

TEC2x45-4, TEC2xx6(H)-4, TEC2xx6H-4+PIR, TEC2xx7-4, and TEC26x7-4+PIR Series Thermostat Controllers

Application Note

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TEC2x45-4, TEC2xx6(H)-4, TEC2xx6H-4+PIR, TEC2xx7-4, and TEC26x7-4+PIR Series Thermostat Controllers

Application Note

Document Introduction

This document describes a number of possible application scenarios using the TEC2x45-4, TEC2xx6(H)-4, TEC2xx6H-4+PIR, TEC2xx7-4, and TEC26x7+PIR Series Thermostat Controllers. Each application scenario includes a table that lists the setup and configuration parameters required for that specific application. Refer to the appropriate thermostat controller installation instructions for more information on adjusting the configuration parameters.

For those application scenarios that include a door switch, a Normally Closed (N.C.) door switch is required. With a N.C. door switch, the contact is closed only when the door is closed. In these application scenarios, the term door toggle means the door is initially closed, then opened, and closed again.

Key Concepts

Passive Infrared (PIR) Occupancy Sensing Cover

PIR motion detecting technology is available as an embedded sensor onboard TEC Thermostat Controller accessory covers. The optional PIR accessory covers are specifically designed to provide an occupancy sensing capability with compatible TEC2x45-4, TEC2xx6(H)-4, TEC2xx6H-4+PIR, TEC2xx7-4, and TEC26x7-4+PIR Series Thermostat Controllers.

When equipped with a PIR accessory cover, the thermostat controller provides advanced active occupancy logic, which automatically switches occupancy levels from Occupied to Unoccupied or Standby as required by the presence of local activity. This added occupancy sensing capability provides energy savings during occupied hours without sacrificing occupant comfort.

A PIR accessory cover is suited for the following applications:

- Hospitality Fan Coil Unit (FCU) applications
- TEC Zoning System Zones
- Conference rooms
- Classroom units
- Any commercial offices that have random occupancy schedules during occupied hours as dictated by the function of the tenant
- Any controlled piece of Heating, Ventilating, and Air Conditioning (HVAC) equipment that may yield energy savings with the introduction of a new automatic standby level of occupancy

Table 1 lists the PIR cover models available.

Table 1: PIR Cover Models

Code Number	Description	Compatible with These Thermostats
TEC-6-PIR	PIR Cover with Commercial Fan Coil Unit (FCU) Interface	TEC2x45-4 and TEC2xx6-4
TEC-6H-PIR	PIR Cover with Hospitality Interface	TEC2xx6H-4 and TEC2xx6H-4+PIR
TEC-7-PIR	PIR Cover for Zoning Thermostats	TEC2xx7-4 and TEC26x7+PIR

For more information on the PIR Accessory Cover, including installation and technical specifications, refer to the *PIR Accessory Cover Installation Instructions (Part No. 24-9890-870)*.

PIR Accessory Cover Configuration Parameters

The following configuration parameters are specifically provided as standard on all TEC2x45-4, TEC2xx6(H)-4, TEC2xx6H-4+PIR, TEC2xx7-4, and TEC26x7-4+PIR Series Thermostat Controllers. They are associated with the advanced occupancy sensing capability provided by a PIR cover or a remote occupancy sensor. These parameters allow the installer to set the thermostat occupancy functions as required by the application.

The occupancy sensing function activates if a PIR cover is connected or if one of the binary/digital inputs is configured to use a remote occupancy sensing device.

Table 2: PIR Cover Configuration Parameters (Part 1 of 2)

Configuration Parameter	Description	Selection Options
BI2 Default: None	If the BI 2 parameter is set to Door Dry, the binary input is configured to effectively use the advanced functions allowed by the installation of a door switch contact. This function is mostly used with fan coil units in hospitality application. When a door contact is used and configured, the Stand-by timer is no longer active. The occupancy toggle between occupied and stand-by is now dictated by the door contact and the PIR cover. • Always Occupied: Movement detected by the PIR over • Stand-by Mode: Door opens/closes as detected by the door switch	None, Door Dry, RemOVR, Filter, Service

Table 2: PIR Cover Configuration Parameters (Part 2 of 2)

Configuration Parameter	Description	Selection Options
Stand-by Heating Setpoint Default: 69.0°F/20.6°C	This parameter sets the Stand-by heating setpoint value. The set value of this parameter should reside between the occupied and unoccupied heating setpoints. Make sure that the difference between stand-by and occupied value can be recovered in a timely fashion when movement is detected in the zone.	Range: 40.0°F/4.5°C to 90.0°F/32.0°C Adjustable in 0.5° increments
Stand-by Cooling Setpoint Default: 78.0°F/25.6°C	This parameter sets the Stand-by cooling setpoint value. The set value of this parameter should reside between the occupied and unoccupied cooling setpoints. Make sure that the difference between the stand-by and occupied value can be recovered in a timely fashion when movement is detected in the zone.	Range: 54.0°F/12.0°C to 100.0°F/37.5°C Adjustable in 0.5 hour increments
Stand-by Time Default: 0.5 hours	This parameter sets the time delay between the moment where the PIR cover detected the last movement in the area and the time which the thermostat stand-by mode and setpoints become active.	Range: 0.5 to 24.0 hours Adjustable in 0.5 hour increments
Unoccupied Time Default: 0.0 hours	If no movement is detected in the area and the current mode is Stand-by, this parameter sets the time delay between the moment where the thermostat controller toggles to stand-by mode and the time which the thermostat controller unoccupied mode and setpoints become active. The Default value of 0.0 hours disables the unoccupied timer. This prevents the thermostat to drift from stand-by mode to unoccupied mode when PIR functions are used	Range: 0.0 to 24.0 hours in 0.5 hour increments.

PIR Application Planning

When reviewing the application scenarios for a thermostat controller equipped with a PIR occupancy sensing cover, consider the factors described in the following sections.

PIR Function Configuration

All PIR application-related configuration parameters are displayed in the configuration menu or available as objects in the network object list. However, the advanced occupancy sensing on a thermostat controller is enabled only if either:

- A PIR cover is installed on the thermostat
- A remote input is configured as a remote PIR sensor (Motion Normally Open [N.O.] or Motion N.C.)

PIR Cover Warm-up Period

When a thermostat controller equipped with a PIR Accessory Cover is powered on, a 1-minute warm-up period occurs before any local movements can be detected and acknowledged by the PIR sensing device. The local status Light-Emitting Diodes (LEDs) for the PIR cover are also inactive during that 1-minute period.

Setpoint Limitations

Occupied, Unoccupied, and Standby setpoints have the following limitations:

- Setpoint range:
 - Heating setpoints: 4.5 to 32.0°C (40.0 to 90.0°F)
 - Cooling setpoints: 12.0 to 37.5°C (54.0 to 100.0)°F
- Applied minimum deadband configuration
- Heat Maximum and Cool Minimum configuration parameters

You can set all individual cooling setpoints and all individual heating setpoints independently. However, a typical arrangement always has the set value of the standby setpoint parameters residing between the corresponding occupied and unoccupied setpoint values.

The installer must make sure that the difference between the standby and occupied setpoint values can be recovered quickly when local activity is detected in the zone.

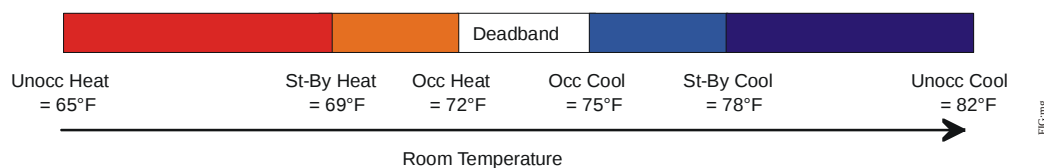


Figure 1: Example Setpoints

Application Range

The PIR occupancy sensor is suitable for hospitality applications and standard commercial applications. Both of these applications have different settings.

- **Hospitality Applications** benefit from the addition of an entry door switch wired to a configured remote thermostat controller input.

When a door contact is used and configured, the Standby timer and its configuration are no longer active or used. The occupancy status switches between occupied and stand-by modes based on both the door contact and the PIR sensing device.

If movements are detected by the PIR cover, the room is Always Occupied. The room returns to Standby mode when the door switch toggles open/close.

- **Commercial Applications** do not usually use a remote door switch contact attached to the thermostat.

PIR occupancy functionality is dictated by both the Stand-by Timer and Unoccupied Timer configuration value, and the presence of movement in the area. See the commercial application examples in the [*Commercial Application Scenarios*](#) section for more information.

Unoccupied Timer Disable

In some applications, the zone may benefit from avoiding unoccupied mode and remaining in stand-by mode when local activity is not present.

This scenario allows for advanced flexibility when used in conjunction with a network, or when areas must remain in stand-by mode to ensure a quick response to the sudden presence of local activity.

See Figure 2 for an example with the Unoccupied timer enabled, and Figure 3 for an example with the Unoccupied timer disabled.

