LCN®

7940-8770 Presence Sensor

Installation Instructions

LCN®

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The LCN Presence Sensor (PN: 750182-00) is a self-monitored ready overhead-mounted diffused active infrared sensing device that provides detection for the triggering of automatic swing door safety functions. When used with LCN's lockout devices, the sensor is programmed to allow two different fields of detection - one for detection when the door is in the fully closed position and the other for detection when the door is fully open. While the door is in the fully open position, the Presence Sensor extends its coverage back through the threshold area of the doorway, to provide coverage that will overlap with LCN's motion sensors.

As with all of LCN's programmable sensing devices, full adjustability is achieved with the use of LCN's hand-held remote control unit. This allows alteration of all of the available functions as well as for inquiry of existing settings. Should the need arise; the Presence Sensor may also be tuned by means of two sensor-mounted buttons contained on the PC Board within the unit. With these two buttons, the Presence Sensor's field of detection can be altered without the use of the hand-held remote. If a complete door-mounted safety sensor (DMSS) system is not used in addition to the Presence Sensor, LCN recommends the use of a lockout safety beam to allow safety signaling if the zone is entered during a door closing cycle.

TECHNICAL SPECIFICATIONS

Installation Height - Variable	9'-0" max. (recommended 6'-6" to 8'-0")
Mounting Angles	
Presence Sensor only	+5°, +10° (factory default setting: +5°)
Presence Sensor with BodyMount	0°, +5°, +10°
Power Supply	12 to 24 V AC / DC +/- 10%
Frequency	50-60 Hz
Output	Max. Voltage at contacts: 60V DC / 125V AC
	Max. Current at contacts: 1 A
	Max. switching power: 30 W (DC), 60 VA (AC)
Relay Hold Time	0.5 to 9 seconds
Operating Temperature	-22°F to +140°F
Immunity	Immune to electrical and radio frequency interference
Cable	4'- six conductor cable
Weight	1lb. 11 oz. (765g)
Dimensions	11.8"L (305 mm.) x 1.9"H (51 mm.) x 1.9"W (46 mm.)
Material	Aluminum & ABS plastic
Housing Color	Black anodized aluminum

COMPONENT ID

Left Lens — Red LED — Right Lens

Left End Cap → ← Right End Cap

Center Eye Shield

4' Cable
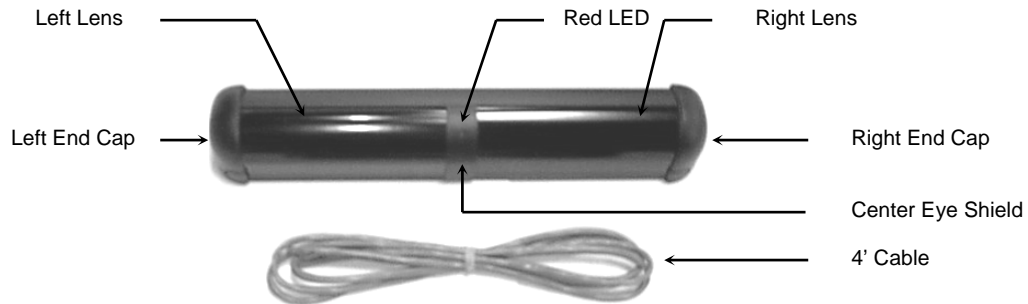
INSTALLATION TIPS

❑ The sensor must be firmly fastened to prevent vibration.

❑ The sensor must not have any unwanted objects likely to move or vibrate in its path.

❑ The sensor should be mounted flush with bottom of door header.

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SAFETY PRECAUTIONS	• Shut off all power going to the header before attempting any wiring procedures. • Maintain a clean & safe environment when working in public areas. • Constantly be aware of pedestrian traffic around the door area. • Always stop pedestrian traffic through the doorway when performing testing that may result in unexpected reactions by the door. • Always check placement of all wiring and components before powering up to insure that moving door parts will not catch any wires and cause damage to equipment.

