BOSCH

Professional Series TriTech AM Motion Detectors with Anti-mask, LSN

en   Reference Manual

Table of contents

1   Safety

Changes or modifications not expressly approved by Bosch Security Systems, Inc. can void the user's authority to operate the equipment.

At least once per year, vary the range and coverage. To ensure continual daily operation, instruct the end user to walk through the far end of the coverage pattern. This ensures an alarm output prior to arming the system.

Old electrical and electronic appliances

Electrical or electronic devices that are no longer serviceable must be collected separately and sent for environmentally compatible recycling (in accordance with the European Waste Electrical and Electronic Equipment Directive).

To dispose of old electrical or electronic devices, you should use the return and collection systems put in place in the country concerned.

ROHS

For use in China: CHINA ROHS DISCLOSURE TABLE

Sensors

Hazardous substance table according to SJ/T 11364-2014						
	Pb (Pb)	Hg (Hg)	Cd (Cd)	Cr 6+ (Cr 6+)	PBB (PBB)	PBDE (PBDE)
PCB	X	O	O	O	O	O
Electronic components	X	O	X	X	O	O
PCBA	X	O	X	O	X	X
Cables	X	O	X	O	X	X
Plastic materials	O	O	O	O	X	X
Metal materials	X	O	X	X	O	O
Glass material (lenses)	X	O	O	O	O	O
Terminal block	X	O	X	X	O	O
This table was created according to the provisions of SJ/T 11364						
O: The content of such hazardous substance in all homogeneous materials of such component is below the limit defined in GB/T 26572						
X: The content of such hazardous substance in a certain homogeneous material is above the limit defined in GB/T 26572						

The manufacturing datecodes of the products are explained in:

http://www.boschsecurity.com/datecodes/

2   Introduction

This document provides install-related information for Professional Series LSN detectors.

2.1   About documentation

Copyright

This document is the intellectual property of Bosch Security Systems, Inc. and is protected by copyright. All rights reserved.

Trademarks

All hardware and software product names used in this document are likely to be registered trademarks and must be treated accordingly.

Notifications

This document uses Notices, Cautions, and Warnings to draw your attention to important information.

i	**Notice!** These include important notes for successful operation and programming of equipment, or indicate a risk of damage to the equipment or environment.

⚠	**Caution!** These indicate a hazardous situation which, if not avoided, could result in minor or moderate injury.

⚠	**Warning!** These indicate a hazardous situation which, if not avoided, could result in death or serious injury.

2.2   Bosch Security Systems, Inc. product manufacturing dates

Use the serial number located on the product label and refer to the Bosch Security Systems, Inc. website at http://www.boschsecurity.com/datecodes/.

The following image shows an example of a product label and highlights where to find the manufacturing date within the serial number.

3   Detector overview
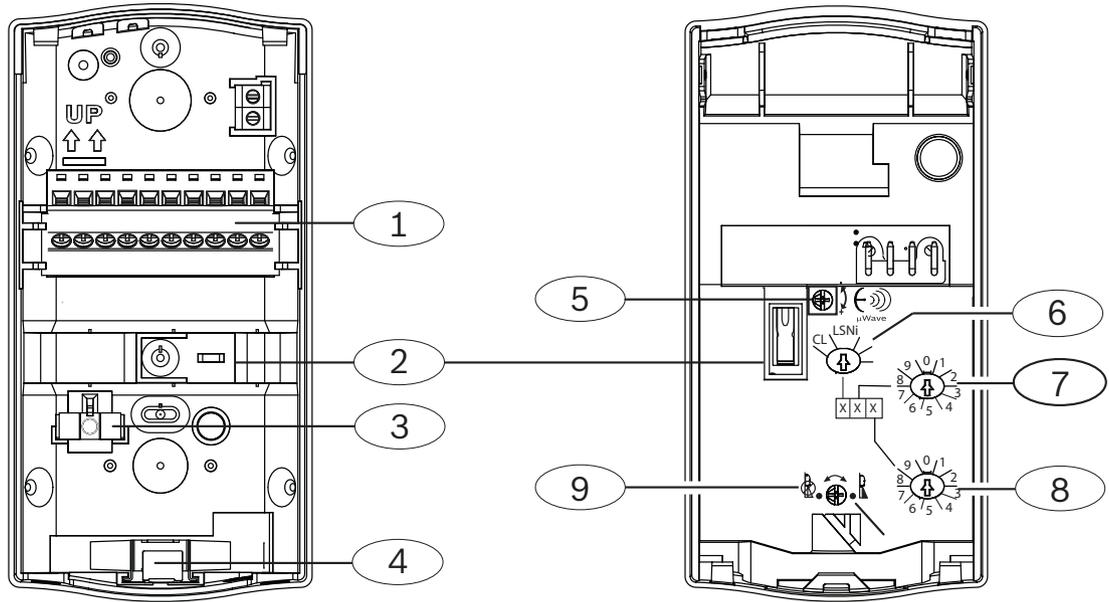
Callout — Description	Callout — Description
1 — Terminal block	6 — LSN address switches
2 — Wall Tamper	7 — LSN address 1 switch (not used)*
3 — Removable bubble level	8 — LSN address 2 switch (not used)*
4 — Self-locking cam lock	9 — Look-down zone On/Off switch*
5 — Microwave Doppler radar range adjustment	
*T-tapping is not supported by the bus.	

i

Notice!
Location and number of features and configuration switches varies by model.

4   Installation considerations

When installing the detector, observe the following installation considerations.

i	**Notice!** **Bracket use** Using a mounting bracket might reduce catch performance, range, as well as increase false alarms. Reduced catch performance might invalidate regulatory certification on the installation. The use of mounting brackets has not been evaluated by regulatory agencies.

Microwave Doppler radar energy passes through glass and most common non-metallic walls. The PIR detector reacts to objects rapidly changing temperature within its field-of-view. Detectors using passive infrared (PIR) technology recognize that all objects give off (emit) infrared energy. The warmer an object is, the greater the amount of infrared energy is emitted. The PIR receiver technology is designed to detect the change in infrared energy caused when a target of a different temperature from a stable background passes through its field of view (coverage pattern).

