The TEC200x-4 and TEC200x-4+PIR Series Wireless Thermostat Controller System provides wireless networked control of Heating, Ventilating, and Air Conditioning (HVAC) equipment on a Building Automation System (BAS) that enables remote monitoring and programming.

The TEC200x-4+PIR Series Wireless Thermostat Controllers have occupancy sensing capability built into the device. These devices provide energy savings in high-energy usage light commercial buildings such as schools and hotels. The devices maximize these energy savings by using additional setpoint strategies during occupied times. See the Integrated PIR Sensor – TEC200x-4+PIR Series Wireless Thermostat Controllers section for more information.

This system integrates into a supervisory controller that uses BACnet® Internet Protocol (IP) or BACnet Master-Slave/Token-Passing (MS/TP) communications.

TEC20 Coordinators allow the supervisory controller to communicate with multiple TEC Wireless Thermostat Controllers. The TEC200x-4 and TEC200x-4+PIR Series Wireless Thermostat Controllers provide networked control of a variety of staged equipment:

- TEC2001-4(+PIR) Single-Stage Wireless Thermostat Controllers control fan coil units, unit heaters, and single-stage packaged heating/cooling equipment
- TEC2002-4(+PIR) Heat Pump Wireless Thermostat Controllers control heat pumps with up to three heating and two cooling stages
- TEC2003-4(+PIR) Multi-Stage Wireless Thermostat Controllers control multi-stage packaged heating/cooling equipment
- TEC2004-3(+PIR) Multi-Stage Economizer Wireless Thermostat Controllers control economizer operation for single- and multi-stage unitary rooftop equipment

The wireless mesh network uses ZigBee™ technology to enable remote monitoring and programming and to enhance reliability by providing redundant transmission paths through other TEC200x-4 and TEC200x-4+PIR Wireless Thermostat Controllers, creating a resilient, self-healing mesh network.

Table 1: Features and Benefits (Part 1 of 2)

<table>
<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wireless Communication</td>
<td>Allows BAS communications capability in applications where field bus wiring within the building is prohibitive.</td>
</tr>
<tr>
<td>Integral Wireless Signal Strength Testing Built into Wireless Thermostat Controllers and Coordinators</td>
<td>Provides quick, easy, visual indication of the wireless Radio Frequency (RF) signal strength between a sensor and associated receiver; helps locate optimum device positions during installation; and aids troubleshooting your applications.</td>
</tr>
<tr>
<td>Password Protection Option</td>
<td>Protects against unwanted thermostat controller tampering.</td>
</tr>
<tr>
<td>Backlit Liquid Crystal Display (LCD)</td>
<td>Offers real-time control status of the environment in easy-to-read, English text messages with constant backlight that brightens during user interaction.</td>
</tr>
</tbody>
</table>
Applications

IMPORTANT: Use the TEC200x-4 and TEC200x-4+PIR Series Wireless Thermostat Controller System only to provide an input to equipment under normal operating conditions. Where failure or malfunction of the thermostat controller could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn of or protect against failure or malfunction of the TEC200x-4 and TEC200x-4+PIR Series Thermostat Controller System.

The TEC200x-4 and TEC200x-4+PIR Series Wireless Thermostat Controller System is ideal for any location where it is cost-prohibitive, difficult, or aesthetically unappealing to hard wire between BACnet devices, including supervisory controllers (such as NCE25 or NAE35/45/55 engines) and thermostat controllers. Examples of these locations include the following:

- commercial structures with brick or solid concrete walls and/or ceilings that impede hard-wired TEC200x-4 and TEC200x-4+PIR Series Thermostat Controller applications
- office buildings, retail stores, and other commercial real estate where tenant turnover is frequent
- museums, historical buildings, atriums, and other sites where building aesthetics and historical preservation are important
- buildings with marble, granite, glass, mirrored, wood veneer, or other decorative surfaces that present challenges to hard-wired applications
- buildings with asbestos or other hazardous materials that must not be penetrated or disturbed
- buildings with occupants sensitive to disruptions to business