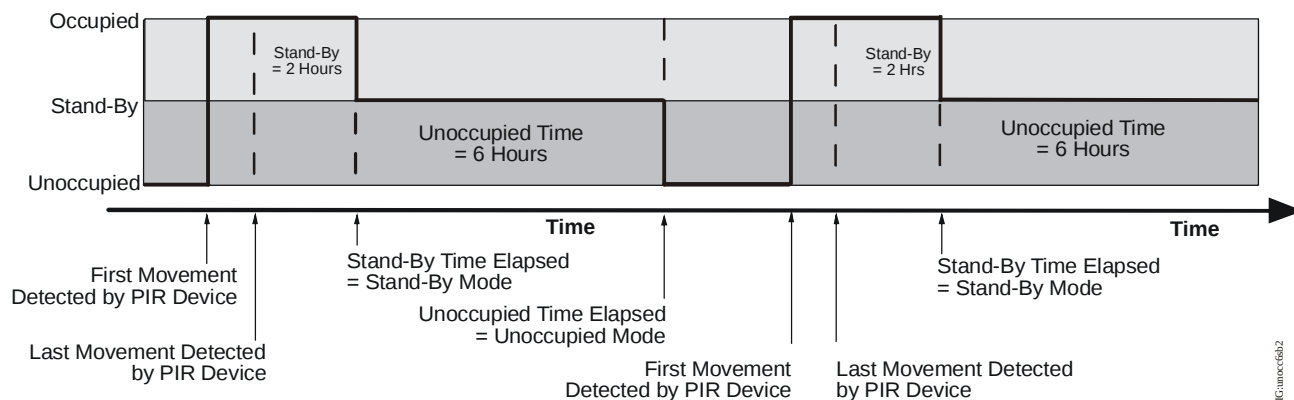


Figure 2: Unoccupied Timer Set to 6 Hours and Stand-By Timer Set to 2 Hours

When the local PIR occupancy routine is running at the thermostat, the zone drifts into Unoccupied mode when the unoccupied timer is set above its factory default value of 0.0 hours.

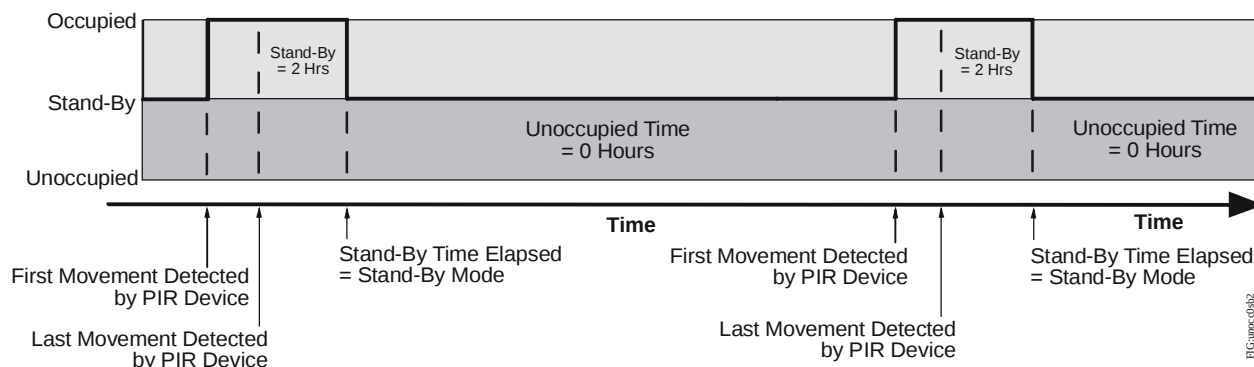


Figure 3: Unoccupied Timer Set to 0 Hours and Stand-By Timer Set to 2 Hours

When the local PIR occupancy routine is running at the thermostat, the zone never drifts into unoccupied mode when the unoccupied timer is set to its factory default value of 0.0 hours.

Network Priority and Local Occupancy Routine

The PIR occupancy logic works with network commands to provide the most flexibility while allowing for simple implementation and operation. Table 3 and Table 4 list commands and feedback used with occupancy logic. See Table 5 for the BACnet® objects used with occupancy logic and Table 6 for N2 objects.

Table 3: Network Occupancy Commands

State Occupancy Command Level ¹	Function
Local Occupancy	- Releases the thermostat to its own occupancy schemes and to use the PIR function. - Can be a PIR sensing device, local schedule, or occupancy routine performed by one of the digital inputs.
Occupied	- Leaves the thermostat in occupied mode and cancels any local occupancy functions, including PIR occupancy sensing. - Forces the zone into always occupied mode.
Unoccupied	- Leaves the thermostat in unoccupied mode and cancels any local occupancy functions, including PIR occupancy sensing. - Forces the zone into always unoccupied mode. - Restricts local command to override if the thermostat is equipped with the option, or if allowed by the keypad lockout.

1. Stand-By is not a commandable level. It exists only as a feedback status level.

Table 4: Network Occupancy Feedback Status

State Occupancy Command Level	Function
Override/Bypass	- Indicates that the zone moved from Unoccupied mode to local Occupied override mode. - Operates like a normal override and its time value as dictated by the ToccTime configuration parameter setting.
Occupied	- Indicates that the zone is occupied. - Can be driven by a local occupancy routine (PIR sensor) or by an occupied network command.
Stand-By	- Indicates that the zone is in Stand-By mode. - Can only be driven by a local occupancy routine (PIR sensor).
Unoccupied	- Indicates that the zone is unoccupied. - Can be driven by a local occupancy routine (PIR sensor) or by an unoccupied network command.

Table 5: BACnet Object Used for Occupancy Commands and Feedback

Object Name	Object ID	BACnet Index	Description
Occupancy Command	MV 18	1	Local Occupancy (PIR or Internal Schedule)
		2	Occupied
		3	Unoccupied
Effective Occupancy	MV 33	1	Occupied
		2	Unoccupied
		3	Temporary Occupied
		4	Stand-By

Table 6: N2 Object Used for Occupancy Commands and Feedback

Object Name	Object ID	N2 Index	Description
For TEC210x-4 and TEC210x-4+PIR Models Only:			
Occupancy Command	BD 3	0	Unoccupied
		1	Occupied
Effective Occupancy	BD 13	0	Occupied
		1	Unoccupied
		2	User Requested Temporary Occupancy
For TEC21x6-4, TEC21x6H-4, TEC21x6H-4+PIR, TEC21x7-4, and TEC2145-4 Models Only:			
Occupancy Command	BD 3	0	Occupied
		1	Unoccupied
Effective Occupancy	BD 16	0	Occupied
		1	Unoccupied
		2	User Requested Temporary Occupancy
		3	Stand-By

Initial State PIR Occupancy Routine

The initial occupancy state on powerup when a PIR cover is present, or when one of the inputs is configured for a remote PIR sensor, is always the following:

- In stand-alone applications at powerup: **Stand-By** (Figure 4)
- From a previous network unoccupied command: **Stand-By** (Figure 5)
- From a previous network occupied command: **Occupied** (Figure 6)

When the network releases a thermostat to its local PIR routine from a previous occupied or unoccupied network state, the resulting occupancy state is always Stand-By mode.

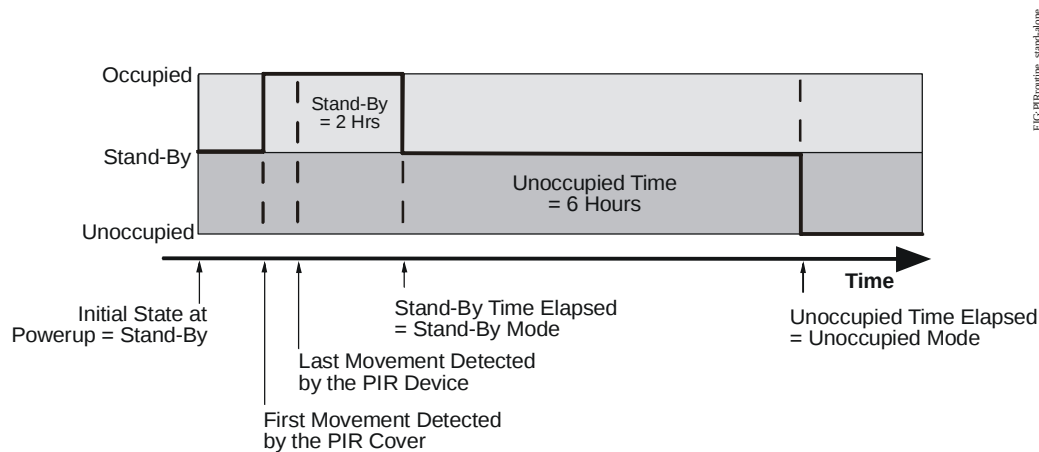


Figure 4: Initial Powerup, Stand-Alone or Networked

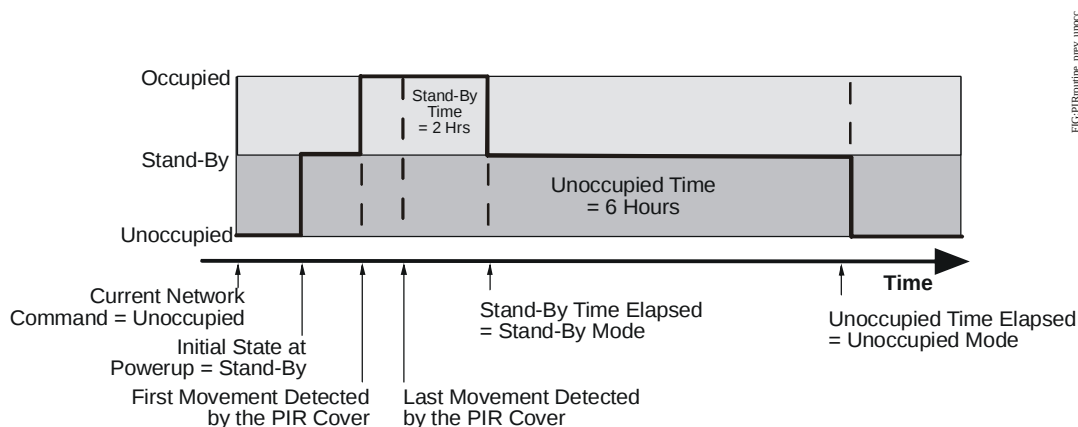


Figure 5: After Receiving Local Occupancy/PIR Network Command from a Previous Unoccupied State

