METASYS BUILDING MANAGEMENT SYSTEM

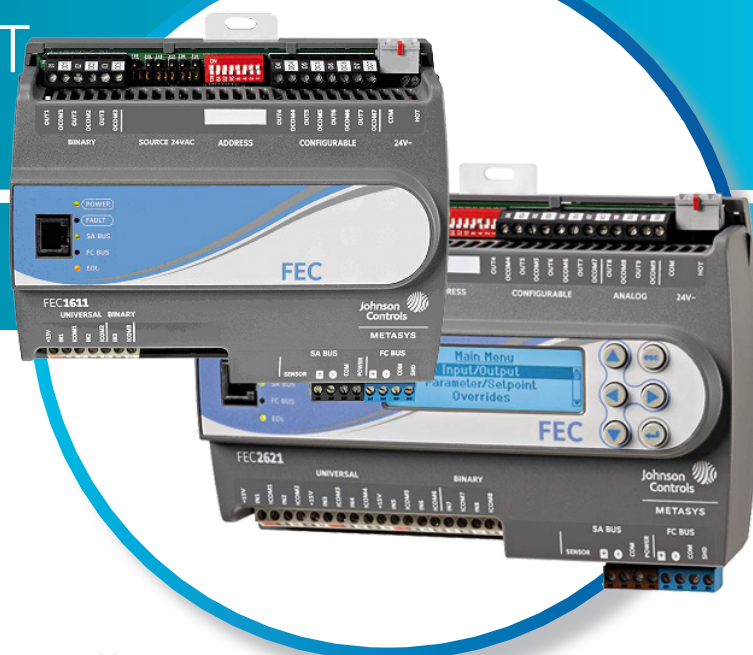## PROGRAMMABLE CONTROLLERS

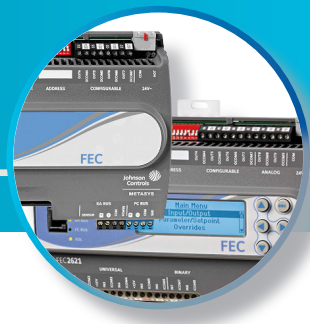### METASYS CONTROLLERS

FEC

FIELD EQUIPMENT CONTROLLERS

The Field Equipment Controller (FEC) Series products are programmable controllers that can be switched between BACnet® MS/TP and N2 communications protocols. When they are used as BACnet MS/TP devices, they are BACnet Application Specific Controllers (B-ASCs) with integral MS/TP communications. In N2 mode, they can be used to modernize sites with legacy Johnson Controls® controllers.

FECs feature 32-bit microprocessor architecture, patented continuous tuning adaptive control, and peer-to-peer communications, and are available with an optional built-in LCD screen local UI.

A full range of FEC models combined with the Input/Output Module (IOM) models can be applied to a wide variety of building applications ranging from simple fan coil or heat pump control to advanced central plant management. All FEC Series Controllers configured for BACnet support wireless communications using the ZFR System accessories.

FEATURES

- **Switchable Communications Protocols –** Provides flexibility with a choice between BACnet MS/TP and N2 communication

- **Standard BACnet® Protocol –** Provides interoperability with other Building Automation System (BAS) products that use the widely accepted BACnet standard.

- **Standard Hardware and Software Platform –** Uses a common hardware design throughout the family line to support standardized wiring practices and installation workflows. Also uses a common software design to support use of a single tool for control applications, commissioning, and troubleshooting to minimize technical training.

- **ZFR Wireless Field Controller (FC) or Sensor/Actuator (SA) Bus Interface –** Provides a wireless alternative to hard-wired Metasys® system counterparts with either the ZFR1800 Series Wireless Bus or the WNC1800/ZFR182x Pro Series Wireless Field Bus (ZFR Pro), offering application flexibility and mobility with minimal disruption to building occupants.

- **Bluetooth® Wireless Commissioning –** Provides an easy-to-use connection to the configuration and commissioning tool.

- **Auto-Tuned Control Loops –** Reduce commissioning time, eliminate change-of-season re-commissioning, and reduce wear and tear on mechanical devices.

- **Universal Inputs, Configurable Outputs, and Point Expansion Modules –** Allows multiple signal options to provide input/output flexibility.