Locations or applications that prohibit cellular telephones or Wireless Fidelity (WiFi) systems are unsuitable for the TEC200x-4 and TEC200x-4+PIR Series Wireless Thermostat Controller System:

- operating rooms or radiation therapy rooms
- validated environments
- UL 864 applications

Wireless Communication

The TEC200x-4 and TEC200x-4+PIR Series Wireless Thermostat Controller System uses Direct-Sequence, Spread-Spectrum (DSSS) Radio Frequency (RF) technology and operate on the 2.4 GHz Industrial, Scientific, and Medical (ISM) band. The system meets the IEEE 802.15.4 standard for low power, low duty-cycle RF transmitting systems, and is compatible with wireless mesh networks compliant with the ZigBee standard. The TEC200x-4 and TEC200x-4+PIR Series Wireless Thermostat Controller System uses a transmission power of 10 dBm.

For more information on wireless communication in the TEC200x-4 and TEC200x-4+PIR Wireless Thermostat Controller System, refer to the TEC20xx-4 and TEC20xx-4+PIR Series Wireless Thermostat Controller System Technical Bulletin (LIT-12011596).

<table>
<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two Configurable Digital Inputs on All Models</td>
<td>Provide additional inputs for advanced functions such as remote night setback, service or filter alarms, or occupancy override.</td>
</tr>
<tr>
<td>Over 20 Configurable Parameters</td>
<td>Enable the TEC200x-4 and TEC200x-4+PIR Series Wireless Thermostat Controllers to adapt to any application, allowing installer parameter access without opening the cover.</td>
</tr>
<tr>
<td>Optional Discharge Air Sensor</td>
<td>Monitors unit efficiency.</td>
</tr>
</tbody>
</table>

Table 1: Features and Benefits (Part 2 of 2)
Wireless Signal Transmission Range

Line-of-sight transmission ranges between a TEC20 Coordinator and a TEC20xx-4 or TEC20xx-4+PIR Wireless Thermostat Controller (or between TEC Wireless Thermostat Controllers) can be less than the recommended distances shown in Table 2. The effective transmission range for indoor applications varies because of RF signal absorption and reflection due to metal obstructions, walls (or floors), and furniture found in typical building interiors.

Table 2: Recommended Transmission Ranges

<table>
<thead>
<tr>
<th>Type</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Through Walls</td>
<td>10 m (30 ft)</td>
</tr>
<tr>
<td>Open Space</td>
<td>30 m (100 ft)</td>
</tr>
</tbody>
</table>

For detailed information on locating devices for optimum signal strength, refer to the Wireless Metasys System Location Guide (LIT-12011294).

Wireless RF Interference and Security

The TEC20xx-4 and TEC20xx-4+PIR Series Wireless Thermostat Controller System is designed to virtually eliminate RF interference with other wireless applications. In most commercial environments, the TEC20xx-4 and TEC20xx-4+PIR Series Wireless Thermostat Controller System does not encounter or generate RF interference, even in environments with cell phones and competing WiFi applications. Wireless RF transmissions using ZigBee technology use modulation schemes different from WiFi applications and use frequencies between popular WiFi bands, enabling these networks to exist in the same areas.

While using industry-standard frequencies, the devices use a proprietary protocol that secures the RF data transmissions and inhibits the deciphering of any intercepted RF data.

For more information on RF interference and wireless security, refer to the following documents:

- TEC20xx-4 and TEC20xx-4+PIR Series Wireless Thermostat Controller System Technical Bulletin (LIT-12011596)
- Wireless Metasys System Location Guide (LIT-12011294)

System Overview

A TEC20xx-4 and TEC20xx-4+PIR Series Wireless Thermostat Controller System consists of:

- a supervisory controller
- at least one TEC20 Coordinator and 15 VDC power supply (available separately)
- multiple TEC20xx-4 and/or TEC20xx-4+PIR Wireless Thermostat Controllers

A TEC20 Coordinator enables the TEC20xx-4 and TEC20xx-4+PIR Wireless Thermostat Controllers to communicate with the supervisory controller, which schedules occupancy, collects trend data, overrides points, and monitors alarms. The TEC20xx-4 and TEC20xx-4+PIR Series Wireless Thermostat Controller System confirms and synchronizes data transmissions between the TEC20xx-4 and TEC20xx-4+PIR Wireless Thermostat Controllers and TEC20 Coordinators.

