PCX Expansion Input/Output Module

The PCXs are expansion I/O modules with integral RS-485 MS/TP communications.

ⓘ **Note:** At Controller Configuration Tool (CCT) 13.0 or later, using 10.1 Release Mode, the PCGs, PCAs, and PCVs can communicate by using either the BACnet or the N2 field bus networking protocol. The operation of the PCX is not affected by the selection of the BACnet or the N2 protocol in the host controller.

PCXs can serve in one of two capacities, depending on where they are installed in the control system. When installed on the Sensor Actuator (SA) Bus of PCA controllers, the PCXs expand the I/O interfaces of the controllers. When installed on the Field Controller (FC) Bus, PCXs can be used as I/O point multiplexors to support monitoring and control from a supervisory controller. The point multiplexor can also be useful for sharing points between other PC controllers on the FC Bus using peer-to-peer connectivity.

A full range of PCA models combined with the PCX 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.

Features and benefits

Standard Protocol with BTL Listing

Provides interoperability with Johnson Controls and third-party 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.

Universal Inputs and Configurable Outputs

Allow multiple signal options per channel to provide input/output flexibility..

Complete Product Family with Modular Components

Meets any HVAC equipment or building system control requirement using only the needed components.

Ability to reside on the FC Bus or SA Bus

Provides application flexibility

PCX Series point type counts per model

Table 1: FX-PCX Series point type counts per model

Point types	Signals accepted	FX-PCX 1711	FX-PCX 2711	FX-PCX 2721	FX-PCX 3711	FX-PCX 3721	FX-PCX 3731	FX-PCX 4711
Universal Input (UI)	Analog Input, Voltage Mode, 0–10 VDC; Analog Input, Current Mode, 4–20 mA; Analog Input, Resistive Mode, 0–2k ohm, RTD (1k NI [Johnson Controls], 1k PT, A99B SI), NTC (10k Type L, 2.252k Type 2); Binary Input, Dry Contact Maintained Mode	2	8	4				6
Binary Input (BI)	Dry Contact Maintained Mode; Pulse Counter/Accumulator Mode (High Speed), 100 Hz	4				16	8	2
Analog Output (AO)	Analog Output, Voltage Mode, 0–10 VDC; Analog Output, Current Mode, 4–20 mA			2				2
Binary Output (BO)	24 VAC Triac						8	3
Universal Output (UO)	Analog Output, Voltage Mode, 0–10 VDC; Binary Output Mode, 24 VAC/DC FET; Analog Output, Current Mode, 4–20 mA		2		4			
Configurable Output (CO)	Analog Output, Voltage Mode, 0–10 VDC; Binary Output Mode, 24 VAC Triac							4
Relay Output (RO) (-0 Models Only)	120/240 VAC		2		4			
Relay Output (RO) (-2 Models Only)	24 VAC		2		4			

Table 2: PCX Series point type counts per model

Point types	Signals accepted	PCX 2723	PCX 3723	PCX 3733
Universal Input (UI)	Analog Input, Voltage Mode, 0–10 VDC; Analog Input, Current Mode, 4–20 mA; Analog Input, Resistive Mode, 0–2k ohm, RTD (1k NI [Johnson Controls], 1k PT, A99B SI), NTC (10k Type L, 2.252k Type 2); Binary Input, Dry Contact Maintained Mode	8		
Binary Input (BI)	Dry Contact Maintained Mode; Pulse Counter/Accumulator Mode (High Speed), 100 Hz		16	8
Analog Output (AO)	Analog Output, Voltage Mode, 0–10 VDC; Analog Output, Current Mode, 4–20 mA	2		
Binary Output (BO)	24 VAC Triac (Ext Power Only)			8

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PCX Series ordering information