MECHANICAL INSTALLATION - PREPARATION	To prepare the Presence Sensor for mounting to the header, perform the following: a) Remove both end caps from the Presence Sensor (picture 1). Each is attached by one Phillips head screw.

b) Remove both lenses from Presence Sensor by simply sliding them out at each end, as shown above in picture 2.

c) Remove the center eye shield as shown in picture 3 (take care not to damage the light tube on the inner side of the shield). Simply pull out from the top end and rotate out as shown below.
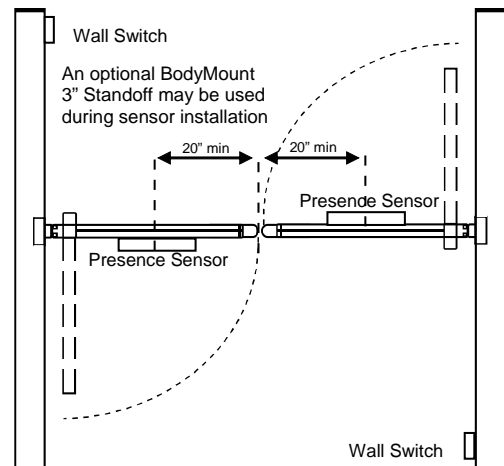

d) Slide the PCB out of the extrusion and set it aside as shown above in picture 4.

| **MECHANICAL INSTALLATION – PLACEMENT OF THE SENSOR**	Remember these guidelines when installing a Presence Sensor: ❑ The Presence Sensor should be mounted at a height range of 6' 6" to 8'. Maximum mounting height is 9'. ❑ The Presence Sensor should be mounted above the door on the swing side. ❑ The Presence Sensor shall be mounted flush with the bottom of the automatic door header. This is absolutely necessary to allow the detection pattern to reach back through the threshold area when the Presence Sensor is in the open door position. ❑ For **single door applications**, the Presence Sensor should be mounted at the center of the door opening. However, if this is not possible, the unit may be installed off-center. In such cases, pattern location will have to be altered for proper placement of the field of detection. Try to avoid mounting locations that may pose potential problems such as directly over a door arm. ❑ For **double-egress applications**, one Presence Sensor should be mounted over each swing-path. There should be at least 40" of separation between the 2 Presence Sensors when measured between the centerline of each sensor. ❑ If the Presence Sensor is the only sensor being used for safety at the swing side of the door, to be in compliance with ANSI 156.10, a lockout safety beam or door mounted safety side (DMSS) is needed in addition to the Presence Sensor. ❑ **For all applications, refer to the pattern charts for width and depth in the applicable section of this Guide. Patterns shall be adjusted to achieve maximum detection zones, and shall be in compliance with all applicable safety standards (i.e. ANSI A156.10).**

Wall Switch

An optional BodyMount 3" Standoff may be used during sensor installation

20" min   20" min

Presence Sensor

Presence Sensor

Wall Switch

NOTE: LCN recommends the use of a BodyMount P/N 761222-79 for most Presence Sensor applications. The BodyMount is a 3" standoff that allows the Presence Sensor to be slightly distanced from the face of the closed door. This helps to prevent ghosting caused by slight door movement while closed, and also prevents ghosting when Door Mounted Safety Sensors are used (as the Door Mounted Safety Sensor extrusions at the top of the door are extremely close to the sensor while the door is closed).