Figure 2 illustrates a simple TEC20xx-4 and TEC20xx-4+PIR Series Wireless Thermostat Controller System using BACnet MS/TP or BACnet IP communication protocol.

For information on commissioning and configuring a TEC Series Wireless Thermostat Controller System for operation, refer to the TEC20xx-4 and TEC20xx-4+PIR Series Wireless Thermostat Controller System Technical Bulletin (LIT-12011596).

Component Quantities

A TEC20xx-4 and TEC20xx-4+PIR Series Wireless Thermostat Controller System can support up to:

- 100 TEC20xx-4 and/or TEC20xx-4+PIR Wireless Thermostat Controllers integrated through MS/TP trunk on the supervisory controller
- 254 TEC20xx-4 and/or TEC20xx-4+PIR Wireless Thermostat Controllers integrated through BACnet IP on a supervisory controller
- 30 TEC20xx-4 and/or TEC20xx-4+PIR Wireless Thermostat Controllers per TEC20 Coordinator
Each increment of 30 TEC200x-4 and TEC200x-4+PIR Wireless Thermostat Controllers requires one additional TEC20 Coordinator. See Table 3 for component quantities.

Table 3: TEC Wireless System Component Quantities

<table>
<thead>
<tr>
<th>Number of TEC200x-4 and TEC200x-4+PIR Wireless Thermostat Controllers</th>
<th>TEC20 Coordinators Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-30</td>
<td>1</td>
</tr>
<tr>
<td>31-60</td>
<td>2</td>
</tr>
<tr>
<td>61-90</td>
<td>3</td>
</tr>
<tr>
<td>91-100</td>
<td>4</td>
</tr>
</tbody>
</table>

TEC200x-4 and TEC200x-4+PIR Wireless Thermostat Controllers can be added as repeaters, as required, to extend range and provide redundant pathways. TEC200x-4 and TEC200x-4+PIR Wireless Thermostat Controllers serving only as repeaters do not count towards the totals shown in Table 3; however, indiscriminate use of TEC200x-4 and TEC200x-4+PIR Wireless Thermostat Controllers as repeaters can lead to reduced performance.

BACnet MS/TP Limitations

TEC20 Coordinators each count as a single device in the BACnet MS/TP trunk limitations. TEC200x-4 and TEC200x-4+PIR Wireless Thermostat Controllers do not count toward device limitations; however, they do count towards number of points limitations on a supervisory controller.

BACnet IP Limitations

Parameters on TEC200x-4 and TEC200x-4+PIR Wireless Thermostat Controllers that are integrated into the supervisory controller as points count towards limitations of number of points per supervisory controller.
Figure 2: TEC200x-4 and TEC200x-4+PIR Series Wireless Thermostat Controller System
Component Descriptions

Supervisory Controllers
The TEC200x-4 and TEC200x-4+PIR Series Wireless Thermostat Controller System uses Web-enabled, Ethernet-based, supervisory controllers that connect BAS networks to IP networks and the Web. These supervisory controllers provide scheduling, alarm and event management, trending, energy management, data exchange, dial-out capability, and password protection. With a computer running Microsoft® Internet Explorer® Web browser version 6.0 (or later), you can browse to a configured supervisory controller, and monitor and control BAS field devices in the User Interface (UI).

Refer to the TEC20xx-4 and TEC20xx-4+PIR Series Wireless Thermostat Controller System Technical Bulletin (LIT-12011596) for information on configuring a TEC Series Wireless Thermostat Controller System.

TEC20 Coordinators
A TEC20 Coordinator (Figure 3) provides a wireless interface between a supervisory controller and the TEC200x-4 and TEC200x-4+PIR Wireless Thermostat Controllers, allowing the exchange of BACnet IP (TEC20-3C) or BACnet MS/TP (TEC20-6C) messages.

