

## K594.RF Product Guide

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## Overview and General Concepts

The K594.RF wall mounted passive infrared (PIR) motion detector (Figure 1) adds occupancy sensing and peripheral–status reporting capability to INNCOM integrated guestroom control systems. The K594.RF can be a key participant in an INNCOM Integrated Room Automation System guestroom network.

The K594.RF, in conjunction with its room controller, and an in-room communication network, helps determine guestroom occupancy. Occupancy sensing leads to better management of energy usage and security; extends heating, ventilation, and air conditioning equipment life; enhances the overall operating efficiency of the hotel; and improves guest satisfaction. The K594.RF's swiveling head adjusts to give optimum coverage to any room configuration.

The K594.RF can also monitor and report on the status (e.g., open/closed) of other devices within the guestroom (see Application below).



**Figure 1. K594.RF Motion Sensor**

## Application

The K594.RF's microprocessor-controlled PIR detects motion in a guestroom and reports it to the room controller. Combined with information from other inputs (such as a lanai or window switch or a minibar), guestroom occupancy can be determined and used for energy control or lighting decisions.

Occupancy information may also be signaled to Housekeeping using the corridor doorbell display or a floor-level terminal.

On power-up, the K594.RF will flash the LED for approximately two seconds as it configures itself using settings in nonvolatile memory (see table below).

The K594.RF will then go into Operation Mode, where it checks the auxiliary input, the motion detector, and the Bind switch status (see **Commissioning**). The K594.RF will process any actions instigated by those checks; after that (or if there is no action), it will enter a low-power state (Sleep Mode) to conserve battery power.

The K594.RF can also act as a minibar server if the IO map is so programmed.

## Features

- Wide angle dispersion
- Swivel mounting
- Light (photo) sensor
- Auxiliary input
- Easy installation
- No maintenance
- Long battery life
- 2.4Ghz IEEE 802.15.4 compliant RF transceiver (CC2430 radio core)
- FCC Part 15b listed

Description	Value
Room ID	65535
RF Channel	26
TX Power	0x5F (0dB)
P5 Address	189
P5 Channel	1

## Installation

Location of the K594.RF is determined by the individual guestroom design. Placement for the K594.RF should provide maximum room coverage by the PIR motion detector while maintaining RF communication between the device and the e4 thermostat. Ideally, the K594.RF should be positioned on a wall in opposition to entrances and interior doors (8ft. high, 0° angle, 0° pitch). It should be positioned to view both the entry door and the bed areas of the guestroom; the swivel mounting allows adjustment for optimal occupancy sensing.

The K594.RF should be mounted within operational range of the e4 thermostat and any other devices it may communicate with. Avoid possible sources of radio interference such as metallic boxes, WiFi access points, microwave ovens, water pipes, and the like.

1. Remove the mounting base from the K594.RF
2. Drill two holes in the wall corresponding to the screw holes in the base
3. Mount the base using the 6x32x1 screws supplied
4. For a wireless device, insert 4 AA batteries into the battery compartment assembly
5. Snap the battery compartment assembly to the base

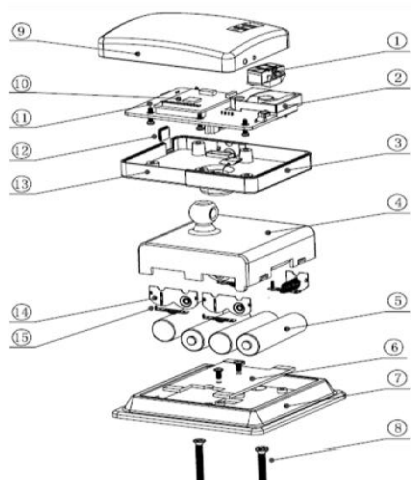


Figure 2. Mechanical Drawing



H2 Aux Input Header

Item	Description
1	Fresnel Lens
2	PIR Board PCBA
3	Right Side Back
4	Battery Cover
5	Battery
6	Base PCBA
7	Mounting Base
8	Screws 6x32x1
9	Front Cover
10	TXR, SMT, PCBA
11	Module PCBA
12	Photo Sensor
13	Left Side Back
14	POS/NEG Plate (R+/L-)
15	Spring Sheet

## Commissioning

To function as part of the in-room network, the K594.RF must be commissioned by accepting instruction as to room identification, RF channel, P5 address, P5 channel, and IOMap setting for the specific room (see IOMap Summary table below). An E528.4G, E527.4G or E529 can be used to configure and bind the K594.RF.

**Prepare the thermostat to bind the K594 by setting the Room ID, PAN ID and RF Channel into the thermostat:**

## If Using the E528/E527.4G:

### 1. Enter Service Parameter Mode on the Thermostat:

- a) Press and hold °F/°C button
- b) Press and release the OFF/AUTO button
- c) Press and release the DISPLAY button
- d) Release the °F/°C button **rld** will be on the display

### 2. Set the Room ID

- a) Press DISPLAY button. Current Room ID will scroll, then highest Room ID digit will display with “HI” below it. Change to desired value with UP/DOWN arrow buttons and press OFF/AUTO button.
- b) The next 2 digits of Room ID will be displayed with “MED” below it. Change to desired value with UP/DOWN arrow buttons and press OFF/AUTO button.
- c) The last 2 digits of Room ID will be displayed with “LO” below it. Change to desired value with UP/DOWN arrow buttons and press DISPLAY button to store Room ID. The thermostat will beep and scroll new Room ID on display.

