RCR-REX Request-to-Exit Dual Technology Motion Sensor Installation Guide

Introduction

This is the Interlogix RCR-REX Request-to-Exit Dual Technology Motion Sensor Installation Instructions for models RCR-REX-W, RCR-REX-B, and RCR-REX-G.

Installation

Determine if the sensor will be ceiling or wall mounted. Avoid locating the sensor between double doorways where objects can be inserted through a crack to gain unauthorized entry.
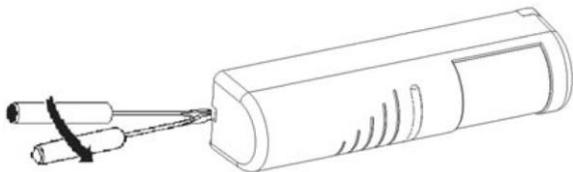
CAUTION: When handling the sensor, do not touch the lens window.

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To install the sensor, do the following:

1. To open the front cover, insert a small screwdriver into the bottom of the locking tab and pull upward (Figure 1).

Figure 1: Open the cover

CAUTION: You must be free of static electricity before handling sensor circuit boards. Touch a grounded, bare metal surface before touching circuit boards or wear a grounding strap.

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2. Remove the screw holding the circuit board (PCB) cradle axle to the back housing and carefully remove the circuit board with cradle from the housing (Figure 2).

Figure 2: Remove the circuit board and cradle
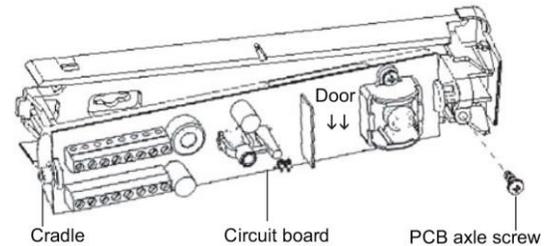
3. Route wiring to the sensor mounting location. If you are using the wall plate, pull the wires through the cable entry hole (Figure 3).

Figure 3: Mounting and wiring access
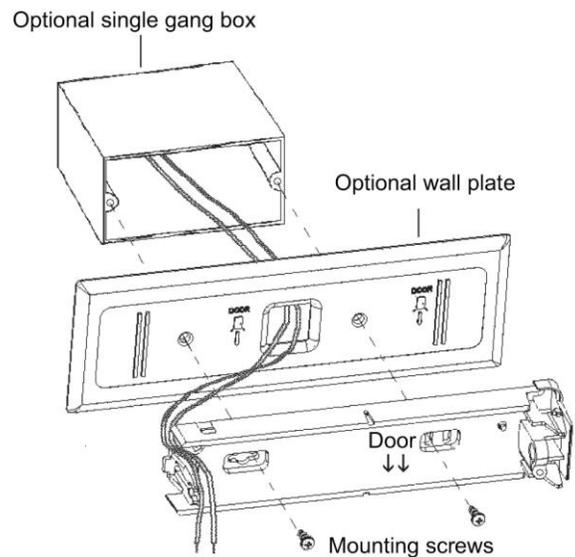
4. Insert the mounting screws into the back (wall mount) or top (ceiling mount) mounting screw holes to fasten the back housing and wall plate, if used, to the wall or ceiling (Figure 3).
5. Reinstall the PCB/cradle and secure in place with the PCB axle screw (Figure 2).
6. Complete wiring connection (See Wiring on page 2).
7. Swing the front cover in place and walk test the sensor for appropriate coverage and function (see Initial power up on page 4.
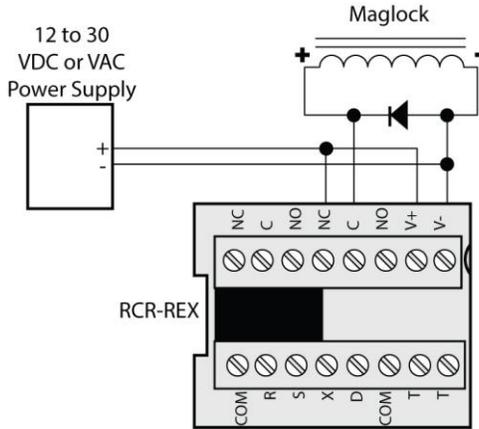
Wiring

This section provides examples of different wiring options. The options are all shown in the failsafe mode.

