

TE-7800 Series

One-to-One Wireless Room Temperature Sensing System

Description

The TE-7800 Series One-to-One Wireless Room Temperature Sensing System is designed to interface with supported Johnson Controls® field controllers to provide wireless temperature monitoring and control of single-zone, room temperature applications.

A simple One-to-One wireless sensing system consists of one WRS-TTx Series Wireless Room Temperature Sensor communicating single-zone temperature data to an associated TE-7800 Series Receiver. Up to four sensors can report to a single receiver to provide enhanced zone control.

- A **TE-7820-x Series Receiver** interfaces with a single Johnson Controls VMA1400 Series Controller.
- A **TE-7830-x Series Receiver** interfaces with a single Johnson Controls AS-AHU, AS-UNT, AS-VAV, DX9100, or FXxx Series Controller.

The TE-7800 Series Receivers operate at 2.4 GHz and use a multiple-frequency, Direct-Sequence Spread-Spectrum (DSSS) technology to virtually eliminate accidental and unauthorized Radio Frequency (RF) interference with other wireless applications. The One-to-One design meets the Institute of Electrical and Electronics Engineers, Inc. (IEEE) 802.15.4 standard for low power, low duty-cycle wireless RF systems.

Refer to the *TE-7800 Series One-to-One Wireless Room Temperature Sensing System Product Bulletin (LIT-12011096)* for important product application information.

Features

- One-to-One wireless RF design — enables quick, economical, and low-maintenance installations, which reduce installation and wiring costs.
- stylish, lightweight wireless room temperature sensors with occupancy override button and 60-second transmission intervals — are easy-to-install and provide room temperature, set point temperature, occupancy status, and low battery conditions to Metasys® system field controllers. Transmission intervals greatly extend sensor battery life, and enable continuous operation over the life of the batteries (approximately 5 years) while maintaining an even temperature in the controlled zones.

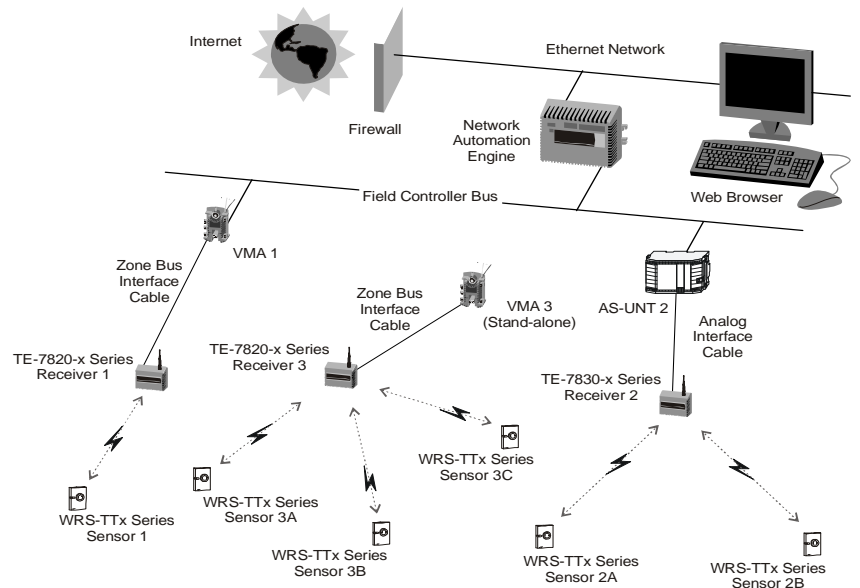
- integral wireless signal strength testing built into sensors and receivers — provides quick, easy, visual indication of the wireless RF signal strength between a sensor and associated receiver, helps locate optimum device positions during installation and aids troubleshooting.
- multiple sensor temperature averaging and high/low selection — enhance zone temperature control by enabling up to four sensors to report to a single receiver, which can be set to average the sensor temperature or select the highest or lowest temperature value to control the zone.
- compact, easy-to-install TE-7800 Series Receiver — receives sensed temperature, set point, and low battery condition from WRS-TTx Series Sensors and interfaces directly with a Metasys system field controller.
- optional, battery-powered WRS-SST Series Wireless Sensing System Tools — connect to a laptop computer and allow you to quickly and easily determine RF signal strength, system temperature values, and the optimum device locations in your application.



