XPM Expansion Modules

The F4-XPM series input/output (I/O) expansion modules are part of the Facility Explorer system CG, CV Equipment Controller family and can serve in one of two capacities depending on where they are installed in the Facility Explorer system. When installed on the Sensor/Actuator (SA) Bus of a Facility Explorer controller, an XPM expands the input and output interfaces that can be used with that equipment controller. When installed on the Field Controller (FC) Bus of a Facility Explorer supervisory controller, an XPM can be used as I/O point multiplexors to support monitoring and control from a Facility Explorer supervisory controller. The point multiplexor can also be useful for sharing points between other equipment controllers on the FC Bus using peer-to-peer connectivity.

XPMs operate on an RS-485 BACnet MS/TP Bus and are BACnet Testing Laboratory (BTL) listed and certified to the BACnet Smart Actuator (B-SA) profile.

Compatibility

You can connect XPM series expansion modules to the SA Bus of the following device types:

- CG series General Purpose Application Controllers
- CV series VAV Box Controllers
- PCA series Advanced Application Programmable Controllers
- PCG series General Purpose Programmable Controllers
- PCV16, PCV18, PCV19, and VAV17 series Programmable Variable Air Volume Box Controllers
- F4-SNC series supervisory controllers

ⓘ **Note:** XPM series expansion modules may coexist on the SA Bus with PCX series input/output expansion modules.

You can connect XPM series expansion modules to the FC bus of the following supervisory controller types:

- FX80 Supervisory Controller
- F4-SNC series Supervisory Controllers

ⓘ **Note:** XPM series expansion modules may coexist on the FC Bus with PCX series input/output expansion modules.

Features and benefits

Sleek and modern packaging and styling

Provides a modern, aesthetically pleasing industrial design.

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.

Ability to reside on the FC Bus or SA Bus

Provides application flexibility.

BACnet Testing Laboratories (BTL) listed and certified

Ensures openness and interoperability with other BTL-listed devices. BTL is a third-party agency, which validates that BAS vendor products meet the BACnet industry-standard protocol.

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BACnet automatic discovery

Supports easy integration into a Facility Explorer BAS.

Wireless ZFR and ZFR Pro support

Wireless ZFR and ZFR Pro support provides a wireless alternative to hard-wired FC Bus MS/TP networking, offering application flexibility and mobility with minimal disruption to building occupants, and also simplifies and speeds up replacements.

Pluggable screw terminal blocks

Pluggable input/output wiring terminal blocks provide electrical installers and field technicians the ability to quickly and easily install and service a device without the need to disconnect and reconnect the input/output wiring.

Decimal MS/TP address set with three rotary switches

Easy-to-use rotary switches set the MS/TP address in decimal format.

Universal Inputs and Configurable Outputs

Allows multiple signal options to provide input/output flexibility.

End-of-Line (EOL) switch

Enables devices to be terminating devices on the communications bus.

XPM series model information

Table 1: XPM series information including point type counts

		F4-XPM04060-0	F4-XPM09090-0	F4-XPM18000-0
Communication protocols	BACnet MS/TP			
Modular jacks	SA/FC Bus Port: RJ-12 6-Pin Modular Jack			
Point types	Signals accepted	Number of points		
Universal Input (UI)	15 VDC Power Source (Provide 100mA total current)	3	7	0
	Analog Input - Voltage Mode (0–10 VDC)			
	Analog Input - Current Mode (4–20 mA)			
	Analog Input - Resistive Mode (0–600k ohm), RTD (1k Nickel [Johnson Controls sensor], 1k PT, A998 SI), NTC (10k Type L, 2.252k Type 2)			
	Binary Input, Dry Contact Maintained Mode			
	Universal Input Common			
Binary Input (BI)	Binary Input, Dry Contact Maintained Mode	1	2	18
	Binary Input - Pulse Counter/Accumulator Mode			
	Binary Input Common			
Configurable Output (CO)	Analog Output - Voltage Mode (0–10 VDC)	4	4	0
	Binary Output 24 VAC Triac			
	Analog Output Signal Common			
	Binary Output Signal Common			
Analog Output (AO)	Analog Output - Voltage Mode (0–10 VDC)	0	2	0
	Analog Output - Current Mode (4–20 mA)			
	Analog Output Signal Common			
Binary Output (BO)	Binary Output - 24 VAC Triac (External Power Source)	2	3	0
	Binary Output Common			

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Ordering information and accessories

The following tables provide the product code number and description for the XPM models and accessories.