The TEC20 Coordinator initiates the formation of the wireless mesh network – one is required per wireless mesh network. Each TEC20 Coordinator and the TEC200x-4 or TEC200x-4+PIR Wireless Thermostat Controllers assigned to it share a Personal Area Network Identification (PAN ID).

A TEC20 Coordinator requires a 15 VDC power source (available separately). The TEC20-8X-1 120 VAC power cord or NPB-PWR 24 VAC/DC DIN rail mount power modules supply sufficient power to the TEC20 Coordinator (Figure 4). An optional remote-mount antenna and cable is available to allow transmission when the TEC20 Coordinator is mounted inside a metal panel.

![Figure 3: TEC20 Wireless Coordinator Physical Features](image-url)
Figure 4: TEC20 Coordinator and NPB-PWR Module Dimensions, in. (mm)

Note: Electronic and printed versions of this document may not show the dimensions to scale. Verify all measurements before drilling.

DIN mounting is recommended over tab mounting.
TEC200x-4 and TEC200x-4+PIR Wireless Thermostat Controllers

Depending on the model, the TEC200x-4 and TEC200x-4+PIR Wireless Thermostat Controllers can communicate sensed temperature, setpoint temperature, and other data with an associated supervisory controller. Using this information, the TEC200x-4 and TEC200x-4+PIR Wireless Thermostat Controllers control rooftop units (with or without economizers), heat pumps, and single- and multi-stage heating/cooling equipment. See Applications for more information.

The TEC200x-4 and TEC200x-4+PIR Wireless Thermostat Controllers can also serve as repeaters to extend the range of the communications within the wireless mesh network.

The TEC200x-4 and TEC200x-4+PIR Wireless Thermostat Controllers are designed for indoor, intra-building applications only.

See Figure 5 for the TEC200x-4 and TEC200x-4+PIR Wireless Thermostat Controllers dimensions.

The following are features common to TEC200x-4 and TEC200x-4+PIR Wireless Thermostat Controllers for staged equipment control:

- **Stationary or Scrolling Display**
  Offers the option of having the display continuously scroll the parameters.

- **Three Levels of Keypad Lockout**
  Provide three levels of keypad lockout that can be set up through the Installer Configuration Menu.

- **Adjustable Power Delay on Startup**
  Enables a delay before any operation is authorized upon powerup of the thermostat. Can be used for equipment protection or to sequence startup of multiple units in one location.

- **Frost Protection Enable/Disable**
  Provides a minimum heating setpoint of 42.0°F/5.5°C to prevent freezing in the zone controlled by the thermostat, regardless of its mode.

- **Adjustable Maximum Heating/Minimum Cooling Setpoints**
  Establish the maximum heating setpoint and minimum cooling setpoint that can be entered through the user interface.

- **Adjustable Anti-Short Cycle Timer**
  Adjusts the minimum on/off times for heating and cooling stages from 0 to 5 minutes.
• **Adjustable Heating/Cooling Cycles per Hour (On/Off Control)**
  Configurable for 3 to 8 heating cycles and 3 or 4 cooling cycles in a 1-hour period, balancing temperature control and equipment cycling.

• **Adjustable Heating/Cooling Deadband**
  Adjusts the minimum heating/cooling deadband from 2.0°F/1.0°C to 4.0°F/2.0°C.

• **Fan Control**
  Provides option for equipment fan control.

• **Fan Delay Control**
  Enables the user to select how the fan operates on a call for heating and the delay at the end of the heating or cooling cycle.

• **Adjustable Temporary Occupancy Time**
  Adjusts the temporary occupancy time from 0 to 12 hours.

• **Sensor Offset Adjustments**
  Sets desired room or outside air temperature calibration (offset).

• **System Mode Lockout**
  Allows the heating and cooling modes to be locked out based on the outdoor air temperature when an outdoor air sensor is connected.

• **Unoccupied Timer**
  Sets the time delay between Occupied mode to Unoccupied mode after movement is detected (PIR models only.)

• **Smart Fan**
  Enables the fan to operate continuously during the occupied times and cycle with the equipment during the unoccupied times.

• **Remote Indoor and Outdoor Sensing**
  Accommodates remote indoor and outdoor sensors. Up to three indoor sensors can be averaged.