1. The extrusion has pre-drilled mounting holes at each end as shown below in pictures 5 & 6.

Pre Drilled
Mounting Holes
Approx. 9 ¾" Apart
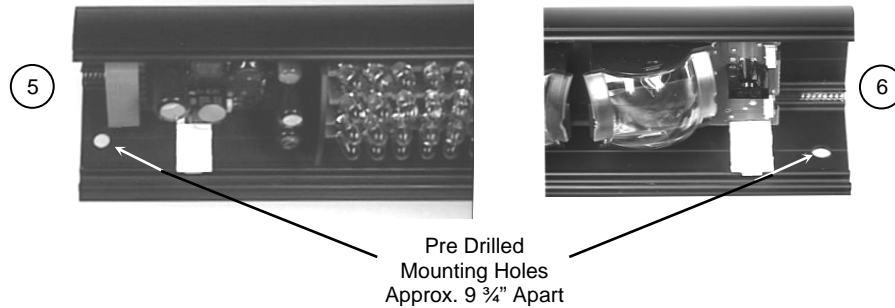
2. Hold the Presence Sensor up to the pre-determined location, and attach using the 2 self-drilling screws that are included with the package, as shown in picture 7 below. It may be necessary to pre-drill a pilot hole (picture 8) in the header for ease of screw installation. Ensure that Presence Sensor is mounted securely at each end.
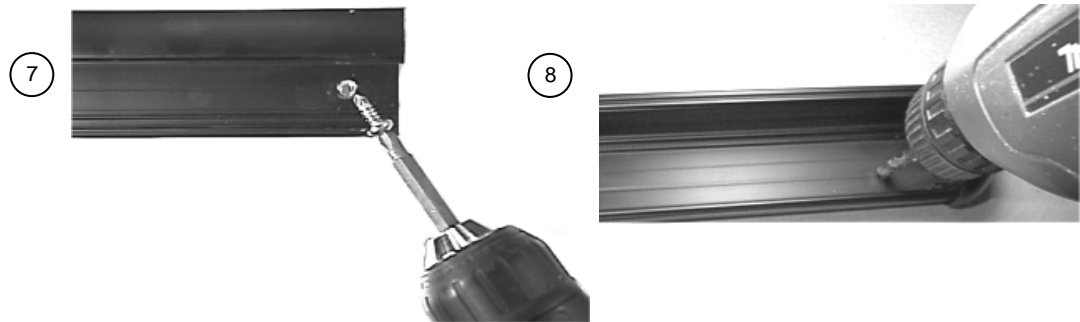

3. If Presence Sensor is mounted directly to door header, and cabling is to pass directly into header, drill a ¼" hole next to the Presence Sensor's left side end cap to allow wire passage into header as shown below. The wire passage hole should be in a location that aligns with the cut out in the end cap as shown below.
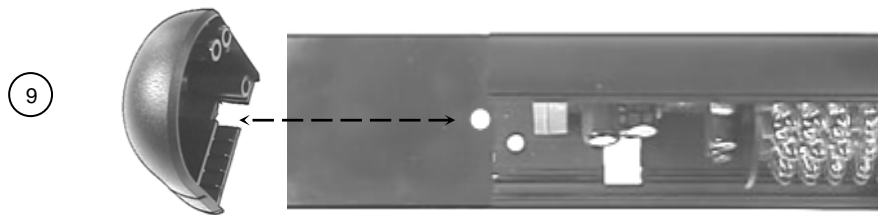
Once the Presence Sensor is securely attached to header, cabling & wiring may be completed.

1. Install the 10-pin connector as shown below in picture 10. If wiring the Presence Sensor to a LCN module, refer to the schematic for the respective module.

1 PWR
2 PWR
3 COM
4 NO
5 NC
6 IN -
7 IN +
10 PIN
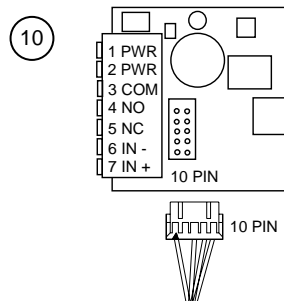
10 PIN

Position	Connection 7-Pin	Wire Color (10-pin cable)
1	12 to 24 V AC / DC +/- 10%	Red
2	24 to 24 V AC / DC +/- 10%	Black
3	Common	White
4	Normally Open	Green
5	Normally Closed	
6	Data -	Brown
7	Data +	Blue

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MECHANICAL ADJUSTMENTS	Once all installation, wiring and cabling procedures have been completed, mechanical adjustments can be made. Please note that further adjustments may be required after powering and walk testing the detection field.