Point the detector away from:	
	Glass exposed to the outdoors.
	Objects that might change temperature rapidly such as heat sources, air conditioning outlets, or surfaces heated by sunlight.
	Objects that small animals such as birds and mice might climb on (stairs, shelves, ledges, furniture) and appear in the upper zones of the PIR which are more sensitive. Small animals in close proximity to the detector, within the field of view might, also cause false alarms.
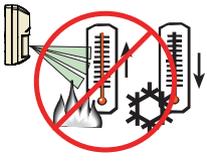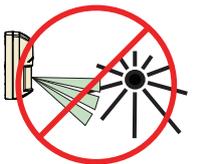
Do not install:	
	In a location where direct sunlight shines onto the detector.
	Outdoors.
	Near rotating machines or other moving objects within the field of view.
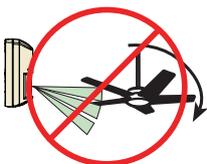
Do not install:	
	Near objects that can block the field of view.
	Where an intruder would walk only directly toward or away from the detector.
	In a location where the detector's field of view is blocked by movable objects such as boxes, furniture, doors or windows, window coverings, hanging signs, etc. The PIR detector does not detect through glass.
	Near doors and windows or other openings where cold or warm air can flow onto the detector.
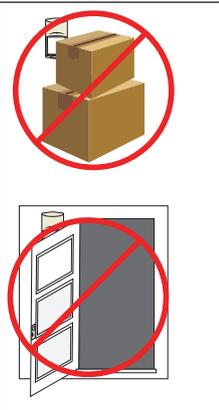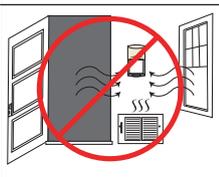
5   Installation

This section includes hardware details and the instructions you need to install the motion detector base.

5.1   Self-locking cam

The detector includes a self-locking cam for easy installation. Refer to the following information to open and close the detector.

Open the detector and remove the base

1.   Insert a flathead screwdriver into the self-locking cam hole.
2.   Turn to the unlock position.
3.   Slide, then lift the detector from the base.
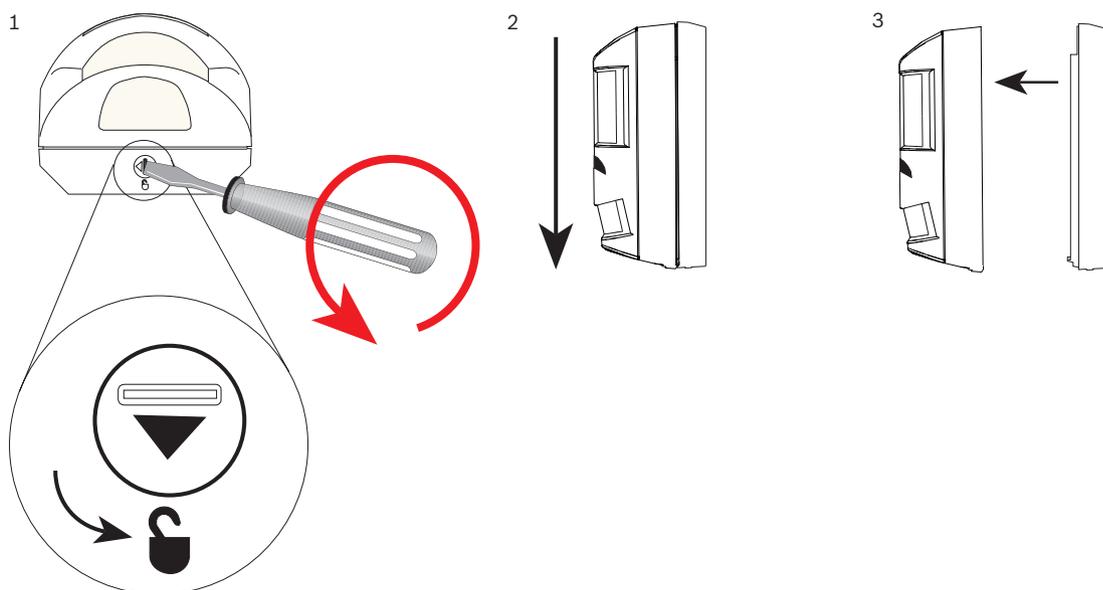
Attach the detector back onto the base

	Notice!
i	When you remove the detector from the base, the cam automatically returns to the locked position. When you place the detector onto the base, the cam must remain in locked position. Do not manually change the cam once you remove the detector from the base; doing so unlocks the detector and prevents you from putting the detector correctly onto to base.

1.   Put detector onto the base.
2.   Slide the detector up until you hear it "click."

5.2 Install options

	Install the detector using the detector base.
	Install the detector on a flat wall or in a corner. Refer to Mount directly – for linking.
	Install the detector using a bracket. Refer to *Install on a bracket, page 11*.
	Detector coverage patterns are designed for optimal performance when installed vertically and horizontally level. The detector base includes a removable bubble level which helps you align the unit. Before drilling the installation holes, use the bubble level to align the detector. Refer to *Bubble level, page 14*.

Install directly to the surface

When installing onto a flat surface, select the installation holes shown in the figure. Drill or tap out holes with a screwdriver.

To use the wall tamper feature, use one of the installation holes shown in red in the following figure.
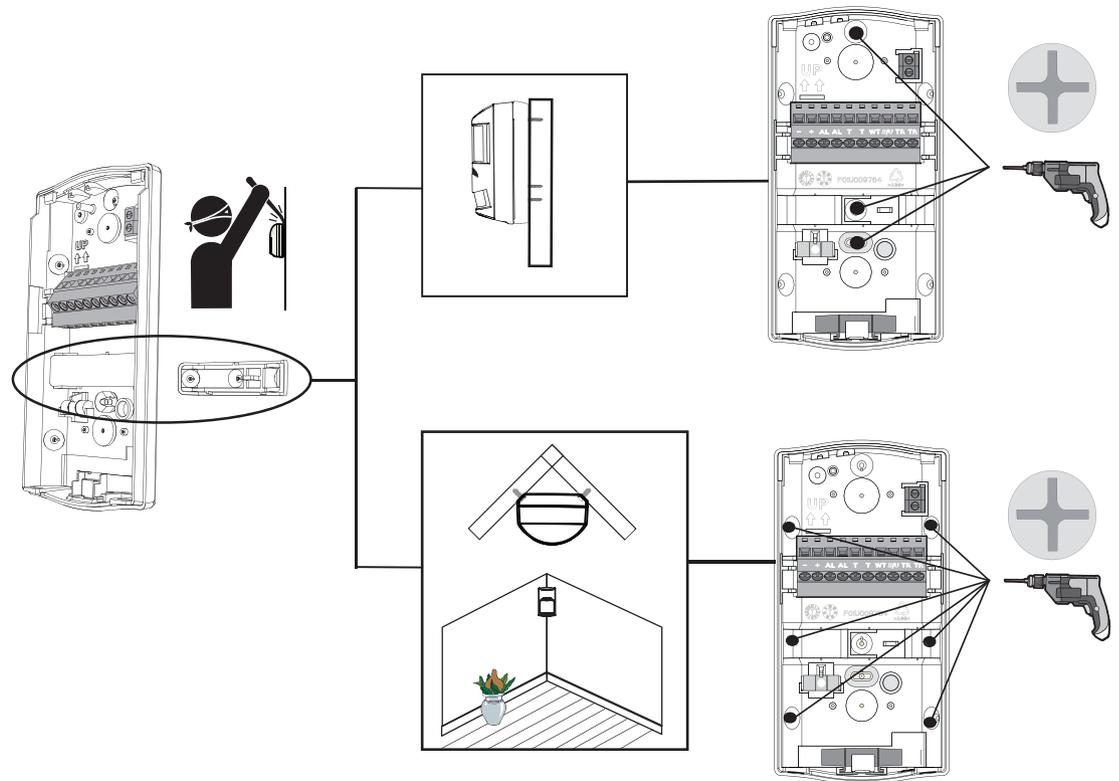
Install on a bracket

