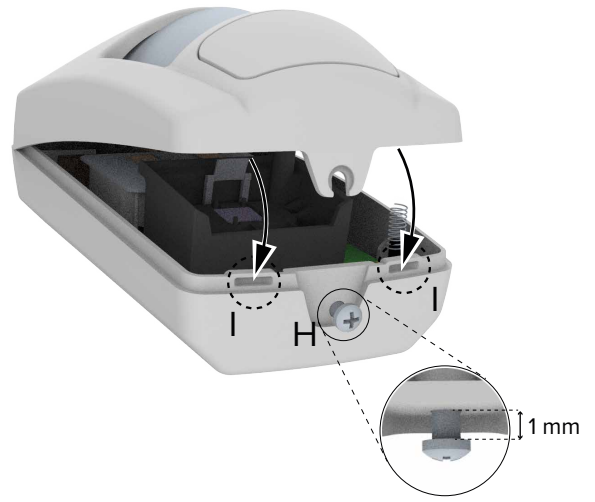
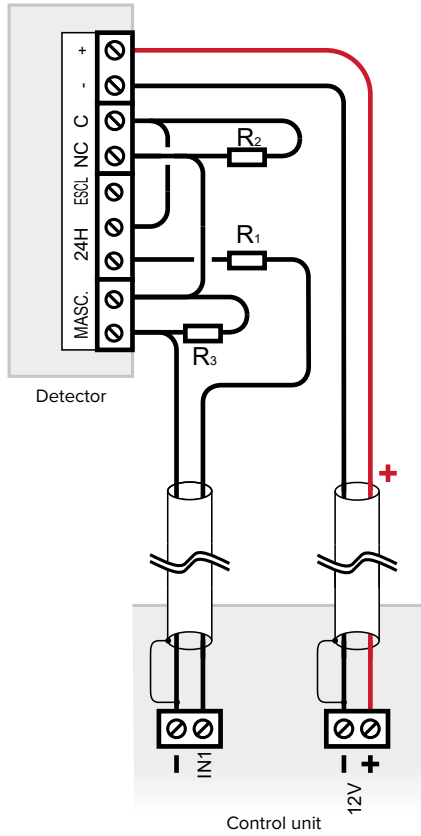
– wire terminals

Dual-balancing drawing:

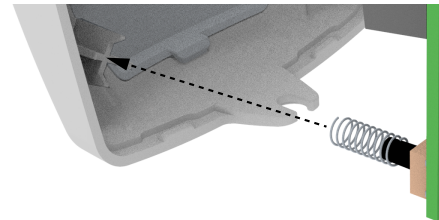


Resistors R1 = R2 = 1500 Ω are supplied with the control unit.

Triple-balancing drawing:



- insert closing screw in hole H, leaving approximately 1 mm between the screw and the housing bottom
- lower the device cover until the hooks on the internal cover fit into the base slots (I)



Verify the unit supports triple-balancing setup.
Resistors $R_1 = 1000 \Omega$, $R_2 = 680 \Omega$, $R_3 = 1200 \Omega$ are supplied with the unit.

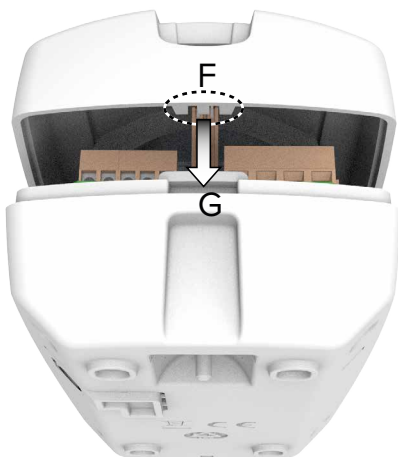
• **Board positioning**

- place the board on the supports
- slide the board downwards until it stops
- tighten the screw A fixing the board to the base

• **Device setup**

Now proceed with detector setup (see following chapter).

• **Closing the housing**



- insert hooks on the upper side of the cover (F) into the base slot (G)

! *Make sure the tamper protection spring fits correctly to its place.*

- tighten closing screw



6.1 DIP switch settings

Detector functions can be set using board DIP switch. To access it, open the cover as illustrated in the mounting procedure.

▼ Activate LED / MW section exclusion

DIP 1	Function
ON	LED exclusion enabled on ESCL. terminal
OFF	MW section exclusion enabled on ESCL. (default) terminal

▼ Activate/deactivate anti-blind, anti-mask, and anti-sneak functions.

