

# VT8000 Room Controllers

## VTR8350 Installation Guide

Line Voltage Fan Coil Unit (FCU)

Firmware Revision 2.5.1



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## 1. SAFETY INFORMATION

### 1.1 IMPORTANT INFORMATION

Read these instructions carefully and inspect the equipment to become familiar with the device before trying to install, operate, service or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

 The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

 This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

#### **DANGER**

**DANGER** indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

#### **WARNING**

**WARNING** indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

#### **CAUTION**

**CAUTION** indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

#### **NOTICE**

NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this signal word.

### 1.2 PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Viconics Technologies for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

## 1.3 BEFORE YOU BEGIN

### LOSS OF CONTROL

#### ⚠ WARNING

##### LOSS OF CONTROL

- The designer of any control scheme must consider the potential failure modes of control paths and, for certain critical control functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are emergency stop and over travel stop.
- Separate or redundant control paths must be provided for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of anticipated transmission delays or failures of the link.<sup>1</sup>
- Each implementation of equipment utilizing communication links must be individually and thoroughly tested for proper operation before being placed into service.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

### ELECTROSTATIC DISCHARGE

#### NOTICE

##### STATIC SENSITIVE COMPONENTS

Circuit boards and option cards can be damaged by static electricity. Observe the electrostatic precautions below when handling controller circuit boards or testing components.

**Failure to follow these instructions can result in equipment damage.**

Observe the following precautions for handling static-sensitive components:

- Keep static-producing material such as plastic, upholstery, and carpeting out of the immediate work area.
- Store static-sensitive components in protective packaging when they are not installed in the drive.
- When handling a static-sensitive component, wear a conductive wrist strap connected to the component or drive through a minimum of 1 megohm resistance.
- Avoid touching exposed conductors and components leads with skin or clothing.

### LOCATION

#### NOTICE

##### LOCATION

- Do not install on an exterior wall.
- Do not install behind a door.
- Do not install in areas with a direct heat source.
- Do not install near any air discharge grill.
- Do not install in areas exposed to direct sunlight.
- Ensure the Room Controller has sufficient natural air circulation.
- Ensure the wall surface is flat and clean.
- Ensure external thermal sensor wirings are away from noisy electrical sources.
- Install 1.3 to 1.5 meters (52 to 60 inches) above the floor.
- Perform preventive maintenance on the damper and Variable Air Volume (VAV) box, according to the supplier documentation.

**Failure to follow these instructions can result in equipment damage.**

<sup>1</sup> For additional information about anticipated transmission delays or failures of the link, refer to NEMA ICS 1.1 (latest edition), *Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control* or its equivalent

**UNAUTHORIZED USB ACCESS****NOTICE****UNAUTHORIZED USB ACCESS**

To prevent unauthorized access to the Room Controller via USB, it is recommended that:

- "USB access" is set to "Disabled" to prevent changing of firmware, standby image, configuration or LUA scripts via USB.
- "Main password" is set to a non-zero value to limit configuration menu access to authorized users only.

**Failure to follow these instructions may lead to unauthorized users modifying the firmware or the configuration of the Room Controller.**

**INSTALLATION****NOTICE****INSTALLATION**

- The Room Controller is only to be used in conjunction with the VC3000 line voltage switching relay pack. Together they are used as operating controls for high voltage fan coil units.
- The system must be installed correctly by a qualified technician.
- If replacing an existing Room Controller, label wires before removal of the Controller.
- Electronic controls are static sensitive devices. Discharge yourself correctly before manipulating and installing Room Controller.
- A short circuit or wrong wiring may permanently damage the Room Controller or equipment.
- All Room Controllers are designed for use as operating controls only and are not safety devices. These instruments have undergone rigorous tests and verification prior to shipping to ensure proper and reliable operation in the field. Whenever a control failure could lead to personal injury and/or loss of property, it becomes the responsibility of the user/installer/electrical system designer to incorporate safety devices such as relays, flow switches, thermal protections, and/or an alarm system to protect the entire system against any catastrophic failures. Tampering with the devices or unintended application of the devices will result in a void of warranty.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- These devices are not serviceable and must be returned to the supplier for any repair.
- A switch or circuit breaker must be installed. It must be suitably located, easily reached, and marked as the disconnecting device.
- 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.
- This device must be installed to provide a separation distance of at least 8in (20cm) from all persons and must not be located or operating in conjunction with any other antenna or transmitter.
- Refer to the Room Controller User Interface Guide for information on how to configure the Room Controller.

**Failure to follow these instructions can result in equipment damage.**

## CLEANING THE ROOM CONTROLLER

### NOTICE

#### CLEANING THE ROOM CONTROLLER

- Use a soft, pre-moistened lint-free cloth for cleaning.
- Avoid getting moisture in openings.
- Do not spray anything directly on the Room Controller or use compressed air.
- Do not use caustic/corrosive products, ammonia, solvents or any cleaning product containing alcohol or grit.
- Never use tools directly on the touchscreen.
- Never use paint on the Room Controller.
- Do not drop or crush the Room Controller, or allow it to come into contact with liquids.
- Do not use a damaged device (such as one with a cracked screen).