### 3. Set the PAN ID

- a) In Service Mode go to Pan (PAN ID) and press DISPLAY button to view value.
- b) Use UP/Down arrow buttons to change to desired PAN ID.
- c) Press DISPLAY to store. The thermostat will beep.

### 4. Set the RF Channel

- a) In Service Mode go to rF (RF Channel) and press DISPLAY button to view value.
- b) Use UP/Down arrow buttons to change to desired RF Channel.
- c) Press DISPLAY to store. The thermostat will beep.

## If Using the E529

### 1. Enter Service Parameter Mode on the Thermostat:

- a) Press and hold °F/°C button
- b) Press and release the OFF/AUTO button
- c) Press and release the DISPLAY button
- d) Release the °F/°C button **rld** will be on the display

### 2. Set the Room ID

- a) Press OFF/AUTO button. Current Room ID will scroll, then highest Room ID digit will display with “HI” below it. Change to desired value with UP/DOWN arrow buttons and press DISPLAY button.

- b) The next 2 digits of Room ID will be displayed with “MED” below it. Change to desired value with UP/DOWN arrow buttons and press DISPLAY button.
- c) The last 2 digits of Room ID will be displayed with “LO” below it. Change to desired value with UP/DOWN arrow buttons and press DISPLAY button to store Room ID. The thermostat will beep and scroll new Room ID on display.

### 3. Set the PAN ID

- a) In Service Mode go to Pan (PAN ID) and press OFF/AUTO button to view value.
- b) Use UP/Down arrow buttons to change to desired PAN ID.
- c) Press DISPLAY to store. The thermostat will beep.

### 4. Set the RF Channel

- a) In Service Mode go to rF (RF Channel) and press OFF/AUTO button to view value.
- b) Use UP/Down arrow buttons to change to desired RF Channel.
- c) Press DISPLAY to store. The thermostat will beep.

## With the Room ID, PAN ID and RF Channel Set into the Thermostat, Bind the K594:

### If Using the E528/E527.4G:

1. In Service Parameter mode, go to the Io (I/O Map) parameter
2. Press DISPLAY button to view value.
3. Change the value to the desired I/O Map. If only using the K594 as a remote Motion Sensor and NOT using its external input to monitor a door switch or other contact, use I/O Map 0. Otherwise, select the appropriate I/O Map from the IOMap Summary table.
4. With the desired I/O Map selected, press the OFF/AUTO button. The display will show “bnd”.  
**DO NOTHING ELSE on the thermostat.**
5. Press the blue S1 switch on the K595 to initiate binding. The K595 will broadcast a Bind Request message. If the thermostat saw the Bind Request, it will reply with a Bind Offer message. Upon seeing the Bind Offer from the E528, the K595 will bind itself to the advertised Room ID and RF Settings.

### *If binding is successful, the K594 will:*

- Flash its Status LED 3 times
- Send the thermostat a message to sound its buzzer
- Reset itself
- Send a device startup message that includes the K595 software version and its battery status.

**If Using the E529:**

1. In Service Parameter mode, go to the **Io** (I/O Map) parameter
2. Press OFF/AUTO button to view value.
3. Change the value to the desired I/O Map. If only using the K594 as a remote Motion Sensor and NOT using its external input to monitor a door switch or other contact, use **I/O Map 0**. Otherwise, select the appropriate I/O Map from the IOMap Summary table. **Do nothing else on the E529 at this point.**
4. Press the blue S1 switch on the K595 to initiate binding. The K595 will broadcast a Bind Request message. If the E529 saw the Bind Request, it will reply with a Bind Offer message. Upon seeing the Bind Offer from the E529, the K595 will bind itself to the advertised Room ID and RF Settings.

***If binding is successful, the K594 will:***

- Flash its Status LED 3 times
- Send the thermostat a message to sound its buzzer
- Reset itself
- Send a device startup message that includes the K595 software version and its battery status.

**IO Map  
Summary**

IO Map	Name	VIF Control	VIF Reinforcement Frame
0	Input Disabled/Not Used	N/A	N/A
1	Entry Door Inverted	0x028	0x029
2	Window	0x02A	0x02A
3	Window Inverted	0x02A	0x02A
4	Mini Bar	0x025	0x025
5	Mini Bar Inverted	0x025	0x025
6	Safe	0x026	0x026
7	Safe Inverted	0x026	0x026
8	Common Door	0x064	0x064
9	Common Door Inverted	0x064	0x064
10	Connecting Door	0x065	0x065
11	Connecting Door Inverted	0x065	0x065
12	Window Segment 0	0x1E	0x1E
13	Window Segment 0 Inverted	0x1E	0x1E

