

# FX-PCA Advanced Application Programmable Controller Catalog Page

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The FX-PCA Series controllers offer more advanced features than the other FX-PC controllers. FX-PCA controllers feature an integral real-time clock and support time-based control logic, such as scheduling, alarming, and trending. As a result, FX-PCAs are well suited for standalone applications that do not have a networked supervisory controller or for networked application where FX-PCAs can continue time-based control and monitoring when offline from the supervisory controller. The FX-PCAs include RS-485 field bus networking with selectable N2 or BACnet MS/TP protocols. FX-PCAs also support wireless field bus networking and sensing by adding FX-ZFR accessories.

A range of FX-PCA models are available with various onboard inputs and outputs, including a 26-point FX-PCA3611. Also, FX-PCA controllers can be combined with FX-PCX Expansion I/O Modules to gain more I/O interfaces if needed. FX-PCAs and their advanced features make them well suited for monitoring and controlling a wide range of equipment including terminal units (such as fan coils and unit ventilators), as well as more complex equipment (such as air handlers and central plants).

Persistence on the FX-PCA3611 model has been significantly upgraded and now includes a fast persistence feature that allows you to hold data values at a configurable value, up to once per second. Persistence refers to how often samples of data are stored locally. This ensures that in the event of a problem, such as a loss of power, data can be retrieved up to the rate that the data is persisted, minimizing the potential loss of data. When power is restored, previously persisted data, up to the rate of persistence, remains available and accessible. For example, if persistence is configured for once per second, you only risk losing one second of data. Persisting data may be essential for situations that require greater data accuracy. This may include certain methods of utility data collection and billing.

FX-PCA2612 controller models feature line-voltage relay outputs, making these controllers well suited for use in terminal units. The FX-PCA2612-2 model uses a line-voltage power supply, eliminating the need for a 24 VAC transformer in line-voltage applications.

Refer to the *FX-PC Series Programmable Controllers and Related Products Product Bulletin (LIT-12011657)* or *FX-PC Series Programmable Controllers and Related Products for Building Control Management (BCM) System Product Bulletin (LIT-12011915)* for product application details.

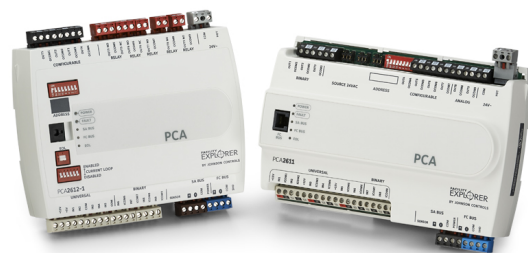
## Features

- Standard BACnet® Protocol with BTL Listing - Provides interoperability with Johnson Controls® and third-party Building Automation System (BAS) products that use the widely accepted BACnet standard.
- Selectable BACnet MS/TP or N2 Field Bus Networking Protocol - Provides a new capability at FX-PCT Release 10.1 that allows FX-PCVs, FX-PCGs, and FX-PCAs to be configured to communicate using either the BACnet or the N2 field bus networking protocol.
- 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.

- ZigBee® Wireless Field Controller (FC)/Sensor/Actuator (SA) Bus Interface (where available) - Provides a wireless alternative to hard-wired field bus networking and sensor connections, providing application flexibility, mobility, and minimal disruption to building occupants.
- State-Based Application Control Logic with Adaptive, Automatically Tuned Control Loops - Prevents simultaneous heating and cooling, reduces commissioning time, eliminates change-of-season re-commissioning, and reduces wear and tear on mechanical devices.
- 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.
- BACnet MS/TP Protocol supports seamless integration into Johnson Controls and third-party BACnet devices.
- Integral end-of-line (EOL) switch enables FX-PC controller as a terminating device on the communications bus.
- Wireless capabilities (where available) via an FX-ZFR Series Wireless Field Bus System enable wireless mesh connectivity between FX-PC controllers to FX-WRZ Series Wireless Room Temperature Sensors and to supervisory controllers, facilitating easy initial location and relocation.
- Patented technologies including Proportional Varying Deadzone Control (PVDC), Pattern Recognition Adaptive Control (PRAC+), and Pulse Modulation Adaptive Control (PMAC) provide continuous loop tuning.
- Writable flash memory allows standard or customized applications to be downloaded from the FX-PCT 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 FX-PCXs or NS Series Network Sensors to provide even more I/O capacity.
- Support for the FX-DIS17 remote display for monitoring and commanding of I/O and configuration parameters

If the product fails to operate within its specifications, replace the product. For a replacement product, contact the nearest Johnson Controls® representative.