- **Optional Local User Interface Display –** Allows convenient monitoring and adjusting capabilities at the local device.
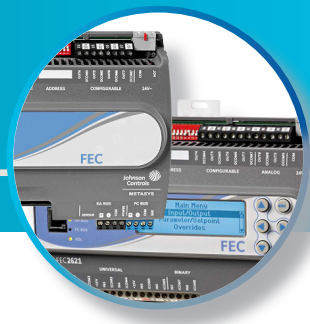
METASYS®

PROGRAMMABLE CONTROLLERS

FEC METASYS CONTROLLERS

FEATURES

- **BACnet® Testing Laboratories (BTL) Listed –** Ensures interoperability with other BTL-listed devices. BTL is a third-party agency, which validates that BAS vendor products meet the BACnet industry-standard protocol.

- **32-bit Microprocessor –** Ensures optimum performance and meets industry specifications.

- **BACnet Automatic Discovery –** Supports easy controller integration into a Metasys BAS.

- **End-of-Line (EOL) Switch in MS/TP Field Controllers –** Enables field controllers to be terminating devices on the communications bus.

- **Pluggable Communications Bus and Supply Power Terminal Blocks –** Expedites installation and troubleshooting.

- **Patented proportional adaptive control (P-Adaptive) and Pattern Recognition Adaptive Control (PRAC) technologies –** Provide continuous loop tuning.

- **Wireless Connectivity through the ZFR1800 Series or the WNC1800/ZFR182x Pro Series Wireless Field Bus Systems in MS/TP Controllers –** Enables wireless mesh connectivity to supervisory controllers, facilitating easy initial location and relocation.

- **Writable Flash Memory –** Allows standard or customized applications to be downloaded from the Controller Configuration Tool (CCT) and enables persistent application data.

- **Large Product Family –** Provides a wide range of point mix to meet application requirements and allows for the addition of one or more Input/Output Module (IOM) and Network Sensors to provide even more I/O capacity.

- **User-Friendly Graphic Theme and Clear Pushbutton Identification –** Facilitate easy navigation of the integral or optional UI/display.

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ORDERING INFORMATION

MODEL INFORMATION (INCLUDING POINT TYPE COUNTS)

		FEC16	FEC26
Communication protocol		BACnet MS/TP, N2	
Engines		All Model types. Some NIE models support MS/TP and N2 devices. Refer to the Network Engines Product Bulletin (LIT–12012138) for details.	
Modular jacks		6-pin SA Bus Modular Port supports one communicating sensor. Or you can wire up to four communicating sensors to the SA Bus Terminal Block. They cannot be used at the same time.	
		6-pin FC Bus for tool support	
Point types	Signals accepted		
Universal Input (UI)	Analog Input, Voltage Mode, 0–10 VDC Analog Input, Current Mode, 4–20 mA [1] Analog Input, Resistive Mode, 0–2k ohm, resistance temperature detector (RTD) (1k NI [Johnson Controls], 1k PT, A99B SI), negative temperature coefficient (NTC) (10k Type L, 2.252k Type 2) Binary Input, Dry Contact Maintained Mode	2	6
Binary Input (BI)	Dry Contact Maintained Mode Pulse Counter/Accumulator Mode (High Speed), 100 Hz	1	2
Analog Output (AO)	Analog Output, Voltage Mode, 0–10 VDC Analog Output, Current Mode, 4–20 mA		2
Binary Output (BO)	24 VAC Triac	3	3
Configurable Output (CO)	Analog Output, Voltage Mode, 0–10 VDC Binary Output Mode, 24 VAC Triac	4	4

Notes

1 Analog Input, Current Mode is set by hardware for the FEC26, and by software for the FEC16.
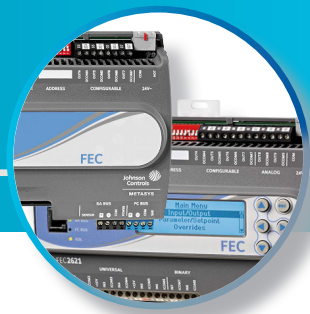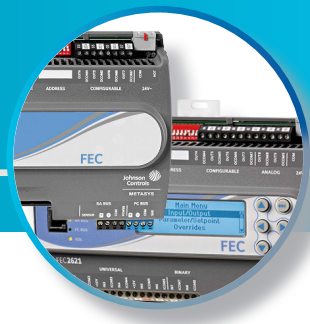
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PROGRAMMABLE CONTROLLERS