**Failure to comply with these recommendations will result in damage to the unit and void the manufacturer's warranty.**

## IMPORTANT SYMBOLS



Products marked with this symbol state that the manuals must be consulted in all cases to any hazards.



Alternating Current



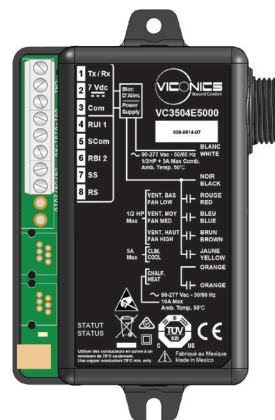
Direct Current



Equipment protected throughout by DOUBLE INSULATION or REINFORCED INSULATION



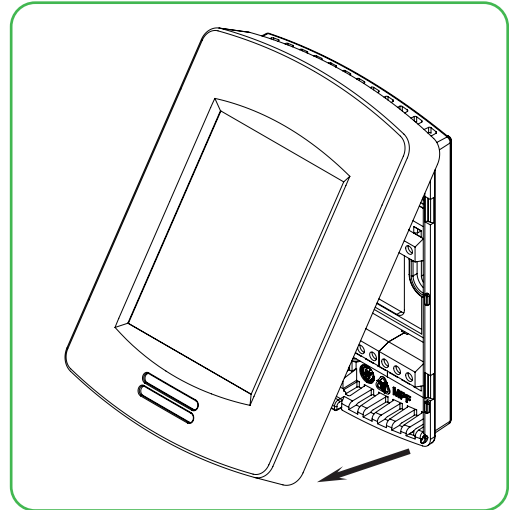
VTR8350 Room Controller



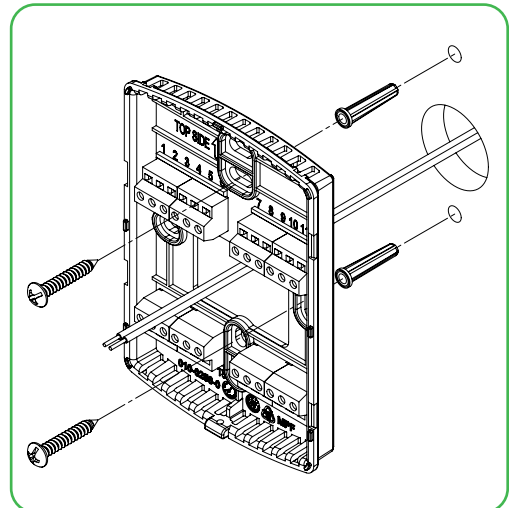
VC3000 Relay Pack

## 2. INSTALLATION

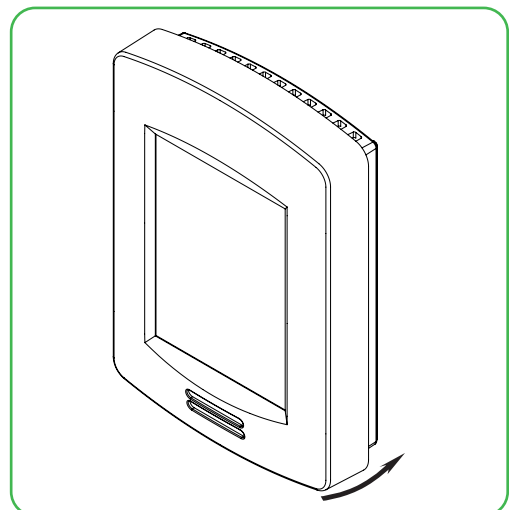
1. Open the unit by pulling on the bottom side of the Room Controller (Figure 1).
2. Read the FCC ID and IC label installed in the cover before installing any wireless product.
3. Ensure the correct side of the base faces up.
4. Pull the cables 6in (15cm) out from the wall.
5. Align the base and mark the location of the two mounting holes on the wall (Figure 2).
6. Install anchors in the wall.
7. Insert the cable in the central hole of the base.
8. Insert screws in the mounting holes on each side of the base.
9. Strip each wire 1/4in ( 0.6cm) from the end.
10. Insert each wire according to the wiring chart (next page).
11. Gently push the excess wiring back into the hole.
12. Gently align the cover with the top of the base and snap in place from the bottom (Figure 3).
13. Install the security screw.