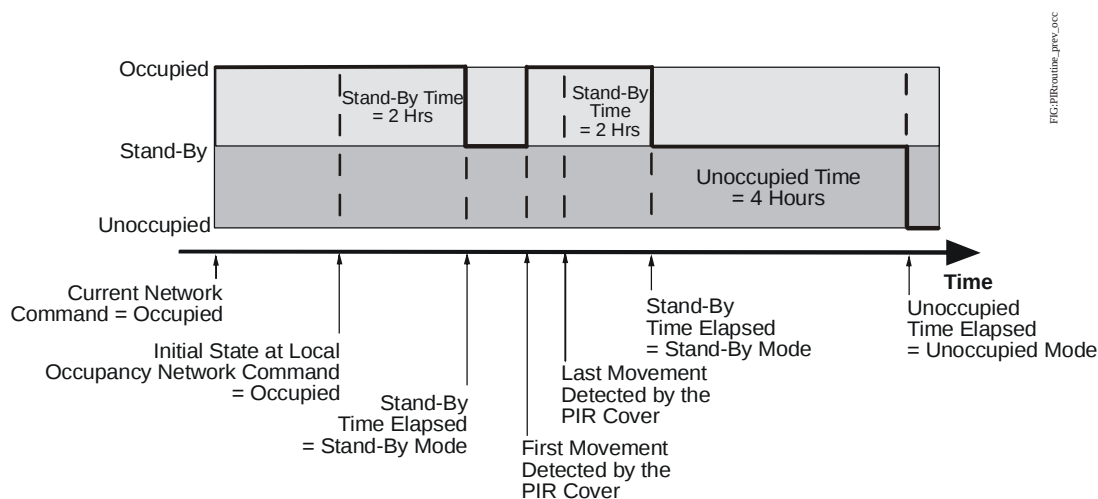


Figure 6: After Receiving Local Occupancy/PIR Network Command from a Previous Occupied State

Application Scenarios

Table 7: Application Scenarios

Application Number	PIR Levels of Occupancy	PIR Used	Remote PIR Used
Commercial Application Scenarios			
1	3	Yes	No
2	2	Yes	No
3	3	No	Yes
4	2	No	Yes
5	3	Yes	Yes
6	2	Yes	Yes
Hospitality Application Scenarios			
7	3	Yes	No
8	2	Yes	No
9	3	No	Yes
10	2	No	Yes
11	3	Yes	Yes
12	2	Yes	Yes

Commercial Application Scenarios

Scenario 1: Networked Fan Coil Application Using 3 Levels of Occupancy with a PIR Accessory Cover

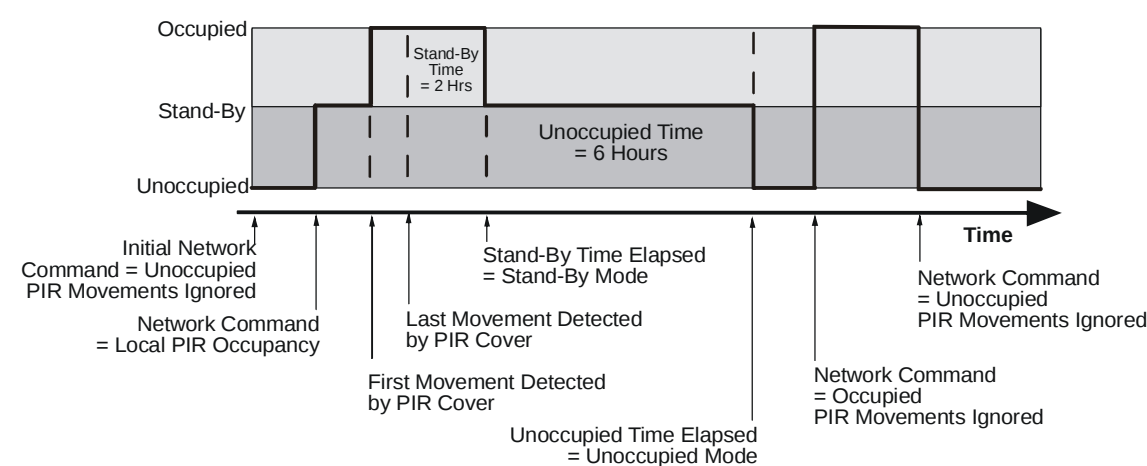


Figure 7: Scenario 1 Sequence of Operation

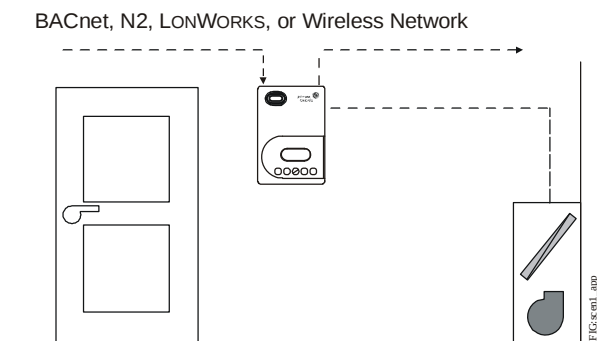


Figure 8: Networked Fan Coil Application with PIR Accessory Cover

Table 8: Scenario 1 Setup and Configuration

Thermostat Controller	TEC2xx6-4 (Commercial Model)
PIR	TEC-6-PIR
BI2 Configuration	None, No Function
Stand-By Timer Value	2.0 Hours
Unoccupied Timer Value	6.0 Hours
Network Interface	BACnet MS/TP, N2, LONWORKS®, or Wireless

At initial powerup, when the thermostat controller 24 VAC power supply is applied, the initial occupancy of the zone is in stand-by mode if the PIR device does not detect any movement and no occupancy command is received by the thermostat controller. Whenever the thermostat receives an occupied network command, or when the PIR device detects a movement while in the local occupancy state network command, the occupancy status switches to occupied and the occupied setpoints are used.

If no motion is detected in the zone for the entire stand-by timer duration, the room switches to stand-by mode and the stand-by setpoints are used. While in stand-by mode, if no motion is detected in the zone for the entire unoccupied timer duration, the room switches to unoccupied mode and the unoccupied setpoints are used. Whenever the PIR device detects local motion, the elapsed stand-by timer value is reset. If the PIR device senses local movement at any time, the occupancy status switches to occupied and the occupied setpoints are used.

Any time the thermostat controller receives an unoccupied network command, the occupancy status switches to unoccupied and the unoccupied setpoints are used. If the thermostat local override function is not configured for lock out, the local user can initiate a temporary occupied mode.

If previously in unoccupied mode when the thermostat receives a local occupancy state network command, the local PIR occupancy loop enables. If the PIR devices do not detect movement, the occupancy status is stand-by mode.