Mounting brackets help align the detector to a vertical angle and to correct imperfections
(non-perpendicular angles) of installation surfaces.

Choosing a mounting bracket:

–   The B335 bracket allows a vertical pivot range of +10º to -20º and a horizontal pivot
     range of ±25º.
–   The B328 bracket installs on a single-gang box and allows rotation of the detector. The
     bracket allows you to insert the wiring through the black tube section in the center of the
     bracket mounting plate and through the back of the detector base.
–   The B338 bracket designed for ceiling mounting allows a vertical pivot range of +7º to
     -16º and a horizontal pivot of ±45º. The bracket allows you to insert the wiring through
     the ceiling cavity and into the detector base.

When using a mounting bracket, pre-drill or tap out all of the mounting holes shown for that
bracket in the following figure.
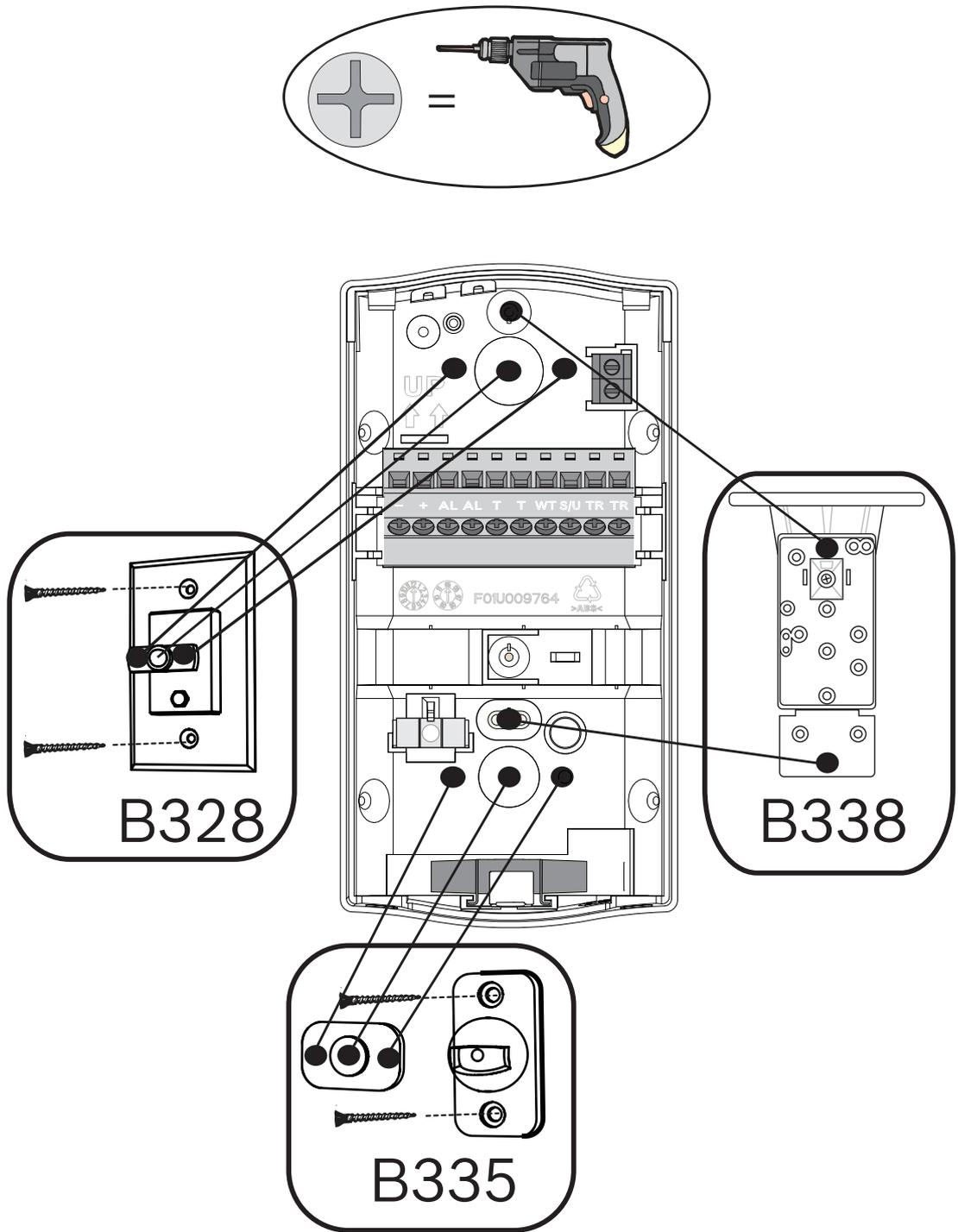
Notice!	

Using a mounting bracket might reduce catch performance and range, as well as increase false alarms.

Always install the detector within the recommended installation height, with or without a mounting bracket.

The use of mounting brackets has not been evaluated by regulatory agencies.

Notice! 	
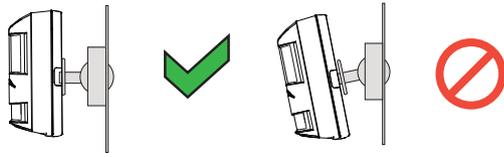
Do not use the bracket to tip the detector vertically unless you intend to compensate for a
non-vertical surface. It might cause false alarms or reduced catch performance.

5.3 Wire knockouts

Use the figure to determine the knockouts to use for installation locations.