Aside from placement on the header, the only mechanical adjustment that may be made to the sensor is the angle adjustment. The Presence Sensor is factory pre-set to the +5º position, but may be reduced to a 0º position or increased to a 10º position. The greater the angle, the farther from the door the pattern will be. The 0º angle should only be used when the Presence Sensor is mounted to a BodyMount block or to a soffett above the door that extends out from the face of the safety side of the door – in this case, the 0º setting would improve the location of the detection field across the threshold area of the doorway. It is recommended that for most applications, the unit be powered and walk tested at the pre-set 5º angle. After walk testing, if the detection field needs to be changed, then proceed with changes to the angle setting as shown below.

1. To change the angle setting the end caps, lenses, and center eye shield must be removed (as shown on page 2). The terminal block must also be removed if it has been wired. Once removed release the white clips, as shown below, and rotate outward to remove the PCB as shown in pictures 12 & 13.

2. Once the PCB is completely removed from the housing, the angle position may be changed. There are two clips per Presence Sensor and the angle must match for each clip on the same PCB. The positions are shown below.

0°   5°   10°

Factory Default
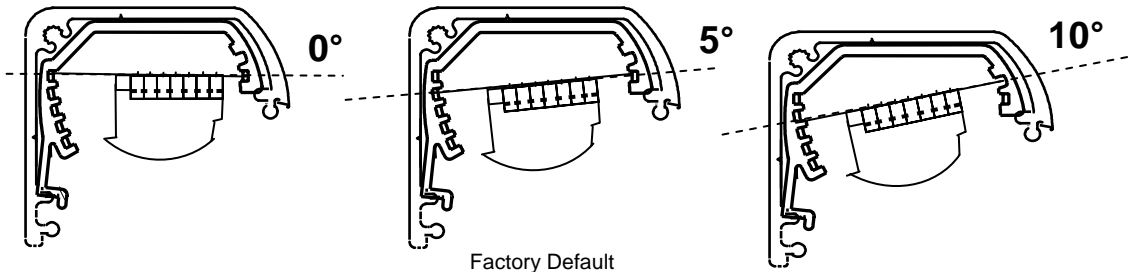
3. Slide the left and right lens back into place and proceed with power-up procedures. Leave the end caps off until all final adjustments have been made.

POWER-UP PROCEDURES	1. Upon completion of mechanical and electrical installation, apply 12 to 24 V AC / DC +/- 10% to the Presence Sensor, with the door in the closed position. The Presence Sensor will flash a green LED at a rate of 2 Hz, then it will expire upon a successful set-up in the door-closed position.

NOTE: If applying the Presence Sensor to a door control that requires a learn cycle upon powering, it is recommended to allow the doors to complete a learn cycle before applying power to the Presence Sensor.

2. Activate the door to the full open position. The Presence Sensor will once again flash the green LED and will execute a door-open set-up. Upon completion of the set-up for the door-open position, the doors will begin closing. Normal operation should resume thereafter. Proceed with fine-tuning to insure compliance with all applicable safety standards (i.e. ANSI A156.10). If set-up is unsuccessful, refer to the Troubleshooting Guide at the end of this Users Guide, and also to the guide located at the end of the respective lockout User's Guide.

NOTE: Always be sure to refer to the applicable lockout User's Guide for more detailed information.

| DOUBLE EGREES: REDUCING CROSS TALK | Perform the following set up using LCN's remote control to reduce cross talk between duel egress applications. Refer to the figure on page 2 to ensure the two Presence Sensors are installed with at least 40" of separation when measured between the centerline of each sensor. |

1. Place doors in the hold open position. Unlock sensor and set open door Pattern Depth to 5 (Medium Pattern). This sequence will turn off threshold IR while door is in open position. This function should be changed on both sensors:

 + + then +

2. The infrared frequency function may need to be changed. Change frequency on one of the sensors:

 + + then +

3. Change to a different mode in applications where high gloss floors or multiple doors are installed in vestibules.

Change sensor one to:

 + + then +

Change sensor two to:

 + + then +

| LCN'S UNIVERSAL REMOTE CONTROL | The Presence Sensor is fully compatible with LCN's Remote Control as shown below. Use of the remote control should be conducted within 10' – 15' of the sensor, and the remote should be pointed directly at the sensor when used. Refer to the "Programming Guide" in the following section for each parameter and its values. |