Basic Hook-up

Figure 4 shows the basic hook-up for the RCR-REX, a power supply and a magnetic lock. When the sensor sees motion, power is removed from the magnetic lock.

Figure 4:   Basic hook-up

CAUTION: For DC powered systems, if the door lock does not contain a diode across the coil winding, install a diode across the door lock to prevent degradation of the lock relay contacts. The diode should have a current rating greater than the maximum lock current. Install the diode so that the cathode end with the bar is connected to the positive side of the coil.

Spike Protection

Many magnetic locks and electric door strikes have built in spike (diode) protection. If the lock is not spike protected, install a bridge rectifier, such as a KBL005, between the relay contacts and the magnetic lock/door strike as shown in Figure 5.

Figure 5:   Spike Protection
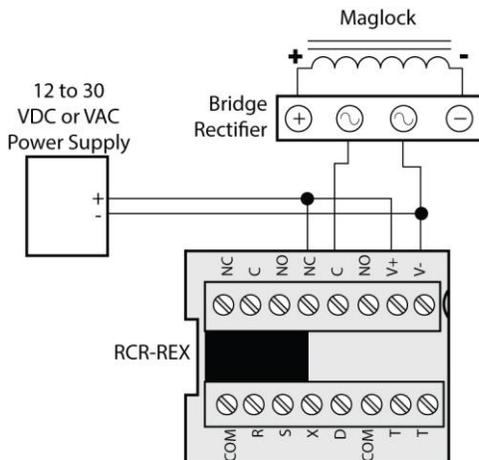
Note: Failure to spike protect the sensor may result in shortening the life of the relay contacts.

RCR-REX and a Keycard Reader

Figure 6 shows the wiring normally used when a keycard reader is on one side of the door and the RCR-REX is on the other side of the door. Both swiping a keycard or the detection of motion by the RCR-REX will remove power from the magnetic lock.

Figure 6:   RCR-REX and a keycard reader
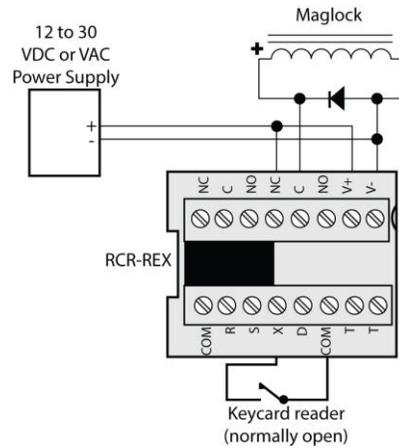
Monitor Door Contacts (first option)

In the monitor door contacts mode, a person entering the sensor's field of view will activate the relay and timer. Door contacts connected to terminal D will monitor if the door is open or closed. If the relay timer gets to ten seconds or less (if set for 16 seconds or greater) and the door is still open, the RCR-REX internal sounder will activate. The sounder will also active if the door is opened without first activating the sensor or keycard input. The sounder will remain on until the door is closed or by someone moving in the field of view (Figure 7).

Figure 7:   Monitor door contacts (first option)
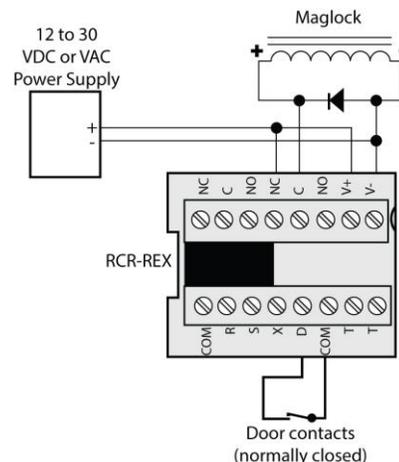
Monitor Door Contacts (second option)

If the sensor is activated but the door is not opened, the relay will drop out after ten seconds. If the sensor is activated and the door is opened, and then closed, the relay will drop out after two seconds. This prevents unauthorized people from entering (Figure 8).