Callout — Description
1 — Surface wiring knockout, detector's left side
2 — Through-the-wall wiring knockout
3 — Surface wiring knockout, detector's right side
4 — Through-B328-bracket wiring knockout*
* If you use the bracket mount knockout for wires, run the wires between the walls marked in red in the figure. With the wiring between the walls and behind the terminal block, other features, such as EOL resistor jumper pins, cannot interfere with or puncture the wires.
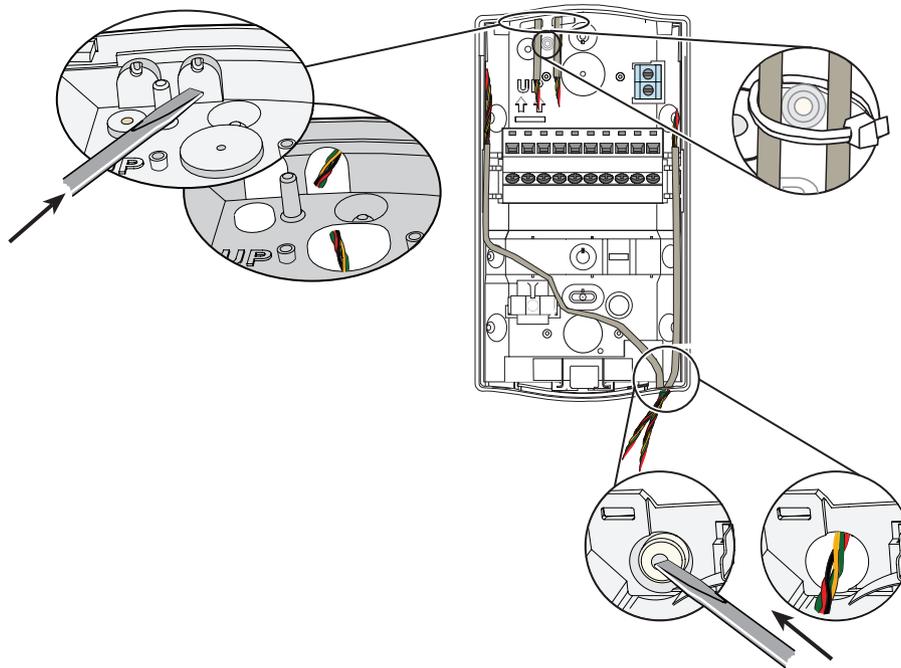
5.4   Bubble level

The detector's coverage pattern performs best when the detector is installed vertically and is level both vertically and horizontally. The detector base includes a removable bubble level which helps you align the unit. Use the bubble level to align the detector before drilling holes.
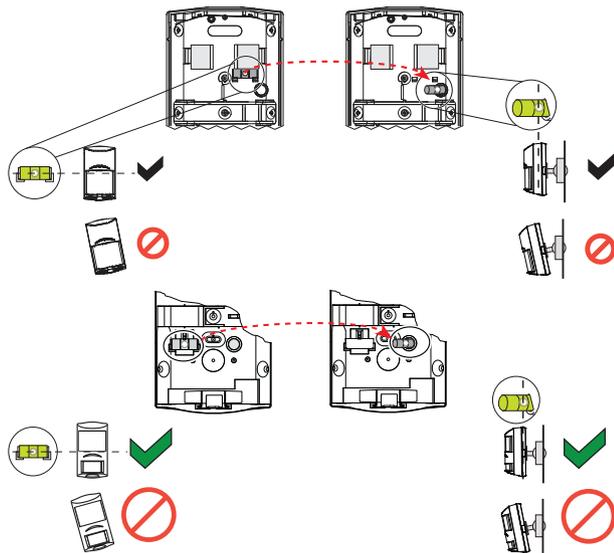
▸ Put the detector base on the surface and install it in place using one screw only. Do not over-tighten the screw.

▸ Make sure the base is level from side to side.

▸ Remove the bubble level and place it into the round cavity on the right side of the base. Make sure the base is level and not tipped forwards or back.

▸ Make adjustments until the base is level, and mark the remaining surface hole locations.

▸ Remove the bubble level and place it back to its original position.

	Notice!
[i]	Do not leave the bubble level in the circular holder. You cannot properly place the detector body onto the mounting base with the bubble level in the circular holder. Do not use a bracket to tip the detector in any direction as it might cause false alarms or reduced catch performance.

‣   Install the remaining screws.

6   Wiring

> **Caution!**
> Apply power only after you have made and inspected all connections. Do not coil excess wiring inside the motion detector.

Refer to the wiring illustration for LSN wiring.
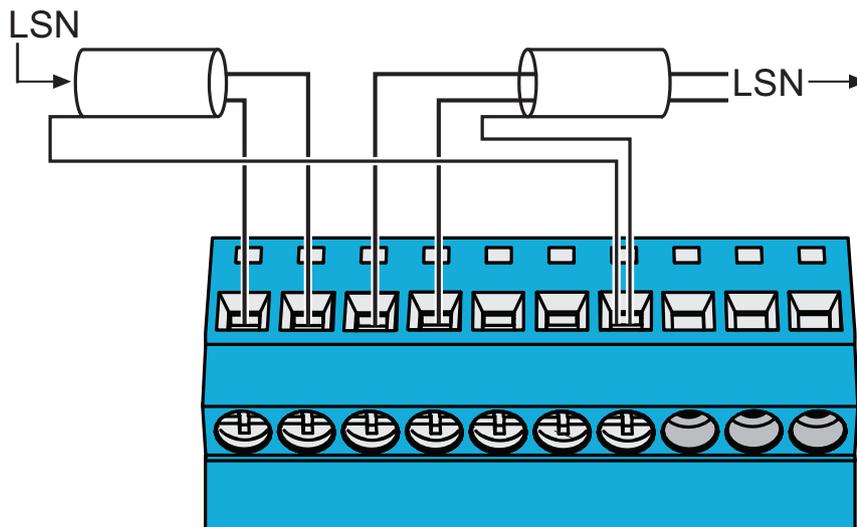
A1 = aLSN1
B1 = bLSN1
A2 = aLSN2
B2 = bLSN2
SH = ⏚

Specification recommendations

– LSN Bus operating voltage limits are 9-29 V.
– Use no smaller than 0.4 mm (26 AWG) wire.
– Shielded cable is recommended.

> **Notice!**
> For all components and connections, only shielded cables are permitted.

7   Look-down and walk test

7.1   Look-down zone

The detector has a manual cam to enable or disable the look-down zone. Enable the look-down zone to detect motion under the detector area.

To reduce false alarms, disable the look-down lens for locations where small animals are likely to cross the look-down zone.