FEC METASYS CONTROLLERS

ORDERING INFORMATION

CODES	DESCRIPTION
MS-FEC1611-1	10-Point Field Equipment Controller with 2 UI, 1 BI, 3 BO, and 4 CO; 24 VAC; FC and SA Bus Support
MS-FEC1611-1ET	10-Point Field Equipment Controller Extended Temperature controller for rooftop applications. Supports Operational Temperature Range of -40 to 70°C.
MS-FEC1621-1	10-Point Field Equipment Controller with 2 UI, 1 BI, 3 BO, and 4 CO; 24 VAC; FC and SA Bus Support; Integral Display and 6-Button Navigation Touchpad
MS-FEC2611-0	17-Point Field Equipment Controller with 6 UI, 2 BI, 3 BO, 2 AO, and 4 CO; 24 VAC; FC and SA Bus Support
MS-FEC2611-0ET	FEC2611 Extended Temperature controller for rooftop applications. Supports Operational Temperature Range of -40 to 70°C
MS-FEC2621-0	17-Point Field Equipment Controller with 6 UI, 2 BI, 3 BO, 2 AO, and 4 CO; 24 VAC; FC and SA Bus Support; Integral Display and 6-Button Navigation Touchpad

ACCESSORIES

| CODES	DESCRIPTION
Mobile Access portal (MAP) Gateway	*Refer to the Mobile Access Portal Gateway Catalog Page (LIT-1900869) to identify the appropriate product for your region.*
MS-DIS1710-0	Local Controller Display *Refer to Local Controller Display Product Bulletin (LIT-12011273) for more information.*
WRZ Series Wireless Room Sensors	Refer to the WRZ Series Wireless Room Sensors Product Bulletin (LIT-12011653) for specific sensor model descriptions.
ZFR1800 Series Wireless Field Bus System	This system is used for installations that only support BACnet MS/TP. Refer to the WNC1800/ZFR182x Pro Series Wireless Field Bus System Product Bulletin (LIT-12012320) for a list of available products.
NS Series Network Sensors	Refer to the NS Series Network Sensors Product Bulletin (LIT-12011574) for specific sensor model descriptions.
Y64T15-0	Transformer, 120/208/240 VAC Primary to 24 VAC Secondary, 92 VA, Foot Mount, 30 in. Primary Leads and 30 in. Secondary Leads, Class 2
AP-TBK4SA-0	Replacement MS/TP SA Bus Terminal, 4-Position Connector, Brown (Bulk Pack of 10)
AP-TBK4FC-0	Replacement MS/TP FC Bus Terminal, 4-Position Connector (Bulk Pack of 10)
AP-TBK3PW-0	Replacement Power Terminal, 3-Position Connector, Gray (Bulk Pack of 10)
AS-CBLTSTAT-0	Cable adapter that provides a connection between 8-pin TE-6700 Series sensors and field controllers that do not have a 8-pin sensor connection.
ZFR-USBHA-0	ZFR USB Dongle provides a wireless connection through CCT to allow wireless commissioning of the wirelessly enabled FEC, Advanced Application Field Equipment Controller (FAC), IOM, and VMA16 controllers. Also allows use of the ZFR Checkout Tool (ZCT) in CCT. **Note:** The ZFR-USBHA-0 replaces the IA OEM DAUBI_2400 ZigBee® USB dongle. For additional information on the ZFR-USBHA-0 ZigBee dongle, refer to the ZFR1800 Series Wireless Field Bus System Technical Bulletin (LIT-12011295) or ZFR1800 Series Wireless Field Bus System Quick Reference Guide (LIT-12011630).
TL-BRTRP-0	Portable BACnet IP to MS/TP Router