**Figure 1: FX-PCA Series Advanced Application Programmable Controllers**



**Table 1: FX-PCA Series Point Type Counts Per Model**

Point Types	Signals Accepted	FX-PCA2611	FX-PCA2612-1, 2	FX-PCA3611 -0A <sup>1</sup> and FX-PCA3611 -0
Universal Input (UI)	Analog Input, Voltage Mode, 0–10 VDC Analog Input, Current Mode, 4–20 mA 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	6	5	8
Binary Input (BI)	Dry Contact Maintained Mode Pulse Counter/Accumulator Mode (High Speed), 100 Hz	2	4	6
Analog Output (AO)	Analog Output, Voltage Mode, 0–10 VDC Analog Current Mode, 4–20 mA	2		6
Binary Output (BO)	24 VAC Triac	3		6
Configurable Output (CO)	Analog Output, Voltage Mode, 0–10 VDC Binary Output Mode, 24 VAC Triac	4	4	
Relay Output (RO)	Relay Output: Single-Pole, Double-Throw (SPDT) Relay Output: Single-Pole, Single-Throw (SPST)		2 - SPDT 3 - SPST	

<sup>1</sup> This model is currently available only in Asia; contact your local Johnson Controls representative for more information.

**Table 2: FX-PCA Series Ordering Information**

Product Code Number	Description
FX-PCA2611-0	17-Point Advanced Application Programmable Controller with 6 UI, 2 BI, 4 CO, 3 BO, and 2 AO; 24 VAC; SA Bus; FC Bus; Integral Real-time Clock
FX-PCA2612-1	18-Point Advanced Application Programmable Controller with 5 UI, 4 BI, 4 CO, 2 SPDT RO, and 3 SPST RO; 24 VAC; SA Bus; FC Bus; Integral Real-time Clock
FX-PCA2612-2	18-Point Advanced Application Programmable Controller with 5 UI, 4 BI, 4 CO, 2 SPDT RO, and 3 SPST RO; 100-240 VAC; SA Bus; FC Bus; Integral Real-time Clock
FX-PCA3611-0	26-Point Advanced Application Programmable Controller with 8 UI, 6 BI, 6 BO, and 6 AO; 24 VAC; SA Bus; FC Bus; Integral Real-time Clock; Improved Fast Persistence
FX-PCA3611-0A <sup>1</sup>	26-Point Advanced Application Programmable Controller with 8 UI, 6 BI, 6 BO, and 6 AO; 24 VAC; SA Bus; FC Bus; Integral Real-time Clock

<sup>1</sup> This model is currently available only in Asia; contact your local Johnson Controls representative for more information.

## Accessories

**Table 3: FX-PCA Accessories**

Product Code Number	Description
FX-DIS1710-0	Local Controller Display. Text only available in English.
FX-BTCVT-1	Bluetooth® Commissioning Converter
TL-BRTRP-0	Portable BACnet/IP to MS/TP Router
FX-ATV7003-0	Handheld VAV Box Balancing Tool
FX-ZFR1810-1	Wireless Field Bus Coordinator, 10 mW Transmission Power. Functions with FX Supervisory Controllers.
FX-ZFR1811-1	Wireless Field Bus Router, 10 mW Transmission Power. Functions with FX-PC controllers and FX-WRZxxx Series Wireless Sensors
FX-ZFRCBL-0	Wire Harness which allows an FX-PCV1610/1620 to be connected to an SA Bus device (Bluetooth Commissioning Converter, Local Controller Display, or NS Series Sensor) when its SA Bus RJ-12 jack is occupied by an FX-ZFR1811 router.
FX-BTCVTCBL-700	Cable Replacement Set for the FX-BTCVT-1 or the FX-ATV7003-0; Includes One 5 ft (1.5 m) Retractable Cable
FX-WRZ Series Wireless Sensors	FX-WRZ Series Wireless Sensors: Refer to the <i>FX-WRZ Series Wireless Room Sensors Product Bulletin (LIT-12011687)</i> for specific sensor model descriptions.
NS Series Sensors	NS Series Network Sensors: Refer to the <i>NS Series Network Sensors Product Bulletin (LIT-12011574)</i> 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
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

