DS840LSN

Security Systems

EN

Installation Guide

TriTech PIR/Microwave Intrusion Detector

BOSCH

1. General Information

The DS840LSN is a microprocessor-based TriTech Passive Infrared/Microwave Intrusion Detector. Patented Passive Infrared and Microwave signal processing provides excellent catch performance with freedom from false alarms.

The DS840LSN can communicate and connect to all LSN Bus Systems.

2. Specifications

Table 1: DS840LSN Specifications

Standby Power		No internal standby battery. For each hour of standby time needed, 4 mAh are required. *For UL Listed Requirements, four hours (16 mAh) are required.*
LSN Supply Voltage		33 V maximum
LSN Current Consumption		4.0 mA
Alarm Signal		Alarms are reported to the panel via the LSN Bus.
Temperature		-40°C to +49°C (-40°F to +120°F). *For UL Certificated Installations, the temperature range is 0°C to +49°C (+32°F to +120°F).*
Microwave Frequency	DS840LSN	10.525 GHz (UL Listed)
	DS840LSNC	10.588 GHz (UK, France)
Coverage		12 m x 12 m (40 ft. x 40 ft.)
Internal Pointability		+2° to –18° Vertical
Cover Tamper		Tamper signaling via LSN Bus
Options		B335 Low Profile Swivel Mount Bracket and B338 Ceiling Mount Bracket. (The use of brackets may reduce range and increase dead zone areas.)
Patents		These detectors are covered under one or more of the following U.S. patents: #4,660,024, #4,764,755, #5,077,548, #5,208,567, #5,262,783, #5,450,062 and #5,670,943. Other patents pending.
Compliance		This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry and Science Canada. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesirable operation.

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

3. Mounting

3.1 Mounting Considerations

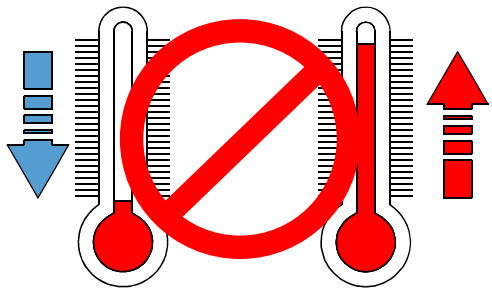
- Never install the detector in an environment that causes a constant alarm in one technology; it should never be left to operate with the LEDs in a constant flashing green, yellow, or red condition. A detector with one technology in constant alarm will cause an alarm output whenever the other technology alarms. Good installations start with the LEDs OFF when there is no target motion.
- Point the unit away from outside traffic (for example, roads, alleys, and parking lots).

Microwave energy will pass through glass and most common non-metallic construction walls.

- Avoid direct or indirect sunlight.
- Point the unit away from glass exposed to the outdoors and objects that may change temperature rapidly (see *Figure 1*)

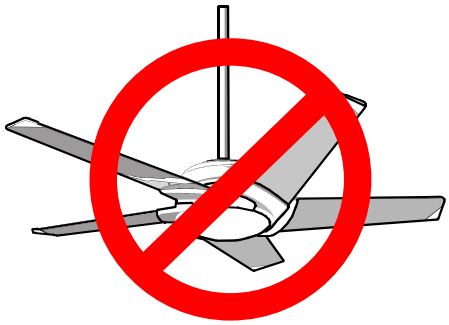
The PIR detector will react to objects rapidly changing temperature within its field-of-view.

Figure 1: Avoid extreme temperature change locations



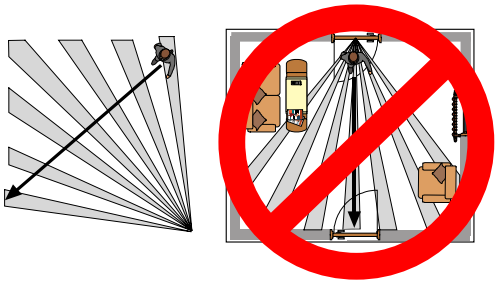
- Eliminate interference from nearby outside sources.
- Avoid installations where rotating machines (such as ceiling fans) are normally in operation within the coverage pattern (see *Figure 2*).