Scenario 2: Networked Fan Coil Application Using 2 Levels of Occupancy with a PIR Accessory Cover

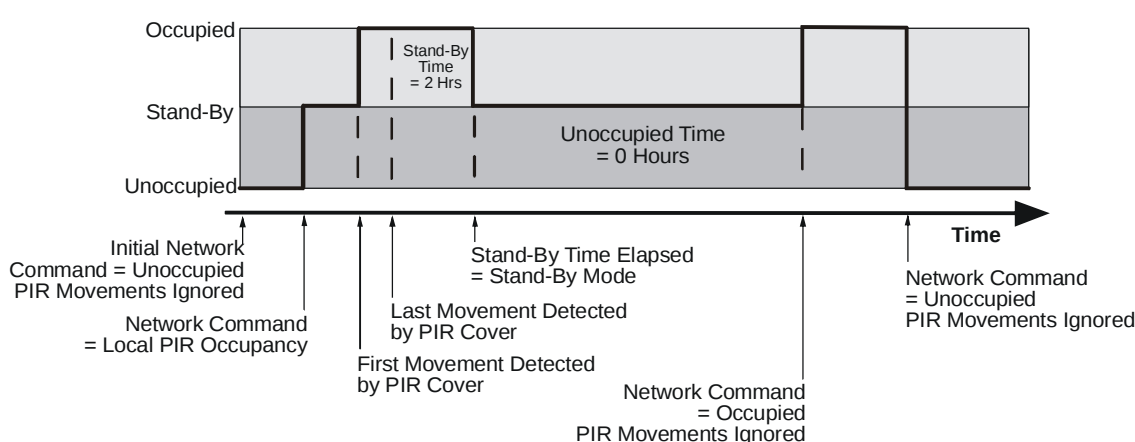


Figure 9: Scenario 2 Sequence of Operation

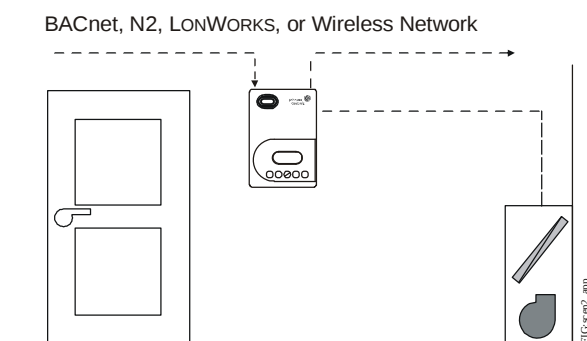


Figure 10: Networked Fan Coil Application with PIR Accessory Cover

Table 9: Scenario 2 Setup and Configuration

Thermostat Controller	TEC2xx6-4 (Commercial Model)
PIR	TEC-6-PIR
BI2 Configuration	None, No Function
Stand-By Timer Value	2.0 Hours
Unoccupied Timer Value	0.0 Hours
Network Interface	BACnet MS/TP, N2, LONWORKS, or Wireless

At initial powerup, when the thermostat controller 24 VAC power supply is applied, the initial occupancy of the zone is in stand-by mode if the PIR device does not detect any movement and no occupancy command is received by the thermostat controller. Whenever the thermostat receives an occupied network command, or when the PIR device detects a movement while in the local occupancy state network command, the occupancy status switches to occupied and the occupied setpoints are used. While in the local occupancy state network command, the local zone never enters unoccupied mode and unoccupied setpoints are not used.

If no motion is detected in the zone for the entire stand-by timer duration, the room switches to stand-by mode and the stand-by setpoints are used. Whenever the PIR device detects local motion, the elapsed stand-by timer value is reset. If the PIR device senses local movement at any time, the occupancy status switches to occupied and the occupied setpoints are used.

Any time the thermostat controller receives an unoccupied network command, the occupancy status switches to unoccupied and the unoccupied setpoints are used. If the thermostat local override function is not configured for lock out, the local user can initiate a temporary occupied mode.

If previously in unoccupied mode when the thermostat receives a local occupancy state network command, the local PIR occupancy loop enables. If the PIR devices do not detect movement, the occupancy status is stand-by mode.

Scenario 3: Networked Fan Coil Application Using 3 Levels of Occupancy with a Remote PIR Sensor

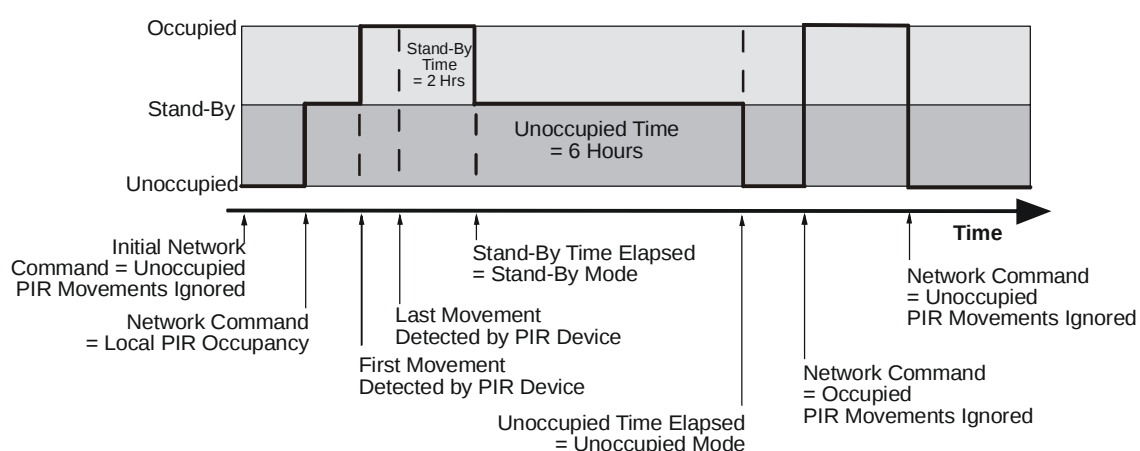


Figure 11: Scenario 3 Sequence of Operation

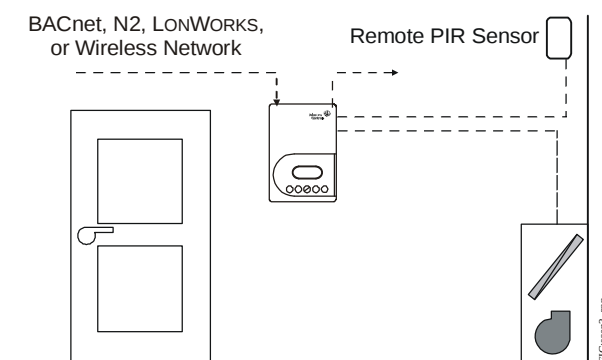


Figure 12: Networked Fan Coil Application with Remote PIR Sensor

Table 10: Scenario 3 Setup and Configuration

Thermostat Controller	TEC2xx6-4 (Commercial Model)
PIR	BI1 Configured for Remote PIR Sensor
BI2 Configuration	None, No Function
Stand-By Timer Value	2.0 Hours
Unoccupied Timer Value	6.0 Hours
Network Interface	BACnet MS/TP, N2, LONWORKS, or Wireless

At initial powerup, when the thermostat controller 24 VAC power supply is applied, the initial occupancy of the zone is in stand-by mode if the PIR device does not detect any movement and no occupancy command is received by the thermostat controller. Whenever the thermostat receives an occupied network command, or when the PIR device detects a movement while in the local occupancy state network command, the occupancy status switches to occupied and the occupied setpoints are used.

If no motion is detected in the zone for the entire stand-by timer duration, the room switches to stand-by mode and the stand-by setpoints are used. While in stand-by mode, if no motion is detected in the zone for the entire unoccupied timer duration, the room switches to unoccupied mode and the unoccupied setpoints are used. Whenever the PIR device detects local motion, the elapsed stand-by timer value is reset. If the PIR device senses local movement at any time, the occupancy status switches to occupied and the occupied setpoints are used.

Any time the thermostat controller receives an unoccupied network command, the occupancy status switches to unoccupied and the unoccupied setpoints are used. If the thermostat local override function is not configured for lock out, the local user can initiate a temporary occupied mode.

If previously in unoccupied mode when the thermostat receives a local occupancy state network command, the local PIR occupancy loop enables. If the PIR devices do not detect movement, the occupancy status is stand-by mode.

Scenario 4: Networked Fan Coil Application Using 2 Levels of Occupancy with a Remote PIR Sensor

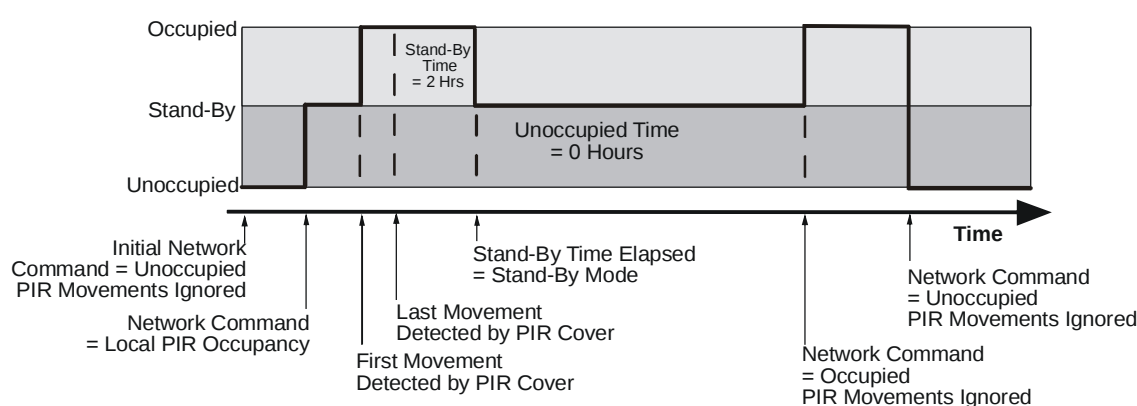


Figure 13: Scenario 4 Sequence of Operation

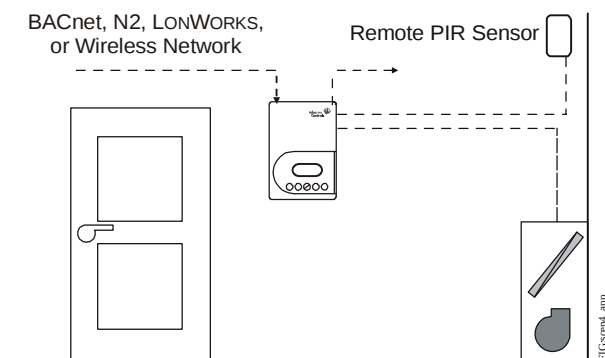


Figure 14: Network Fan Coil Application with Remote PIR Sensor

Table 11: Scenario 4 Setup and Configuration

Thermostat Controller	TEC2xx6-4 (Commercial Model)
PIR	BI1 Configured for Remote PIR Sensor
BI2 Configuration	None, No Function
Stand-By Timer Value	2.0 Hours
Unoccupied Timer Value	0.0 Hours
Network Interface	BACnet MS/TP, N2, LONWORKS, or Wireless