• **Nonvolatile Electrically Erasable Programmable Read-Only Memory (EEPROM)**
  Prevents loss of adjusted parameters during a power failure.

  Reverts the operation of two-stage thermostats to a single-stage thermostat when the second heating or cooling stage is not needed.

• **High and Low Balance Point Adjustments (TEC2002-4 and TEC2002-4+PIR Models)**
  Allows more precise control of heat pump operation based on the outdoor air temperature.

• **Heat Pump Compressor Stage Enable/Disable (TEC2002-4 and TEC2002-4+PIR Models)**
  Allows operation of the second-stage compressor to be disabled, reverting the thermostat controller to single-stage compressor operation on heat pump thermostats.

• **Three Light-Emitting Diodes (LEDs)**
  Provide fan, heating, and cooling status at a glance.

• **Auxiliary Contact**
  Provides 24 VAC control for reheat, lighting, and other auxiliary functions.

• **Network Addressing and Viewing**
  Allows network addressing via the menu-driven user interface.

• **Remote Access**
  Allows the user to read/write and access the parameters of the thermostat via a supervisory controller.
Thermostat Controller User Interface Keys

The user interface consists of five keys on the front cover (Figure 6). The function of each key is as follows:

- **Use the YES key to:**
  - confirm menu selections and to advance to the next menu item
  - stop the Status Display Menu from scrolling and to manually scroll to the next parameter on the menu

  **Note:** When the device is left unattended for 45 seconds, the display resumes scrolling through the Status Display Menu.

- **Use the NO key to decline a parameter change and to advance to the next menu item.**

- **Use the MENU key to:**
  - access the Main User Menu or to exit the menu (see the Main User Menu section)
  - access the Installer Configuration Menu or to exit the menu (see the Installer Configuration Menu section)

- **Use the UP/DOWN arrow keys change the configuration parameters and activate a setpoint adjustment.**

Backlit LCD

The TEC200x-4 and TEC200x-4+PIR Series Thermostat Controllers include a 2-line, 8-character backlit display. Low-level backlighting is present during normal operation, and it brightens when any user interface key is pressed. The backlight returns to low level when the thermostat is left unattended for 45 seconds.

LEDs

Three LEDs are included to indicate the fan status, call for heat, or call for cooling:

- The fan LED is on when the fan is on.
- The heat LED is on when heating is on.
- The cool LED is on when cooling is on.

Integrated PIR Sensor – TEC200x-4+PIR Series Wireless Thermostat Controllers

The integrated PIR sensor allows for automatic switching between fully adjustable Occupied and Unoccupied temperature setpoints without user interaction. This feature generates incremental energy savings during scheduled occupied periods while the space is unoccupied.
Programming Overview

There are three menus available to view, program, and configure the TEC200x-4 and TEC200x-4+PIR Series Wireless Thermostat Controllers:

**Status Display Menu**

The Status Display Menu is displayed on the LCD during normal operation. This menu continuously scrolls through these parameters:

- Room Temperature
- System Mode
- Occupancy Status (Occupied/Unoccupied/Override)
- Outdoor Temperature – An outdoor air temperature sensor must be connected.
- Applicable Alarms – The backlight lights up as an alarm condition is displayed.

**Note:** Press the YES key to temporarily stop this menu from scrolling.

**Note:** An option is available within the Installer Configuration Menu to lock out the scrolling display and show only the Room Temperature parameter.

**Main User Menu**

The Main User Menu is used to access and change the basic operating parameters of the thermostat. During normal thermostat operation, press the MENU key once to access the Main User Menu.

**Installer Configuration Menu**

The Installer Configuration Menu is used to set up the thermostat for an application-specific operation. To access the menu, press and hold the MENU key for approximately 8 seconds.