Figure 2: Avoid installing near rotating machines



- Select a location likely to intercept an intruder moving across the coverage pattern (see *Figure 3*).

Figure 3: Coverage Pattern



Avoid mounting the detector in locations (such as above a doorway) where people can pass in close proximity (0.5 m / 1.5 ft.) of the detector.

- The surface should be solid and vibration-free.
- Mounting height range is 1.8 m to 2.4 m (6 ft. to 8 ft.). The recommended height is 2.3 m (7.5 ft.). Mounting height for Pet Applications is 2 m (6.5 ft.).

3.2 Mounting the Detector

See *Figure 4* for location of features.

1. Remove the cover by inserting a thin flathead screwdriver into the locking tab hole at the bottom front of the detector, pressing in, and pulling the cover up and forward.

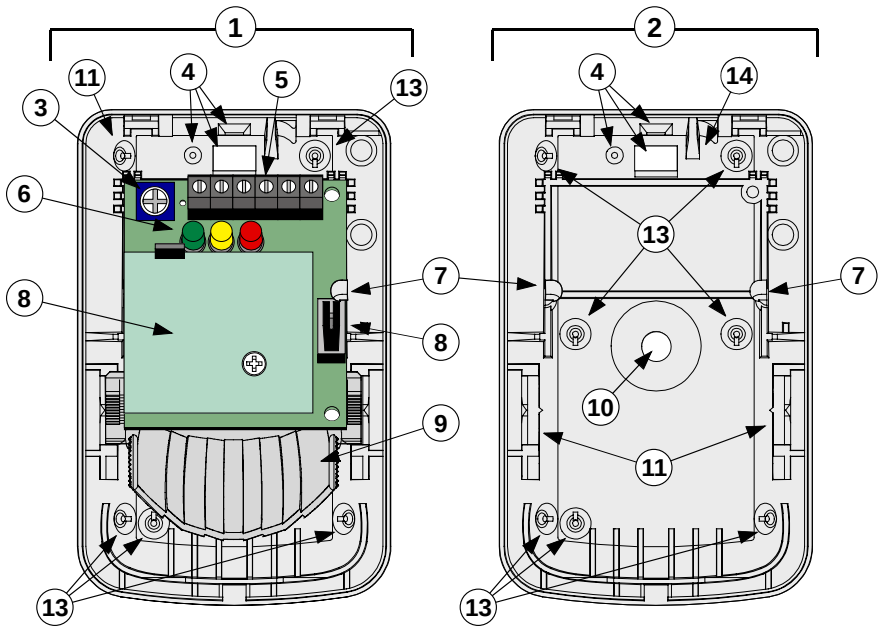
> Mount the unit with the terminal block up.

2. Remove the circuit board from the base by pulling outward slightly on one of the Circuit Board Locking Tabs (7).

> Do not touch the mirror surface.
>
> If you have touched the mirror surface accidentally, be sure to carefully clean wipe off fingerprints with a clean cloth and a mild non-abrasive cleaning solution.

3. Remove the Mirror Assembly (9).
   Carefully press with two fingers on the top end of the mirror assembly (9) and slide it out of the spring loaded tracks (11).
4. Break away the needed Wire Knockouts for the wire entrance (4).
5. Open two holes for surface or corner mounting (13).
6. Mark the location for the mounting screws using the enclosure as a template.
7. Pre-start the mounting screws.
8. Route wiring as necessary (see *Section 4. Wiring*). Route to the rear of the base and through the wire entrance. **Make sure all wiring is unpowered before routing.**
9. Securely attach the base to the mounting surface.
10. Return the circuit board to the base.
11. Install the mirror using settings in *Table 3*.