Table 2: XPM Series ordering information

Product code number	Description
F4-XPM04060-0	10-point Input/Output Expansion Module
	Includes: MS/TP communication; 10 points (3 UI, 1 BI, 4 CO, 2 BO); 24VAC input
F4-XPM09090-0	18-point Input/Output Expansion Module
	Includes: MS/TP communication; 18 points (7 UI, 2 BI, 4 CO, 2 AO, 3 BO); 24VAC input
F4-XPM18000-0	18-point Input Expansion Module
	Includes: MS/TP communication; 18 points (18 BI); 24VAC input

Table 3: XPM series accessories (order separately)

Product Code Number	Description
TL-CCT-0	Controller Configuration Tool (CCT) software
FX-FCP-0	Facility Explorer Equipment Controller Firmware Package Files required for CCT
Mobile Access Portal (MAP) Gateway	Refer to the *Mobile Access Portal Gateway Catalog Page (LIT-1900869)* to identify the appropriate product for your region.
WRZ Series Wireless Room Sensors	Refer to the *WRZ Series Wireless Room Sensors Product Bulletin (LIT-12011653)* for specific sensor model descriptions.
WRZ-7860-0	Receiver for One-to-One Wireless Room Sensing Systems - functions with WRZ Series Sensors
	Refer to the *WRZ-7860 Receiver for One-to-One Wireless Room Sensing Product Bulletin (LIT-12011640)* for a list of available products.
WRZ-SST-120	Wireless System Survey Tool. For use with the lower power 10mW WRZ and WRZ-7860 systems.
	Refer to the *WRZ-SST-120 Wireless Sensing System Tool Installation Guide (24-10563-55)* for usage instructions.
ZFR-HPSST-0	Wireless System Survey Tool. For use with the higher power WRG1830/ZFR183x System and lower power WRZ Sensors (10mW). Refer to the *ZFR-HPSST-0 Wireless Sensing System Tool Installation Guide (Part No. 24-11461-00012)* for usage instructions.
Receiver for One-to-One Wireless Room Sensing WRG1830/ZFR183x Pro Series Wireless Field Bus System	For more information on products needed for wireless field bus installations and for a list of available products, refer to the *WRG1830/FX-ZFR183x Pro Series Wireless Field Bus System Catalog Page (LIT-1901153)*.
Y64T15-0	Transformer, 120/208/240 VAC Primary to 24 VAC Secondary, 92 VA, Foot Mount, 72.2 cm (30 in.), Primary Leads and 76.2 cm (30 in.) Secondary Leads, Class 2
Y65A13-0	Transformer, 120 VAC Primary to 24 VAC Secondary, 40 VA, Foot Mount (Y65AS), 20.32 cm (8 in.), Primary Leads and 76.2 cm (30 in.) Secondary Leads, Class 2
Y65T31-0	Transformer, 120/208/240 VAC Primary to 24 VAC Secondary, 40 VA, Foot Mount (Y65AR+), 20.32 cm (8 in.), Primary Leads and Secondary Screw Terminals, Class 2
Y65T42-0	Transformer, 120/208/240 VAC Primary to 24 VAC Secondary, 40 VA, Hub Mount (Y65SP+), 20.32 cm (8 in.), Primary Leads and Secondary Screw Terminals, Class 2
ACC-TBKINOUT-0	Input and Output terminal block replacement kit for SNC, CGE, CGM, CVE, CVM and XPM products. Kit includes 5 of each 2, 3, and 4 position Input and Output terminal blocks. 30 terminal blocks in total.
ACC-TBKPWFCSA-0	Power, FC Bus, and SA Bus terminal block replacement kit for SNC, CGE, CGM, CVE, CVM, and XPM products. Kit includes 5 of each terminal block type. 15 terminal blocks in total.

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Table 3: XPM series accessories (order separately)

Product Code Number	Description
MS-FIT100-0	The Field Inspection Tool or (FIT) is a portable handheld device with a user interface that is used to test and troubleshoot the BACnet protocol MS/TP RS-485 communications bus that connects supervisory controllers and equipment controllers to field point interfaces.
	The FIT can be used to check out the wiring of the MS/TP RS-485 bus as well as verify proper communications of supervisory controllers and equipment controllers connected to the bus. The FIT can be used on both the FC Bus and SA Bus.
TL-BRTRP-0	Portable BACnet/IP to MS/TP Router