**Figure 1** Open the cover



**Figure 2** Install the base



**Figure 3** Reinstall cover

### 3. TERMINAL IDENTIFICATION AND FUNCTION

| Terminal Identification | VTR8350 Terminal Equipment Controller |
|-------------------------|---------------------------------------|
| Terminal 4              | Tx – Rx Communication                 |
| Terminal 5              | Power Hot 7.0 VDC                     |
| Terminal 6              | Power Common                          |
| Terminal 12             | ECM 0-10 VDC output                   |
| Terminal 13             | BACnet +                              |
| Terminal 14             | BACnet -                              |
| Terminal 16             | BI 1 ( Configurable )                 |
| Terminal 17             | BI 2 ( Configurable )                 |
| Terminal 18             | Scom                                  |

**NOTE:** never use any terminal on Room Controller not mentioned in the above table.

### 4. COMMUNICATION WIRING TO VC3000 RELAY PACK



Only **ONE** Relay Pack with remote monitoring inputs (VC3404 or VC3504) can be used for a single VTR8350 Room Controller. All other Relay Packs must be **without** remote monitoring inputs (VC3300, VC3400 or VC3500).

A maximum of 10 Relay Packs can be used for a single VTR8350 Room Controller.

The Relay Packs can be arranged in any order.

#### From VTR8350 to the first VC3000 Relay Pack:

- Uses existing or new field wires.
- A minimum of 3 wires is required.
- Solid or Stranded, Shield is not necessary.
- Distance between the two units must not exceed 15 m (49 ft).
- Wire gauge depends on available distance:
  - $\leq 10$  m (33 ft): AWG 16-18 (1.31 - 0.823 mm<sup>2</sup>)
  - $> 10$  m (33 ft): AWG 16 (1.31 mm<sup>2</sup>)

#### From the first VC3000 Relay Pack to all other VC3000 Relay Packs:

- Uses existing or new field wires.
- 2 required wires AWG 16-18 (1.31 - 0.823 mm<sup>2</sup>):
  - Tx/Rx (1)
  - Power Common (3)
- Solid or Stranded, Shield is not necessary.

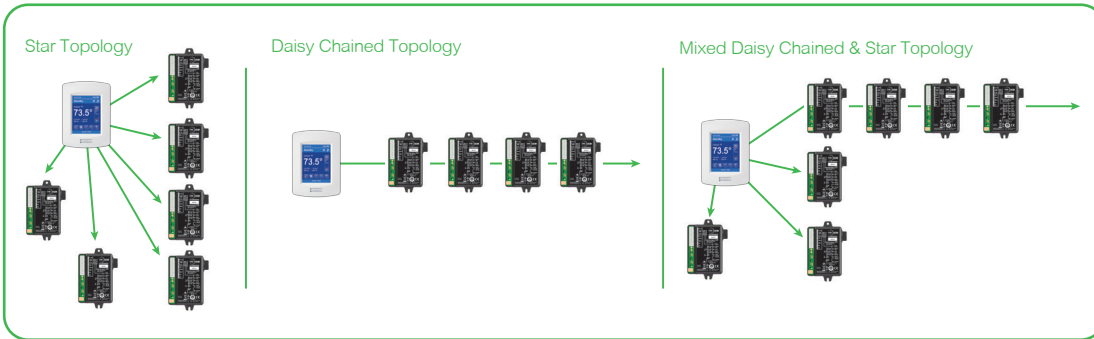
#### 4.1 BACNET® COMMUNICATION SHIELDED WIRING (IF REQUIRED)