Table 3: FX-PCX Series ordering information

Product code number	Description	UL and cUL	CE marked
FX-PCX1711-0	4-Point Expansion I/O Module with 4 BI, FC, and SA Bus Support	X	X
FX-PCX2711-0	6-Point Expansion I/O Module with 2 UI, 2 UO, 2 RO, FC and SA Bus Support. Relays are rated for 120/240 VAC.	X	
FX-PCX2711-2	6-Point Expansion I/O Module with 2 UI, 2 UO, 2 BO, FC, and SA Bus Support. Relays are rated for 240 VAC.		X
FX-PCX2721-0	10-Point Expansion I/O Module with 8 UI, 2 AO, FC, and SA Bus Support	X	X
FX-PCX3711-0	12-Point Expansion I/O Module with 4 UI, 4 RO, 4 BO, FC, and SA Bus Support. Relays are rated for 120/240 VAC.	X	
FX-PCX3711-2	12-Point Expansion I/O Module with 4 UI, 4 UO, 4 BO, FC, and SA Bus Support. Relays are rated for 240 VAC.		X
FX-PCX3721-0	16-Point Expansion I/O Module with 16 BI, FC, and SA Bus Support	X	X
FX-PCX3731-0	16-Point Expansion I/O Module with 8 BI, 8 BO, FC, and SA Bus Support	X	X
FX-PCX4711-0	17-Point Expansion I/O Module with 6 UI, 2 BI, 3 BO, 2 AO, 4 CO, 24 VAC, FC, and SA Bus Support	X	X

Table 4: PCX Series ordering information

Product code number	Description
CH-PCX2723-0	10-Point Expansion I/O Module with 8 UI, 2 AO, FC, and SA Bus Support.
CH-PCX3723-0	16-Point Expansion I/O Module with 16 BI, FC, and SA Bus Support.
CH-PCX3733-0	16-Point Expansion I/O Module with 8 BI, 8 BO, FC, and SA Bus Support. ⓘ **Note:** BOs on the CH-PCX3733-0 controller do not supply power for the outputs; the BOs require external low-voltage (<30 VAC) power sources.

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Accessories

Table 5: Accessories

Product code number	Description
FX-DIS1710-0	Local display/keypad
TL-MAP 1810-0	Mobile Access Portal Gateway
TL-BRTRP-0	Portable BACnet/IP to MS/TP Router
WRZ Series Wireless Room Sensors	Refer to the WRZ Series Wireless Room Sensors Product Bulletin (LIT-12011653) for specific sensor model descriptions.
FX-DIS1710-0	Local Controller Display
WRZ-7860-0	Receiver for One-to-One Wireless Room Sensing Systems - functions with WRZ Series Sensors room sensors
WRZ-SST-120	Wireless System Survey Tool (for use with the lower power 10mW WRZ and WRZ-7860 systems)
ZFR-HPSST-0	Wireless System Survey Tool (for use with the higher power WRG1830/ZFR183x systems)
WRG1830/ZFR183x Pro Wireless Field Bus System	This system is used for installations that support BACnet/IP but can also coexist with the ZFR1800 Series when installed under the same supervisor such as a network engine. Refer to the WRG1830/ZFR183x Pro Series Wireless Field Bus System Catalog Page (LIT-1901026) for a list of available products.
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
Y65A13-0	Transformer, 120 VAC Primary to 24 VAC Secondary, 40 VA, Foot Mount (Y65AS), 8 in. Primary Leads and 30 in. Secondary Leads, Class 2
Y65T42-0	Transformer, 120/208/240 VAC Primary to 24 VAC Secondary, 40 VA, Hub Mount (Y65SP+), 8 in. Primary Leads and Secondary Screw Terminals, Class 2
Y65T31-0	Transformer, 120/208/240 VAC Primary to 24 VAC Secondary, 40 VA, Foot Mount (Y65AR+), 8 in. Primary Leads and Secondary Screw Terminals, 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)

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PCX series technical specifications