IO Map	Name	VIF 0x1E Control	VIF Reinforcement Frame
14	Window Segment 1	0x1E	0x1E
15	Window Segment 1 Inverted	0x1E	0x1E
16	Window Segment 2	0x1E	0x1E
17	Window Segment 2 Inverted	0x1E	0x1E
18	Window Segment 3	0x1E	0x1E
19	Window Segment 3 Inverted	0x1E	0x1E
20	Window Segment 4	0x1E	0x1E
21	Window Segment 4 Inverted	0x1E	0x1E
22	Window Segment 5	0x1E	0x1E
23	Window Segment 5 Inverted	0x1E	0x1E
24	Window Segment 6	0x1E	0x1E
25	Window Segment 6 Inverted	0x1E	0x1E
26	Window Segment 7	0x1E	0x1E
27	Window Segment 7 Inverted	0x1E	0x1E
28	Smoke	0x06B	0x06B
29	Smoke Inverted	0x06B	0x06B
30	Key Tag	0x01A	0x01A
31	Key Tag Inverted	0x01A	0x01A

## Testing

To perform the PIR Walk test, press the K594 Bind switch twice quickly. Activate the E528/E527.4G thermostat's testing function by executing RUN parameter 12. The E529 has no such test and can't be used to perform the Walk test. Motion detected by the K594 PIR should be transmitted to the E527/E528, causing the thermostat's buzzer to sound and "**pir**" to appear on the LCD screen. The K595 will remain in PIR Walk Test mode for 60 seconds.



## PIR Specification

Parameter	K594.RF
Lens Data	70ft
No. of Fresnel Beams	27 9+5
No. of Curtain Beams MAX. Coverage	12x12m (40x40ft.) 90 degrees
Sensitivity	0.5m-12m (1.64-40ft)

## RF Specification

Parameter	K594.RF
RF Data Rate	250kbps
Antenna Type	SMT
Indoor Range	70ft
Transmit Power	1mW (+0dBm)
Receive Sensitivity	-94.6dBm
Frequency Band	2.4 Ghz
Encryption	AES-128
Protocol	802.15.4
Frequency Channels	11-26

## Technical Specifications

Parameter	K594.RF
Input Voltage	4 x AA Batteries
Battery Life	2.2 Years
Operating Temperature	0 °C to 60 °C (32 °F to 140 °F)
Storage Temperature	-20 °C to 60 °C (-4 °F to 140 °F)

## Safety Regulatory

### FCC ID: GTC202150TXR or GTC202152TXR

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

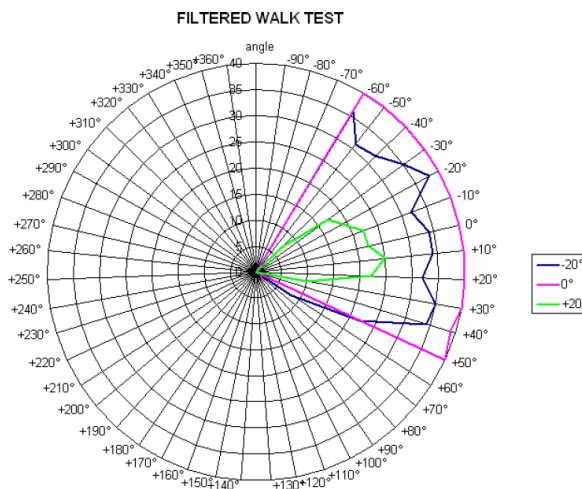
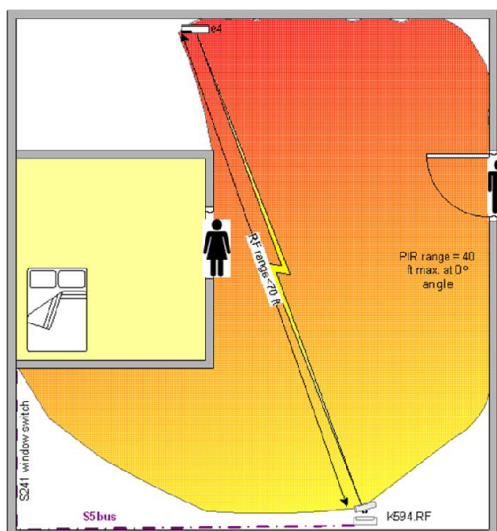
Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

### IC ID: 1609A-202150TXR, or 1609A-202152TXR

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

*Le présent appareil est conforme aux CNR d'industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

## PIR Coverage



This chart graphs the testing of the effective range of the K594.RF's PIR motion detector through 180° of horizontal movement (-90° to +90°) and 40° of vertical movement (-20° to +20°).

## Document Revision History

REVISION	DATE ISSUED	REASON FOR CHANGE
0.1	18-NOV-2009	First Draft
0.2	03-DEC-2009	Incorporate Comments from Technical Review
0.3	08-DEC-2009	Final Revisions Before Review
1.0	08-DEC-2009	Release to Grid
1.1	18-FEB-2010	Updated FCC Statement
1.2	09-MAT-2012	Changed Battery Life
1.3	15-JUL-2013	Changed OPN
1.4	25-JUL-2014	Changed Binding Procedure to Reflect Reverse Binding
2.0	03-MAR-2017	Rebranded to Honeywell Design Specifications

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