Figure 8:   Monitor door contacts (second option)
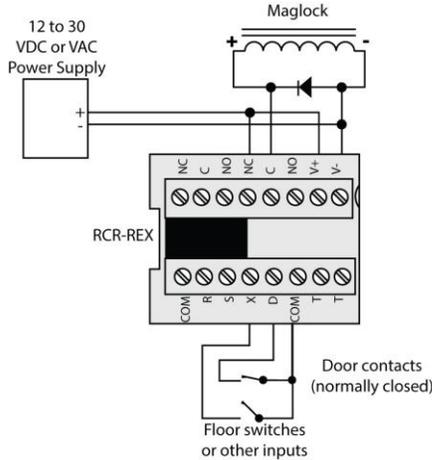
Panic Button

Many fire codes require a panic button to be part of the installation. The RCR-REX has an X (external) input (see X (input) external) for a normally open panic button or an internal timer panic button. When X input is grounded, the door will open. Two normally open devices may be connected to the X input (Figure 9).

Figure 9:   Panic Button
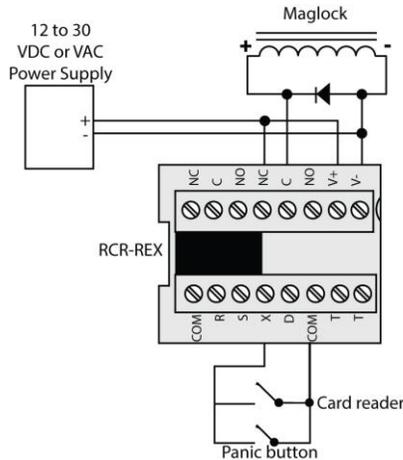
NC, C, NO (I/O) Monitor Relay Section

Connect the monitor relay terminals across the normally closed contacts (NC) of the door switch and across the access control system. If there is no access control system, connect the normally closed contacts of the door switch across the monitor relay terminals.

R (input) Arm

This pin is used to enable and disable the unit with an external signal. The unit will be disabled when R is grounded for more than 10 seconds. Thereafter, when R is ungrounded, the unit will be enabled. Motion detected by the unit up to 10 seconds after R is grounded and at least 100 milliseconds after R is ungrounded will start the relay timer.

This pin must be switched with a dry contact or an open collector transistor referenced to COM (ground).

S (input) Sounder

This pin allows external control of the sounder that takes precedence over all other sounder modes. If the unit is powered up with S ungrounded, then the unit assumes that S is unused.

Whenever S is grounded after power up, the unit assumes that S is being used to externally activate the sounder. Thereafter, when S is ungrounded for at least 100 milliseconds, the sounder will unconditionally turn on and stay on until S is grounded.

This pin must be switched with a dry contact or an open collector transistor referenced to COM (ground).

X (input) External

This pin can be used by card readers, keypads, remote push buttons, and key locks to cause the sensor to start a timing cycle.

If X is pulled to ground for at least 500 milliseconds and less than 3 seconds, the lock/monitor relay will unlock the door and the lock timer will start as if a person walked into the detection area. If X is grounded for more than 3 seconds, then the relay will stay in the unlocked state until X is allowed to go high. When X goes high and if the door is still open, the sounder will produce a beeping tone and the relay will remain in the unlocked state until the door closes. When the door closes, the relay will lock the door and shunt the door switch.

This pin must be switched with a dry contact or an open collector transistor referenced to COM (ground).

D (input) Door

This pin is used to detect the state of the door switch. The door switch must be connected between pins D and COM (ground). If the unit is powered up with D ungrounded, the unit assumes that D is unused. If D is ever grounded after the unit is powered up, the unit assumes that D is being used to sense door position and the sounder will beep (if enabled) when the door is left open.