Table 6: FX-PCX Series technical specifications

	Description
Product Code Numbers	**FX-PCX1711-0** - 4-Point Expansion Input/Output Module with 4 BI, FC and SA Bus Support. **FX-PCX2711-0** - 6-Point Expansion Input/Output Module with 2 UI, 2 UO, 2 BO, FC and SA Bus Support. Relays are rated for 120/240 VAC. **FX-PCX2711-2** - 6-Point Expansion Input/Output Module with 2 UI, 2 UO, 2 BO, FC and SA Bus Support. Relays are rated for 240 VAC. **FX-PCX2721-0** - 10-Point Expansion Input/Output Module with 8 UI, 2 AO, FC and SA Bus Support **FX-PCX3711-0** - 12-Point Expansion Input/Output Module with 4 UI, 4 UO, 4 BO, FC and SA Bus Support. Relays are rated for 120/240 VAC. **FX-PCX3711-2** - 12-Point Expansion Input/Output Module with 4 UI, 4 UO, 4 BO, FC and SA Bus Support. Relays are rated for 240 VAC. **FX-PCX3721-0** - 16-Point Expansion Input/Output Module with 16 BI, FC and SA Bus Support **FX-PCX3731-0** - 16-Point Expansion Input/Output Module with 8 BI, 8 BO, FC and SA Bus Support **FX-PCX4711-0** - 17-Point Expansion Input/Output Module with 6 UI, 2 BI, 3 BO, 2 AO, 4 CO, FC and SA Bus Support
Supply Voltage	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:** 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), depending on the FX-PCX model.
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
BACnet/MS/TP Addressing	DIP switch set; valid controller device addresses 4–127 (Device addresses 0–3 and 128–255 are reserved and not valid FX-PCX addresses).
Communications Bus	BACnet MS/TP, RS-485 3-wire FC Bus between the supervisory controllers and FX-PC controllers 4-wire SA Bus between FX-PC controller, NS Series Network Sensors, and other sensor/actuator devices. Includes a lead source 15 VDC supply power (from FX-PC controller) to bus devices.
Processor	H8SX/166xR Renesas® 32-bit microcontroller
Memory	512 KB Flash Memory and 128 KB RAM

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Table 6: FX-PCX Series technical specifications

	Description
Input and Output Capabilities	**FX-PCX1711:** 4 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/ Accumulator Mode **FX-PCX2711:** 2 - Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm, or Binary Dry Contact 2 - Universal Outputs: Analog Output: Voltage Mode, 0–10 VDC; Binary Output Mode: 24 VAC/DC FET; Analog Output: Current Mode, 4–20 mA 2 - Relay Outputs (Single-Pole, Double-Throw): **UL Listing (-0 model only):** 1/4 hp 120 VAC, 1/2 hp 240 VAC; 360 VA Pilot Duty at 120/240 VAC (B300); 3 A Non-inductive 24–240 VAC; **CE Marking (-2 model only):** 6 (4) A N.O. or N.C. only, 240 VAC **FX-PCX2721** 8 - Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm, or Binary Dry Contact 2 - Analog Outputs: Defined as 0–10 VDC or 4–20 mA **FX-PCX3711:** 4 - Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm, or Binary Dry Contact 4 - Universal Outputs: Analog Output: Voltage Mode, 0–10 VDC; Binary Output Mode: 24 VAC/DC FET; Analog Output: Current Mode, 4–20 mA 4 - Relay Outputs (Single-Pole, Double-Throw): **UL Listing (-0 model only):** 1/4 hp 120 VAC, 1/2 hp 240 VAC; 360 VA Pilot Duty at 120/240 VAC (B300); 3 A Non-inductive 24–240 VAC; **CE Marking (-2 model only):** 6 (4) A N.O. or N.C. only, 240 VAC **FX-PCX3721:** 16 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode **FX-PCX3731:** 8 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode 8 - Binary Outputs: Defined as 24 VAC Triac (Require external low-voltage power source.)
Input and Output Capabilities	**FX-PCX4711:** 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
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 SA/FC Bus and Supply Power: 4-wire and 3-wire Pluggable Screw Terminal Blocks SA/FC 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)

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Table 6: FX-PCX Series technical specifications