Additional program notes:

1. The Presence Sensor is capable of having two patterns (door closed and door open) that are independently adjustable. Thus, when programming, it is necessary to adjust the pattern for door closed, and then to adjust the pattern again when the door is open. The following functions may be independently adjusted for each door position:

- Sensitivity
- Pattern Width
- Pattern Depth

2. The following functions apply to both door closed and door open positions:

- Automatic Learn Time
- Immunity
- Frequency
- Output Configuration
- Door Control Mode
- Hold Time
- Interface Type

3. The immunity modes include Rain Mode and Snow Mode. During these modes, learn time of the sensor will not be affected. These modes affect the interpretation of the objects in the field of detection relative to the background.

Number Keys

Number keys (0 through 9) are used for assigning a value for a given function

Infrared Frequency

	Mode	Frequency
1	**Normal**	**Low**
2	Normal	High
3	Quiet	Low
4	Quiet	High

See Note: Quiet Mode

Interface   F1

1: LO-Linx
2: LO21 - Old Style (LO21, B, K, P, U)

Door Control   F2

**1: normal
(LED in normal mode)**
2: door permanently open
(red LED ON)
3: door permanently closed
(red LED OFF)

Unlock
Inquire
Lock

To UNLOCK the sensor:
Press the UNLOCK key once. Red LED flashes slowly. If flashing fast, see Note below.

To LOCK the sensor:
Press the LOCK key twice, OR press once then followed by a 4-digit lock code. If less than 4 digits, press lock again after the last digit. LED goes out when complete.

To INQUIRE the sensor:
Unlock the sensor, press the desired function key, followed by the INQUIRY key – the number of green flashes corresponds to the value.

Note: If sensor is locked, but code is unknown, power the sensor off and then back on. Press the UNLOCK key within 60 seconds. Re-lock with 0000. This is the default code. Sensor will unlock with one press of the unlock key, when set to 0000.

Output Configuration

1 – Normally Open Relay
2 – Normally Closed Relay

Setup

launch a quick setup

restore factory defaults

launch a closed door setup

launch an open door setup

See Note: Automatic Setup

Hold Tme

0 (0.5s) → 9 (9s)

NOTE: **AUTOMATIC SETUP**: When performing an automatic setup (setup key pressed twice in a row), the sensor will begin to flash green during the door closed position, and will continue to do so until the door is activated to the open position. The LED will then go out and the door will close. The LED will flash green again at the closed position until a setup is complete. Upon the next activation, the sensor will launch another setup for the open door position, and will begin normal operation thereafter.

NOTE: **QUIET MODE**: The QUIET mode uses a different pulsing pattern to avoid interference with other infrared systems. The NORMAL mode transmits more energy and detects slightly in a more crisp fashion. The NORMAL mode is recommended for installations with only one door.

Sensitivity Door Open-Closed

0 (min) → **9** (max) **(default 7 for door open, default 6 for door closed)**

Pattern Width Door Open or Closed

1: Wide (closed door)
2 : Middle (open door)
3 : Asymmetric Left Narrow
4 : Asymmetric Right Narrow
5 : Narrow Left
6 : Narrow Right
7 : Asymmetric Left Wide
8 : Asymmetric Right Wide
9 : Center Narrow

See Note: Pattern Width or Depth

Automatic Learn Time

0: 30 seconds
1: 1 minute
2: 2 minutes
3: 3 minutes
4: 5 minutes
5: 7 minutes
6: 10 minutes
7: 15 minutes
8: 10 seconds
9: Infinity – no learn

Immunity

1: Normal
2 : Rain Mode
3 : Snow Mode

Pattern Depth

1: Deep – Threshold ON
2 : Medium – Threshold ON (open)
3 : Limited – Threshold ON
4 : Deep – Threshold OFF
5 : Medium – Threshold OFF (closed)
6 : Limited – Threshold OFF

See Note: Threshold
See Note: Pattern Width or Depth

NOTE: **THRESHOLD**: The Threshold is always OFF when the door is closed.