**NOTE:** See VTR8350 BACnet® integration manual for more details



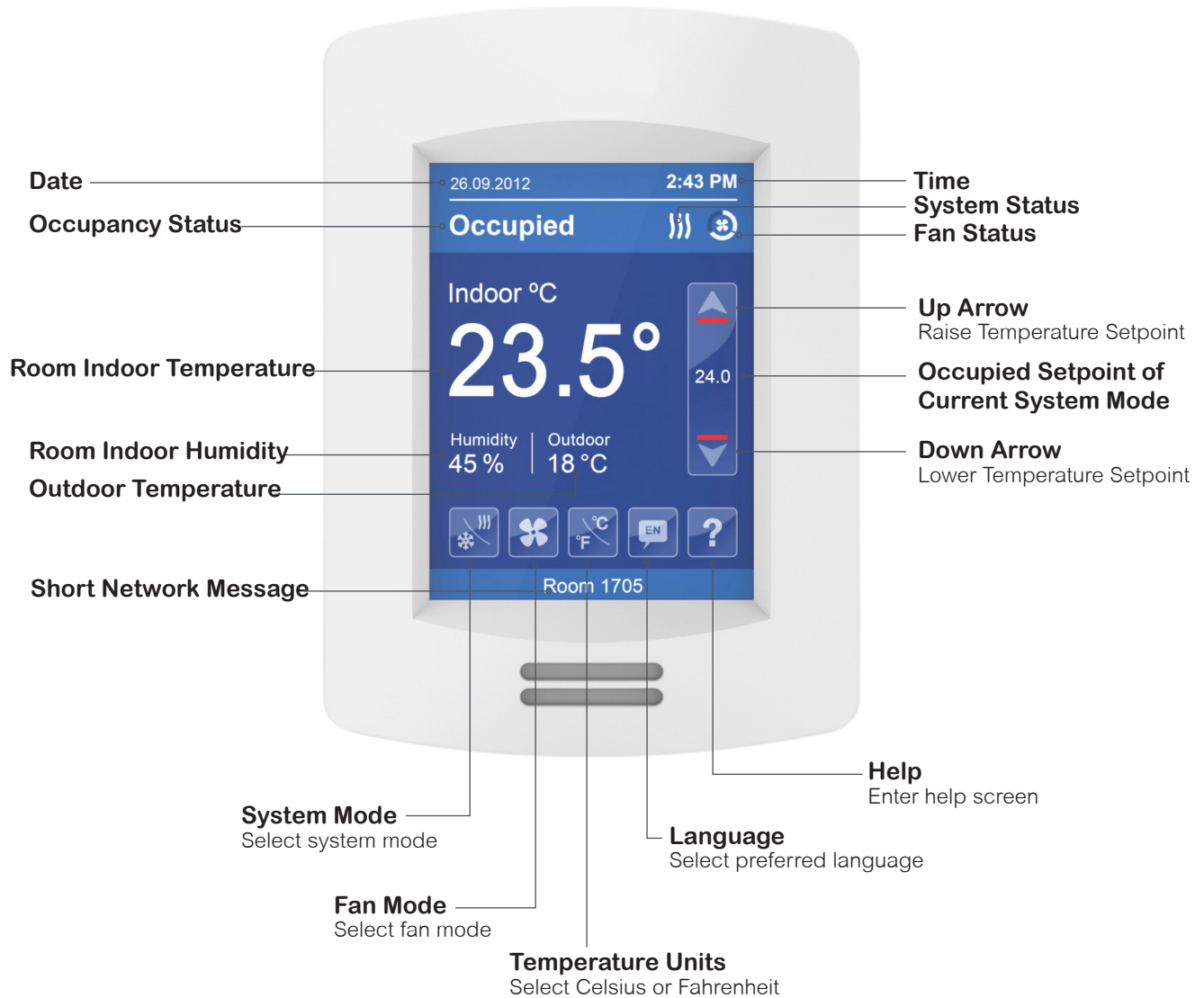
## 4.2 NETWORK WIRING TOPOLOGY



**NOTE:**  
Only one VC3404 or VC3504 Relay Pack with remote monitoring inputs can be used for a single VTR8350 Room Controller.

## 5. HOME SCREEN DISPLAY

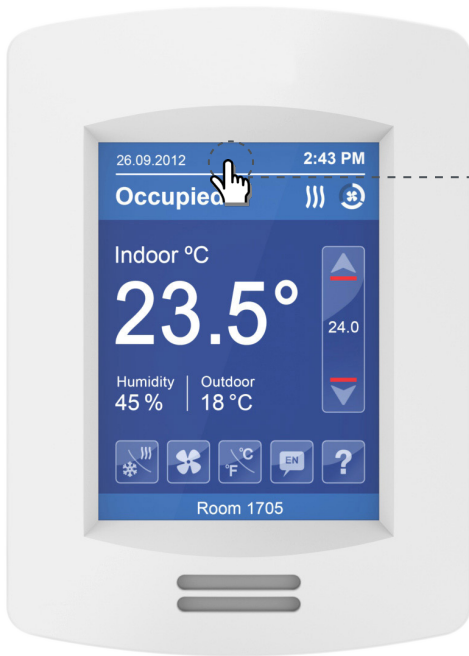
### Hospitality User Interface Shown



**NOTE:** User HMI is configurable and allows display functions such as Date, Time, Humidity, Outdoor Temperature, Setpoint, and others to be enabled or disabled by setting various parameters.

The outdoor temperature is displayed only on controllers connected to relay packs.

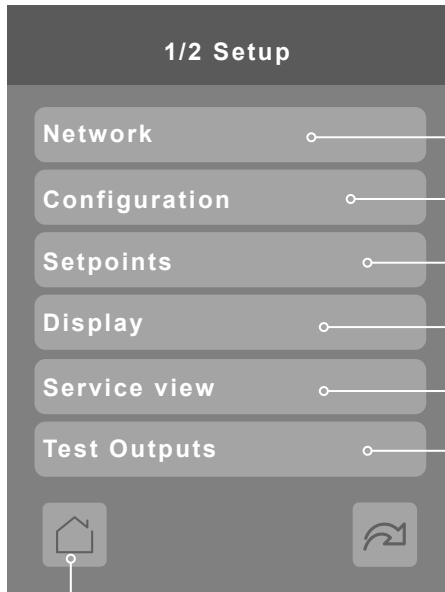
### 6. ENTER SET-UP SCREEN



Touch and hold this point for 3 seconds to enter set-up mode

**NOTE:** If a configuration/installer password is activated to prevent unauthorized access to the configuration menu parameters, a password entry prompt shows to prevent access to the device configuration components.