At initial powerup, when the thermostat controller 24 VAC power supply is applied, the initial occupancy of the zone is in stand-by mode if the PIR device does not detect any movement and no occupancy command is received by the thermostat controller. Whenever the thermostat receives an occupied network command, or when the PIR device detects a movement while in the local occupancy state network command, the occupancy status switches to occupied and the occupied setpoints are used. While in the local occupancy state network command, the local zone never enters unoccupied mode and unoccupied setpoints are not used.

If no motion is detected in the zone for the entire stand-by timer duration, the room switches to stand-by mode and the stand-by setpoints are used. Whenever the PIR device detects local motion, the elapsed stand-by timer value is reset. If the PIR device senses local movement at any time, the occupancy status switches to occupied and the occupied setpoints are used.

Any time the thermostat controller receives an unoccupied network command, the occupancy status switches to unoccupied and the unoccupied setpoints are used. If the thermostat local override function is not configured for lock out, the local user can initiate a temporary occupied mode.

If previously in unoccupied mode when the thermostat receives a local occupancy state network command, the local PIR occupancy loop enables. If the PIR devices do not detect movement, the occupancy status is stand-by mode.

Scenario 5: Networked Fan Coil Application Using 3 Levels of Occupancy with Dual PIR Sensors

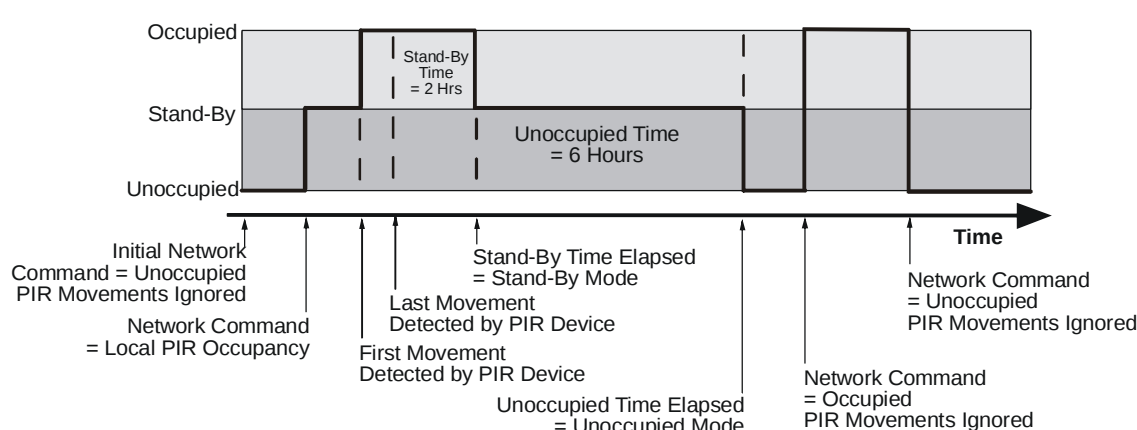


Figure 15: Scenario 5 Sequence of Operation

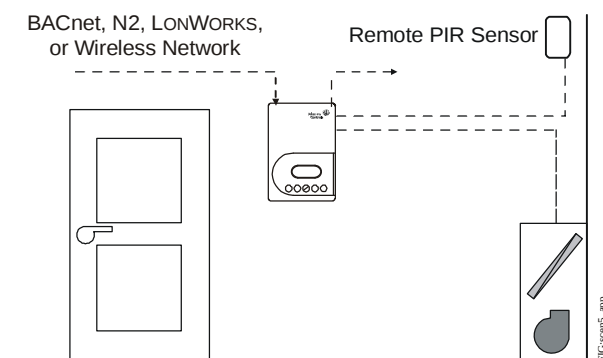


Figure 16: Networked Fan Coil Application with Dual PIR Sensors

Table 12: Scenario 5 Setup and Configuration

Thermostat Controller	TEC2xx6-4 (Commercial Model)
PIR	BI1 Configured for Remote PIR Sensor and TEC-6-PIR Accessory Cover
BI2 Configuration	None, No Function
Stand-By Timer Value	2.0 Hours
Unoccupied Timer Value	6.0 Hours
Network Interface	BACnet MS/TP, N2, LONWORKS, or Wireless

At initial powerup, when the thermostat controller 24 VAC power supply is applied, the initial occupancy of the zone is in stand-by mode if the PIR device does not detect any movement and no occupancy command is received by the thermostat controller. Whenever the thermostat receives an occupied network command or when the PIR device detects a movement while in the local occupancy state network command, the occupancy status switches to occupied and the occupied setpoints are used.

If no motion is detected in the zone for the entire stand-by timer duration, the room switches to stand-by mode and the stand-by setpoints are used. While in stand-by mode, if no motion is detected in the zone for the entire unoccupied timer duration, the room switches to unoccupied mode and the unoccupied setpoints are used. Whenever the PIR device detects local motion, the elapsed stand-by timer value is reset. If the PIR device senses local movement at any time, the occupancy status switches to occupied and the occupied setpoints are used.

Any time the thermostat controller receives an unoccupied network command, the occupancy status switches to unoccupied and the unoccupied setpoints are used. If the thermostat local override function is not configured for lock out, the local user can initiate a temporary occupied mode.

If previously in unoccupied mode when the thermostat receives a local occupancy state network command, the local PIR occupancy loop enables. If the PIR devices do not detect movement, the occupancy status is stand-by mode.

Scenario 6: Networked Fan Coil Application Using 2 Levels of Occupancy with Dual PIR Sensors

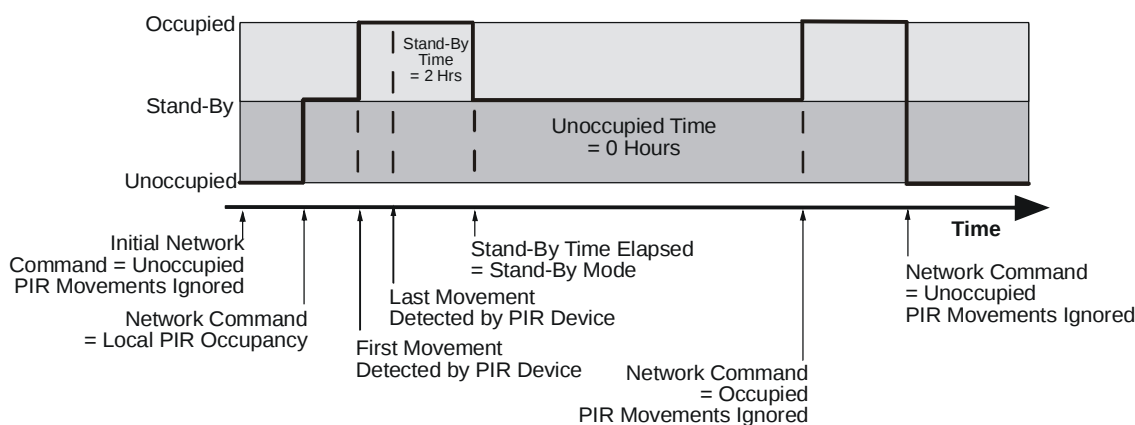


Figure 17: Scenario 6 Sequence of Operation

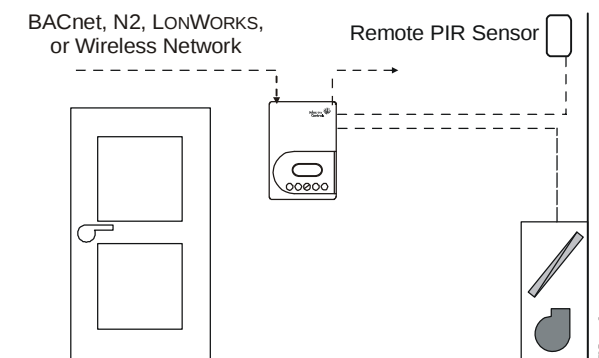


Figure 18: Networked Fan Coil Application with Dual PIR Sensors

Table 13: Scenario 6 Setup and Configuration

Thermostat Controller	TEC2xx6-4 (Commercial Model)
PIR	BI1 Configured for Remote PIR Sensor and TEC-6-PIR Accessory Cover
BI2 Configuration	None, No Function
Stand-By Timer Value	2.0 Hours
Unoccupied Timer Value	0.0 Hours
Network Interface	BACnet MS/TP, N2, LONWORKS, or Wireless

At initial powerup, when the thermostat controller 24 VAC power supply is applied, the initial occupancy of the zone is in stand-by mode if the PIR device does not detect any movement and no occupancy command is received by the thermostat controller. Whenever the thermostat receives an occupied network command or when the PIR device detects a movement while in the local occupancy state network command, the occupancy status switches to occupied and the occupied setpoints are used. While in the local occupancy state network command, the local zone never enters unoccupied mode and unoccupied setpoints are not used.