If used, this pin must be switched with a dry contact or an open collector transistor referenced to COM (ground). See **S2-7 (door monitor mode)** on page 4.

T and T Tamper Switch

These two pins connect to the tamper switch, which opens when the housing cover is opened.

COM (I/O) Common or Ground

These two pins are connected to ground and serve as the ground reference when using pins R, S, X, and D.

DIP Switch Options

The factory default (**D**) setting is on for all switches.

S2-1 (sounder enable)

- **On.** Sounder is enabled for all modes (**D**).
- **Off.** Sounder is completely disabled.

S2-2 (LED control)

- **On.** LED is enabled (**D**).
- **Off.** LED is disabled except during warm-up.

S2-3 (timer reset mode)

- **On.** Relay timer does not reset with motion (**D**).
- **Off.** Relay timer resets with motion.

S2-4, S2-5, S2-6 (relay time)

These switches determine how long the lock relay stays energized when motion is detected (Table 1).

Table 1:   Relay Time Settings

Relay time	S2-4	S2-5	S2-6
1/2 seconds (D)	On	On	On
1 second	On	On	Off
2 seconds	On	Off	On
4 seconds	On	Off	Off
8 seconds	Off	On	On
16 seconds	Off	On	Off
32 seconds	Off	Off	On
64 seconds	Off	Off	Off

S2-7 (door monitor mode)

- **On.** Monitor the door switch (**D**).
- **Off.** Do not monitor the door switch.

S2-8 (relay mode)

- **On.** Fail safe mode (**D**) is enabled.
- **Off.** Fail secure mode is enabled.

Initial Power Up

After mounting and wiring the sensor, apply AC or DC power to the input power terminals (V+ and V-). Allow at least 2 minutes following power up for the sensor to stabilize before conducting any tests.

To walk test the detection pattern, approach the door from all directions and watch the walk test LED for detection. See **Pattern Adjustment** if changes are required in the detection area.

Reassemble the sensor and completely walk test again following any lens adjustment.

To select the appropriate relay time, set the DIP switches as shown in **DIP Switch Options** on page 4.

LED Indicator

The LED turns red for the duration of the lock relay time when motion is detected and flashes twice per second during the 20-second warm-up period. The LED turns yellow when the radar detects motion. The LED turns green when the passive infrared (PIR) detects motion.

Internal Sounder

A continuous tone will sound 15 seconds prior to the end of the relay timer period. A beeping tone will sound at the end of the external input (**X**) signal if the door is open.
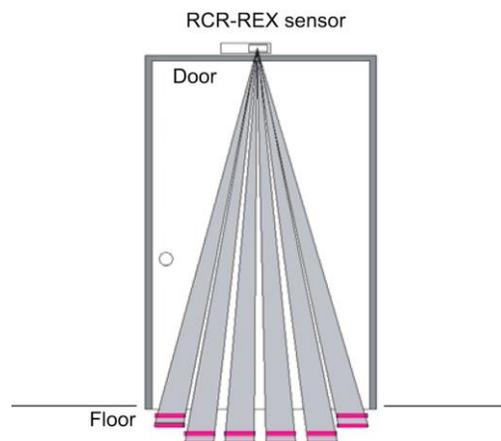
Pattern Adjustment

The RCR-REX has both PIR and radar detection patterns that may be adjusted independently.

PIR Detection Pattern

Figure 10 shows the passive infrared (PIR) detection pattern.
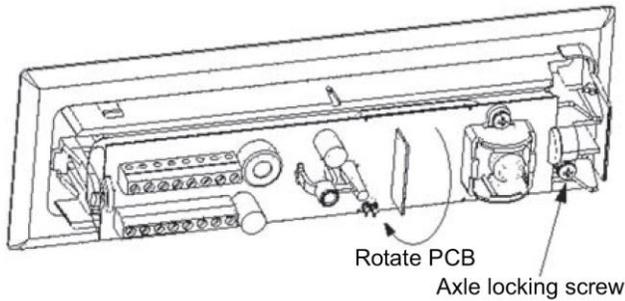
Figure 10:   PIR Detection Pattern