WRS-TTx Series Wireless Room Temperature Sensor, TE-7820-x Series Receiver, and TE-7830-x Series Receiver for the One-to-One Wireless Room Temperature Sensing System

Repair Information

If the TE-7800 Series One-to-One Wireless Room Temperature Sensing System fails to operate within its specifications, replace the system. For a replacement system, contact the nearest Johnson Controls representative.



One-to-One Wireless Room Temperature Sensing Applications



TE-7800 Series One-to-One Wireless Room Temperature Sensing System (Continued)

Selection Chart

Product Code Number	Product Description
TE-7820-0	Receiver with Zone Bus Interface for One-to-One Wireless Room Temperature Sensing System, Interfaces with VMA1400 Series Controllers (Only), Includes 1.8 m (6 ft) Zone Bus Interface Cable and Omnidirectional Antenna, 15 dBm Transmission Power
TE-7820-1	Receiver with Zone Bus Interface for One-to-One Wireless Room Temperature Sensing System, Interfaces with VMA1400 Series Controllers (Only), Includes 1.8 m (6 ft) Zone Bus Interface Cable and Omnidirectional Antenna, 10 dBm Transmission Power (CE Mark)
TE-7830-0	Receiver with Analog Interface for One-to-One Wireless Room Temperature Sensing System, Interfaces with Specified Analog Digital Controllers (Johnson Controls AS-AHU, AS-UNT, AS-VAV, DX-9100, or FXxx Series Controllers), Includes 1.8 m (6 ft) Analog Interface Cable and Omnidirectional Antenna, 15 dBm Transmission Power
TE-7830-1	Receiver with Analog Interface for One-to-One Wireless Room Temperature Sensing System, Interfaces with Specified Analog Digital Controllers (Johnson Controls AS-AHU, AS-UNT, AS-VAV, DX-9100, or FXxx Series Controllers), Includes 1.8 m (6 ft) Analog Interface Cable and Omnidirectional Antenna, 10 dBm Transmission Power (CE Mark)
WRS-TTP0000-0	Wireless Room Temperature Sensor, Warmer/Cooler (+/-) Set Point Adjustment, 15 dBm Transmission Power
WRS-TTP0000-1	Wireless Room Temperature Sensor, Warmer/Cooler (+/-) Set Point Adjustment, 10 dBm Transmission Power (CE Mark)
WRS-TTR0000-0	Wireless Room Temperature Sensor, No Set Point Adjustment, 15 dBm Transmission Power
WRS-TTR0000-1	Wireless Room Temperature Sensor, No Set Point Adjustment, 10 dBm Transmission Power (CE Mark)
WRS-TTS0000-0	Wireless Room Temperature Sensor, Set Point Adjustment Scale: 13 to 29°C/55 to 85°F, 15 dBm Transmission Power
WRS-TTS0000-1	Wireless Room Temperature Sensor, Set Point Adjustment Scale: 13 to 29°C/55 to 85°F, 10 dBm Transmission Power (CE Mark)

Accessories

Product Code Number	Product Description
WRS-SST-100	Wireless Sensing System Tool Designed to Associate with WRS-TTx Series Sensors and Provide RF Signal Strength and System Temperature Information, 15 dBm Transmission Power
WRS-SST-101	Wireless Sensing System Tool Designed to Associate with WRS-TTx Series Sensors and Provide RF Signal Strength and System Temperature Information, 10 dBm Transmission Power (CE Mark)
CBL-STAT25	7.6 m (25 ft) Interface Cable to Connect Zone Bus between TE-7820-x Series Receiver and Johnson Controls VMA1400 Series Controllers (Does Not Include Power Cable)
CBL-STAT50	15.2 m (50 ft) Interface Cable to Connect Zone Bus between TE-7820-x Series Receiver and Johnson Controls VMA1400 Series Controllers (Does Not Include Power Cable)
CBL-STAT75	22.9 m (75 ft) Interface Cable to Connect Zone Bus between TE-7820-x Series Receiver and Johnson Controls VMA1400 Series Controllers (Does Not Include Power Cable)
CBL-STAT100	30.5 m (100 ft) Interface Cable to Connect Zone Bus between TE-7820-x Series Receiver and Johnson Controls VMA1400 Series Controllers (Does Not Include Power Cable)
T-4000-119	Allen-Head Adjustment Tool (30 per Bag)
TP-2420	Transformer, Wall Plug Mount, 120 VAC Primary to 24 VAC Secondary, 20 VA, Class 2
Y65T31-0 ¹	Transformer, 120/208/240 VAC Primary to 24 VAC Secondary, 40 VA, Foot Mount, 8 in. Primary Leads and Secondary Screw Terminals, Class 2

