

TEC20xx-4 and TEC20xx-4+PIR Series

Wireless Thermostat Controller System for Fan Coil and Zoning Equipment

Description

The TEC20xx-4 and TEC20xx-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. This system integrates into a supervisory controller that uses BACnet® Internet Protocol (IP) or BACnet Master-Slave/Token-Passing (MS/TP) communications.

The TEC20xx-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.

TEC20 Coordinators allow the supervisory controller to communicate with multiple TEC20xx-4 and TEC20xx-4+PIR Series Wireless Thermostat Controllers:

- **TEC2045-4 Wireless Thermostat Controllers** control two-pipe fan coils, cabinet unit heaters, or other equipment using a proportional 0 to 10 VDC control input and one-speed fan control.
- **TEC20x6(H)-4 and TEC20x6H-4+PIR Series Wireless Thermostat Controllers** control two- or four-pipe fan coils, cabinet unit heaters, or other equipment using on/off, floating, or proportional 0 to 10 VDC control input, three speeds of fan control, dehumidification capability, and occupancy sensing capability.
- **TEC20x7-4 Series Wireless Thermostat Controllers** control local hydronic reheat valves, pressure dependent Variable Air Volume (VAV) equipment with or without local reheat, or other zoning equipment using an on/off, floating, or proportional 0 to 10 VDC control input.

The wireless mesh network uses ZigBee™ technology to enable remote monitoring and programming and to enhance reliability by providing redundant transmission paths through other TEC20xx-4 and TEC20xx-4+PIR Series Wireless Thermostat Controllers, creating a resilient, self-healing mesh network.

Refer to *TEC20xx-4 and TEC20xx-4+PIR Series Wireless Thermostat Controller System for Fan Coil and Zoning Equipment Product Bulletin (LIT-12011593)* for important product application information.

Features

- wireless communication — allows BAS communications capability in applications where field bus wiring within the building is prohibitive
- onboard occupancy sensor (Passive Infrared [PIR] Models) — provides energy savings without additional installation time and cost
- password protection option — protects against unwanted thermostat controller tampering
- integral humidity sensing capability (dehumidification models) — increases occupancy comfort by providing dehumidification
- on/off, floating, or proportional 0 to 10 VDC control — offers additional application flexibility by providing more advanced control signals
- three speeds of fan control (model dependent) — provide easy **FAN** speed selection via the interface key, to meet the application requirements
- integral wireless signal strength testing built into wireless thermostat controllers and coordinators — 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



TEC Wireless Thermostat Controllers and TEC20 Coordinator with Direct-Mount Antenna and Remote Mount Antenna

- single/dual setpoint adjustment — enables user setpoint options to accommodate application
- backlit Liquid Crystal Display (LCD) — offers real-time control status of the environment in easy-to-read, English text messages with constant backlight that brightens during user interaction
- two configurable binary inputs — provide additional inputs for advanced functions such as remote night setback, service or filter alarms, motion detector, and window status
- over 20 configurable parameters — enable the TEC20xx-4 or TEC20xx-4+PIR Series Wireless Thermostat Controller to adapt to any application, allowing installer parameter access without opening the cover
- optional discharge air sensor — monitors unit efficiency

Applications

The TEC20xx-4 and TEC20xx-4+PIR Series Wireless Thermostat Controller System is ideal for any location where it is cost-prohibitive, difficult, or aesthetically unappealing to hardwire 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 TEC20xx-4 and TEC20xx-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 TEC20xx-4 and TEC20xx-4+PIR Series Wireless Thermostat Controller System:

- operating rooms or radiation therapy rooms
- validated environments
- UL864 applications

Repair Information

If a TEC20xx-4 or TEC20xx-4+PIR Series Wireless Thermostat Controller System fails to operate within its specifications, replace the unit. For a replacement, contact the nearest Johnson Controls® representative.

