Code No. LIT-1900684
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FX-ZFR1810 Series

FX-ZFR Series Wireless Field Bus System

Description

The FX-ZFR Series Wireless Field Bus System uses ZigBee™ technology to provide a wireless platform for Facility Explorer Programmable Controllers (FX-PCs), including FX-PCA, FX-PCGs, FX-PCVs, and FX-PCXs.

One FX-ZFR1811 router is required per FX-PC Controller. This pairing of a router and an FX-PCA, FX-PCG, FX-PCX, or FX-PCV is a Wireless Enabled Programmable Controller (WEPC).

An FX-ZFR Series system consists of:

- up to eight FX-ZFR1810 Wireless Field Bus Coordinators per field bus
- up to 35 Wireless Enabled Programmable Controllers (WEPCs) per coordinator
- up to nine FX-WRZ Sensors per FX-PCG or FX-PCV Controller
- additional FX-ZFR1811 Wireless Field Bus Routers as required, acting as repeaters

Note: Repeaters extend the wireless transmission distance of the data communications, fill in any gaps within the wireless mesh network, and provide multiple wireless data transmission pathways.

The wireless mesh network enhances reliability by providing redundant transmission paths for the data through other routers in the mesh network. The result is a resilient, self-healing network.

Together, these components create a wireless mesh network that allows the exchange of data between the collection of devices within the FX-ZFR Series System's wireless network and wired Programmable Controllers.

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Features

- Wireless Communications for a Facility Explorer System
- Wireless Mesh Network
- Improved Application Mobility and Flexibility
- Support of up to Nine FX-WRZ Series Wireless Room Sensors per Wirelessly Enabled Field Controller
- Multiple Diagnostic Light-Emitting Diodes (LEDs)
- Compact, Easy-to-Install, and Versatile FX-ZFR1811 Routers

Applications

The wireless products within a Facility Explorer system are ideal for any location where it is cost-prohibitive, difficult, or aesthetically unappealing to hardwire between Facility Explorer products. Examples of these locations include the following:

- hospitals, office buildings, university campuses, educational facilities, correctional facilities, and other commercial structures with brick or solid concrete walls or ceilings that impede hard-wired applications
- office buildings, retail stores, and other commercial real estate where tenant turnover is frequent and temporary walls and ceilings are common
- museums, historical buildings, atriums, and other sites where building aesthetics and historical preservation are important
- stadiums, arenas, gymnasiums, convention centers, airports, zoos, and other locations with large, open spaces
- buildings with marble, granite, glass, mirrored, wood veneer, or other decorative surfaces that present challenges to hardwiring

FX-ZFR1811 Routers (Top Left), FX-ZFR1810 Coordinator (Top Center), and FX-WRZ Series Sensors (Bottom)

- buildings with asbestos or other hazardous materials that must not be disturbed
- buildings with occupants sensitive to disruptions to business
- regions with high labor costs

The FX-ZFR Series Wireless Field Bus System is approved by national compliance agencies for use only in the United States and Canada. See *Technical Specifications*.

Refer to the *FX-ZFR Series Wireless Field Bus System Product Bulletin (LIT-12011686)* for more information.

Repair Information

If an FX-ZFR Series Wireless Field Bus System component fails to operate within its specifications, replace the unit. For a replacement FX-ZFR Series System component, contact the nearest Johnson Controls® representative.