The Installer Configuration Menu includes the following parameters that are accessed by pressing the same MENU key:

- Password Setting
- Communication Addresses
- DI1 and DI2 Input Configuration
- Menu Scroll
- Three Keypad Lockout Levels
- Power Delay on Power Up
- Frost Protection
- Maximum Heating Setpoint/Minimum Cooling Setpoint
- Proportional Band Adjustment
- Anti-Short Cycle Times
- Heating Stage Cycles per Hour
- Cooling Stage Cycles per Hour
- Heating/Cooling Minimum Deadband
- Heating/Cooling Fan Control
- End-of-Cycle Fan Delay
- Temporary Occupancy Time
- Room Air Sensor Calibration
- Outdoor Air Sensor Calibration
- Number of Heat Pump Stages (TEC2002-4 and TEC2002-4+PIR Models)
- Outdoor Air Temperature Heating Lockout
- Outdoor Air Temperature Cooling Lockout
- Unoccupied Timer Value (when occupancy sensor is used)
- Auxiliary Output Configuration

The following parameters are for the TEC2002-4 and TEC2002-4+PIR models only:

- High Balance Point
- Low Balance Point
- Comfort/Economy Auxiliary Heat
- Reversing Valve Operation
- Heat Pump Compressor/Auxiliary Heat Interlock

The following parameters are for the TEC2004-4 and TEC2004-4+PIR models only:

- Outdoor Air Temperature Changeover Setpoint
- Outdoor Air Damper Minimum Position
- Mechanical Cooling On/Off during Economizer Operation
- Mixed Air Temperature Setpoint
- Mixed Air Temperature
Ordering Information

Use the information in Table 4 to order a TEC200x-4 or TEC200x-4+PIR Wireless Thermostat Controller for Staged Equipment Control. Use the information in Table 5 to order a TEC20 Coordinator. Use the information in Table 6 to order accessories.

Table 4: TEC200x-4 and TEC200x-4+PIR Series Wireless Thermostat Controller Models

<table>
<thead>
<tr>
<th>Code Number</th>
<th>Description</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEC2001-4</td>
<td>Single-Stage</td>
<td>Fan Coil Units, Unit Heaters, and Single-Stage Packaged Heating/Cooling Equipment</td>
</tr>
<tr>
<td>TEC2001-4+PIR</td>
<td>Single-Stage with Onboard Occupancy Sensor</td>
<td></td>
</tr>
<tr>
<td>TEC2002-4</td>
<td>Heat Pump</td>
<td>One or Two Heat Pump Stages with Optional Auxiliary Heat Stage</td>
</tr>
<tr>
<td>TEC2002-4+PIR</td>
<td>Heat Pump with Onboard Occupancy Sensor</td>
<td></td>
</tr>
<tr>
<td>TEC2003-4</td>
<td>Multi-Stage</td>
<td>Multi-Stage Packaged Heating/Cooling Equipment</td>
</tr>
<tr>
<td>TEC2003-4+PIR</td>
<td>Multi-Stage with Onboard Occupancy Sensor</td>
<td></td>
</tr>
<tr>
<td>TEC2004-4</td>
<td>Multi-Stage Economizer</td>
<td>Economizer Operation for Single- and Multi-Stage Unitary Rooftop Equipment</td>
</tr>
<tr>
<td>TEC2004-4+PIR</td>
<td>Multi-Stage Economizer with Onboard Occupancy Sensor</td>
<td></td>
</tr>
</tbody>
</table>

Table 5: TEC20 Coordinators

<table>
<thead>
<tr>
<th>Code Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEC20-3C-2</td>
<td>BACnet IP Wireless Coordinator; Requires 15 VDC Power Supply</td>
</tr>
<tr>
<td>TEC20-6C-2</td>
<td>BACnet MS/TP Wireless Coordinator; Requires 15 VDC Power Supply</td>
</tr>
</tbody>
</table>

Table 6: Accessories (Order Separately)