1. Additional Y60 Series Transformers are also available from Johnson Controls.

Technical Specifications

TE-7800 Series Receivers (Part 1 of 2)	
Product Codes	TE-7820-x Series Receivers for One-to-One Zone Bus Interface Applications TE-7830-x Series Receivers for One-to-One 0 to 5 VDC Analog Interface Applications
Field Controller Interface	TE-7820-x Series Receivers: Power and Zone Bus Interface between TE-7820-x Series Receiver and VMA1400 Series Controller TE-7830-x Series Receivers: Power and 0 to 5 VDC Analog Interface between TE-7830-x Series Receiver and AS-AHU, AS-UNT, AS-VAV, DX-9100, and FXxx Series Controller
Power Requirements	24 VAC (+10%/-15%), 50/60 Hz, 4.5 VA (Minimum) Class 2 Power Supply
Addressing	TE-7820-x Series Receivers: DIP Switches, Field Adjustable for up to 510 Unique Addresses; For Addresses 0 and 511, the TE-7820-x Series Receiver Matches the N2 Address of the Associated VMA1400 Series Controller for its Actual Address TE-7830-x Series Receivers: DIP Switches, Field Adjustable for up to 510 Unique Addresses; Addresses 0 and 511 are Invalid
Ambient Operating Temperature Limits	0 to 50°C (32 to 122°F)
Ambient Operating Humidity Limits	0 to 95% RH, Noncondensing
Ambient Storage Temperature Limits	-40 to 71°C (-40 to 160°F)

The performance specifications are nominal and conform to acceptable industry standards. For applications 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. © 2012 Johnson Controls, Inc. www.johnsoncontrols.com



TE-7800 Series One-to-One Wireless Room Temperature Sensing System (Continued)

TE-7800 Series Receivers (Part 2 of 2)	
Ambient Storage Humidity Limits	5 to 90% RH, Noncondensing
RF Band	Direct-Sequence Spread-Spectrum, 2.4 GHz ISM Bands
Transmission Range	TE-78x0-0 Series Receivers: 152 m (500 ft) Maximum Indoor Line-of-Sight; 61 m (200 ft) Practical Average Indoor TE-78x0-1 Series Receivers: 114 m (375 ft) Maximum Indoor Line-of-Sight; 50 m (165 ft) Practical Average Indoor
Transmissions	Every 60 Seconds (±20 Seconds)
Receiver Outputs	TE-7820-x Series Receivers: One Zone Bus Output for Temperature, Set Point, Field Strength Measurements, and Low Battery Indication TE-7830-x Series Receivers: Two Analog Outputs for Zone Temperature and Set Point: 0 to 5 VDC, 2 mA Maximum; Two Binary Outputs for Occupancy and Low Battery: Dry Contacts Rated for 24 VAC, 50 mA Maximum
Temperature System Accuracy	0.6C° (1F°) Over a Range of 13 to 29°C (55 to 85°F); 0.9C° (1.5F°) Over the Ranges of 0 to 13°C (32 to 55°F) and 29 to 43°C (85 to 110°F)
Temperature Sensor Type	Internal 10k ohm Negative Temperature Coefficient (NTC) Thermistor
Wiring Terminations and Network Interfaces	TE-7820-x Series Receivers: One Two-Position Terminal Block for 24 VAC Class 2 Supply Power and One Zone Bus Port TE-7830-x Series Receivers: One Two-Position Terminal Block for 24 VAC Class 2 Supply Power, One Three-Position Terminal Block for Occupancy and Low Battery Binary Input Relays, and One Three-Position Terminal Block for Zone Temperature and Set Point Temperature Outputs
Materials	Gray Plastic Housing with UL94-5VB Flammability Rating
Mounting	Screw Mount; Four No. 6 Pan-Head Sheet-Metal Screws Included
Dimensions	TE-7800 Series Receivers: 146 x 122 x 52 mm (5.8 x 4.8 x 2.1 in.) Omnidirectional Antenna Length: 140 mm (5.5 in.)
Shipping Weight	0.45 kg (1.0 lb)
Compliance (TE-78x0-0 Series Receivers)	United States: Intended for NEC Class 2 Connection UL Listed, File E107041, CCN PAZX UL 94-5VB Flammability Rating FCC Compliant to CFR 47, Part 15, Subpart B, Class A Transmission Complies with FCC Part 15.247 Regulations for Low Power Unlicensed Transmitters Receiver Radio Module FCC Identification: CB2-TMPSENS2400A Canada: Intended for CEC Class 2 Connection UL Listed, File E107041, CCN PAZX7 UL 94-5VB Flammability Rating Industry Canada IC: 279A-RFMOD24A Australia and New Zealand: Australia/NZ Emissions Compliant (C-Tick Mark)
Compliance (TE-78x0-1 Series Receivers)	European Union: CE Mark – EMC Directive 89/336/EEC, Radio Telecommunications Terminal Equipment Directive 99/5/EC South Africa: Accepts Directives for Europe