FX-ZFR Series Wireless Field Bus System (Continued)

Selection Charts

FX-ZFR Series Wireless Field Bus System Components

Product Code Number	Product Description
FX-ZFR1810-x	Wireless Field Bus Coordinator, 10 mW Transmission Power; Functions with FX Supervisory Controllers
FX-ZFR1811-x	Wireless Field Bus Router, 10 mW Transmission Power; Functions with Facility Explorer Programmable Controllers (FX-PCs) and FX-WRZ Series Wireless Room Sensors
FX-WRZMHN01-0	Wireless Room Temperature and Humidity Sensor with PIR Occupancy Sensor, Battery Level/Signal Strength LED, and Manual Occupancy Override Button
FX-WRZMNN01-0	Wireless Room Sensor (No Temperature or Humidity Sensing) with PIR Occupancy Sensor, Battery Level/Signal Strength LED, and Manual Occupancy Override Button
FX-WRZMTB01-0	Wireless Room Temperature Sensor with PIR Occupancy Sensor, Display, Setpoint Adjustment Scale: 55 to 80°F (13 to 27°C), F/C Button, and Manual Occupancy Override Button
FX-WRZMTN01-0	Wireless Room Temperature Sensor with PIR Occupancy Sensor, Battery Level/Signal Strength LED, and Manual Occupancy Override Button
FX-WRZRMT10K-0	Wireless Remote Temperature Transmitter designed to operate with a TE-6300 Series 10k ohm Johnson Controls® Type II Thermistor Sensor (order separately) to sense temperature in warmer applications up to 158°F (70°C). Includes one Transmitter, one Mounting Base, strips of Double-Sided Adhesive Foam Tape (all factory assembled), and one Strain Relief
FX-WRZSTR00-0	Wireless Transmitter and Temperature Sensor with Display and F/C Button. Includes Temperature Probe encased in a Clear Acrylic Cylinder, 9 ft (2.7 m) Wire Lead, one Probe Mounting Strap, and a strip of Double-Sided Adhesive Foam Tape, 10 mW Transmission Power
FX-WRZTHB00-0	Wireless Room Temperature and Humidity Sensor with Display, Warmer/Cooler (+/-) Setpoint Adjustment or Setpoint Adjustment Scale: 55 to 85°F (13 to 27°C), F/C Button, Relative Humidity (RH) Button, and Manual Occupancy Override Button
FX-WRZTHN00-0	Wireless Room Temperature and Humidity Sensor with Battery Level/Signal Strength LED and Manual Occupancy Override Button
FX-WRZTHP00-0	Wireless Room Temperature and Humidity Sensor, Warmer/Cooler (+/-) Setpoint Adjustment, F/C Button, Relative Humidity (RH) Button, and Manual Occupancy Override Button
FX-WRZTTB00-0	Wireless Room Temperature Sensor with Display, F/C Button, and Manual Occupancy Override Button
FX-WRZTTD00-0	Wireless Room Temperature Sensor with Display, F/C Button, Fan Speed Control, and Manual Occupancy Override Button
FX-WRZTTP00-0	Wireless Room Temperature Sensor with Warmer/Cooler (+/-) Setpoint Adjustment, Battery Level/Signal Strength LED, and Manual Occupancy Override Button
FX-WRZTTR00-0	Wireless Room Temperature Sensor with Battery Level/Signal Strength LED, Manual Occupancy Override Button, and No Setpoint Adjustment
FX-WRZTTS00-0	Wireless Room Temperature Sensor with Setpoint Adjustment Scale: 55 to 80°F (13 to 27°C), Battery Level/Signal Strength LED, and Manual Occupancy Override Button

FX-WRZ Sensor Model Comparison

Sensor Model	Temperature	3% Humidity	Display	F/C Button	Fan Control	Occupancy Motion Detection (PIR)	Occupancy Override Button	Setpoint Adjustment Dial[1]
FX-WRZMHN01-0	x	x				x		
FX-WRZMNN01-0						x		
FX-WRZMTB01-0	x					x		
FX-WRZMTN01-0	x		x			x		ABSOL
FX-WRZSTR00-0	x		x	x				
FX-WRZSTRNIST-0			x	x				
FX-WRZTHB00-0	x	x	x	x			x	Both
FX-WRZTHN00-0	x	x					x	
FX-WRZTHP00-0	x	x					x	W/C
FX-WRZTTB00-0	x		x	x			x	Both
FX-WRZTTD00-0	x		x	x	x		x	Both
FX-WRZTTP00-0	x						x	W/C
FX-WRZTTR00-0	x						x	
FX-WRZTTS00-0	x						x	ABSOL