<table>
<thead>
<tr>
<th>Code Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEN-600-1</td>
<td>Remote Indoor Air Temperature Sensor</td>
</tr>
<tr>
<td>SEN-600-4</td>
<td>Remote Indoor Air Temperature Sensor with Occupancy Override and LED</td>
</tr>
<tr>
<td>TEC-3-PIR</td>
<td>Cover with Occupancy Sensor</td>
</tr>
<tr>
<td>TE-6361M-1(^2)</td>
<td>Duct Mount Air Temperature Sensor</td>
</tr>
<tr>
<td>TE-636S-1</td>
<td>Strap-Mount Temperature Sensor</td>
</tr>
<tr>
<td>TE-6363P-1(^2)</td>
<td>Outside Air Temperature Sensor</td>
</tr>
<tr>
<td>TEC20-A-1</td>
<td>Replacement Antenna for TEC20 Coordinator</td>
</tr>
<tr>
<td>TEC20-RA-1(^3)</td>
<td>Remote Antenna for TEC20 Coordinator</td>
</tr>
<tr>
<td>NPB-PWR(^4)</td>
<td>DIN Rail Mount 24 VAC/DC Power Module for TEC20 Coordinator</td>
</tr>
<tr>
<td>TEC20-8X-1</td>
<td>120 VAC to 15 VDC Power Supply for TEC20 Coordinator</td>
</tr>
<tr>
<td>TEC20-9B-1</td>
<td>Replacement Battery Pack for TEC20 Coordinator</td>
</tr>
</tbody>
</table>

1. The TEC-3-PIR Accessory Cover can be used to replace the existing cover on a non-PIR TEC200x-4 Thermostat Controller to provide occupancy sensing capability.
2. Additional TE-636xx-x Series 10k ohm Johnson Controls Type II Thermistor Sensors are available; refer to the TE-6300 Series Temperature Sensors Product Bulletin (LIT-216320) for more details.
3. This antenna is used when the TEC Coordinator is installed inside a metal cabinet, or when a remote antenna is required by physical installation.
4. DIN Rail: Type NS35/7.5 (35 x 7.5 mm) and DIN rail end clips. Length of DIN rail depends on the number of DIN rail mounted options.
Technical Specifications

**TEC20 Wireless Coordinator**

| Product Code Numbers | TEC20-3C-2: BACnet IP Version  
TEC20-6C-2: BACnet MS/TP Version |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Requirements</td>
<td>15 VDC, 6 W Maximum</td>
</tr>
</tbody>
</table>
| Platform              | IBM® PowerPC® 405EP 250 MHz Processor  
64 MB SDRAM and 64 MB Serial Flash  
Battery Backup - Shutdown Begins within 10 Seconds  
Real-Time Clock - 3 Month Backup Maximum with Battery |
| Operating System      | Niagara®                        |
| Communications        | Ethernet: Two 10/100 Mbps Ports (RJ-45 Connection)  
RS-232: 9-Pin D-Shell Connection  
RS-485: 3-Pin Non-Isolated Port |
| Transmission Range    | Through Walls: 10 m (30 ft)  
Line-of-Sight (Open Space): 30 m (100 ft) |
| RF Band               | Direct-Sequence, Spread-Spectrum Transmission; 2.4 Ghz Unlicensed Band |
| Transmission Power    | 10 mW Maximum                   |
| Wire Size             | 18 AWG Maximum, 22 AWG Recommended |
| Ambient Conditions    | Operating: 0 to 50°C (32 to 122°F); 95% RH Maximum, Noncondensing  
Storage: -20 to 60°C (-4 to 140°F); 95% RH Maximum, Noncondensing |
| Compliance            | United States:  
UL Listed, File E27734, CCN XAPX, Under UL 873, Temperature Indicating and Regulating Equipment  
FCC Compliant to CFR 47, Part 15, Subpart B and Part 15 Class A  
Canada:  
C-UL Listed, File E207782, CCN XAPX7, Under CAN/CSA C22.2 No. 24, Temperature Indicating and Regulating Equipment, and C22.2 No. 205-M1983 Signal Equipment  
Industry Canada, ICES-003 |
| Shipping Weight       | 1.1 lb (0.499 kg)               |