NOTE: **PATTERN WIDTH OR DEPTH**: When pattern width or depth is changed, a setup of the new pattern size will automatically be triggered once a value key has been pressed.

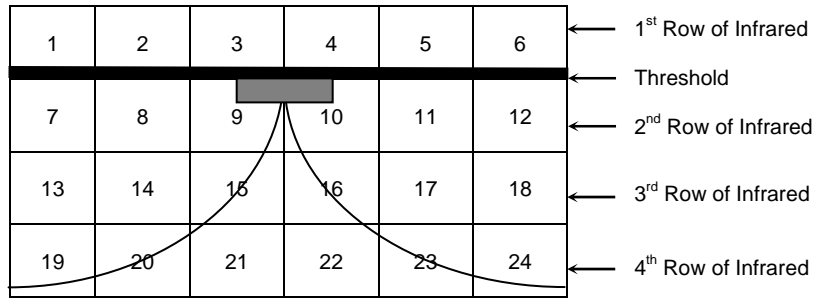| MANUAL (NON-REMOTE) SET-UP | Without the LCN Remote Control, the Presence Sensor may be set up using the manual push buttons (see diagram below) located under the right end cap. <u>Only the sensitivity, relay mode, auto-learn time, pattern width, and pattern depth may be adjusted with the manual push buttons</u>. To adjust the Presence Sensor, complete the following: |
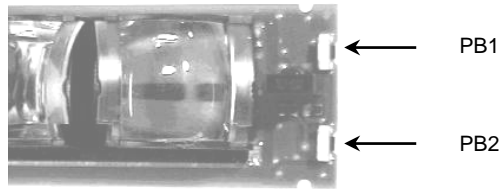
1. To start the set-up process, press PB1 (for less than 2 seconds)

   ❑ The set-up function will be launched according to the current door position. The green LED will flash at 2+/- Hz for 10 seconds. This LED will stop flashing once a successful set-up is achieved.
   ❑ If there is an interruption to the field of detection during this procedure, the green LED will flash at a slower rate. Press PB1 to re-launch the set-up.

2. To change the detector's parameters, press PB1 (for more than 2 seconds), then release.

3. Press either PB1 or PB2. The LED will immediately flash red, followed by a sequence of green flashes.

4. The red flashes indicate the parameter and the green flashes indicate the setting of the particular parameter.

   NOTE: Pressing PB1 will toggle between the parameters and pressing PB2 will toggle between the range of adjustments for that particular setting. Once you achieve the highest adjustment, the value will roll over to the lowest setting, upon the next press of PB2. A zero value will result in no flash of the LED.
   To exit manual set-up, simply wait 20 seconds or press PB1 for more than 2 seconds. Replace the right end cap back on the Presence Sensor.
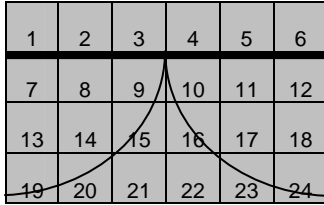
   ❑ Use the chart below as a reference for the manual set-up process.

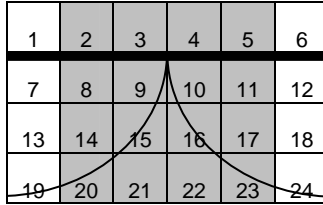| RED LED STATUS	PARAMETER	DESCRIPTION	GREEN LED STATUS
1 Red Flash	1	Sensitivity (Door open)	0 – 9 Green Flashes (default = 7)
2 Red Flashes	2	Sensitivity (Door closed)	0 – 9 Green Flashes (default = 6)
3 Red Flashes	3	Output Configuration	1 – 2 Green Flashes (default = 1)
4 Red Flashes	4	Auto Learn Time	0 – 9 Green Flashes (default = 0)
5 Red Flashes	5	Pattern Width (Door Open)	0 – 9 Green Flashes (default = 2)
6 Red Flashes	6	Pattern Width (Door Closed)	0 – 9 Green Flashes (default = 1)
7 Red Flashes	7	Pattern Depth (Door Open)	1 – 6 Green Flashes (default = 1)
8 Red Flashes	8	Pattern Depth (Door Closed)	1 – 6 Green Flashes (default = 1)