1. Either Absolute Scale (ABSOL), Warmer/Cooler (W/C) or Both.

FX-ZFR Series Wireless Field Bus System (Continued)

Accessories

Product Code Number	Product Description
FX-ZFRRPT-0	Optional power supply accessory for use with FX-ZFR1811 Router when used as a repeater. Includes 20 to 28 VAC or 16 to 30 VDC input power, 12 VDC output power supply (regulated at 500 mA maximum, 6 VA), and 4 x 4 in. (10.16 x 10.16 cm) electrical box with cover. Kit does not include an FX-ZFR1811 Router.
FX-ZFRCBL-0	Wire Harness for use with Wireless Field Bus Router. Allows Wireless Field Bus Router to function with FX-PCV1610/1620; in conjunction with NS Series Network Sensors, Wireless Commissioning Converter, or Local Controller DIsplay.
FX-WRZSST-120	Wireless Sensing System Tool: For Use with an FX-WRZ Series Sensor, to Function as a Site Survey Tool for the FX-WRZ7860 One-to-One Room Temperature Sensing System, or for the FX-ZFR1800 Series Bluetooth® Field Bus System
ZFR-USBHA-0	USB dongle with ZigBee driver to provide a wireless connection through FX-PCT to allow wireless commissioning of the wirelessly enabled FX-PC controllers. The dongle is used with the FX-ZFR Checkout Tool to troubleshoot and validate FX-ZFR wireless meshes using a laptop computer.
ZFR-1810ANT-700	Replacement antenna kit for FX-ZFR1810 Wireless Field Bus Coordinator. Includes antenna, coaxial cable, and mounting hardware
FX-WRZSST-120	Optional Wireless Sensing System Tool to be used with a FX-WRZ Series Sensor to indicate wireless signal strength between potential locations of ZFR1800 System devices.
FX-BTCVT-1	Bluetooth® Commissioning Converter
FX-DIS1710-0	Local Controller Display
TP-2420	Transformer, Wall Plug Mount, 120 VAC to 24 VAC, 20 VA, Class 2
Y65T31-0[1]	Transformer, 120/208/240 VAC to 24 VAC, 40 VA, Class 2, Foot Mount, 20 cm (8 in.) Primary Leads and Secondary Screw Terminals
T-4000-119	1.6 mm (1/16 in.) Allen-Head Adjustment Tool (30 per Bag) for Accessing and Securing FX-WRZ Series Wireless Room Sensors
MAGNET-BASE-PLW	Magnetic Backplate for Mounting an FX-WRZRMT10K-0 Transmitter on Metal Surfaces; 5 Magnetic Backplates per Package
1.5 VDC, AA Alkaline Battery	Replacement Battery for FX-WRZ Series Wireless Room Sensors (Purchase Locally.)

1. Additional Y6x Series Transformers are available from Johnson Controls. Refer to the *Series Y63, Y64, Y65, Y66, and Y69 Transformers Product Bulletin (LIT-125755)*.