Turn left to disable the look-down zone. Turn right to enable the look-down zone.
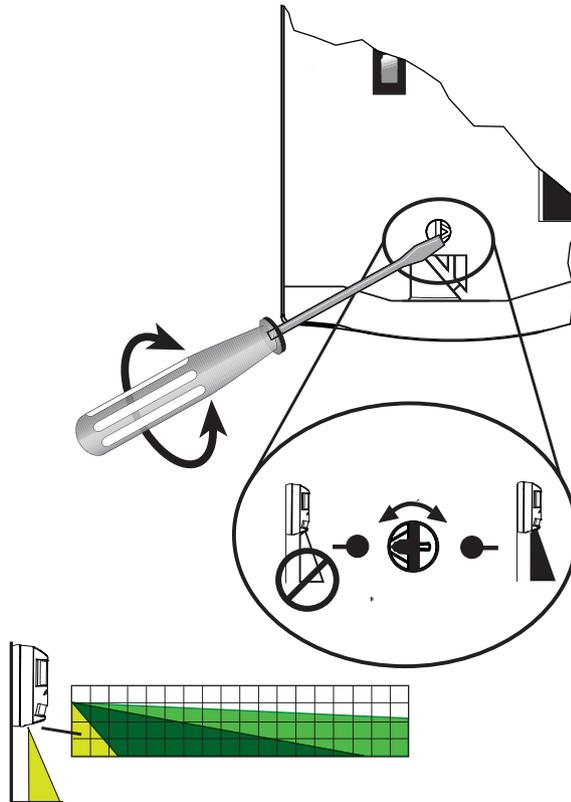
7.2   Walk test LED

The walk test LED indicates the detector's operational status.

2 min	During the warm-up period (after providing power to the device), the LED flashes continuously until the device is ready for use.
	During walk test, the LED indicates PIR and microwave activity activity and also a motion alarm condition (dual alarm).
	If the detector is in a self test fault condition, the LED flashes 4 times repeatedly.
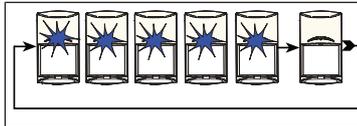
	If the detector is in a low power supply fault condition, the LED flashes 5 times repeatedly.

Notice!

Some regulations require that you disable the LED after the walk test.

8   Configuration

Selecting the detector configuration setups are done using the control panel's supported
remote programming software. The remote programming software allows you to enable or
disable the configuration setups by selecting the appropriate menu options within the
software.

Accessing through MAP RPS

1. Launch MAP 5000 RPS program.
2. Open **Hardware Manager**.
3. Expand **Internal BDB** menu tree.
4. Expand **[LSN GW 1]** menu tree.
5. Find **Dual PIR** option under **Toolbox**.
6. Click and drag **[LSNPro/PDL1-WA18x/WAC25x LSN** from **Toolbox** to the LSN loop box**.
7. Right-click, and select **Properties**.
8. Scroll down and find **Misc** to find the configuration setups. (for example, Anti-mask
   Detection, Anti-mask Latched, Detection Range).

> **Notice!**
> A description of the configuration setup appears when you select it in the field below the
> configuration setup selection.
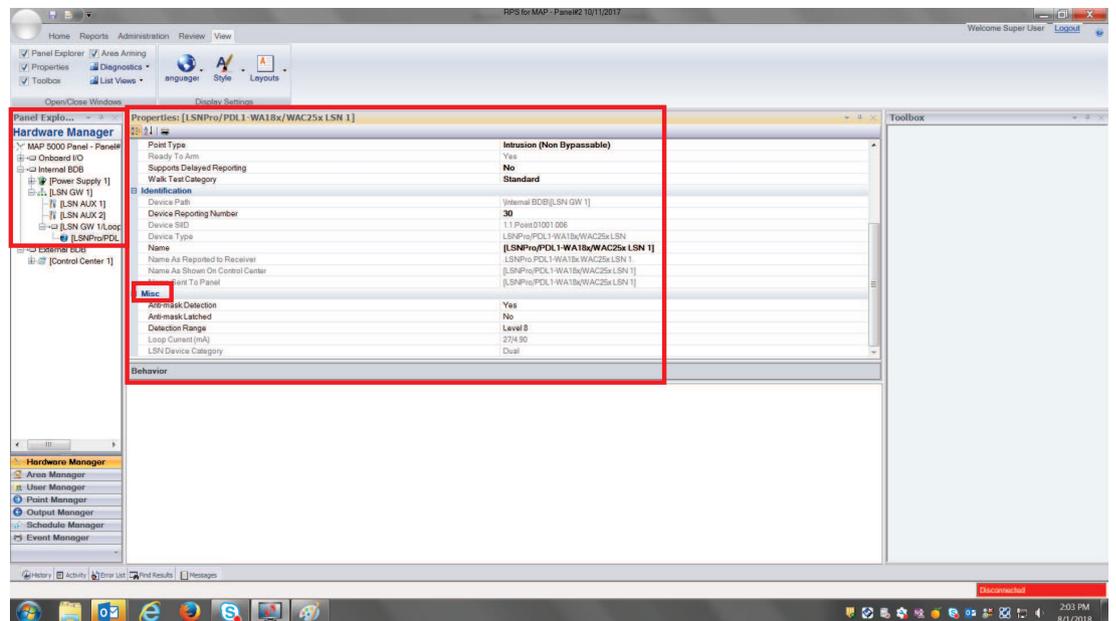
8.1   Classic/LSNi mode

8.1.1   Classic mode

Classic Mode was first introduced with traditional LSN configuration setups. The address for
the detector is not set by selecting the LSN address switch, but is automatically assigned an
address on the bus by the supporting control panel. The address range is restricted up to a
range of 127.

8.1.2   LSNi mode

Most of the classic features like topology characteristics and initialization order are transferable to the Neo-Classic (or LSNi) mode. The address assignment command, the address range and the cable range are different.

The address for the detector is not set by selecting the LSN address switch, but is automatically assigned an address on the bus by the supporting control panel. The address range is extended up to 254. Additionally the cable length can be increased up to 3000 m (9842 ft). Numerous range tests confirm the law of Ohm as main restriction of the bus range. Therefore, the cable length is dependent on the bus current and the number of installed network elements.

8.2   Detection range

8 M|25 FT

The detector is designed to work in two different range modes. With the full range (or long range) mode, both the upper and lower PIR elements operate to provide the rated coverage. When the detector is set to short-range mode, the upper PIR element is disabled and the device ignores the microwave Doppler radar signal changes caused by movement in the area not covered by the PIR.