1	2	3	4	5	6	← 1st Row of Infrared
						← Threshold
7	8	9	10	11	12	← 2nd Row of Infrared
13	14	15	16	17	18	← 3rd Row of Infrared
19	20	21	22	23	24	← 4th Row of Infrared

(1) Wide Pattern

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24

(2) Middle Pattern

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24

(3) Asymmetric Left Narrow

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24

(4) Asymmetric Right Narrow

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24

(5) Left Narrow

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24

(6) Right Narrow

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24

(7) Asymmetric Left Wide

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24

(8) Asymmetric Right Wide

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24

(9) Center Narrow

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
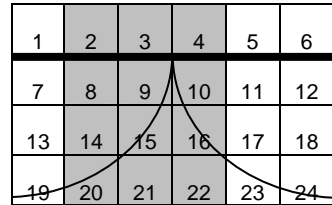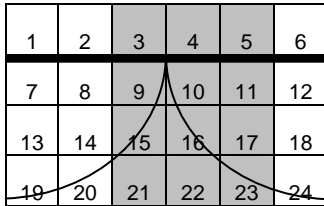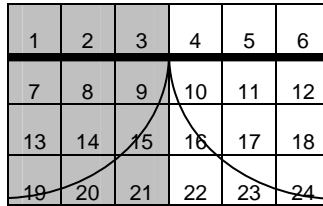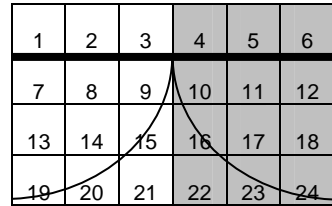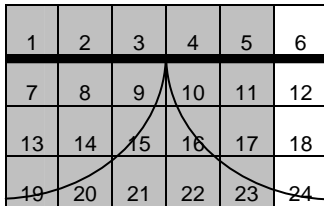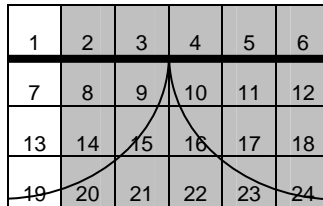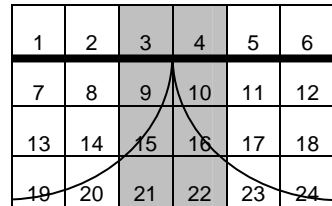
Row 1 (spots 1 through 6), remain on, even during the closed door position

(1) Deep

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24

(2) Middle

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24

(3) Limited

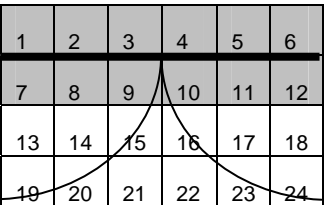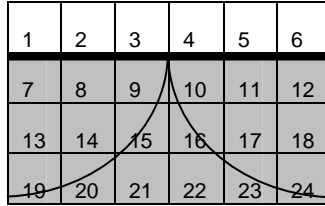| 1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
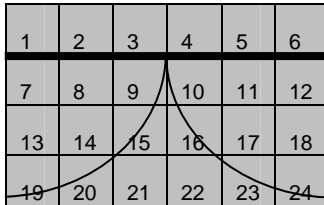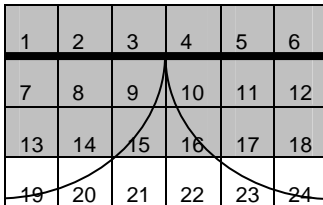
NOTE: When the Presence Sensor is mounted at 7', each block on the pattern charts shown above equates to a size of approximately 14" x 14". Pattern sizes shown are only as an approximation. Always walk-test the pattern once complete, to insure compliance with all applicable safety and performance standards.
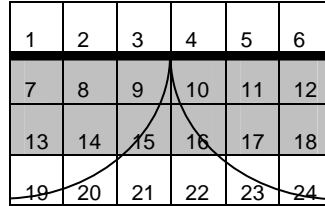
Row 1 (spots 1 through 6), are on during open door position and off during closed door position.