### 7. SET-UP SCREEN DISPLAY



Enter BACnet® & Zigbee® network settings

Enter parameter configuration menu

Enter setpoint settings

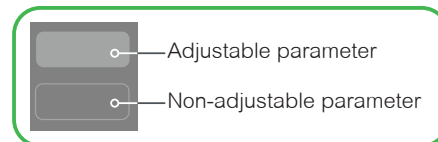
Enter display settings

Enter status display (read only)

Enter test outputs settings

Return to the home screen

#### General Note:



## APPENDIX A. DEPLOYMENT

The placement of the Room Controller must be given consideration. It is recommended to install the Room Controller as close to a door as possible (without being blocked by the door), or in an area with high occupant movement.

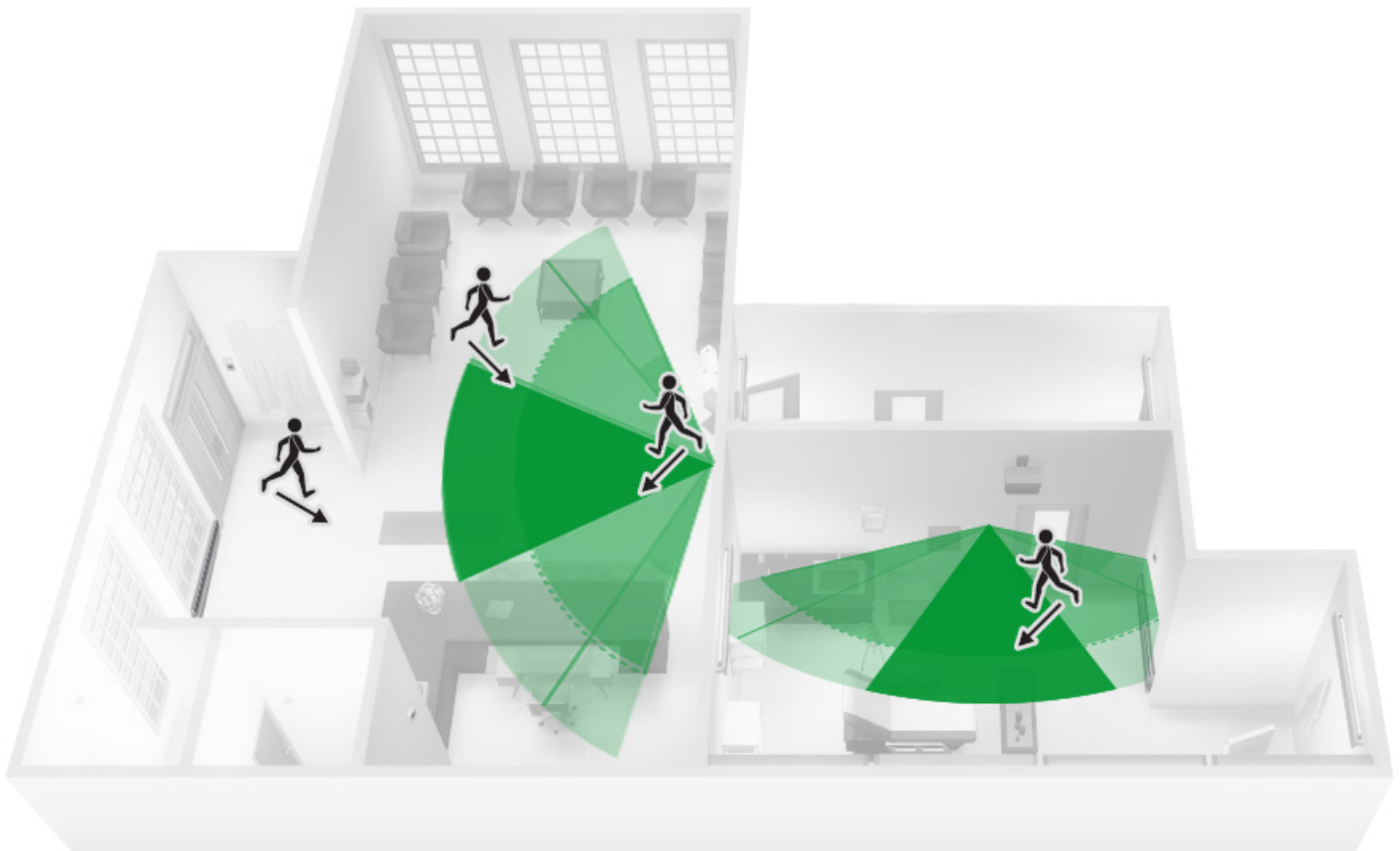
Ideally, the Room Controller should be installed 5 feet (1.5 meters) above the floor surface to ensure maximum detection range is achieved. As well, Room Controller placement should ensure the occupant crosses the lens beam in a perpendicular path within the prescribed detection zone.

