

## S541.RF 4G Product Guide

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## Overview and General Concepts

The S541 family of remote monitors is a member of INNCOM's Integrated Room Automation System (IRAS). These devices provide remote reporting of door switch status, temperature and humidity. The models consist of the S541 Battery Operated Door Switch Monitor, the RT3 Battery Operated RF remote temperature sensor, and the RT4 Battery Operated RF remote temperature and humidity sensor.

Each of these family members is equipped with a 2.4Ghz radio for wireless RF communications and is battery operated, with up to a 5 year battery life.



Figure 1. S541 Remote Sensor

## Application

### S541

The S541 monitors guestroom door status and reports the status into the Integrated Room Automation System. This, in conjunction with motion sensing performed by another INNCOM devices such as the K595 or the INNCOM e4 thermostats on-board motion sensor, is used for energy management. It is ideal for retrofit situations and for transmitting door status from balcony doors or other room openings.

### RT3

The RT3 remotely monitors guestroom temperature where the thermostat must be located close to the heat/cool source. The RT3's temperature accuracy is 0.5°C from 0°C to +65 °C.

### RT4

The RT4 remotely monitors guestroom temperature and humidity where the thermostat must be located close to the heat/ cool source. The RT4 has a temperature accuracy of 0.5°C from 0°C to +65 °C and can measure relative humidity to +/- 5%RH over a compensated range of 5°C–50°C.

The S541 family operates in three modes: *sleep*, to conserve battery life when there are no events to report; *operation*, to transmit switch status, temperature, or humidity; and *bind*, when commissioning the product into the INNCOM RF Integrated Room Automation System.

The S541 family uses 2.4Ghz wireless radio frequency to communicate to the INNCOM system, therefore direct line of sight is not required for communication between the S541family of remote monitors and the e4 digital thermostat.

## Features

- Small, wall mountable design
- 2.4Ghz IEEE 802.15.4 compliant 0dB RF transceiver
- Deep mesh networking
- On-board door switch monitor, temperature sensor, and humidity sensing
- Industrial temperature ratings 0–65°C
- FCC Part 15b listed

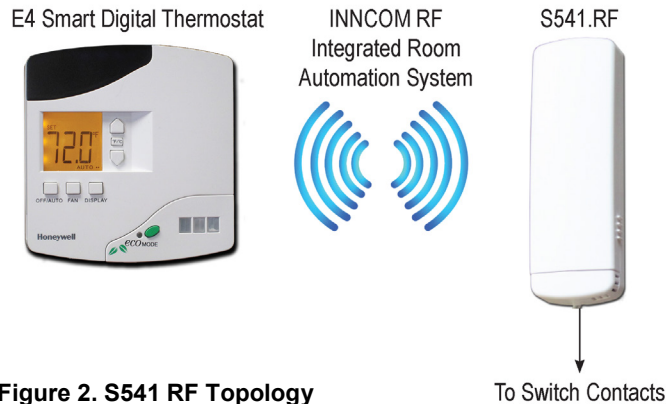
## Specifications

Parameter	S541.RF 4G
RF Data Rate	250kbps
Antenna Type	SMT
Indoor Range	70ft
Outdoor/RF Line-of-Sight-Range	540ft
Transmit Power	1mW (+0dBm)
Receive Sensitivity	-94.6dBm
Frequency Band	2.4Ghz
Encryption	AES-128
Protocol	802.15.4
Frequency Channels	11-26
Temperature Sensing Accuracy	0.5°C from 0°C–65 °C
Humidity Sensing Accuracy	+/- 5%RH over a compensated range of 5°C - 50°C
Battery Life	5 Years
Operating Ambient Temperature	0°C–40 °C
LED / Switch	Flashes on power up. Flashes slow in bind mode. Flashes fast on receiving the bind command. Switch presses are used for teach mode and to initiate bind mode.
Dimensions	L=102mm × W=32mm × H=14mm

## Network Typology

The S541.RF wirelessly transmits the switch status to the e4 digital thermostat in an INNCOM RF IRAS application.

The RT3/RT4 topology is virtually the same, wirelessly transmitting temperature / humidity data to the e4.



**Figure 2. S541 RF Topology**

## Installation

The S541, RT3, and RT4 should be mounted unobtrusively within operational range (70 ft. indoors) of the e4 thermostat and any other devices it may communicate with. Care should be taken to avoid possible sources of interference such as metallic boxes, WiFi access points, water pipes, and the like. It should also not be mounted in areas of high humidity.