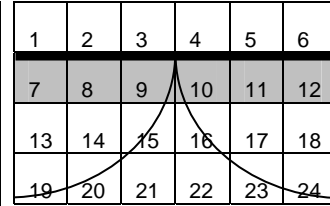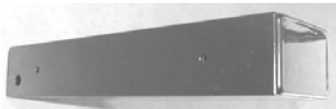| (4) Deep Without Row 1	(5) Middle Without Row 1	(6) Limited Without Row 1

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24

TROUBLE-SHOOTING

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Presence Sensor will not set-up upon initial powering	1. Improper input voltage 2. Presence Sensor is in detection 3. Potential interferences from high intensity lighting	1. Check terminals 1 & 2 for proper voltage 24 V AC/DC ± 10%. 2. Make certain that the field of detection is all clear during the set-up and that all lenses are installed on the Presence Sensor. If detection is encountered upon initial set-up, the Presence Sensor will continuously flash Green at ± 2 Hz. The Presence Sensor will also not set-up if permanent stationary objects are extremely close to the sensor. Ensure that, not only is the detection field all clear, but that the sensor is mounted properly (using the Presence Sensor mounting block if necessary). 3. Ensure that no high intensity lighting is in the immediate area of the sensor.
Door will not open once set-up has been completed.	1. Presence Sensor is in detection. 2. Improper wiring 3. Lockout safety beams are in detection 4. Improper relay output configuration	1. Ensure that there is no detection occurring at the Presence Sensor. If the Red LED is on steady, there is detection. Make sure there have been no changes in the field of detection since set-up. If permanent changes have occurred, launch a new set-up and re-test door. 2. Remove the output wires (common, normally open, normally closed) from the Presence Sensor. **CAUTION – there may possibly be no safety on the door when this test is performed.** Activate the door control, if the door opens, the fault exists with Presence Sensor or related wiring. If door does not open, the faults may exist with the door control or it's related wiring. 3. Ensure proper relay output setting. Refer to page 6. Typically, relay setting should be "Normally Open". This means the relay would close upon detection.

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Presence Sensor repeatedly re-learns the environment with each	1. Improper data from the lockout device 2. Data polarity at the Presence Sensor is incorrect	1. Allow the door to open in the automatic mode. Unlock the Presence Sensor and launch a setup by pressing the Setup key, followed by the number 2. If the sensor does not begin flashing green, and instead goes back to a red indication, improper data exists. Refer to respective lockout User's Guide for troubleshooting. 2. Check for proper polarity at terminal 6 and 7. The negative wire from the lockout (white) should be connected to terminal 6, and the red/white striped wire from the lockout should connect at terminal 7. ❏ **HELPFUL HINT:** If faulty data is suspected, simply power the door to the open position (by activation OR with the use of a hold open switch). While the door is open, unlock the Presence Sensor, and press the setup key, followed by the number 2. If the sensor goes back to a red LED (as opposed to flashing the green LED to indicate a setup), there is a strong probability that the data is incorrect. Refer then to the respective lockout User's Guide for troubleshooting help.
Presence Sensor not reacting to the remote control	1. Batteries in the remote control are dead. 2. Distance between sensor and remote is too far.	1. Replace batteries in the remote control 2. Move in closer to the sensor when programming. 3. If remote control fails, manual programming procedures may have to be used. See page 8. ❏ **HELPFUL HINT**: Use LCN's Spotfinder to test the output of the remote control. Simply point the remote at the IR Spot on the Spotfinder, press the Unlock key on the remote, and red LED should illuminate.

ACCESSORIES

BodyMount **P/N 761222-79**	**Presence Sensor Quick Disconnect Harness** **P/N 20.5051.00**	**Lockout Safety** **Beams / SBK-30**

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