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TEC200x-4 and TEC200x-4+PIR Series

Wireless Thermostat Controller System for Staged Equipment

Description

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.

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.

Refer to the *TEC200x-4 and TEC200x-4+PIR Series Wireless Thermostat Controller System for Staged Equipment Product Bulletin (LIT-12011590)* for important product application information.

Features

- wireless communication — allows BAS communications capability in applications where field bus wiring within the building is prohibitive
- 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
- 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
- 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 digital inputs on all models — provide additional inputs for advanced functions such as remote night setback, service or filter alarms, or occupancy override

TEC200x-4 Wireless Thermostat Controller and TEC20 Coordinator with Direct-Mount Antenna and Remote Mount Antenna

- over 20 configurable parameters — enable the TEC200x-4 and TEC200x-4+PIR Series Wireless Networked Thermostat Controllers to adapt to any application, allowing installer parameter access without opening the cover
- Economizer output (TEC2004-4 and TEC2004-4+PIR models) — provides control of economizer operation for single- and multi-stage unitary rooftop equipment
- optional discharge air sensor — monitors unit efficiency

Applications

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

Repair Information

If the TEC200x-4 and TEC200x-4+PIR Series Wireless Thermostat Controller System for Staged Equipment fails to operate within its specifications, replace the unit. For a replacement, contact the nearest Johnson Controls® representative.

TEC200x-4 and TEC200x-4+PIR Series Wireless Thermostat Controller System for Staged Equipment (Continued)

Selection Charts

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

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

TEC20 Coordinators

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
TEC-3-PIR[1]	Cover with Occupancy Sensor
TE-6361M-1[2]	Duct Mount Air Temperature Sensor
TE-636S-1	Strap-Mount Temperature Sensor
TE-6363P-1[2]	Outside Air Temperature Sensor
TEC20-A-1	Replacement Antenna for TEC20 Coordinator
TEC20-RA-1[3]	Remote Antenna for TEC20 Coordinator
NPB-PWR[4]	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

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 (Part 1 of 2)	
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	Niagara[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

TEC200x-4 and TEC200x-4+PIR Series Wireless Thermostat Controller System for Staged Equipment (Continued)

TEC20 Wireless Coordinator (Part 2 of 2)	
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	
Power Requirements	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)
Economizer Output Rating	**TEC2004-4 and TEC2004-4+PIR Models:** 0 to 10 VDC into 2k ohm Resistance (Minimum)
Relay/Triac Contact Rating	19 to 30 VAC, 1.0 A Maximum, 15 mA Minimum, 3.0 A In-Rush, Class 2 or SELV
Digital Inputs	Voltage-Free Contacts across Terminal C to Terminals DI1 and DI2
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
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
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
Compliance	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
	Canada: UL Listed, File E27734, CCN XAPX7, Under CAN/CSA C22.2 No. 24, Temperature Indicating and Regulating Equipment Industry Canada, ICES-003
Shipping Weight	**TEC200x-4 Models:** 0.34 kg (0.75 lb) **TEC200x-4+PIR Models:** 0.35 kg (0.77 lb)