**TEC200x-4 and TEC200x-4+PIR Wireless Thermostat Controllers (Part 1 of 2)**

<table>
<thead>
<tr>
<th>Power Requirements</th>
<th>19 to 30 VAC, 50/60 Hz; 2 VA (Terminals RC and C) at 24 VAC Nominal, Class 2 or Safety Extra-Low Voltage (SELV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economizer Output Rating</td>
<td>TEC2004-4 and TEC2004-4+PIR Models: 0 to 10 VDC into 2k ohm Resistance (Minimum)</td>
</tr>
<tr>
<td>Relay/Triac Contact Rating</td>
<td>19 to 30 VAC, 1.0 A Maximum, 15 mA Minimum, 3.0 A In-Rush, Class 2 or SELV</td>
</tr>
<tr>
<td>Digital Inputs</td>
<td>Voltage-Free Contacts across Terminal C to Terminals DI1 and DI2</td>
</tr>
</tbody>
</table>
| Transmission Range    | Through Walls: 10 m (30 ft)  
Line-of-Sight (Open Space): 30 m (100 ft) |
| RF Band               | Direct-Sequence, Spread-Spectrum Transmission; 2.4 Ghz Unlicensed Band |
| Transmission Power    | 10 mW Maximum                   |
| Wire Size             | 18 AWG Maximum, 22 AWG Recommended |
| Temperature Sensor Type | Local 10k ohm Negative Temperature Coefficient (NTC) Thermistor |
| Resolution            | ±0.1°C/±0.2°F                   |
| Accuracy              | Temperature: ±0.5°C/±0.9°F at 21.0°C/70.0°F Typical Calibrated |
| Temperature Range     | Backlit Display: -40.0°C/-40.0°F to 50.0°C/122.0°F  
Heating Control: 40.0°F/4.5°C to 32.0°C/90.0°F in 0.5° Increments  
Cooling Control: 54.0°F/12.0°C to 38.0°C/100.0°F in 0.5° Increments |
| Auxiliary/Outdoor Air Temperature Indication Range | -40.0°C/-40.0°F to 50.0°C/122.0°F |
**TEC200x-4 and TEC200x-4+PIR Wireless Thermostat Controllers (Part 2 of 2)**

<table>
<thead>
<tr>
<th>Minimum Deadband</th>
<th>1°C/2°F between Heating and Cooling</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ambient Conditions</strong></td>
<td>Operating: 0 to 50°C (32 to 122°F); 95% RH Maximum, Noncondensing</td>
</tr>
<tr>
<td><strong>Compliance</strong></td>
<td><strong>United States:</strong> UL Listed, File E27734, CCN XAPX, Under UL 873, Temperature Indicating and Regulating Equipment</td>
</tr>
<tr>
<td></td>
<td><strong>Canada:</strong> UL Listed, File E27734, CCN XAPX7, Under CAN/CSA C22.2 No. 24, Temperature Indicating and Regulating Equipment</td>
</tr>
<tr>
<td><strong>Shipping Weight</strong></td>
<td>TEC200x-4 Models: 0.34 kg (0.75 lb)</td>
</tr>
</tbody>
</table>

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc., shall not be liable for damages resulting from misapplication or misuse of its products.

**United States Emissions Compliance**

Compliance Statement (Part 15.19)

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.

Warning (Part 15.21)

Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

RF Exposure (OET Bulletin 65)

To comply with FCC RF exposure requirements for mobile transmitting devices, this transmitter should only be used or installed at locations where there is at least 20cm separation distance between the antenna and all persons.

**Canadian Emissions Compliance**

Industry Canada Statement

The term IC before the certification/registration number only signifies that the Industry Canada technical specifications were met.

Le terme « IC » précédant le numéro d'accréditation/inscription signifie simplement que le produit est conforme aux spécifications techniques d'Industrie Canada.

Section 5.5 of RSS-210

This device has been designed to operate with an antenna having a maximum gain of 3.2 dB. Antenna having a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna impedance is 50 ohms.

Cet appareil a été conçu pour fonctionner avec une antenne d'un gain maximum de 3.2 dBi. En application des réglementations d'Industrie Canada, l'utilisation d'une antenne de gain supérieur est strictement interdite. L'impédance d'antenne requise est de 50 ohms.

Section 5.11 of RSS-210

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication.

Pour réduire les interférences radio potentielles avec les dispositifs d'autres utilisateurs, le type d'antenne et son gain doivent être choisis de façon à ce que la puissance isotrope rayonnée équivalente (PIRE) ne soit pas supérieure à la puissance nécessaire pour une bonne communication.