DIP 2	DIP 3	Functions enabled
OFF	OFF	None (default)
OFF	ON	Anti-masking function
ON	OFF	Anti-masking, anti-blinding
ON	ON	Anti-masking, anti-blinding, anti-sneak

▼ Sensitivity adjustment

DIP 4	Sensitivity
ON	Minimum: 8 MW pulses, 3 IR pulses
OFF	Maximum: 4 MW pulses, 2 IR pulses (default)

▼ AND/OR

DIP 5	Mode
ON	AND (default)
OFF	OR

▼ MW range adjustment

DIP 7	DIP 8	Range
ON	ON	25%
ON	OFF	50% (default)
OFF	ON	75%
OFF	OFF	100%

Dip 6 is not used.

6.2 ESCL. terminal settings

The detector features a ESCL. terminal input that can be used to disable the MW section or the LED indicators.

Disable MW section

- set dip 1 to OFF
- wire ESCL. terminal to +12V

MW section will be disabled regardless of dip 5 position.

Disable LED indicator

- set dip 1 to ON
- wire ESCL. terminal to +12V



The detector detects motion inside the covered area.

7.1 AND/OR mode

The way the alarm notification is given differs depending on operating mode set:

AND mode

To activate it, set dip 5 to ON.

The alarm relay is activated only when both IR and MW technologies trigger an alarm.

One of the two technologies detects a movement and switches to pre-alarm status (IR or MW) for the set time.

If within such time the other technology does not confirm the detection, the technology in pre-alarm status will reset.

OR mode

To deactivate it, set dip 5 to OFF.

The alarm relay is activated when either of the two technologies sends an alarm notification due to movement within the controlled area.


7.2 Anti-blinding function

DT93 features anti-blinding function.

The function detects blinding attempts made by placing a reflective body before the lens. Use dip switches 2 and 3 to activate the function.

When the device enters a "blinded" condition, the green LED will start blinking slowly.

When the reflective body is removed, the standard operating mode will be restored.

 *We recommend to disable anti-blinding function if the detector is installed in places with people passing often at less than 20 cm distance.*

7.3 Anti-masking function

DT93 features anti-masking function.

The function detects attempts to obscure/cover the vision by placing an object in front of the detector.

In order to activate the anti-masking function, the device shall be operating in AND mode and the MW mode shall be enabled.

Use dip switches 2 and 3 to activate the function.

When the device enters a "detector masked" condition, the blue LED will start blinking slowly.

The standard operating mode will be restored when one of the technologies confirms the first movement.

Activation status of the anti-masking function can be controlled with indications only during stabilisation at power on: if someone passes close to the sensor, blue and green LEDs will blink.

It is advisable to connect MASC output to an independent

alarm input, or in series to the detector alarm output. In any case, when possible, connect the detector to a control unit that individualises alarm, tamper and fault events separately. If using 24H input, set it to silent mode.

! *We recommend to disable anti-masking function if the detector is installed in places with people passing often close to the detector.*

Note: for grade 3 compliance, enable anti-masking and anti-blinding functions.

7.4 Anti-sneak

DT93 features anti-sneak function.

The function detects attempts to elude the IR section from far off with special physical expedients.

In order to activate the function, the device shall be operating in AND mode.

Use dip switches 2 and 3 to activate the function.

When the function activates, blue LED indicator will start blinking quickly.

The standard operating mode will be restored when one of the technologies confirms the first movement.

! *We suggest disabling the anti-sneak function in case there are plastic curtains or glass windows close to the detector and, in any case, where there are big metal objects (metal shelving, metal gates etc.).*

! *We suggest disabling the anti-sneak function in case the detector is installed for protection of long hallways (not recommended).*

7.5 Fault detection

The device manages the detection and signalling of the following faults:

- power fault: when power low voltage is detected a fault event is generated.
- PIR fault
- microwave section fault

Detector LED indicators will light on as shown in the table of paragraph 7.6 p. 8.

7.6 LED indications

Condition	Red LED	Green LED	Blue LED
Stabilisation at power on	Steady light		
IR pulse		Single blinking	
MW pulse			Single blinking
Pre-alarm IR		Steady light	
Pre-alarm MW			Steady light
General alarm		Steady light	Steady light

Condition	Red LED	Green LED	Blue LED
Power failure	Slow blinking	Slow blinking	Slow blinking
PIR fault		Fast blinking	
MW fault			Fast blinking
Blinding		Slow blinking	
Sneak/Masking			Slow blinking

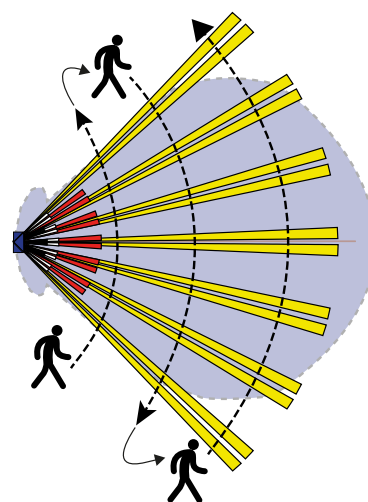
Note: for grade 3 compliance, it must be possible to disable the LEDs remotely.