If no motion is detected in the zone for the entire stand-by timer duration, the room switches to stand-by mode and the stand-by setpoints are used. Whenever the PIR device detects local motion, the elapsed stand-by timer value is reset. If the PIR device senses local movement at any time, the occupancy status switches to occupied and the occupied setpoints are used.

Any time the thermostat controller receives an unoccupied network command, the occupancy status switches to unoccupied and the unoccupied setpoints are used. If the thermostat local override function is not configured for lock out, the local user can initiate a temporary occupied mode.

If previously in unoccupied mode when the thermostat receives a local occupancy state network command, the local PIR occupancy loop enables. If the PIR devices do not detect movement, the occupancy status is stand-by mode.

Hospitality Application Scenarios

An advanced network interface is available when the thermostat controllers are fully integrated into the reservation system. Table 14 lists the expanded occupancy command descriptions that appear on the hospitality front end system.

Table 14: Hospitality Occupancy State Display Text

Occupancy Network Command State	Front End System State Text Displayed
Local Occupancy (PIR active)	Room Rented PIR Economy Enabled
Occupied	Room Rented High Comfort Assured
Unoccupied	Room Not Rented

Scenario 7: Networked Fan Coil Application Using 3 Levels of Occupancy with a PIR Accessory Cover and a Door Switch

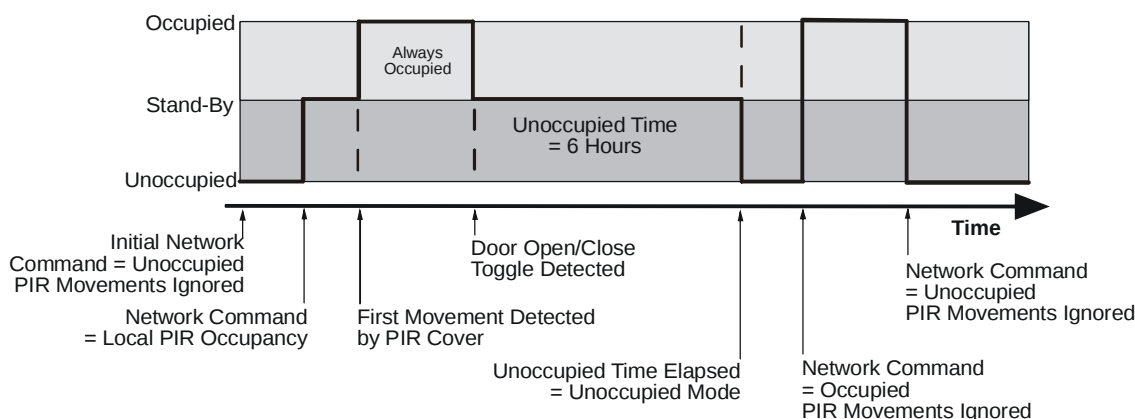


Figure 19: Scenario 7 Sequence of Operation

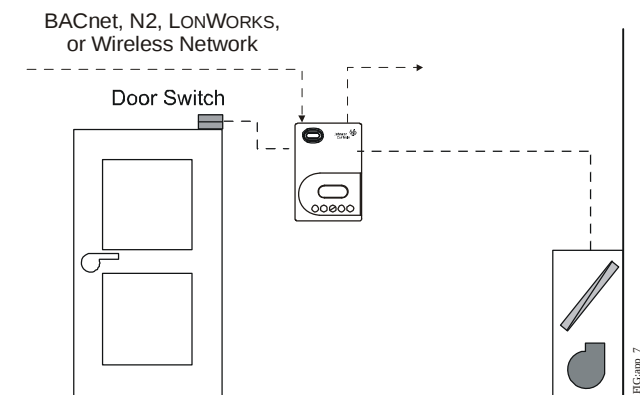


Figure 20: Networked Fan Coil Application with PIR Accessory Cover and Door Switch

Table 15: Scenario 7 Setup and Configuration

Thermostat Controller	TEC2xx6H-4 (Hospitality Model)
PIR	TEC-6H-PIR Accessory Cover
BI2 Configuration	Door Dry Contact
Stand-By Timer Value	Not Used
Unoccupied Timer Value	6.0 Hours
Network Interface	BACnet MS/TP, N2, LONWORKS, or Wireless

At initial powerup, when the thermostat controller 24 VAC power supply is applied, the initial occupancy of the zone is in stand-by mode if the PIR device does not detect any movement and no occupancy command is received by the thermostat controller.

As soon the PIR device detects a movement, the occupancy status switches to occupied and the occupied setpoints are used. The room is in occupied mode until a door toggle is detected.

If a door toggle is detected, the room switches to stand-by mode and the stand-by setpoints are used. If any occupants remain in the room, local movements must be seen to resume the occupied mode. While in stand-by mode, if no motion is detected in the zone for the entire unoccupied timer duration, the room switches to unoccupied mode and the unoccupied setpoints are used. If the PIR device senses local movement any time the door is closed, the occupancy status switches to occupied and the occupied setpoints are used.

Any time the thermostat controller receives an unoccupied network command, the occupancy status switches to unoccupied and the unoccupied setpoints are used. If the thermostat local override function is not configured for lock out, the local user can initiate a temporary occupied mode.

If previously in unoccupied mode when the thermostat receives a local occupancy state network command, the local PIR occupancy loop enables. If the PIR devices do not detect movement, the occupancy status is stand-by mode.

At any time, an occupied network command will always force the local zone to be in occupied mode and to use the occupied setpoints.

Scenario 8: Networked Fan Coil Application Using 2 Levels of Occupancy with a PIR Accessory Cover and a Door Switch

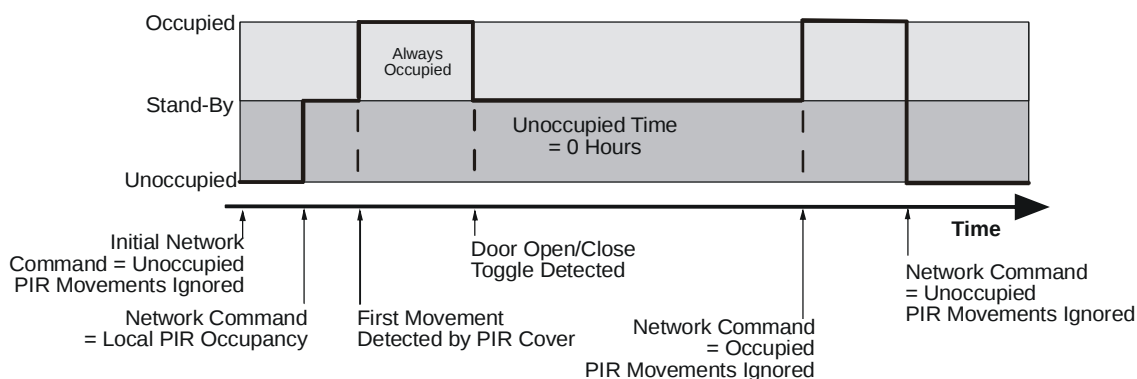


Figure 21: Scenario 8 Sequence of Operation

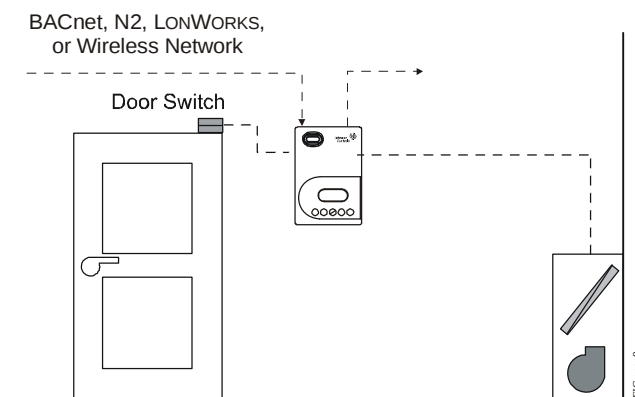


Figure 22: Networked Fan Coil Application with PIR Accessory Cover and Door Switch

Table 16: Scenario 8 Setup and Configuration

Thermostat Controller	TEC2xx6H-4 (Hospitality Model)
PIR	TEC-6H-PIR Accessory Cover
BI2 Configuration	Door Dry Contact
Stand-By Timer Value	Not Used
Unoccupied Timer Value	0.0 Hours
Network Interface	BACnet MS/TP, N2, LONWORKS, or Wireless

At initial powerup, when the thermostat controller 24 VAC power supply is applied, the initial occupancy of the zone is in stand-by mode if the PIR device does not detect any movement and no occupancy command is received by the thermostat controller.