### A.1 EXAMPLE OF RECOMMENDED DEPLOYMENT

The below shows Room Controllers installed in ideal locations for two rooms.

The examination room shows one Room Controller installed adjacent to the door. In this area of the room, occupant traffic is high and ensures the occupant will almost always cross the PIR detection path laterally and within the detection range.

The waiting room shows one Room Controller installed beside a door in the middle of the room. As shown in the diagram below, occupant traffic is high in several areas of the room including the entrance, waiting room, access to the door and activity around the reception desk.



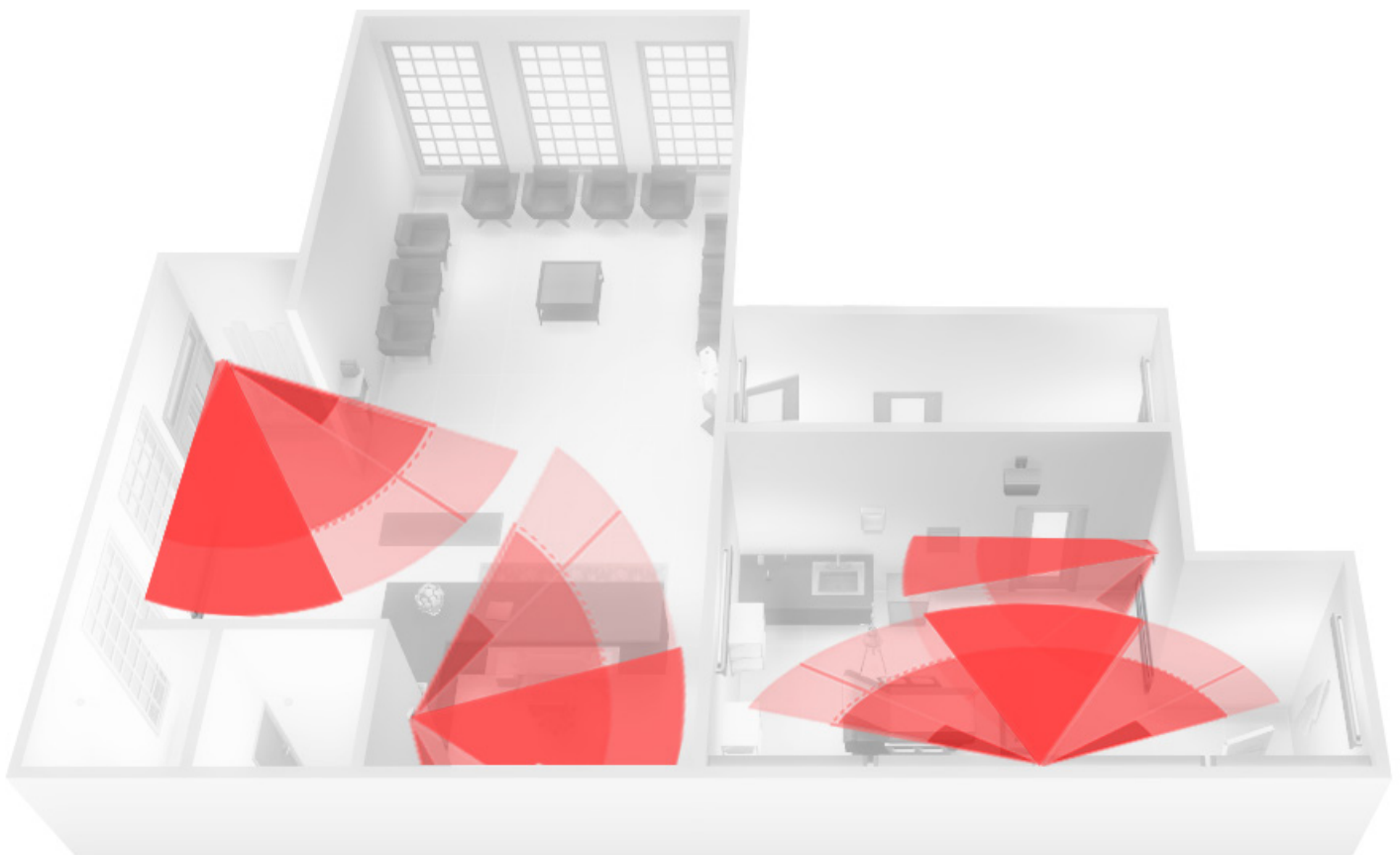
Recommended Installation

## A.2 EXAMPLE OF NON-RECOMMENDED DEPLOYMENT

The below shows four Room Controllers (two for each room) installed in non-ideal locations for the two rooms.