Both long range and short range modes are configured using remote programming software. Refer to your remote programming software for detection range information.

Configuration

Detection range is configured using remote programming software (RPS). The detection range options show Level 1 through Level 8:

– Level 1-4 stand for short range (0-8 m)
– Level 5-8 for long range
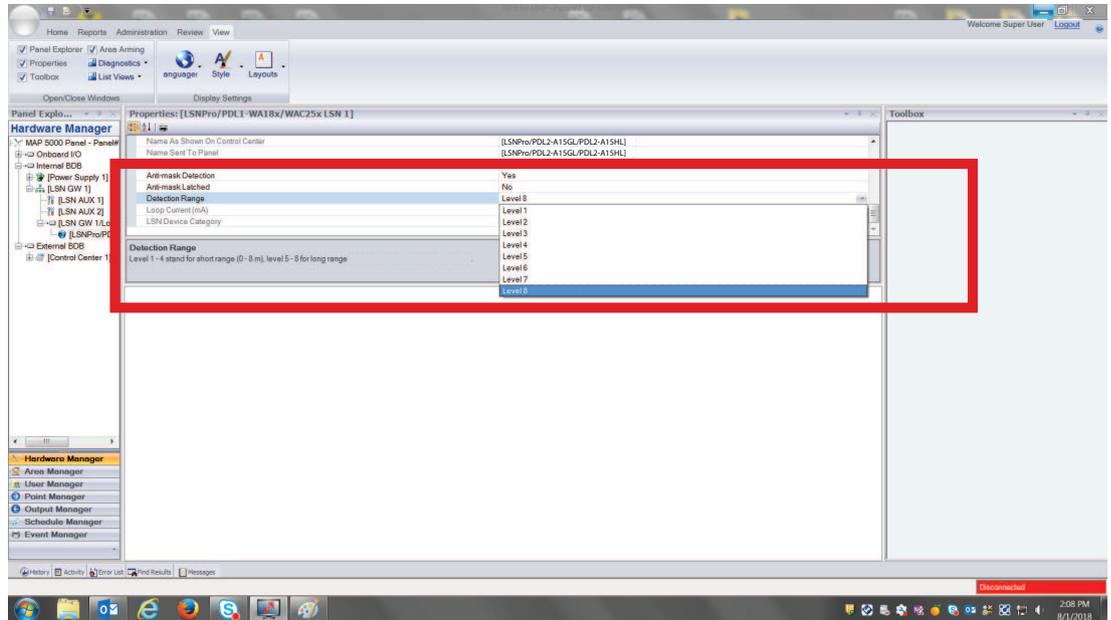
8.3 Anti-mask
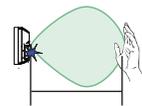
< 30 cm (1 ft)
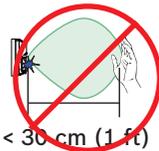
< 30 cm (1 ft)

This feature detects obstructions in the detector's field of view. Obstructions include an object placed within 30 cm (1 ft) of the detector, or infrared blocking material placed or sprayed on the detector lens surface. When anti-mask detects a masking attempt, the detector activates the alarm and trouble outputs, and by an LED 3 flash pattern. The anti-mask notification occurs after 30 seconds of continuous blocking (masking).

Notice!

The anti-mask system can detect objects approximately 30 cm (1 ft) below the detector. Do not install the detector in locations where an object might appear too close to the unit (for example, above doorways).

Configuring

The Anti-mask Detection options are **Yes** or **No**. Selecting **Yes** enables anti-mask detection while selecting **No** disables this feature.
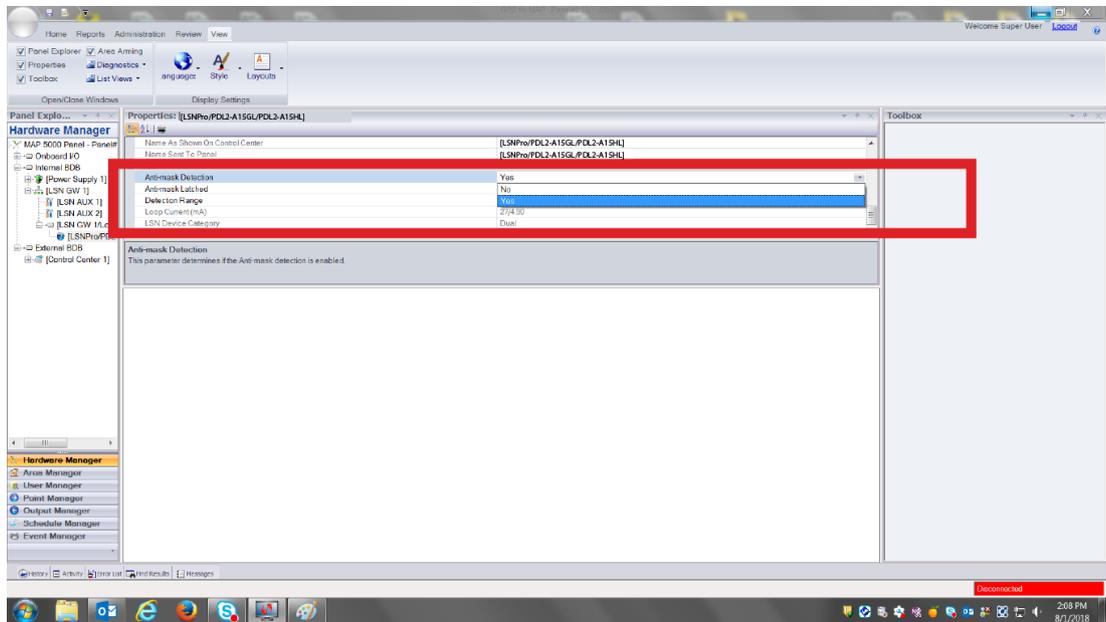
The Anti-mask Latched parameter within RPS is set to Yes or No. This parameter determines whether the Anti-mask alarm condition will require a reset.
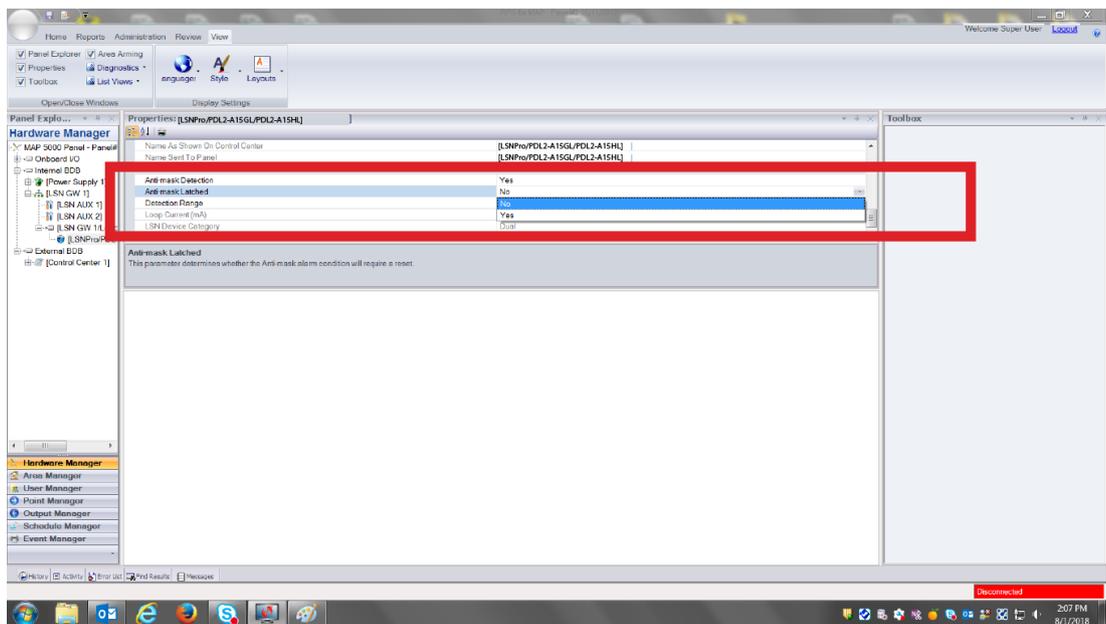
How to clear an Anti-mask