As soon the PIR device detects a movement, the occupancy status switches to occupied and the occupied setpoints are used. The room is in occupied mode until a door toggle is detected.

If a door toggle is detected, the room switches to stand-by mode and the stand-by setpoints are used. If any occupants remain in the room, local movements must be seen to resume the occupied mode. If the PIR device senses local movement any time the door is closed, the occupancy status switches to occupied and the occupied setpoints are used.

Any time the thermostat controller receives an unoccupied network command, the occupancy status switches to unoccupied and the unoccupied setpoints are used. If the thermostat local override function is not configured for lock out, the local user can initiate a temporary occupied mode.

If previously in unoccupied mode when the thermostat receives a local occupancy state network command, the local PIR occupancy loop enables. If the PIR devices do not detect movement, the occupancy status is stand-by mode.

At any time, an occupied network command will always force the local zone to be in occupied mode and to use the occupied setpoints. While in the local occupancy state network command, the local zone never enters unoccupied mode and the unoccupied setpoints are never used.

Scenario 9: Networked Fan Coil Application Using 3 Levels of Occupancy with a Remote PIR Sensor and a Door Switch

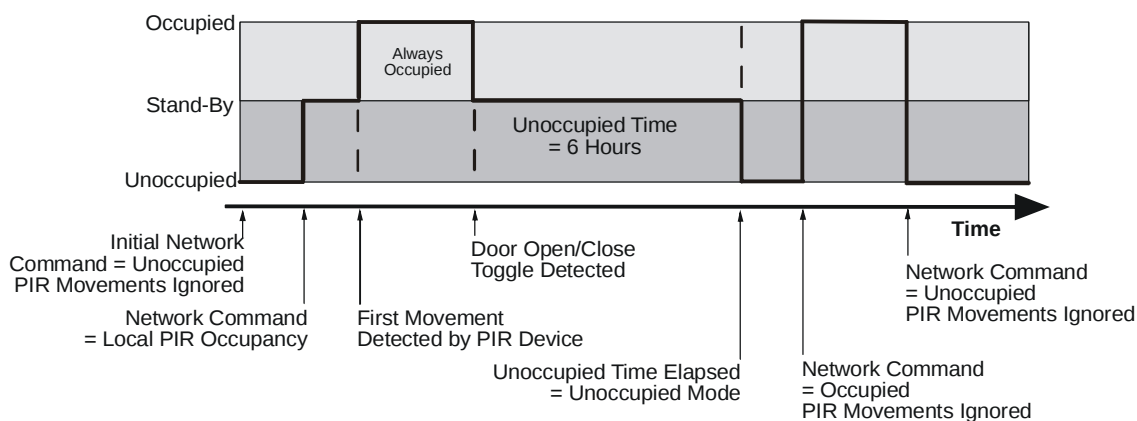


Figure 23: Scenario 9 Sequence of Operation

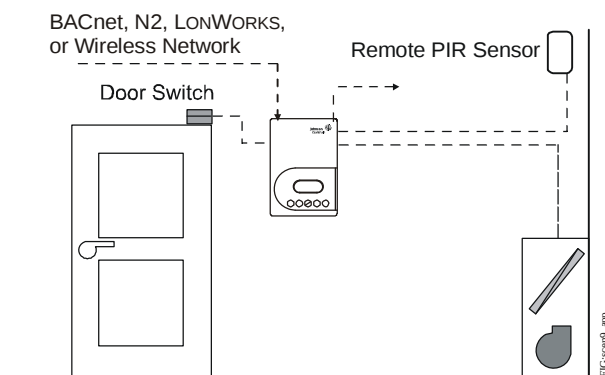


Figure 24: Networked Fan Coil Application with Remote PIR Sensor and Door Switch

Table 17: Scenario 9 Setup and Configuration

Thermostat Controller	TEC2xx6H-4 (Hospitality Model)
PIR	BI1 Configured for Remote PIR Sensor
BI2 Configuration	Door Dry Contact
Stand-By Timer Value	Not Used
Unoccupied Timer Value	6.0 Hours
Network Interface	BACnet MS/TP, N2, LONWORKS, or Wireless

At initial powerup, when the thermostat controller 24 VAC power supply is applied, the initial occupancy of the zone is in stand-by mode if the PIR device does not detect any movement and no occupancy command is received by the thermostat controller.

As soon the PIR device detects a movement, the occupancy status switches to occupied and the occupied setpoints are used. The room is in occupied mode until a door toggle is detected.

If a door toggle is detected, the room switches to stand-by mode and the stand-by setpoints are used. If any occupants remain in the room, local movements must be seen to resume the occupied mode. While in stand-by mode, if no motion is detected in the zone for the entire unoccupied timer duration, the room switches to unoccupied mode and the unoccupied setpoints are used. If the PIR device senses local movement any time the door is closed, the occupancy status switches to occupied and the occupied setpoints are used.

Any time the thermostat controller receives an unoccupied network command, the occupancy status switches to unoccupied and the unoccupied setpoints are used. If the thermostat local override function is not configured for lock out, the local user can initiate a temporary occupied mode.

If previously in unoccupied mode when the thermostat receives a local occupancy state network command, the local PIR occupancy loop enables. If the PIR devices do not detect movement, the occupancy status is stand-by mode.

At any time, an occupied network command will always force the local zone to be in occupied mode and to use the occupied setpoints.

Scenario 10: Networked Fan Coil Application Using 2 Levels of Occupancy with a Remote PIR Sensor and a Door Switch

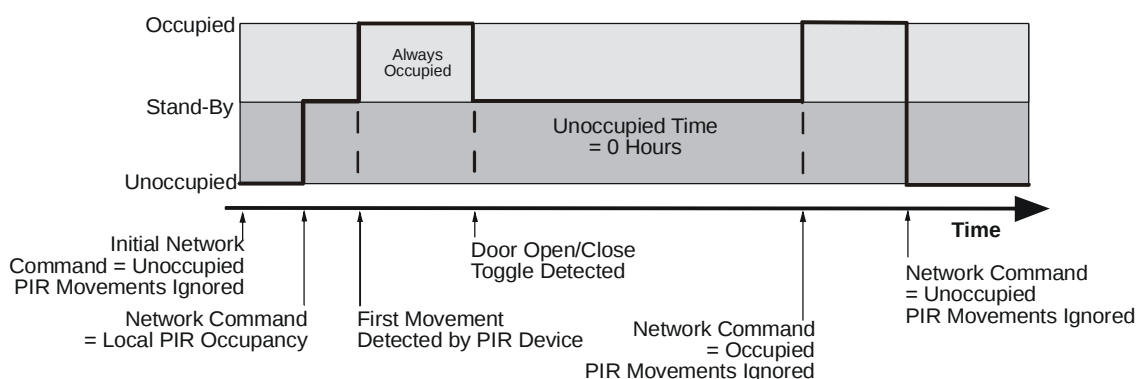


Figure 25: Scenario 10 Sequence of Operation

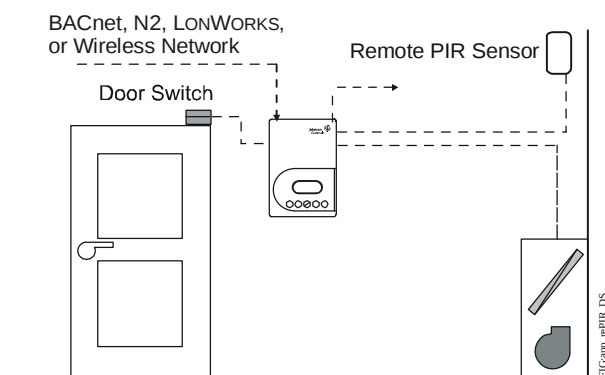


Figure 26: Networked Fan Coil Application with Remote PIR Sensor and Door Switch

Table 18: Scenario 10 Setup and Configuration

Thermostat Controller	TEC2xx6H-4 (Hospitality Model)
PIR	BI1 Configured for Remote PIR Sensor
BI2 Configuration	Door Dry Contact
Stand-By Timer Value	Not Used
Unoccupied Timer Value	0.0 Hours
Network Interface	BACnet MS/TP, N2, LONWORKS, or Wireless

At initial powerup, when the thermostat controller 24 VAC power supply is applied, the initial occupancy of the zone is in stand-by mode if the PIR device does not detect any movement and no occupancy command is received by the thermostat controller.

As soon the PIR device detects a movement, the occupancy status switches to occupied and the occupied setpoints are used. The room is in occupied mode until a door toggle is detected.

If a door toggle is detected, the room switches to stand-by mode and the stand-by setpoints are used. If any occupants remain in the room, local movements must be seen to resume the occupied mode. If the PIR device senses local movement any time the door is closed, the occupancy status switches to occupied and the occupied setpoints are used.