To adjust the PIR detection pattern toward or away from the door opening, do the following:

1. Open the sensor cover; see "Figure 1: Open the cover" on page 1 and loosen the PCB axle screw (Figure 11).

Figure 11:   PIR Pattern Adjustment

Rotate PCB

Axle locking screw

2. Rotate the PCB to the desired position and tighten the PCB axle screw. Table 2 gives the suggested angle for a given mounting height.
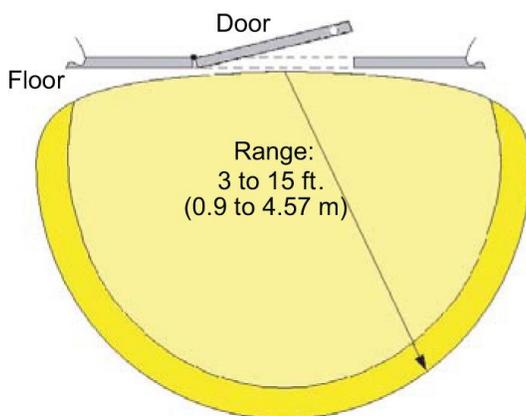
Table 2:   Suggested Angles

Mounting height	Wall angle	Ceiling angle
7 ft. (2.1 m)	-10°	+10°
10 ft. (3.0 m)	-20°	+20°
15 ft. (4.6 m)	-30°	+30°

3. Close the cover.

4. Test to be sure undesired sources of motion will not be detected.

Radar Detection Pattern

Figure 12 shows the radar detection pattern.

Figure 12:   Radar Detection Pattern

Door

Floor

Range:
3 to 15 ft.
(0.9 to 4.57 m)

You can adjust the radar range from 3 to 15 ft. (0.9 to 4.57 m). To adjust the range, rotate the range adjustment control (Figure 13) to the desired position. The radar range is not affected by the PCB rotation during PIR range adjustment. The radar range can be set to just above the floor, to prevent door activation from objects that have been slipped under the door. After adjusting the radar range, carefully test to be sure undesired sources of motion will not be detected.

Figure 13:   Range Adjustment Control

13(4,0)

11(3,4)   15(4,6)

9(2,7)   R32
RANGE

7(2,1)   5(1,5)   3(0,9)
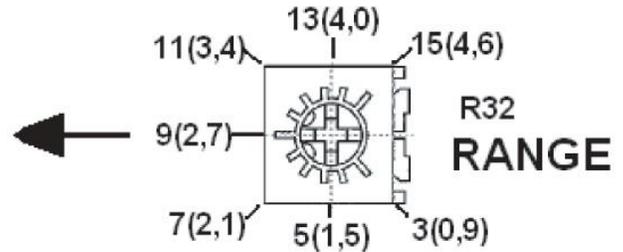
Operation

By connecting the lock relay in series with the door lock and the monitor relay in parallel to the door switch and alarm circuit, the sensor will allow normal egress and will monitor alarms from the door being held or forced open. The sensor will monitor the operation of the door switch without affecting the access control system.

When the sensor detects motion, the lock relay contacts open, unlocking the door, and the monitor relay contacts close, preventing an alarm from being sent to the access control system for a fixed time. The time is selected with the DIP switch from 1/2 to 64 seconds or until reset by the sensor. See DIP switch options on page 4.

If the sensor does not detect the opening of the door switch within 10 seconds of sensor activation; the lock and monitor relays will return to their normal condition. If the relay timer is set to 8 seconds or shorter, the lock relay will change back to the normal condition when the relay timer times out. After the door switch opens and closes, the sensor will automatically cancel any remaining relay time if the door switch remains closed for at least 2 seconds.