The examination room shows one Room Controller installed in a low traffic area near the door, and a second Room Controller installed on the wall directly opposite the door. For the Room Controller installed in the corner wall, the PIR could be blocked by the opened door, while occupant traffic could also be minimal in this area of the room. For the second Room Controller installed opposite the door, the PIR detection could fall outside the specified detection zone, while at the same time most occupant movement would not be lateral to the PIR, thereby not respecting optimal crossing patterns for PIR detection.

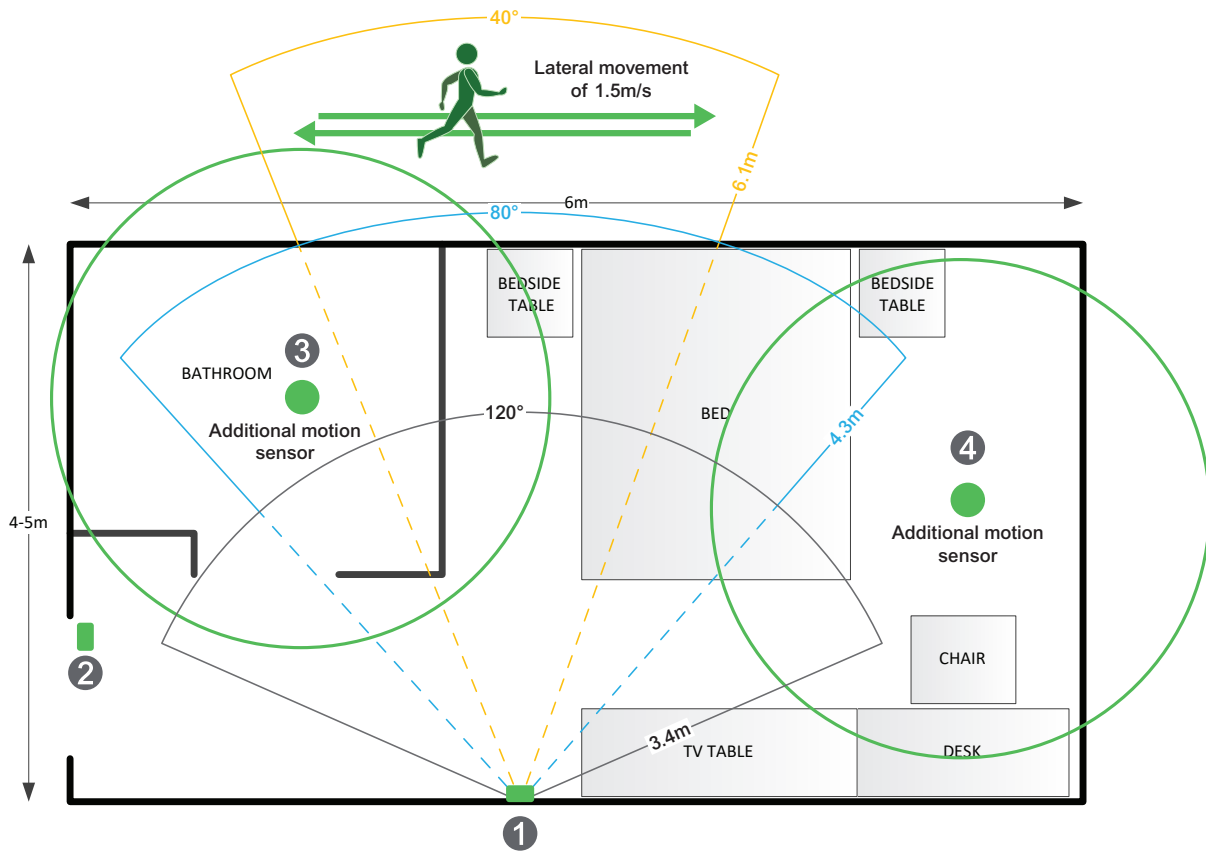
The waiting room shows one Room Controller installed in the corner of the room, and a second Room Controller installed beside the reception area. For the Room Controller installed in the corner, the opening/closing of the door creates a high probability that the PIR would get blocked, and therefore, occupancy going undetected. For the Room Controller installed beside the reception area, occupant traffic could fall outside the detection zone, and the receptionist would often be below the 5-foot recommended installation height for the Room Controller.