1. Remove any foreign objects that might be interfering or causing the detector to be blocked or masked.
2. Let the detector stay idle for 7 sec with no movement in the PIR/microwave Doppler radar field of view.
3. Walk in front of the detector to initiate a dual alarm.

The anti-mask alarm is cleared from the detector. If **Anti-mask Latched** is set to **Yes** in RPS, you will have to have to clear the anti-mask alarm at the control panel.

8.4   Walk test

Before you begin the walk test, review the walk test LED indicator statuses. At the beginning of the test, with no motion in the protection area, the LED should be OFF. If you observe LED activity without movement, check for disturbances affecting the microwave or PIR technologies.

Configuring

Walk test is enabled using remote programming software.

	Notice!
i	You should perform a walk test of the full field of view of the detector at least once per year in order to make sure the detector is performing properly.

8.4.1   Establish the PIR and microwave doppler radar coverage

The detector PIR and microwave factory settings are optimal for most installations. If you must adjust the PIR and microwave coverages, use the microwave potentiometer and walk test to do so.

Preparing for the PIR and microwave walk test

1. Remove the detector body from the base.
2. Turn the microwave potentiometer to the minimum range (to the left, counterclockwise).
3. Place the detector body onto the base.
4. Wait at least 2 minutes.

Before you start the test, you can adjust the range for the PIR between short and long range. Refer to Short/long range.

With no motion in the protection area, the LED should be OFF. If you observe LED activity without movement, check for disturbances affecting the microwave dopper radar or PIR technologies. During a walk test, the tri-color LED might flash various colors:

– Red indicates PIR activity only, which is not considered an alarm
– Yellow indicates microwave Doppler radar activity only, which is not considered an alarm
– Blue indicates an alarm condition caused by both PIR and microwave Doppler radar activity

Performing the walk test and making adjustments

1. Begin the walk test and observe the red LED.
2. If you observe red LED activity while walking along the farthest edge of the desired coverage area, increase the microwave Doppler radar range. If you observe continuous activation of the yellow LED activity while walking outside the coverage area, decrease the microwave Doppler radar range. Remove the detector body from the base and increase the range by turning the potentiometer clockwise. (Refer to Adjustable microwave sensitivity for detailed instructions.)
3. Place the detector body onto the base.
4. Wait at least 2 minutes.
5. Repeat walk test procedures and range increase until the PIR and microwave Doppler radar detection range is as desired.

6. If on the last walk test, you observe LED activity while walking outside the coverage area, decrease the microwave Doppler radar range and repeat the walk test.

	Notice!
i	Do not adjust the microwave Doppler radar range higher than required. Doing so might cause the detector to detect movement outside of the intended coverage pattern. Microwave Doppler radar signals penetrate certain surfaces such as drywall, wood, and glass. If the protected area is significantly smaller that the detector's nominal range, reduce the microwave Doppler radar range so that it can still detect motion on the near side, but not on the other side of the surface.

8.4.2 Establish the coverage pattern

	Notice!
i	Wait at least 10 seconds between the tests listed in this section.

1. Place the detector body onto the base.
2. Walk test across the coverage pattern at its farthest edge, then several times closer to the detector.
3. Start walking from outside of the intended protection area, and observe the LED.
4. Walk test from the opposite direction across the pattern to determine both boundaries. The center of the pattern should be pointed toward the center of the intended protection area.
5. Walk test the unit from all directions across the pattern to determine all the detection pattern boundaries.

8.4.3 Adjustable microwave doppler radar sensitivity

The detector has a microwave Doppler radar sensitivity adjustment potentiometer. Use this feature to adjust the microwave Doppler radar detection range, if necessary.

	Notice!
i	The product ships with the potentiometer pre-set to meet the rated range. In most cases, you do not need to adjust the potentiometer during the installation. You might adjust the potentiometer, as instructed, to reduce the potential for false alarms or for very large rooms.