The RT3 and RT4, used to remotely measure temperature and humidity, must be mounted vertically with the ventilation slits at the bottom edge of the unit. This allows convection to create airflow through the unit. Additional placement considerations include

- avoiding areas in direct sunlight
- avoiding areas of direct air discharge (preferably closer to an air intake point)
- avoiding areas around windows and exterior doors

## Installing Door Switches

The S541 receives open / close status from doors or windows equipped with INNCOM S241 magnetic switches (PN 04-1095 or surface-mounted 04-1097). To install the switches in a door and frame

- Make a 0.75" diameter, 1.5" deep hole in the door and frame (align holes).
- Push the S541 wires through the frame hole.
- Attach the S541 in position on the wall.
- Strip the ends of the S541 wires about 1/6 in. long and attach to the S241 terminal. Push excess wire inside frame.
- Insert the S241 door switch into the door.

## Commissioning

To function as part of the deep mesh network, the S541, RT3, or RT4 must accept identification and instruction from an e4 thermostat.

1. Enter the Service Mode on the e4 thermostat (press and hold the °F/°C button; press and release the OFF/AUTO button; press and release the DISPLAY button; release the °F/°C button)
2. On the thermostat LCD, scroll to Adr and press OFF/AUTO.
3. Set the address to teach the S541 (typically 209).
4. Press OFF/AUTO. The LCD will display bnd.
5. Remove the S541/RT3/RT4 cover and press the switch once to send a bind request towards the thermostat.
6. The thermostat sends a bind offer to the S541. If accepted, the thermostat will buzz loudly. The S541 will reset.
7. Test the S541 functionality.

If multiple S541s, RT3s, and RT4s are installed, each must have a unique Address. Use the procedure above to set the Address.

For the first minute during power up, the S541 is in test mode (the RT3 and RT4 have no test mode). In that period, the LED will illuminate when the device is actuated.

**Default S541 I/O Maps and Addresses**

<b>I/O Map</b>	<b>Description</b>	<b>S541LX Address</b>
0	Entry Door	209
1	Entry Door Inverted	209
2	Window	210
3	Window Inverted	210
4	Mini Bar	219
5	Mini Bar Inverted	219
6	Safe	219
7	Safe Inverted	219
8	Common Door	219
9	Common Door Inverted	219
10	Connecting Door	219
11	Connecting Door Inverted	219
12	Window Segment 0	211
13	Window Segment 0 Inverted	211
14	Window Segment 1	212
15	Window Segment 1 Inverted	212
16	Window Segment 2	213
17	Window Segment 2 Inverted	213
18	Window Segment 3	214
19	Window Segment 3 Inverted	214

20	Window Segment 4	215
21	Window Segment 4 Inverted	215
22	Window Segment 5	216
23	Window Segment 5 Inverted	216
24	Window Segment 6	217
25	Window Segment 6 Inverted	217
26	Window Segment 7	218
27	Window Segment 7 Inverted	218
28	Smoke	219
29	Smoke Inverted	219
30	Key Tag	219
31	Kay Tag Inverted	219

## Safety/Regulatory

### **This device contains FCC ID: GTC202913TXR.**

This device complies with part 15 of the FCC Rules. 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 undesired operation.

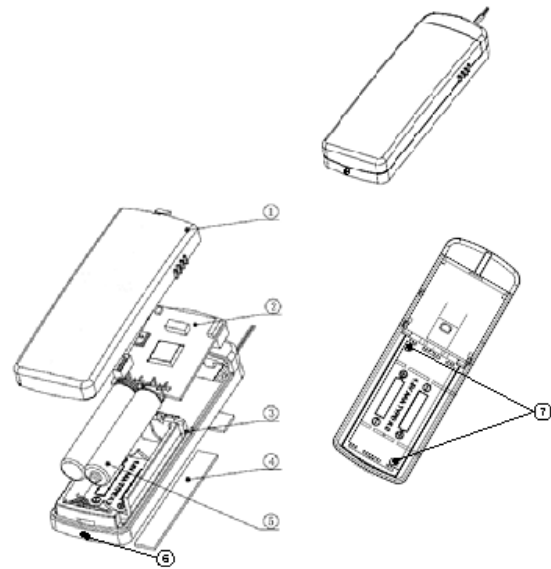
### **IC:1609A-202913TXR**

*This Class B Digital Apparatus complies with Canadian ICES-0003. 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.*

*Cet appareil numérique de la classe B est conforme à la norme NMB-0003 du Canada. 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.*

## Mechanical Drawings

Item	Description
1	Top Housing
2	S1 "Bind" Switch
3	H1 Programming Header
4	Bottom Housing
5	Double Sided Tape
6	2 AAA Batteries
7	Security Screw
8	Mounting Screw Holes



## Document Revision History

REVISION	DATE ISSUED	REASON FOR CHANGE
0.1	03-OCT-2013	First Draft
0.2	09-OCT-2013	First R&D Review
0.3	13-NOV-2013	Correct Binding Instructions / Add FCC statement
1.0	20-NOV-2013	Prepare for release
1.1	06-MAY-2014	Fixed OPN
2.0	02-MAR-2017	Rebranded to meet Honeywell Specifications

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