Non-Recommended Installation

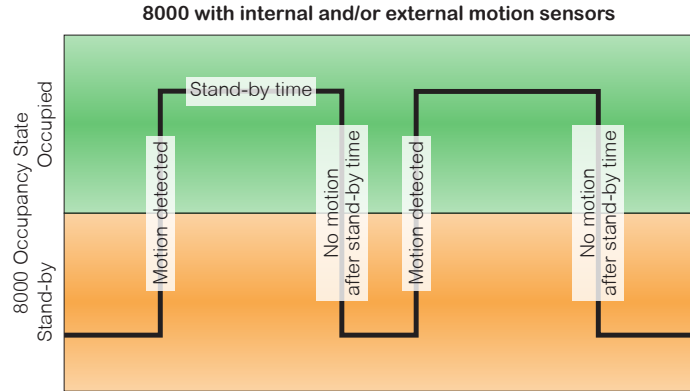
### A.3 ROOM CONTROLLER PIR SENSOR DETAILS

The internal Room Controller PIR sensor only detects lateral movement. It cannot detect movement when a person is moving toward it. It will not detect someone seating on a chair and/or lying on the bed.

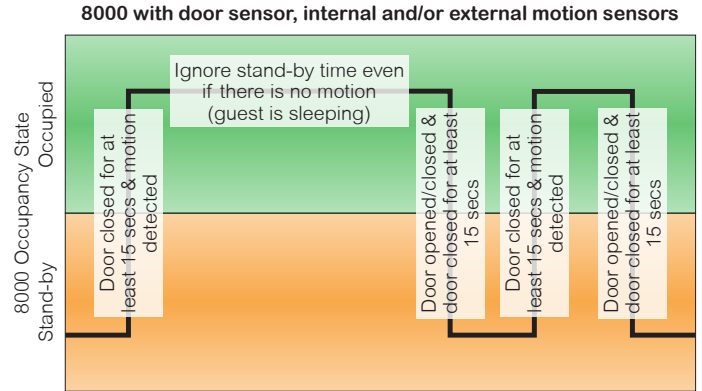


### A.4 RECOMMENDATIONS FOR INSTALLATIONS

1. Install the Room Controller to cover more lateral movement.
2. Install a door sensor, the internal Room Controller occupancy logic works better with a door sensor. Once a motion is detected after a door is opened, the room stays in an occupied state until the door is opened again which puts the Room Controller in stand-by mode and if there is a motion then it goes back in occupied mode. It is also recommended to disable the unoccupied mode, set the “unoccupied time” to 0, so there are only 2 modes in the Room Controller: stand-by and occupied for a stand-alone solution. Please refer to the two(2) diagrams below for the Room Controller internal occupancy states transition.



More aggressive energy savings logic but may cause a bad guest experience (when a guest is sleeping or not moving)



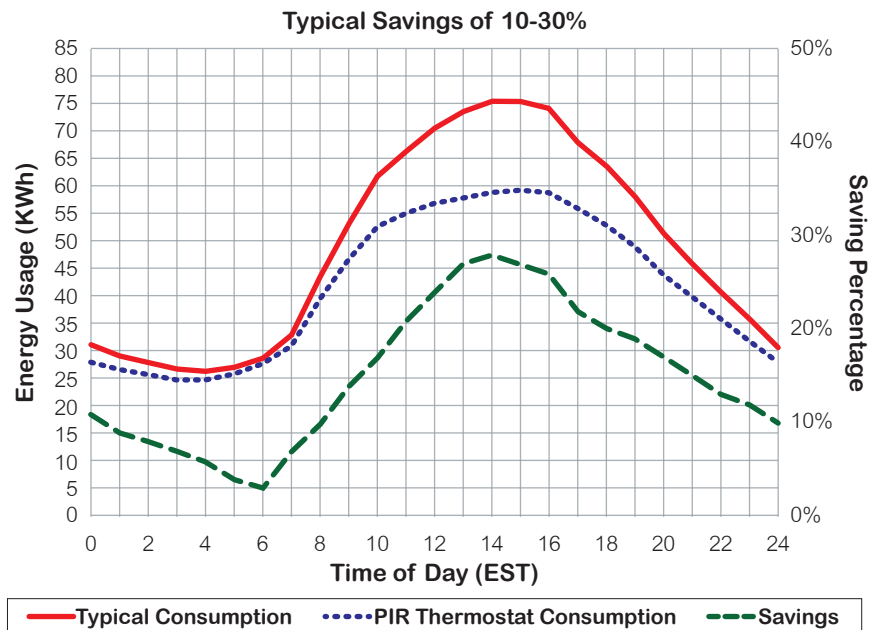
Good energy savings logic and better guest experience even when a guest is sleeping or not moving

3. Install additional motion sensors in the bathroom.
4. Install additional motion sensors for better motion detection in the entire room.

### A.5 ENERGY SAVINGS

PIR can maximize your energy saving from 10-30% by adjusting temperature set points in unoccupied zones during scheduled periods.

PIR can maximize your energy saving from 10-30% by adjusting temperature set points in unoccupied zones during scheduled periods.



**APPENDIX B. CALIFORNIA PROPOSITION 65 WARNING STATEMENT FOR CALIFORNIA RESIDENTS**

**⚠ WARNING:** This product can expose you to chemicals including Lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm, and Bisphenol A (BPA), which is known to the State of California to cause birth defects or other reproductive harm. For more information, go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).