TEC20xx-4 and TEC20xx-4+PIR Series Wireless Thermostat Controller System for Fan Coil and Zoning Equipment (Continued)

Selection Charts

TEC20xx-4 and TEC20xx-4+PIR Thermostat Controller Models

Code Number	Control Outputs	Speeds of Fan Control	Dehumidification Capability	Market	Application Category
TEC2016-4	Two On/Off	3	No	Commercial	1
TEC2016H-4	Two On/Off	3	No	Hospitality	1
TEC2016H-4+PIR ¹	Two On/Off	3	No	Hospitality	1
TEC2026-4	Two On/Off or Floating	3	No	Commercial	1
TEC2026H-4	Two On/Off or Floating	3	No	Hospitality	1
TEC2026H-4+PIR ¹	Two On/Off or Floating	3	No	Hospitality	1
TEC2027-4	Two On/Off or Floating	0	No	Commercial	2
TEC2036-4	Two On/Off or Floating	3	Yes	Commercial	1
TEC2036H-4	Two On/Off or Floating	3	Yes	Hospitality	1
TEC2036H-4+PIR ¹	Two On/Off or Floating	3	Yes	Hospitality	1
TEC2045-4	One Proportional 0 to 10 VDC	1	No	Commercial	3
TEC2046-4	Two Proportional 0 to 10 VDC	3	No	Commercial	1
TEC2046H-4	Two Proportional 0 to 10 VDC	3	No	Hospitality	1
TEC2046H-4+PIR ¹	Two Proportional 0 to 10 VDC	3	No	Hospitality	1
TEC2047-4	Two Proportional 0 to 10 VDC	0	No	Commercial	2
TEC2056-4	Two Proportional 0 to 10 VDC	3	Yes	Commercial	1
TEC2056H-4	Two Proportional 0 to 10 VDC	3	Yes	Hospitality	1
TEC2056H-4+PIR ¹	Two Proportional 0 to 10 VDC	3	Yes	Hospitality	1

Application Categories

- Two- or four-pipe fan coils, cabinet unit heaters, or other equipment using on/off, floating, or proportional 0 to 10 VDC control input, and three speeds of fan control.
 - Local hydronic reheat valves, pressure dependent Variable Air Volume (VAV) equipment with or without local reheat, or other zoning equipment using an on/off, floating, or proportional 0 to 10 VDC control input.
 - Two-pipe fan coils, cabinet unit heaters, or other equipment using a proportional 0 to 10 VDC control input and one-speed fan control.
1. Includes onboard occupancy sensor.

TEC20 Coordinator Ordering Information

Code Number	Description
TEC20-3C-2	BACnet IP Wireless Coordinator; Requires 15 VDC Power Supply
TEC20-6C-2	BACnet MS/TP Wireless Coordinator; Requires 15 VDC Power Supply

TEC Wireless Accessories (Order Separately)

Code Number	Description
SEN-600-1	Remote Indoor Air Temperature Sensor
SEN-600-4	Remote Indoor Air Temperature Sensor with Occupancy Override and LED
TE-636S-1	Strap-Mount Temperature Sensor
TE-6361M-1 ¹	Duct Mount Air Temperature Sensor
TEC20-A-1	Replacement antenna for TEC20 Coordinator
TEC20-RA-1	Remote antenna for TEC20 Coordinator when it is installed inside a metal cabinet or when remote antenna mounting is required by physical installation
NPB-PWR ²	DIN Rail Mount 24 VAC/DC Power Module for TEC20 Coordinator
TEC20-8X-1	120 VAC to 15 VDC Power Supply for TEC20 Coordinator
TEC20-9B-1	Replacement Battery Pack for TEC20 Coordinator
TEC-6-PIR ³	Commercial Fan Coil Cover with Occupancy Sensor
TEC-6H-PIR ⁴	Hospitality Fan Coil Controller Cover with Occupancy Sensor
TEC-7-PIR ⁵	Zone Controller Cover with Occupancy Sensor

- 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.
- 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.
- The TEC-6-PIR Accessory Cover can be used to replace the existing cover on a non-PIR TEC20x6-4 Series Wireless Thermostat Controller to provide occupancy sensing capability.
- The TEC-6H-PIR Accessory Cover can be used to replace the existing cover on a non-PIR TEC20x6H-4 Series Wireless Thermostat Controller to provide occupancy sensing capability.
- The TEC-7-PIR Accessory Cover can be used to replace the existing cover on a non-PIR TEC20x7-4 Series Wireless Thermostat Controller to provide occupancy sensing capability.