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PROGRAMMABLE CONTROLLERS

FEC METASYS CONTROLLERS

TECHNICAL SPECIFICATION

Codes	
MS-FEC1611-1	10-Point FEC
MS-FEC1611-1ET	FEC1611 Extended Temperature controller for rooftop applications. Supports Operational Temperature Range of -40 to 70°C.
MS-FEC1621-1	10-Point FEC with Integral Display and Pushbutton User Interface
MS-FEC2611-0	17-Point FEC
MS-FEC2611-0ET	FEC2611 Extended Temperature controller for rooftop applications. Supports Operational Temperature Range of -40 to 70°C
MS-FEC2621-0	17-Point FEC with Integral Display and Push Button User Interface
Supply voltage	24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Safety, Extra-Low Voltage (SELV)
Power consumption	20 VA maximum
	Note: VA ratings do not include any power supplied to the peripheral devices connected to Binary Outputs (BOs) or Configurable Outputs (COs), which can consume up to 12 VA for each BO or CO, for a possible total consumption of an additional 84 VA (maximum).
Ambient conditions	
Operating	0 to 50°C; 10 to 90% RH noncondensing
Storage	-40 to 80°C; 5 to 95% RH noncondensing
	Note: FEC models with an -xET suffix have an operating temperature range of -40 to 70°C.
Controller addressing	
For BACnet-configured controllers	DIP switch set; valid field controller device addresses 4–127 (device addresses 0–3 and 128-255 are reserved)
For N2-configured controllers	DIP switch set; valid control device addresses 1–255
Communications Bus [1]	RS-485, field selectable between BACnet MS/TP and N2 communications:
	3-wire FC Bus between the supervisory controller and field controllers
	4-wire SA Bus between field controller, network sensors, and other sensor/actuator devices, includes a lead to source 15 VDC supply power (from field controller) to bus devices
Processor	H8SX/166xR Renesas® 32-bit microcontroller
Memory	1 MB Flash Memory and 512 KB RAM
Input and Output capabilities	
MS-FEC16 Models	2 - Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm, or Binary Dry Contact
	1 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode
	3 - Binary Outputs: Defined as 24 VAC Triac (selectable internal or external source power)
	4 - Configurable Outputs: Defined as 0–10 VDC or 24 VAC Triac BO
MS-FEC26 Models	6 - Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm, or Binary Dry Contact
	2 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode
	3 - Binary Outputs: Defined as 24 VAC Triac (selectable internal or external source power)
	4 - Configurable Outputs: Defined as 0–10 VDC or 24 VAC Triac BO
	2 - Analog Outputs: Defined as 0–10 VDC or 4–20 mA

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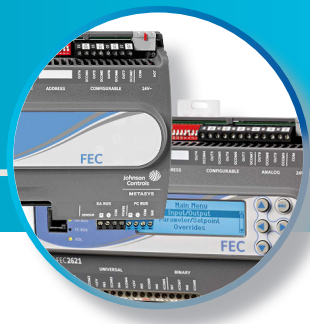
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Analog Input/Analog Output resolution and accuracy	Analog Input: 16-bit resolution Analog Output: 16-bit resolution and ±200 mV in 0-10 VDC applications
Terminations	Input/Output: Fixed Screw Terminal Blocks
	FC Bus, SA Bus, and Supply Power: 3-wire and 4-wire Pluggable Screw Terminal Blocks
	FC Bus and SA Bus Port: RJ-12 6-pin Modular Jacks
Mounting	Horizontal on single 35 mm DIN rail mount (preferred), or screw mount on flat surface with three integral mounting clips on controller
Housing	
Enclosure material	ABS and polycarbonate UL94 5VB; self-extinguishing; Plenum-rated
Protection Class	IP20 (IEC529)
Dimensions (Height x Width x Depth)	
MS-FEC16 Models	150 x 164 x 53 mm including terminals and mounting clips
MS-FEC26 Models	150 x 190 x 53 mm including terminals and mounting clips
	Note: Mounting space for all field controllers requires an additional 50 mm space on top, bottom, and front face of controller for easy cover removal, ventilation, and wire terminations.
Weight	
MS-FEC16 Models	0.4 kg
MS-FEC26 Models	0.5 kg
CE Compliance	Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive.
BACnet International	BACnet Testing Laboratories (BTL) Protocol Revision 4 Listed BACnet Application Specific Controller (B-ASC)

Note

1 *For more information, refer to the MS/TP Communications Bus Technical Bulletin (LIT-12011034).*

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