Any time the thermostat controller receives an unoccupied network command, the occupancy status switches to unoccupied and the unoccupied setpoints are used. If the thermostat local override function is not configured for lock out, the local user can initiate a temporary occupied mode.

If previously in unoccupied mode when the thermostat receives a local occupancy state network command, the local PIR occupancy loop enables. If the PIR devices do not detect movement, the occupancy status is stand-by mode.

At any time, an occupied network command will always force the local zone to be in occupied mode and to use the occupied setpoints. While in the local occupancy state network command, the local zone never enters unoccupied mode and the unoccupied setpoints are never used.

Scenario 11: Networked Fan Coil Application Using 3 Levels of Occupancy with Dual PIR Sensors and a Door Switch

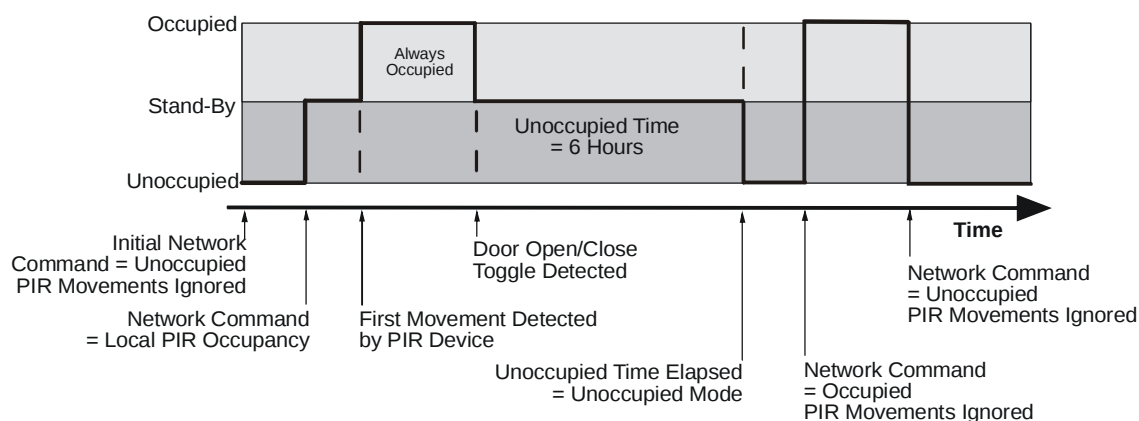


Figure 27: Scenario 11 Sequence of Operation

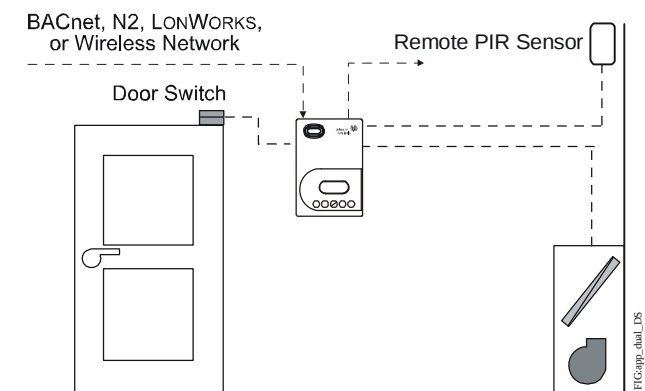


Figure 28: Networked Fan Coil Application with Dual PIR Sensors and Door Switch

Table 19: Scenario 11 Setup and Configuration

Thermostat Controller	TEC2xx6H-4 (Hospitality Model)
PIR	BI1 Configured for Remote PIR Sensor and TEC-6H-4 Accessory Cover
BI2 Configuration	Door Dry Contact
Stand-By Timer Value	Not Used
Unoccupied Timer Value	6.0 Hours
Network Interface	BACnet MS/TP, N2, LONWORKS, or Wireless

At initial powerup, when the thermostat controller 24 VAC power supply is applied, the initial occupancy of the zone is in stand-by mode if the PIR device does not detect any movement and no occupancy command is received by the thermostat controller.

As soon the PIR device detects a movement, the occupancy status switches to occupied and the occupied setpoints are used. The room is in occupied mode until a door toggle is detected.

If a door toggle is detected, the room switches to stand-by mode and the stand-by setpoints are used. If any occupants remain in the room, local movements must be seen to resume the occupied mode. While in stand-by mode, if no motion is detected in the zone for the entire unoccupied timer duration, the room switches to unoccupied mode and the unoccupied setpoints are used. If the PIR device senses local movement any time the door is closed, the occupancy status switches to occupied and the occupied setpoints are used.

Any time the thermostat controller receives an unoccupied network command, the occupancy status switches to unoccupied and the unoccupied setpoints are used. If the thermostat local override function is not configured for lock out, the local user can initiate a temporary occupied mode.

If previously in unoccupied mode when the thermostat receives a local occupancy state network command, the local PIR occupancy loop enables. If the PIR devices do not detect movement, the occupancy status is stand-by mode.

At any time, an occupied network command will always force the local zone to be in occupied mode and to use the occupied setpoints.

Scenario 12: Networked Fan Coil Application Using 2 Levels of Occupancy with Dual PIR Sensors and a Door Switch

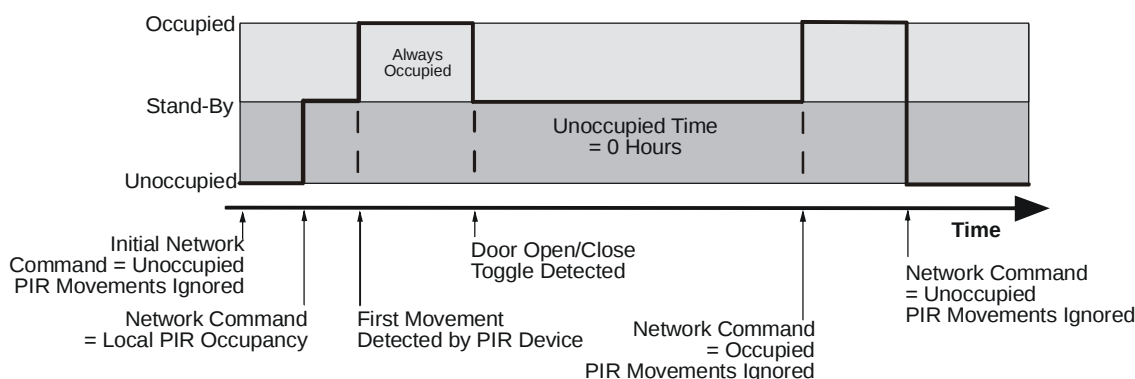


Figure 29: Scenario 12 Sequence of Operation

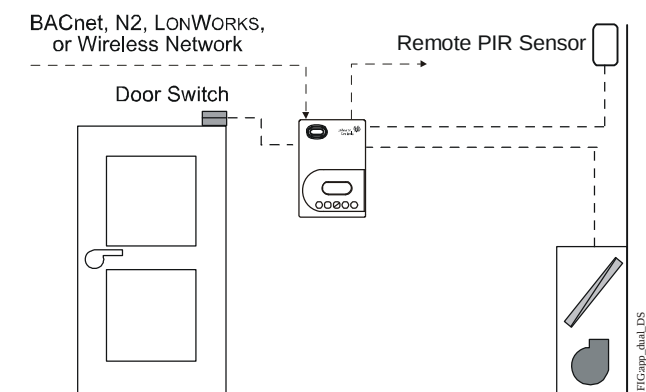


Figure 30: Networked Fan Coil Application with Dual PIR Sensors and Door Switch

Table 20: Scenario 11 Setup and Configuration

Thermostat Controller	TEC2xx6H-4 (Hospitality Model)
PIR	B11 Configured for Remote PIR Sensor and TEC-6H-4 Accessory Cover
B12 Configuration	Door Dry Contact
Stand-By Timer Value	Not Used
Unoccupied Timer Value	0.0 Hours
Network Interface	BACnet MS/TP, N2, LONWORKS, or Wireless

At initial powerup, when the thermostat controller 24 VAC power supply is applied, the initial occupancy of the zone is in stand-by mode if the PIR device does not detect any movement and no occupancy command is received by the thermostat controller.

As soon the PIR device detects a movement, the occupancy status switches to occupied and the occupied setpoints are used. The room is in occupied mode until a door toggle is detected.

If a door toggle is detected, the room switches to stand-by mode and the stand-by setpoints are used. If any occupants remain in the room, local movements must be seen to resume the occupied mode. If the PIR device senses local movement any time the door is closed, the occupancy status switches to occupied and the occupied setpoints are used.

Any time the thermostat controller receives an unoccupied network command, the occupancy status switches to unoccupied and the unoccupied setpoints are used. If the thermostat local override function is not configured for lock out, the local user can initiate a temporary occupied mode.

If previously in unoccupied mode when the thermostat receives a local occupancy state network command, the local PIR occupancy loop enables. If the PIR devices do not detect movement, the occupancy status is stand-by mode.

At any time, an occupied network command will always force the local zone to be in occupied mode and to use the occupied setpoints. While in the local occupancy state network command, the local zone never enters unoccupied mode and the unoccupied setpoints are never used.



Building Efficiency

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