TEC20xx-4 and TEC20xx-4+PIR Series Wireless Thermostat Controller System for Fan Coil and Zoning Equipment (Continued)

Technical Specifications

TEC20 Wireless Coordinator	
Product Code Numbers	TEC20-3C-2: BACnet IP version TEC20-6C-2: BACnet MS/TP version
Power Requirements	15 VDC, 6 W maximum
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	Niagra ^{AX}
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 (Other compliance information pending) 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 (Other compliance information pending)
Dimensions (H x W x D)	122.4 x 160.4 x 61.9 mm (4.820 x 6.313 x 2.438 in.)
Shipping Weight	0.499 kg (1.1 lb)
TEC20xx-4 and TEC20xx-4+PIR Wireless Thermostat Controllers for Fan Coil and Zoning Equipment Control (Part 1 of 2)	
Power Requirements	19 to 30 VAC, 50/60 Hz, 2 VA (Terminals 4 and 5) at 24 VAC Nominal, Class 2 or Safety Extra-Low Voltage (SELV)
Analog Output Rating	Proportional Control (TEC204x-4 and TEC205x-4) Models 0 to 10 VDC into 2k ohm Resistance (Minimum)
Fan Relay Output Rating	TEC2045-4, TEC20x6(H)-4, TEC20x6H-4+PIR Models: 19 to 30 VAC, 1.0 A Maximum, 15 mA Minimum, 3.0 A In-Rush
Relay/Triac Contact Rating	On/Off and Floating Control (TEC201x[H]-4, TEC201xH-4+PIR, TEC202x[H]-4, TEC202xH-4+PIR, TEC203x[H]-4, TEC203xH-4+PIR Models): 19 to 30 VAC, 1.0 A Maximum, 15 mA Minimum, 3.0 A In-Rush, Class 2 or SELV
Auxiliary Output Rating	Triac Output: 19 to 30 VAC, 1.0 A Maximum, 15 mA Minimum, 3.0 A In-Rush
Binary Inputs	Voltage-Free Contacts across Terminal Scm to Terminals B11, B12, or UI3
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	±0.1C°/±0.2F°
Accuracy	Temperature: ±0.5C°/±0.9F° at 21.0°C/70.0°F Typical Calibrated Humidity (TEC2036[H]-2 or TEC2056[H]-2Models): ±5% RH from 20 to 80% RH at 10 to 32°C (50 to 90°F)
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
Minimum Deadband	1C°/2F° between Heating and Cooling
Ambient Conditions	Operating: 0 to 50°C (32 to 122°F); 95% RH Maximum, Noncondensing Storage: -30 to 50°C (-22 to 122°F); 95% RH Maximum, Noncondensing

TEC20xx-4 and TEC20xx-4+PIR Series Wireless Thermostat Controller System for Fan Coil and Zoning Equipment (Continued)

TEC20xx-4 and TEC20xx-4+PIR Wireless Thermostat Controllers for Fan Coil and Zoning Equipment Control (Part 2 of 2)	
Compliance (Pending)	<p>United States: UL Listed, File E27734, CCN XAPX, Under UL 873, Temperature Indicating and Regulating Equipment FCC Compliant to Part 15.247 Regulations for Low Power Unlicensed Transmitters (Other compliance information pending)</p> <p>Canada: UL Listed, File E27734, CCN XAPX7, Under CSA C22.2 No. 24, Temperature Indicating and Regulating Equipment Industry Canada, ICES-003 (Other compliance information pending)</p>
Dimensions (H x W x D)	<p>TEC20xx(H)-4 Models: 125 x 86 x 29 mm (4-15/16 x 3-3/8 x 1-1/8 in.) TEC20xx-4+PIR Models: 125 x 86 x 36 mm (4-15/16 x 3-3/8 x 1-3/8 in.)</p>
Shipping Weight	<p>TEC20xx(H)-4 Models: 0.75 lb (0.34 kg) TEC20xx-4+PIR Models: 0.77 lb (0.35 kg)</p>