**Table 3: FX-PCA Accessories**

Product Code Number	Description
<b>Y65T42-0</b>	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
<b>Y65T31-0</b>	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
<b>AP-TBK4SA-0</b>	Replacement MS/TP SA Bus Terminal, 4-Position Connector, Brown, Bulk Pack
<b>AP-TBK4FC-0</b>	Replacement MS/TP FC Bus Terminal, 4-Position Connector, Blue, Bulk Pack
<b>AP-TBK3PW-0</b>	Replacement Power Terminal, 3-Position Connector, Gray, Bulk Pack
<b>MS-TBKLV03-0</b>	Terminal Block Kit - FX-PCA Line Voltage AC Power - 3 Pieces
<b>MS-TBKRO02-0</b>	Terminal Block Kit -FX-PCA 2-Position Relay Output - 9 Pieces
<b>MS-TBKRO03-0</b>	Terminal Block Kit - FX-PCA 3-Position Relay Output - 6 Pieces
<b>MS-TBKCO04-0</b>	Terminal Block Kit - FX-PCA 4-Position Configurable Output - 6 Pieces
<b>MS-TBKUI04-0</b>	Terminal Block Kit - FX-PCA 4-Position Universal Input - 3 Pieces
<b>MS-TBKUI05-0</b>	Terminal Block Kit - FX-PCA 5-Position Universal Input - 3 Pieces
<b>FX-WRZ7860-0</b>	One-to-One ZigBee Wireless Receiver for Wireless Sensor Only Applications
<b>FX-WRZSST-120</b>	Wireless Sensing System Tool Kit
<b>ZFR-USBHA</b>	<p>USB Dongle with ZigBee® Driver provides a wireless connection through FX-PCT to allow wireless commissioning of the wirelessly enabled FX-PCA, FX-PCG, FX-PCV, and FX-PCX programmable controllers. Also allows use of the FX-ZFR Checkout Tool (FX-ZCT) in FX-PCT.</p> <p>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 <i>FX-ZFR Series Wireless Field Bus System Technical Bulletin (LIT-12011660)</i> or <i>FX-ZFR Series Wireless Field Bus System Quick Reference Guide (LIT-12011696)</i>.</p>
<b>TL-BRTRP-0</b>	Portable BACnet/IP to MS/TP Router

## FX-PCA Series Technical Specifications

**Table 4: FX-PCA Series Technical Specifications**

<b>Product Code Numbers</b>	<p><b>FX-PCA2611-0</b> – 17-Point Advanced Application Programmable Controller with Integral Real-Time Clock and 24 VAC Supply Power</p> <p><b>FX-PCA2612-1</b> – 18-Point Advanced Application Programmable Controller with Integral Real-Time Clock and 24 VAC Supply Power</p> <p><b>FX-PCA2612-2</b> – 18-Point Advanced Application Programmable Controller with Integral Real-Time Clock and 100–240 VAC Supply Power</p> <p><b>FX-PCA3611-0</b> – 26-Point Advanced Application Programmable Controller with Integral Real-time Clock, 24 VAC Supply Power, and Fast Persistence</p> <p><b>FX-PCA3611-0A<sup>1</sup></b> – 26-Point Advanced Application Programmable Controller with Integral Real-Time Clock and 24 VAC Supply Power</p>
<b>Supply Voltage</b>	<p><b>FX-PCA2611-0, FX-PCA2612-1, FX-PCA3611-0A, and FX-PCA3611-0:</b> 24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Power Supply Class 2 (North America), SELV (Europe)</p> <p><b>FX-PCA2612-2:</b> 100–240 VAC 50/60 Hz</p>
<b>Power Consumption</b>	<p>14 VA maximum for FX-PCA2611-0, FX-PCA3611-0A, and FX-PCA3611-0</p> <p>30 VA maximum for FX-PCA2612-1</p> <p>40 VA maximum for FX-PCA2612-2</p> <p><b>Note:</b> 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).</p>
<b>Ambient Conditions</b>	<p><b>Operating:</b> 0 to 50°C (32 to 122°F); 10 to 90% RH noncondensing; Pollution Degree 2</p> <p><b>Storage:</b> -40 to 80°C (-40 to 176°F); 5 to 95% RH noncondensing</p>
<b>BACnet/MSTP Controller Addressing</b>	<p>DIP switch set; valid controller device addresses 4–127</p> <p>(Device addresses 0–3 and 128–255 are reserved and not valid controller addresses.)</p>
<b>N2 Controller Addressing</b>	DIP switch set; valid controller device addresses 1–255
<b>Communications Bus</b>	<p><b>RS-485, selectable between BACnet MS/TP or N2:</b></p> <p>3-wire FC Bus between the supervisory controller and FX-PC controllers</p> <p>4-wire SA Bus between FX-PC controller, NS Series Network Sensors, and other sensor/actuator devices, includes a lead to source 15 VDC supply power (from FX-PC controller) to bus devices.</p>