The following figure shows how to adjust the setting using the potentiometer. Turn counterclockwise to reduce sensitivity.
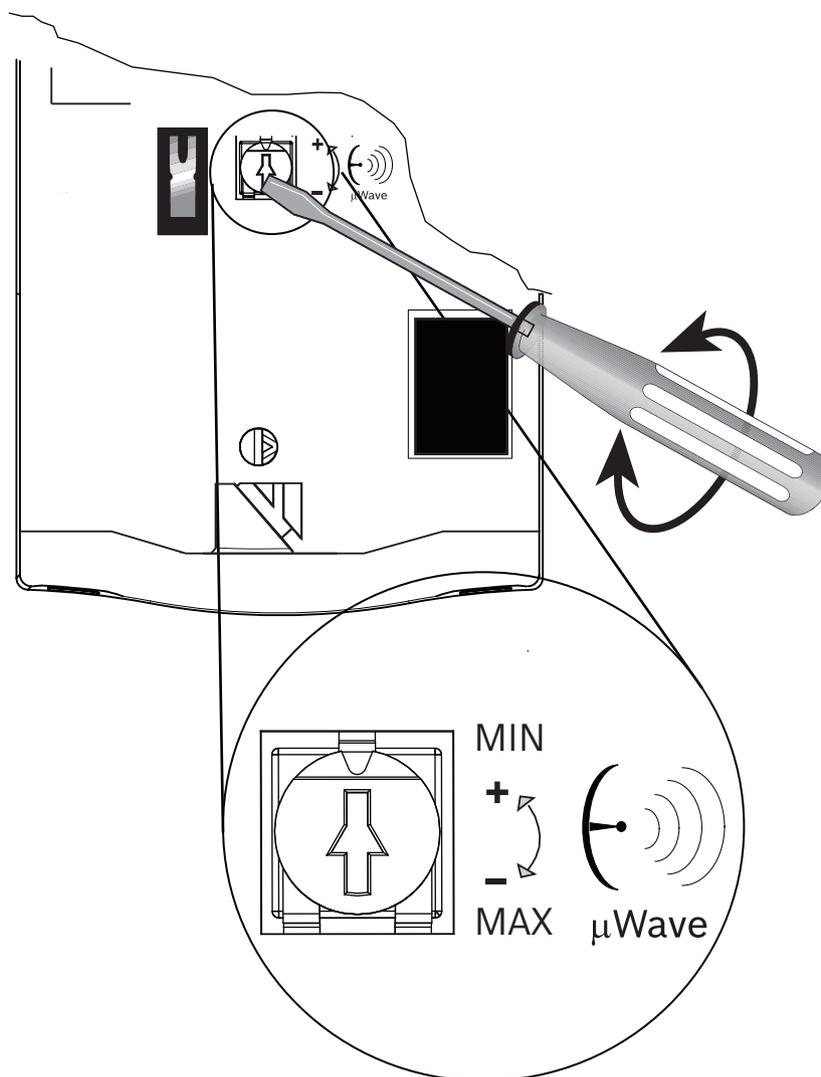
8.5   Self test

The detector performs a routine self-test every 7 hours, testing both the PIR and microwave Doppler radar circuit. If either technology fails the self-test, the detector indicates a trouble condition by activating the trouble output and the LED 4 flash pattern.

Notice!
A self-test fail condition indicates that the detector cannot perform as expected. Replace the detector.

9   Troubleshooting

9.1   Detector does not appear to respond to motion

Potential causes
- Insufficient power
- Loose wires in the terminals
- Cabling or wiring error
- Defective unit
- Walk test LED is disabled
- Detector is not level vertically or horizontally

> **Notice!**
> Some regulations require that you disable the LED after the walk test.

9.2   Detector is in continuous alarm

Potential causes
- Mounting location does not meet the recommendations listed in this document
- Insufficient power
- Input loop continuity broken
- Incorrect alarm loop resistance configuration
- Defective unit
- Masking attempt detected

9.3   Detector appears normal but does not send alarms to the control panel

Potential causes
- Incorrect alarm loop resistance configuration
- Incorrect alarm loop wiring

9.4   Detector does not appear to detect motion in the space directly under it

Potential causes
- The look-down zone is disabled

9.5   Detector does not appear to detect motion in farthest coverage area

Potential causes
- Microwave range is too short
- Verify that the correct detection range is selected in RPS

9.6   Detector LED flashes continuously

Potential causes
- Warm-up mode requires a certain amount of time with no motion in the area to settle the PIR and microwave circuit
- Defective unit
- Detector indicates an alarm event stored in the memory during the last Armed (Set) mode

9.7 Detector LED flashes three times in a row repeatedly

Potential causes
– Masking attempt is detected
– The installer or an object is too close to the detector during the power-up period

9.8 Detector LED flashes four times in a row repeatedly

Potential causes
– The detector failed during the routine self test

9.9 Detector LED flashes five times in a row repeatedly

Potential causes
– The supply voltage is too low

9.10 Detector does not detect motion near the edge of the coverage area

Potential causes
– Microwave Doppler radar range too short
– Installation height does not meet the recommendation listed in this document
– Level alignment does not meet the requirement noted in this document

10   Appendix

Use the table for descriptions of icons and symbols used in the reference guide.

Description	Icon/symbol
Small animal immunity.	
Signifies that the item is the correct choice, selection, or location.	
Point away from rotating machines.	
Point away from objects that rapidly change temperature	
Do not mount the device that has direct exposure to sunlight.	
Do not point toward window.	
Intended for indoor use only.	
Electrostatic discharge	
Anti-mask	< 30 cm (1 ft)
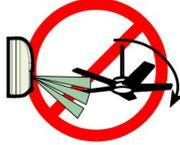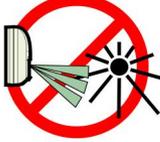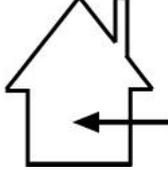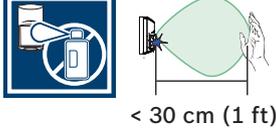
Frequency and power range	
Detection Range. This is an example of a detectors detection range.	**8 M|25 FT**
Remote Programming Software (RPS). Use this to perform programming functions.	RPS
Country restriction. This is an example of a country restriction label. Restricted countries are displayed using their abbreviations.	AT FI IE SI BG FR LT SK CZ EE LV UK CY HR MT
Humidity range	
Temperature range	
Frequency range	
Duration of time	
Questions are answered in the reference guide.	
Universal sign for connecting or disconnecting power.	
Universal sign for connecting to a power source.	
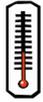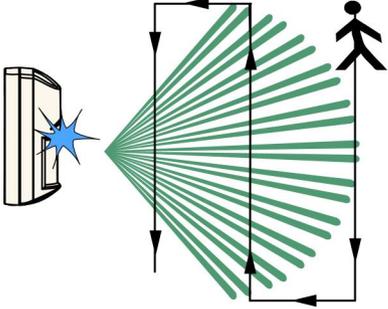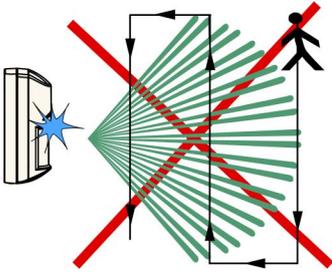
Perform a walk test	
Walk test has concluded	
Device has wall tamper detection.	
Video. This icon and associated QR code are linked to point of need self-help videos.	