XPM Expansion Modules technical specifications

Table 4: Technical specifications

Specification	Description
Power requirement	24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Power Supply Class 2 (North America), Safety Extra-Low Voltage (SELV) (Europe)
Power consumption	14 VA maximum
	ⓘ **Note:** The VA rating does 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).
Power source	+15 VDC power source terminals provide 100 mA total current.
	ⓘ **Note:** Only present on XPM09090 and XPM04060 models.
	• **F4-XPM09090-0:** Quantity 2-located in Universal Input terminals for active (3-wire) input devices.
	• **F4-XPM04060-0:** Quantity 1-located in Universal Input terminals for active (3-wire) input devices.
Ambient conditions	**Operating:** 0°C to 50°C (32°F to 122°F); 10% to 90% RH noncondensing
	Storage: -40°C to 80°C (-40°F to 176°F); 5% to 95% RH noncondensing
Communications protocol	BACnet MS/TP; Zigbee Wireless also supported (at FC Bus and for Sensors) with additional hardware.
	XPM expansion modules support Zigbee wireless functionality for the FC bus and for sensors with additional hardware.
Device addressing for BACnet MS/TP	Decimal address set using the three rotary switches; valid controller device addresses 4-127
Communications bus	RS-485
	3-wire FC Bus between the supervisory controller and expansion modules
	4-wire SA Bus between equipment controller, network sensors and other sensor/actuator devices, includes a lead to source 15 VDC supply power (from equipment controller) to bus devices.
Processor	RX64M Renesas® 32-Bit microcontroller
Memory	16 MB flash memory and 8 MB SDRAM
Input and output capabilities	**Universal Inputs:** Defined as 0–10 VDC, 4–20 mA, 0–600k ohms, or Binary Dry Contact
	Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode
	Configurable Outputs: Defined as 0-10 VDC or 24 VAC @500mA Triac BO
	Analog Outputs: Defined as 0–10 VDC or 4–20 mA
	Binary Outputs: Defined as 24 @500mA VAC Triac (external power source only)
Universal Input (UI) Resolution / Analog Output (AO) Accuracy	**Input:** 24-bit Analog to Digital converter
	Output: +/- 200 mV accuracy in 0–10 VDC applications

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Table 4: Technical specifications

Specification	Description
Terminations	**Input/Output:** Pluggable Screw Terminal Blocks
	SA/FC Bus and Supply Power: 4-Wire and 2-Wire Pluggable Screw Terminal Blocks
	SA/FC Bus Port: RJ-12 6-Pin Modular Jack
Mounting	Horizontal on single 35 mm DIN rail mount (recommended), or screw mount on flat surface with three integral mounting clips on controller
Housing	**Enclosure material:** ABS and polycarbonate UL94 5VB; Self-extinguishing
	Protection Class: IP20 (IEC529)
Dimensions (height x width x depth)	**XPM09090-0:** 150 mm x 190 mm x 44.5 mm (5-7/8 in. x 7-1/2 in. x 1-3/4 in.) including terminals and mounting clips
	XPM04060-0 and XPM18000-0: 150 mm x 152 mm x 44.5 mm (5-7/8 in. x 6 in. x 1-3/4 in.) including terminals and mounting clips
	ⓘ **Note:** Mounting space requires an additional 50 mm (2 in.) space on top, bottom, and front face of controller for easy cover removal, ventilation, and wire terminations.
Weight	**XPM09090-0:** 0.5 kg (1.1 lb)
	XPM04060-0 and XPM18000-0: 0.29 kg (0.64 lb)
Compliance	**United States:** UL Listed, File E107041, CCN PAZX, UL 916, Energy Management Equipment
	FCC Compliant to CFR47, Part 15, Subpart B, Class A
	Canada: UL Listed, File E107041, CCN PAZX7 CAN/CSA C22.2 No. 205, Signal Equipment
	Industry Canada Compliant, ICES-003
$C\epsilon$	**Europe:** Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and RoHS Directive.
	Australia and New Zealand: RCM Mark, Australia/NZ Emissions Compliant
	BACnet International: BACnet Testing Laboratories™ (BTL) Protocol Revision 18 Listed and Certified BACnet Smart Actuator (B-SA), based on ANSI/ASHRAE 135-2020
UKCA	**United Kingdom:** Johnson Controls declares that this product is in compliance with Electromagnetic Compatibility Regulations, The Electrical Equipment (Safety) Regulations, and Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations.

The performance specifications are nominal and conform to acceptable industry standard. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products.

Repair information

If an expansion module fails to operate within its specifications, replace the expansion module. For a replacement expansion module, contact your Johnson Controls representative.

Product warranty

This product is covered by a limited warranty, details of which can be found at www.johnsoncontrols.com/buildingswarranty.

Single point of contact

APAC	EU	UK	NA/SA
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