The sensor's sounder will produce a continuous tone to warn of an open door 15 seconds before the timer closes the lock relay contacts and opens the monitor relay contacts. Closing the door will silence the sounder. New movement within the detection area will restart the timer and reset the sounder. If the door is still open when the timer ends, the monitor relay contacts will open, which will cause an alarm signal to be sent to the access control system.

Fail Safe/F ail Secure Modes

The lock relay operates in the failsafe mode (factory default) when the lock relay state during alarm is the same state as when the unit is not powered. During the power up period, the relay will be in the same state as during normal unalarmed operation. The lock relay operates in the fail secure mode where the lock relay state during normal unalarmed operation is the same as when the unit is not powered. During the power up period, the relay will be in the same state as during the alarm period.

Note: The fail secure mode must be authorized by your local authority. Listed panic hardware shall be used to allow emergency exit from the protected area.

Figure 14 shows the fail safe and fail secure modes relay contacts.

Figure 14:   Fail Safe/Fail Secure Modes Relay Contacts
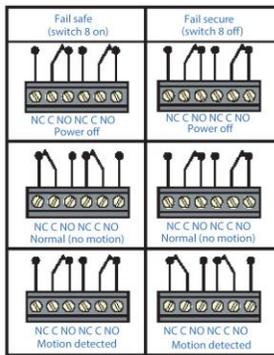

Mask Installation

The RCR-REX has a mask included that allows you to adjust the PIR field of view. This may be necessary for some installations when the unit may be tripped by non-exiting foot traffic or other erroneous sources that are with the detection area.

To install the mask, do the following:

1. Remove the appropriate segments of the mask to include the desired area of detection.
2. Open the RCR-REX cover and locate the PIR lens.
3. Slip the mask into the two side brackets that hold the PIR lens in place (Figure 15). Be careful not to dislodge the lens.
4. Close the cover.

Figure 15:   Mask installation
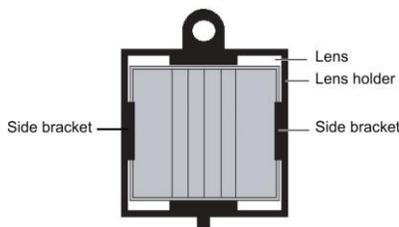
Specification

Voltage	12 to 30 VAC or VDC
Current	23mA typical, 27mA maximum at 12 VDC
	15mA typical, 17mA maximum at 24 VDC
	31mA typical, 38mA maximum at 12 VAC
	26mA typical, 29mA maximum at 24 VAC
Time delay	1/2, 1, 2, 4, 8, 16, 32, 64 seconds ± 10%, selectable
Alarm output	DPDT (2 Form C)
Maximum loop rating	2 A at 30 V AC/DC
Loop type	Closed, open
Tamper output	50 mA at 30 VDC
Wire gauge	AWG 14 to 22 (18 to 22 recommended)
Operating temperature	-20 to 122°F (-29 to 50°C)
Relative humidity	10 to 95% non-condensing
RFI immunity	20V/meter from 80 MHz to 1 GHz
Static immunity	8k V
Lightning immunity	2.4kV, 1.4 Joules
Radar frequency	5.84 GHz
Range	
Depth	3 to 15 ft. (0.9 to 4.57 m)
Width	7.9 ft. (2.4 m)
Mounting height	7 to 15 ft. (2.13 to 4.57 m) typical
Dimensions (W x H x D)	7.4" x 1.76" x 1.85" (187.8 x 44.7 x 47 mm)
Color	Off-white, black, gray
Listings	C UL-US
	Industry Canada
	CE (pending)
	FCC

Product Ordering

Product	Description
RCR-REX-W	RCR-REX request-to-exit dual technology motion sensor, off-white
RCR-REX-B	RCR-REX request-to-exit dual technology motion sensor, black
RCR-REX-G	RCR-REX request-to-exit dual technology motion sensor, gray

Note: The equipment should be installed in accordance with the National Electrical Code, ANSI / NFPA70.

FCC Compliance

This device complies with Part 15 of the FCC rules. Operation is subject to the following three conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.
3. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC ID: CGGAA2

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