Figure 4: Location of Features

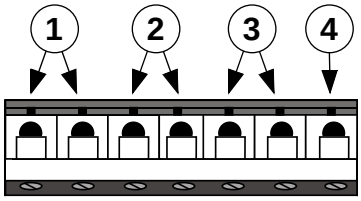


1 - Inside view (circuit board and mirror assembly mounted)
2 - Inside view (no circuit board and mirror assembly mounted)
3 - Microwave Range Adjustment
4 - Wiring Knockouts
5 - Terminal Block (T-strip)
6 - LEDs (green, yellow, red)
7 - Circuit Board Locking Tab (One on each side)
8 - Tamper Switch
9 - Mirror Assembly
10 - Microwave Board
11 - Mirror Tracks (2)
12 - Bracket Mounting Hole
13 - Mounting Hole Knockouts
14 - Cable Tie Strain Relief

4. Wiring

Apply power ONLY after all connections have been made and inspected. Do NOT coil excess wiring inside the detector.

Figure 5: DS840LSN Terminals



1 - ***aLSN1 & bLSN1:*** *coming from the preceding LSN element. Shielded cable is recommended for bus connections*

2 - ***aLSN2 & bLSN2:*** *going to the next LSN element. Shielded cable is recommended for bus connections.*

3 - ***5 & 6:*** *Spare terminals.*

4 - ***7:*** *Connection for ground wire from shielded cable.*

Do not coil excess wire inside the enclosure.

Plug the wire entrance hole with the foam plug provided after all wiring connections have been made.

5. LED Operation

The detector uses 3 colored LEDs to indicate the various alarm and supervision trouble conditions that that exist. See *Table 2*.

Table 2: Status of LEDs

Walk Test Status	Condition	Red	Yellow	Green
Disabled	All	Off	Off	Off
Enabled	Power-Up	Sequential Green, Yellow, Red Flashing		
	Dual Alarm	Flashing	Off	Off
	Microwave Alarm	Off	Flashing	Off
	PIR Alarm	Off	Off	Flashing
	No Activity	Off	Off	Off

During walk testing, the LEDs light for the first technology (microwave or PIR) and then light red to indicate a detector alarm. The LEDs will not indicate activation of the second technology with color.

If the detector experiences a Microwave or PIR self-test failure, it is in need of replacement.

6. Mirror Alignment

1. Select the vertical mirror angle from *Table 3* to match the mounting height and desired maximum coverage.

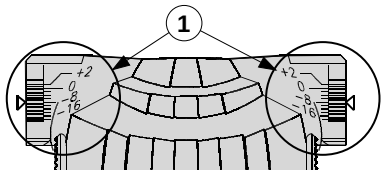
Table 3: Broad Coverage Mirror

Mounting Height	Maximum Coverage Distance	
	7.5 m (25 ft.)	12 m (40 ft.)
2.0 m (6.5 ft.)	-6° *	-4° *
2.3 m (7.4 ft.)	-10°	-8°
2.6 m (8.5 ft.)	-12°	-8°

** = Required Settings for Pet Applications*

2. The angle adjust markings are on the mirror. Push in on the bottom or top of the mirror assembly to position the angle hash marks with the markers on each side of the frame (*Figure 6*) based on the values in *Table 3*.

Figure 6: Mirror Adjustment Markings



1 - Adjust frame marks

3. See *Section 10. Using Pet Immunity for Pet Applications*

7. Walk Test

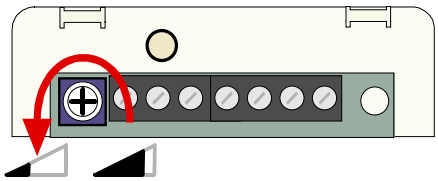
1. Wait at least two minutes, after applying power, to start walk tests.