**Table 4: FX-PCA Series Technical Specifications**

<b>Processor</b>	H8SX/166xR Renesas® microcontroller FX-PCA3611-0A and FX-PCA3611-0 use RX630 32-Bit Renesas® microcontroller
<b>Memory</b>	4 MB Flash Memory and 1 MB Random Access Memory (RAM)
<b>Input and Output Capabilities</b>	<p><b>FX-PCA2611-0:</b></p> <p>6 - Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm, or Binary Dry Contact</p> <p>2 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode</p> <p>2 - Analog Outputs: Defined as 0–10 VDC or 4–20 mA</p> <p>3 - Binary Outputs: Defined as 24 VAC Triac (selectable internal or external source power)</p> <p>4 - Configurable Outputs: Defined as 0–10 VDC or 24 VAC Triac BO</p> <p><b>FX-PCA2612-1 and FX-PCA2612-2:</b></p> <p>5 - Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm, or Binary Dry Contact</p> <p>4 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode</p> <p>4 - Configurable Outputs: Defined as 0–10 VDC or 24 VAC Triac BO</p> <p>2 - Relay Outputs: (Single-Pole, Double-Throw) Rated as UL 916; 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; EN 60730: 6 (4) N.O. or N.C. only</p> <p>3 - Relay Outputs: (Single-Pole, Single-Throw) Rated as UL 916; 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; EN 60730: 6 (4) N.O. or N.C. only</p> <p><b>FX-PCA3611-0A and FX-PCA3611-0:</b></p> <p>8 - Universal Inputs: Defined as 0-10 VDC, 4-20 mA, 0-600k ohms, or Binary Dry Contact</p> <p>6 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode</p> <p>6 - Binary Outputs: Defined as 24 VAC Triac (external power source only)</p> <p>6 - Analog Outputs: Defined as 0-10 VDC or 4-20 mA</p>
<b>Analog Input/Analog Output Resolution and Accuracy</b>	<p>Analog Input: 15-bit resolution</p> <p>Analog Output: 15-bit resolution and <math>\pm 200</math> mV in 0–10 VDC applications</p>
<b>Terminations</b>	<p>Input/Output: Fixed Screw Terminal Blocks on FX-PCA2611-0, FX-PCA3611-0A, and FX-PCA3611-0 and Pluggable Terminal Blocks on FX-PCA2612-1 and FX-PCA2612-2</p> <p>FC Bus, SA Bus, and Supply Power: 3-wire and 4-wire Pluggable Screw Terminal Blocks</p> <p>FC Bus and SA Bus: RJ-12 6-pin Modular Jacks</p>
<b>Mounting</b>	Horizontal on single 35 mm DIN rain mount (preferred), or screw mount on flat surface with three integral mounting clips on controller
<b>Housing</b>	Enclosure material: ABS and polycarbonate UL94 5VB; self-extinguishing; Plenum-rated Protection Class: IP20 (IEC529) (except the FX-PCA2612 controller)
<b>Dimensions (Height x Width x Depth)</b>	<p><b>FX-PCA2611-0:</b> 150 x 190 x 53 mm (5-7/8 x 7-1/2 x 2-1/8 in.) including terminals and mounting clips</p> <p><b>FX-PCA2612 Models:</b> 150 x 164 x 53 mm (5-7/8 x 6-7/16 x 2-1/8 in.) including terminals and mounting clips</p> <p><b>FX-PCA3611-0A<sup>1</sup> and FX-PCA3611-0:</b> 150 x 220 x 57.5 mm (5-7/8 x 8-3/4 x 2-3/8 in.) including terminals and mounting clips</p> <p><b>Note:</b> Mounting space for FX-PCA26 models requires an additional 50 mm (2 in.) space on top, bottom, and front face of controller for easy cover removal, ventilation, and wire terminations.</p>
<b>Weight</b>	0.5 kg (1.1 lb)

**Table 4: FX-PCA Series Technical Specifications**

<b>Compliance</b>	<b>United States:</b> UL Listed, File E107041, CCN PAZX, UL 916, Energy Management Equipment; FCC Compliant to CFR47, Part 15, Subpart B, Class A
	<b>Canada:</b> UL Listed, File E107041, CCN PAZX7, CAN/CSA C22.2 No. 205, Signal Equipment; Industry Canada Compliant, ICES-003
	<b>Europe:</b> CE Mark – Johnson Controls, Inc., declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC.  Johnson Controls, Inc., declares that the FX-PCA2612-2 models are also in compliance with the essential requirements and other relevant provisions of the Low Voltage Directive 2006/95/EC. Declared as Independently Mounted, Intended for Panel Mounting, Operating Control Type 1.B, 4kV rated impulse voltage. 100°C ball pressure test.
	<b>Australia and New Zealand:</b> C-Tick Mark, Australia/NZ Emissions Compliant
	<b>BACnet International:</b>
	<b>FX-PCA26xx Models</b> - BACnet Testing Laboratories (BTL) Protocol Revision 7 Listed BACnet Advanced Application Controller (B-AAC)  <b>FX-PCA3611-0A and FX-PCA3611-0</b> - BACnet Testing Laboratories™ Protocol Revision 9 (BTL) Listed BACnet Advanced Application Controller (B-AAC)

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