

# FX-PCA Advanced Application Programmable Controller Catalog Page

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The FX-PCAs are advanced application controllers with integral RS-485 Master-Slave/Token-Passing (MS/TP) communications.

FX-PCA Series Controllers feature an integral real-time clock and support time-based tasks, which enables these controllers to monitor and control schedules, calendars, alarms, and trends. FX-PCAs can continue time-based control and monitoring for extended periods of time when offline from a supervisory controller.

FX-PCA Series Controllers can also operate as stand-alone controllers in applications that do not require a networked supervisory device or for network applications where it is preferred to have the scheduling, alarming, or trending performed locally in the field controllers.

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.

A full range of FX-PCA and FX-PCG models combined with the FX-PCX models can be applied to a wide variety of building applications ranging from simple fan coil or heat pump control to air handlers to advanced central plant management.

All FX-PCA controllers support wireless communications using the FX-ZFR Series accessories.

Refer to the *FX-PC Series Programmable Controllers and Related Products Product Bulletin (LIT-12011657)* for product application details.

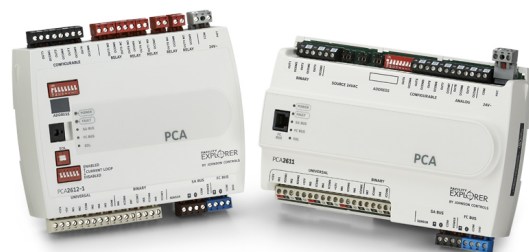
## Features

- 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.
- 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 - Provides a wireless alternative to hard-wired system counterparts, 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 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 Facility Explorer (FX) Supervisory Controllers, facilitating easy initial location and relocation.
- Patented proportional adaptive control (P-Adaptive) and Pattern Recognition Adaptive Control (PRAC) technologies 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     |
|--------------------------|--|------------|----------------------|
| Universal Input (UI)     | Analog Input, Voltage Mode, 0–10 VDC<br>Analog Input, Current Mode, 4–20 mA<br>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)<br>Binary Input, Dry Contact Maintained Mode | 6          | 5                    |
| Binary Input (BI)        | Dry Contact Maintained Mode<br>Pulse Counter/Accumulator Mode (High Speed), 100 Hz   | 2          | 4                    |
| Analog Output (AO)       | Analog Output, Voltage Mode, 0–10 VDC<br>Analog Current Mode, 4–20 mA  | 2          |                      |
| Binary Output (BO)       | 24 VAC Triac   | 3          |                      |
| Configurable Output (CO) | Analog Output, Voltage Mode, 0–10 VDC<br>Binary Output Mode, 24 VAC Triac  | 4          | 4                    |
| Relay Output (RO)        | Relay Output: Single-Pole, Double-Throw (SPDT)<br>Relay Output: Single-Pole, Single-Throw (SPST)   |            | 2 - SPDT<br>3 - SPST |

**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 |

**Accessories**

**Table 3: FX-PCA Accessories**

| Product Code Number            | Description   |
|--------------------------------|---|
| FX-DIS1710-0                   | Local Controller Display  |
| FX-BTCVT-1                     | Bluetooth® Commissioning Converter  |
| TL-BRTRP-0                     | Portable BACnet/IP to MS/TP Router  |
| FX-ZFR1811-0                   | Wireless Field Bus Router, 10 mW Transmission Power. Functions with FX-PC controllers and FX-WRZTx 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  |
| 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   |
| AP-TBK4FC-0                    | Replacement MS/TP FC Bus Terminal, 4-Position Connector, Blue, Bulk Pack  |
| AP-TBK3PW-0                    | Replacement Power Terminal, 3-Position Connector, Gray, Bulk Pack   |
| MS-TBKLV03-0                   | Handheld VAV Box Balancing Tool   |
| MS-TBKRO02-0                   | Terminal Block Kit -FX-PCA 2-Position Relay Output - 9 Pieces   |
| MS-TBKRO03-0                   | Terminal Block Kit - FX-PCA 3-Position Relay Output - 6 Pieces  |

**Table 3: FX-PCA Accessories**

| Product Code Number | Description   |
|---------------------|---|
| MS-TBKCO04-0        | Terminal Block Kit - FX-PCA 4-Position Configurable Output - 6 Pieces   |
| MS-TBKUI04-0        | Terminal Block Kit - FX-PCA 4-Position Universal Input - 3 Pieces   |
| MS-TBKUI05-0        | Terminal Block Kit - FX-PCA 5-Position Universal Input - 3 Pieces   |
| FX-ZFR              | <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><b>Note:</b> 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> |
| TL-BRTRP-0          | Portable BACnet/IP to MS/TP Router  |

**FX-PCA Series Technical Specifications**

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

|                                 |  |
|---------------------------------|--|
| Product Code Numbers            | <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>  |
| Supply Voltage                  | <p><b>FX-PCA2611-0 and FX-PCA2612-1:</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>   |
| Power Consumption               | <p>14 VA maximum for FX-PCA2611-0</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>  |
| Ambient Conditions              | <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>  |
| Controller Addressing           | <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>  |
| Communications Bus <sup>1</sup> | <p>BACnet® Master-Slave/Token-Passing (MS/TP), RS-485:</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>  |
| Processor                       | H8SX/166xR Renesas microcontroller   |
| Memory                          | 4 MB Flash Memory and 1 MB Random Access Memory (RAM)  |
| Input and Output Capabilities   | <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> |

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

|   |   |
|---|---|
| <b>Analog Input/Analog Output Resolution and Accuracy</b> | Analog Input: 16-bit resolution<br>Analog Output: 16-bit resolution and $\pm 200$ mV in 0–10 VDC applications   |
| <b>Terminations</b>                                       | Input/Output: Fixed Terminal Blocks on FX-PCA2611-0 and Pluggable Terminal Blocks on FX-PCA2612-1 and FX-PCA2612-2<br>FC Bus, SA Bus, and Supply Power: 3-wire and 4-wire Pluggable Screw Terminal Blocks<br>FC Bus and SA Bus: RJ-12 6-pin Modular Jacks   |
| <b>Mounting</b>   | Horizontal on single 35 mm DIN rail 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>                | <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<br><b>FX-PCA2612-x 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<br><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.   |
| <b>Weight</b>   | 0.5 kg (1.1 lb)   |
| <b>Compliance</b>   | <p><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</p> <p><b>Canada:</b> UL Listed, File E107041, CCN PAZX7, CAN/CSA C22.2 No. 205, Signal Equipment; Industry Canada Compliant, ICES-003</p> <p><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.<br/>Johnson Controls, Inc., declares that the FX-PCA2612-2 model is also in compliance with the essential requirements and other relevant provisions of the Low Voltage Directive 2006/95/EC. Declared as Free Standing Operating Control Type 1.B 2,500 V rated impulse voltage. 100°C ball pressure test.</p> <p><b>Australia and New Zealand:</b> C-Tick Mark, Australia/NZ Emissions Compliant</p> <p><b>BACnet International:</b> BACnet Testing Laboratories Protocol Revision 7 Listed BACnet Advanced Application Specific Controller (B-AAC)</p> |

1 For more information, refer to the *FX-PC Series Controllers MS/TP Communications Bus Technical Bulletin (LIT-12011670)*.



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