During the warm-up period, the LEDs will flash red, yellow and green until the unit stabilizes (approximately one to two minutes) and has not registered movement for two seconds. When the LEDs stop flashing, the detector is ready to be tested. With no motion in the protection area, the LEDs should not be flashing. If the LEDs are flashing, recheck the protection area for disturbances affecting the microwave (yellow) or PIR (green) technologies.

7.1 Establishing PIR Pattern Coverage

1. Enable Walk Test via the keypad.
2. Turn the Microwave range adjust to minimum (counter-clockwise) and replace the cover.

Figure 7: Microwave Range Adjustment



3. Walk test across the pattern at its farthest edge, then several times closer to the detector. Start walking from outside of the intended protection area, and observe the three colored LEDs. The edge of the pattern is determined by the first green PIR activation of the LEDs (or the first red activation if the yellow microwave LED activates first).
4. Walk test from the opposite direction to determine both boundaries.
5. While standing 3 m to 6 m (10 ft. to 20 ft.) from the detector, slowly bring your arm up and into the pattern to mark the lower boundary on PIR alarm. Repeat from above for the upper boundary.

The center of the pattern should be pointed toward the center of the intended protection area.

6. If the desired coverage cannot be achieved, try angling the coverage pattern up or down to assure the pattern is not aimed too high or low.

7.2 Establishing Microwave Coverage

Wait one minute after removing/replacing the cover so the microwave portion of the detector can settle. Wait at least ten seconds between the following walk testing procedures.

1. Enable Walk Test via the keypad.
2. The LEDs should be OFF before walk testing.
3. Walk test across the pattern at the intended coverage's farthest end. Start walking from outside the intended protection area and observe the 3 colored LEDs. The edge of the microwave pattern is determined by the first yellow, microwave activation of the LEDs (or the first red activation if the LEDs show green first).
4. If adequate range can not be reached, increase the Microwave Range Adjust slightly. Continue walk testing (waiting one minute after removing/replacing the cover) and adjusting the range until the farthest edge of desired coverage has been accurately placed.

Do not adjust the microwave range higher than required. Doing so will enable the detector to catch movement outside of the intended coverage pattern.

5. Walk test the unit from all directions to determine all the pattern boundaries.

7.3 Verify Detector Coverage

The LEDs should be OFF before walk testing.

1. Walk test the unit from all directions to determine the detection boundaries. A detector alarm is signaled by the first red activation of the 3 colored LEDs after an initial green or yellow activation.

8. Supervision Features

The supervision features function as follows:

- **PIR/Microwave:** The complete circuit operation of these subsystems is checked approximately every 12 hours. If the PIR or microwave subsystem fails, this will be communicated to the control panel.
- **Default:** The detector will default to PIR technology protection if the microwave subsystem fails.

9. Other Information

- **Maintenance:** At least once a year, the range and coverage should be verified. To ensure continual daily operation, the end user should be instructed to walk through the far end of the coverage pattern. This ensures an alarm output prior to arming the system.
- **Pattern Masking:** The PIR coverage pattern may be masked using masking tape or electrical tape on the inside of the mirror.

Many adhesives will either destroy the mirror surface or leave enough residue behind to degrade the coverage performance. Be sure to clean the mirror surface with a mild window cleaning solution after masking removal.

Masking only eliminates the PIR portion of the coverage and has no affect on the microwave pattern.

Add the Pet Filter for pet applications only.

10. Using Pet Immunity

The DS840LSN detector provides reasonable protection from nuisance alarms caused by the following sources:

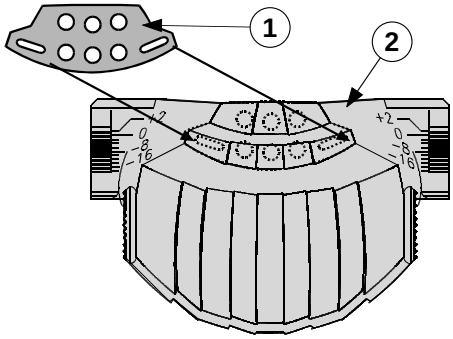
- One dog up to 27 kg (100 lbs.)
- Up to 10 cats
- Multiple small rodents, such as rats
- Random flying birds

The Pet Filter is not a mirror mask. Use only the supplied filter for pet applications.