Technical Specifications

FX-ZFR1810 Wireless Field Bus Coordinator (Part 1 of 2)	
Product Code Number	FX-ZFR1810-x
Power Supply Input	**One of the following:** 24 VAC +10%/-15%, 50/60 Hz, Class 2. Transformer allowance should be 2.5 VA maximum, 2 VA typical. Provided through the three-position 24 V~ screw terminal pluggable block. 15 VDC, 180 mA (7 to 18 VDC, 185 mA maximum current draw) on the FC Bus provided through the FC/SA BUS IN RJ-12 jack from the FC Bus Jack on an FX-PC Controller
Power Supply Output	15 VDC; Provided through the FC/SA BUS, FC/SA BUS OUT RJ-12 jack for external devices.
Addressing	DIP Switches, Field Adjustable
Wireless Band	Direct-Sequence Spread-Spectrum, 2.4 GHz ISM Bands
Transmission Power	10 mW Maximum
Transmission Range	76.2 m (250 ft) Maximum Line-of-Sight 15 m (50 ft) Recommended
Ambient Conditions	**Operating:** 0 to 50°C (32 to 122°F), 5 to 95% RH, Noncondensing **Storage:** -20 to 70°C (-4 to 158°F), 5 to 90% RH, Noncondensing
Materials	White Plastic Housing with Plenum rating per UL1995 UL94-5VB Flammability Rating
Terminations	Two spade terminals with three-position screw terminal pluggable block for 24 VAC power supply input. Four spade terminals with four-position screw terminal pluggable block for RS-485 communications. RJ-12 IN jack for 15 VDC power supply and communications connection from an FX-PC Bus jack. RJ-12 OUT jack supplies 15 VDC and communications to FX-BTCVT Bluetooth Commissioning Converter.
Dimensions	146 x 122 x 52 mm (5.8 x 4.8 x 2.1 in.)
Mounting Hardware	Four No. 6 Trade Size Sheet Metal Screws
Shipping Weights	0.45 kg (1.0 lb)

FX-ZFR Series Wireless Field Bus System (Continued)

FX-ZFR1810 Wireless Field Bus Coordinator (Part 2 of 2)	
Compliance	**United States:** Intended for Connection to an NEC Class 2 Power Source; UL 916 Energy Management Plenum rated per UL1995 UL94-5VB Flammability Rating FCC Compliant to CFR47, Part 15, Subpart B, Class A Transmission Complies with FCC Part 15.247 Regulations for Low Power Unlicensed Transmitters Transmitter FCC Identification: TFB-MATRIXL **Canada:** CAN/CSA C22.2 No. 205, Signal Equipment Industry Canada (IC) Compliant to Canadian ICES-003, Class B Limits Industry Canada IC: 5969A-MATRIXL
CE	**Europe**: CE Mark – Johnson Controls, Inc., declares that this product is in compliance with the essential requirements and other relevant provisions of the R&TTE Directive 1999/05/EC and EMC Directive 2004/108/EC. **Australia and New Zealand:** C-Tick Mark, Australia/NZ Emissions Compliant

FX-ZFR Wireless Field Bus Routers	
Product Code Number	FX-ZFR1811-x
Supply Voltage	8 to 18 VDC, 15 VDC Nominal, Provided from the FC/SA BUS RJ-12 Jack on the FX-PC Controller or FX-ZFRRPT-0 when used as a Repeater
Current Consumption	90 mA maximum
Addressing	DIP Switches, Field Adjustable
Wireless Band	Direct-Sequence Spread-Spectrum, 2.4 GHz ISM Bands
Transmission Power	10 mW Maximum
Transmission Range	76.2 m (250 ft) Maximum Indoor Line-of-Sight 15 m (50 ft) Recommended
Ambient Conditions	**Operating:** 0 to 50°C (32 to 122°F), 5 to 95% RH, Noncondensing **Storage:** -20 to 70°C (-4 to 158°F), 5 to 90% RH, Noncondensing
Materials	Translucent Plastic Housing with Plenum rating per UL1995 UL94-5VB Flammability Rating
Terminations	RJ-12 Plug for Connection to FX-PC controller FC/SA Bus Jack
Dimensions	136 x 100 x 18 mm (5-3/8 x 3-15/16 x 3/4 in.)
Mounting Hardware	1/2 in. trade size Electrical Mechanical Tubing (EMT) connector
Shipping Weights	0.095 kg (0.21 lb)
Compliance CE	**United States:** Intended for Connection to an NEC Class 2 Power Source; UL 916 Energy Management Plenum rated per UL1995 UL94-5VB Flammability Rating FCC Compliant to CFR47, Part 15, Subpart B, Class A Transmission Complies with FCC Part 15.247 Regulations for Low Power Unlicensed Transmitters Transmitter FCC Identification: TFB-MATRIXL **Canada:** CAN/CSA C22.2 No. 205, Signal Equipment Industry Canada (IC) Compliant to Canadian ICES-003, Class B Limits Industry Canada IC: 5969A-MATRIXL **Europe**: CE Mark – Johnson Controls, Inc., declares that this product is in compliance with the essential requirements and other relevant provisions of the R&TTE Directive 1999/05/EC and EMC Directive 2004/108/EC. **Australia and New Zealand:** C-Tick Mark, Australia/NZ Emissions Compliant