8 MAINTENANCE



8.1 Periodic test

Carry out a simple test regularly to verify the functionality and the coverage limits of the detector.



- taking detector position as the point of reference, make half-circle movements from opposite directions to check coverage from both sides

Detector LED indicators shall respond as shown in the table of 7.6 p. 8 paragraph.

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EU DECLARATION OF CONFORMITY

Hereby, EL.MO. Spa declares that the radio equipment DT93 is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address: www.elmospa.com – registration is quick and easy.



GENERAL WARNINGS



This device has been designed, built and tested with the utmost care and attention, adopting test and inspection procedures in compliance with current legislation. Full compliance of the working specifications is only achieved in the event the device is used solely for its intended purpose, namely:

Indoor long-range dual technology detector for intrusion detection systems

The device is not intended for any use other than the above and hence its correct functioning in such cases cannot be assured. Consequently, any use of the manual in your possession for any purpose other than those for which it was compiled - namely for the purpose of explaining the product's technical features and operating procedures - is strictly prohibited.

Production processes are closely monitored in order to prevent faults and malfunctions. However, the components adopted are subject to an extremely modest percentage of faults, which is nonetheless the case with any electronic or mechanical product.

Given the intended use of this item (protection of property and people), we invite you to adapt the level of protection offered by the system to suit the actual situation of risk (allowing for the possibility of impaired system operation due to faults or other problems), while reminding you that there are specific standards for the design and production of systems intended for this kind of application.

We hereby advise you (the system's operator) to see that the system receives regular routine maintenance, at least in accordance with the provisions of current legislation, and also check on as regular a basis as the risk involved requires that the system in question is operating properly, with particular reference to the control unit, sensors, sounders, dialler(s) and any other device connected. You must let the installer know how well the system seems to be operating, based on the results of periodic checks, without delay.

Work involved in the design, installation and maintenance of systems incorporating this product should be performed only by personnel with suitable skills and knowledge required to work safely so as to prevent any accidents. It is vital that systems be installed in accordance with current legislation. The internal parts of certain equipment are connected to the mains and therefore there is a risk of electrocution when maintenance work is performed inside without first disconnecting the primary and emergency power supplies. Certain products include batteries, rechargeable or otherwise, as an emergency backup power supply.

If connected incorrectly, they may cause damage to the product or property, and may endanger the operator (explosion and fire).

INSTALLER WARNINGS



Comply strictly with current standards governing the installation of electrical systems and security systems, and with the manufacturer's directions given in the manuals supplied with the products.

Provide the user with full information on using the system installed and on its limitations, pointing out that there are different levels of security performance that will need to suit the user's requirements within the constraints of the specific applicable standards. See that the user looks through the warnings given herein.

Work involved in the design, installation and maintenance of systems incorporating this product should be performed only by personnel with suitable skills and knowledge required to work safely so as to prevent any accidents. It is vital that systems be installed in accordance with current legislation. The internal parts of certain equipment are connected to the mains and therefore there is a risk of electrocution when maintenance work is performed inside without first disconnecting the primary and emergency power supplies. Certain products include batteries, rechargeable or otherwise, as an emergency backup power supply. If connected incorrectly, they may cause damage to the product or property, and may endanger the operator (explosion and fire).

USER WARNINGS



Check the system's operation thoroughly at regular intervals, making sure the equipment can be armed and disarmed properly.

Make sure the system receives proper routine maintenance, employing the services of specialist personnel who meet the requirements prescribed by current regulations.

Ask your installer to check that the system suits changing operating conditions (e.g. changes in the extent of the areas to be protected, change in access methods, etc...)

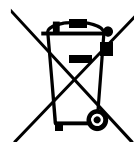
MAIN SAFETY RULES

The use of the device is forbidden for children and unassisted disabled individuals.

Do not touch the device when bare footed, or with wet body parts. Do not directly spray or throw water on the device.

Do not pull, remove or twist the electric cables protruding from the device even if the same is disconnected from the power source.

DISPOSAL WARNINGS



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In accordance with Directive 2012/19/EU on waste electrical and electronic equipment (WEEE), please be advised that the EEE was placed on the market after 13 August 2005 and must be disposed of separately from normal household waste.