	Description
Dimensions (Height x Width x Depth)	**FX-PCX171x-x and FX-PCX271x-x Models:** 150 mm x 120 mm x 53 mm (5-7/8 in. x 4-3/4 in. x 2-1/8 in.) including terminals and mounting clips **FX-PCX2721-x, FX-PCX3721-x, FX-PCX3731-0, and FX-PCX3731-0A Models:** 150 mm x 164 mm x 53 mm (5-7/8 in. x 6-7/16 x 2-1/8 in.) including terminals and mounting clips **FX-PCX371x-x and FX-PCX471x-x Models:** 150 mm x 190 mm x 53 mm (5-7/8 in. x 7-1/2 in. x 2-1/8 in.) including terminals and mounting clips ⓘ **Note:** Mounting space for all controllers 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	0.5 kg (1.1 lb) maximum
Compliance CE	**United States:** UL Listed, File E107041, CCN PAZX, UL 916, Energy Management Equipment; FCC Compliant to CFR47, Part 15, Subpart B, Class A ⓘ **Note:** Except FX-PCX2711-2 and FX-PCX3711-2 **Canada:** UL Listed, File E107041, CCN PAZX7, CAN/CSA C22.2 No. 205, Signal Equipment; Industry Canada Compliant, ICES-003 ⓘ **Note:** Except FX-PCX2711-2 and FX-PCX3711-2 **Europe:** CE Mark –Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC. ⓘ **Note:** Except FX-PCX2711-0 and FX-PCX3711-0 **Australia and New Zealand:** RCM Mark, Australia/NZ Emissions Compliant ⓘ **Note:** Except FX-PCX2711-0 and FX-PCX3711-0 **BACnet International:** BACnet Testing Laboratories (BTL) Protocol Revision 18 Listed BACnet Application Specific Controller (B-ASC)

Table 7: PCX Series technical specifications

Product Code Numbers	**CH-PCX2723-0** - 10-Point Expansion Input/Output Module with 8 UI, 2 AO, FC and SA Bus Support **CH-PCX3723-0** - 16-Point Expansion Input/Output Module with 16 BI, FC and SA Bus Support **CH-PCX3733-0** - 16-Point Expansion Input/Output Module with 8 BI, 8 BO, FC and SA Bus Support
Supply Voltage	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:** 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), depending on the CH-PCX model.
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
BACnet/MS/TP Addressing	DIP switch set; valid controller device addresses 4–127 (Device addresses 0–3 and 128–255 are reserved and not valid CH-PCX addresses).
Communications Bus	BACnet MS/TP, RS-485 3-wire FC Bus between the supervisory controllers and CH-PC controllers 4-wire SA Bus between CH-PC controller, NS Series Network Sensors, and other sensor/actuator devices. Includes a lead source 15 VDC supply power (from CH-PC controller) to bus devices.
Processor	RX631 Renesas 32-bit microcontroller
Memory	4 MB External Serial Flash Memory

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Table 7: PCX Series technical specifications

Input and Output Capabilities	**CH-PCX2723:** 8 - Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm, or Binary Dry Contact 2 - Analog Outputs: Defined as 0–10 VDC or 4–20 mA
	CH-PCX3723: 16 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode
	CH-PCX3733: 8 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode 8 - Binary Outputs: Defined as 24 VAC Triac (Require external low-voltage power source) ⓘ **Note:** Binary Outputs (BOs) on CH-PCX3733 controllers do not supply power for the outputs; the BOs require external low-voltage (< 30 VAC) power sources
Analog Input/Analog Output Resolution and Accuracy	**Analog Input:** 15-bit resolution **Analog Output:** 15-bit resolution and ±200 mV in 0–10 VDC applications
Terminations	**Input/Output:** Fixed Screw Terminal Blocks ⓘ **Note:** There are no labels on I/O terminal blocks. The labels are above/below the terminal blocks on the PCX packaging. SA/FC Bus and Supply Power: 4-wire and 3-wire Pluggable Screw Terminal Blocks SA/FC 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)	150 mm x 164 mm x 53 mm (5-7/8 in. x 6-7/16 in. x 2-1/8 in.) including terminals and mounting clips ⓘ **Note:** Mounting space for all controllers 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	0.5 kg (1.1 lb) maximum
Compliance C E	**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
	Europe: CE Mark – Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive.
	Australia and New Zealand: RCM Mark, Australia/NZ Emissions Compliant
	BACnet International: BACnet Testing Laboratories Protocol Revision 18 Listed BACnet Advanced Application Controller (B-AAC)

Repair information

If an equipment 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	Europe	NA/SA
JOHNSON CONTROLS C/O CONTROLS PRODUCT MANAGEMENT NO. 32 CHANGJIJANG RD NEW DISTRICT WUXI JIANGSU PROVINCE 214028 CHINA	JOHNSON CONTROLS WESTENDHOF 3 45143 ESSEN GERMANY	JOHNSON CONTROLS 507 E MICHIGAN ST MILWAUKEE WI 53202 USA

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Contact information

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