FX-ZFR Wireless Field Bus Routers (Part 1 of 2)	
Product Code Number	FX-ZFR1811-x
Supply Voltage	8 to 18 VDC, 15 VDC Nominal, Provided from the FC/SA BUS RJ-12 Jack on the FX-PC Controller or FX-ZFRRPT-0 when used as a Repeater
Current Consumption	90 mA maximum
Addressing	DIP Switches, Field Adjustable
Wireless Band	Direct-Sequence Spread-Spectrum, 2.4 GHz ISM Bands
Transmission Power	10 mW Maximum
Transmission Range	76.2 m (250 ft) Maximum Indoor Line-of-Sight 15 m (50 ft) Recommended

FX-ZFR Series Wireless Field Bus System (Continued)

FX-ZFR Wireless Field Bus Routers (Part 2 of 2)	
Ambient Conditions	**Operating:** 0 to 50°C (32 to 122°F), 5 to 95% RH, Noncondensing **Storage:** -20 to 70°C (-4 to 158°F), 5 to 90% RH, Noncondensing
Materials	Translucent Plastic Housing with Plenum rating per UL1995 UL94-5VB Flammability Rating
Terminations	RJ-12 Plug for Connection to FX-PC controller FC/SA Bus Jack
Dimensions	136 x 100 x 18 mm (5-3/8 x 3-15/16 x 3/4 in.)
Mounting Hardware	1/2 in. trade size Electrical Mechanical Tubing (EMT) connector
Shipping Weights	0.095 kg (0.21 lb)
Compliance CE	**United States:** Intended for Connection to an NEC Class 2 Power Source; UL 916 Energy Management Plenum rated per UL1995 UL94-5VB Flammability Rating FCC Compliant to CFR47, Part 15, Subpart B, Class A Transmission Complies with FCC Part 15.247 Regulations for Low Power Unlicensed Transmitters Transmitter FCC Identification: TFB-MATRIXL **Canada:** CAN/CSA C22.2 No. 205, Signal Equipment Industry Canada (IC) Compliant to Canadian ICES-003, Class B Limits Industry Canada IC: 5969A-MATRIXL **Europe**: CE Mark – Johnson Controls, Inc., declares that this product is in compliance with the essential requirements and other relevant provisions of the R&TTE Directive 1999/05/EC and EMC Directive 2004/108/EC. **Australia and New Zealand:** C-Tick Mark, Australia/NZ Emissions Compliant

USB Zigbee Dongle	
Product Code	ZFR-USBHA-0
Electrical Specifications	**Operating Voltage:** USB std 5 VDC **Standby Current:** 50 mA **Tx Current**: 190 mA **Rx Current**: 50 mA
RFSpecifications	**RF Frequency**: 2.4 - 2.4835 GH **Channels**: 16 **Modulation**: DSSS (O-QPSK) **Data Rate**: 250 Kbps **Tx Power**: 8 dBm **Rx Sensitivity**:- 85 dBm **Antenna Type**: Built-in Antenna **Coverage Range**: 100 meter (328 feet) line of sight. This distance is limited by the maximum line of sight transmission distance of the ZFR system. Actual line of sight distances may be lower.
Physical Specifications	**Dimensions**: 63.5 mm x 27.5mm x 10.5 mm **Operating Temperature**: Range -10°C (14°F) to 50°C (122°F)