To take full advantage of the Pet Immunity feature, the following steps should be followed:

1. Add the Pet Filter to the mirror (included in the hardware bag). See *Figure 8.*

Figure 8: Applying the Pet Filter



1 - Pet Filter

2 - Mirror Assembly

2. Mount the detector 2 m (6.5 ft.) high and adjust the Mirror angle as in *Section 6. Mirror Alignment.*
3. Mount where the animals can not come within 1.8 m (6 ft.) of the detector by climbing on furniture or other objects.
4. Adjust the microwave range for the minimum acceptable coverage for the room in which the detector is installed.

Pet immunity is only available when using the filter provided with the detector. This pet nuisance protection has not been verified by Underwriters Laboratories, Inc

11. Coverage Patterns

The protected coverage area is where the microwave and PIR patterns overlap (indicated in *Figure 10* and *Figure 11* in light gray).

Numbered callouts in *Figure 10* and *Figure 11* below correspond to the mirror segments in *Figure 9*.

Figure 9: Mirror Segments

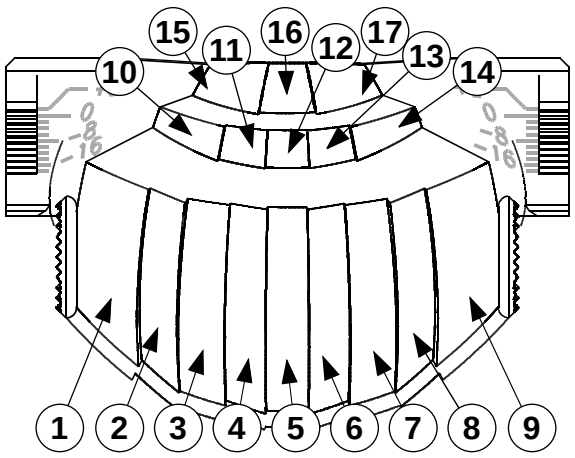
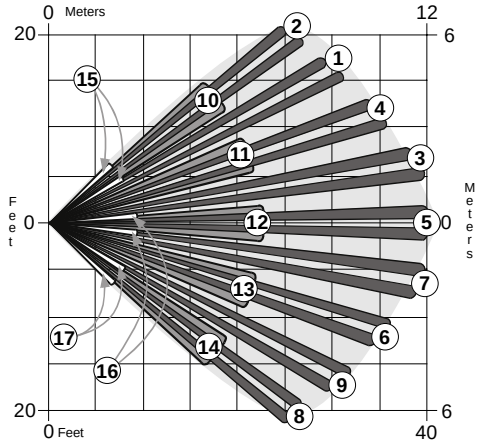
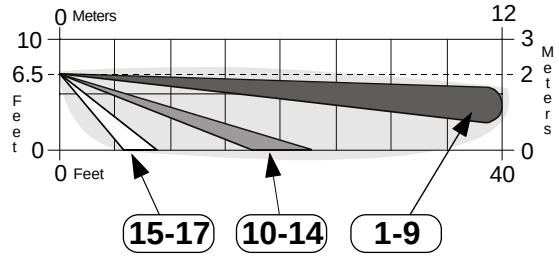


Figure 10: Coverage Pattern – Top View



Coverage patterns are based on a detector mounting height of 2.0 m (6.5 ft.)t

Figure 11: Coverage Pattern – Side View



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Bosch Security Systems
130 Perinton Parkway
Fairport, NY 14450-9199
Customer Service: (800) 289-0096
Technical Support: (888) 886-6189

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