WRS-TTx Series Sensors (Part 1 of 2)	
Product Codes	WRS-TTP0000-x Series Sensors: Warmer/Cooler (+/-) Set Point Adjustment WRS-TTR0000-x Series Sensors: No Set Point Adjustment WRS-TTS0000-x Series Sensors: Set Point Adjustment Scale 13 to 29°C/55 to 85°F
Power Requirements	3 VDC Supplied by Two 1.5 VDC AA Alkaline Batteries (Included with Sensor); Typical Battery Life: 60 Months (48 Months Minimum)
Addressing	DIP Switches, Field Adjustable for up to 511 Unique Transmitter ID Addresses and for up to 31 Unique Property Code Addresses
Ambient Operating Temperature Limits	-18 to 50°C (0 to 122°F)
Ambient Operating Humidity Limits	5 to 95% RH, Noncondensing
Ambient Storage Temperature Limits	-40 to 71°C (-40 to 160°F)
Ambient Storage Humidity Limits	5 to 95% RH, Noncondensing
RF Band	Direct-Sequence Spread-Spectrum, 2.4 GHz ISM Bands
Transmission Power	WRS-TTx0000-0 Series Sensors: 15 dBm Maximum WRS-TTx0000-1 Series Sensors: 10 dBm Maximum
Transmission Range	WRS-TTx0000-0 Series Sensors: 152 m (500 ft) Maximum Indoor Line-of-Sight; 61 m (200 ft) Practical Average Indoor WRS-TTx0000-1 Series Sensors: 114 m (375 ft) Maximum Indoor Line-of-Sight; 50 m (165 ft) Practical Average Indoor
Transmissions	Every 60 Seconds (±20 Seconds); Every 10 Seconds (±2 Seconds) in Rapid Transmit Mode
Temperature System Accuracy	0.6C° (1F°) Over a Range of 13 to 29°C (55 to 85°F); 0.9C° (1.5F°) Over the Ranges of 0 to 13°C (32 to 55°F) and 29 to 43°C (85 to 110°F)

The performance specifications are nominal and conform to acceptable industry standards. For applications 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. © 2012 Johnson Controls, Inc. www.johnsoncontrols.com

One-to-One Wireless Room Temperature Sensing System (Continued)

WRS-TTx Series Sensors (Part 2 of 2)	
Sensor Type	Internal 10K ohm NTC Thermistor
Materials	NEMA 1 White Plastic Housing
Mounting	Screw Mount, Double-Sided Adhesive Foam Tape Mount; Mounting Screws, Plastic Anchors, and Double-Sided Adhesive Foam Tape Included
Dimensions	120 x 80 x 38 mm (4.7 x 3.1 x 1.5 in.)
Shipping Weight	0.14 kg (0.3 lb)
Compliance (WRS-TTx0000-0 Series Sensors)	United States: Transmission Complies with FCC Part 15.247 Regulations for Low Power Unlicensed Transmitters Transmitter FCC Identification: CB2-TMPSENS2400A
	Canada: Industry Canada IC: 279A-TSENS24A
	Australia and New Zealand Australia/NZ Emissions Compliant (C-Tick Mark)
Compliance (WRS-TTx0000-1 Series Sensors)	European Union: CE Mark – EMC Directive 89/336/EEC, Radio Telecommunications Terminal Equipment Directive 99/5/EC
	South Africa: Accepts Directives for Europe