FX-PCG General Purpose Programmable Controllers Catalog Page

Johnson Controls

FX-PCG General Purpose Programmable Controller

The FX-PCG 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 a BACnet Application Specific Controller (B-ASC) with integral MS/TP communications. In N2 mode, they can be used to modernize sites with legacy Johnson Controls controllers.

These controllers run pre-engineered and user-programmed applications and provide the inputs and outputs required to monitor and control a wide variety of HVAC equipment.

A full range of FX-PCG models combined with the FX-PCX model 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 FX-PCG Series Controllers configured for BACnet support wireless communications using the FX-ZFR or FX-ZFR Pro System accessories.
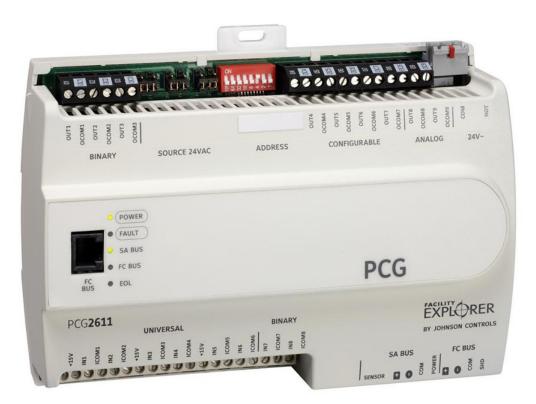
Figure 1: FX-PCG2611 General Purpose Programmable Controller

Application documentation

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

Repair information

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

Features and benefits

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 Controller Configuration Tool (CCT) 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

Enables 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

Includes 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 CCT and enables persistent application data.

Large Product Family

A 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.

FX-PCG Series point type counts per model

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

Point types	Signals accepted	FX-PCG16xx	FX-PCG25xx	FX-PCG26xx
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	4 (Does not support Current Mode)	6
Binary Input (BI)	Dry Contact Maintained Mode Pulse Counter/Accumulator Mode (High Speed), 100 Hz	1	6	2
Analog Output (AO)	Analog Output, Voltage Mode, 0–10 VDC Analog Output, Current Mode, 4–20 mA		2 (Voltage Only)	2
Binary Output (BO)	24 VAC Triac	3	2 (Ext Power Only)	3
Configurable Output (CO)	Analog Output, Voltage Mode, 0–10 VDC Binary Output Mode, 24 VAC Triac	4	2	4

ⓘ **Note:** Analog Input, Current Mode is set by hardware for the FX-PCG26xx, and by software for the FX-PCG25xx.

FX-PCG Series ordering information

Table 2: FX-PCG Series ordering information

Product Code Number	Description
FX-PCG1611-1	0-Point General Purpose Programmable Controller with 2 UI, 1 BI, 3 BO, and 4 CO; 24 VAC; FC and SA Bus Support
FX-PCG1611-1ET	FX-PCG1611 Extended Temperature controller for rooftop applications. Supports Operational Temperature Range of -40°C to 70°C (-40°F to 158°F).

Table 2: FX-PCG Series ordering information

Product Code Number	Description
FX-PCG1621-1	10-Point General Purpose Programmable Controller with 2 UI, 1 BI, 3 BO, and 4 CO; 24 VAC; FC and SA Bus Support; Integral Display with Pushbutton User Interface
FX-PCG2611-0	17-Point General Purpose Programmable Controller with 6 UI, 2 BI, 3 BO, 2 AO, and 4 CO; 24 VAC; FC and SA Bus Support
FX-PCG2611-0ET	FX-PCG2611 Extended Temperature controller for rooftop applications. Supports Operational Temperature Range of -40°C to 70°C (-40°F to 158°F).
FX-PCG2621-0	17-Point General Purpose Programmable Controller with 6 UI, 2 BI, 3 BO, 2 AO, and 4 CO; 24 VAC; FC and SA Bus Support; Integral Display and Pushbutton User Interface

Accessories

Table 3: FX-PCG accessories

Product code number	Description
FX-DIS1710-0	Local Controller Display
FX-BTCVT-1	Bluetooth Commissioning Converter with Bluetooth Technology
MS-ZFRCBL-0	Wire Harness for Use with FX-ZFR or FX-ZFR Pro Router. Allows the Router to function with FX-PCG Series, FX-PCG Series, and FX-PCA Series Controllers in Conjunction with NS Series Sensors, Bluetooth Commissioning Converter, or FX-DIS1710 Local Controller Display
MS-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
NS Series Sensors	NS Series Network Sensors
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, Blue (Bulk Pack of 10)
AP-TBK3PW-0	AP-TBK3PW-0
ZFR-USBHA	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 *FX-ZFR Series Wireless Field Bus System Technical Bulletin (LIT-12011660)* or *FX-ZFR Series Wireless Field Bus System Quick Reference Guide (LIT-12011696)*. USB Dongle with ZigBee® Driver provides a wireless connection through CCT 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 CCT.
TL-BRTRP-0	Portable BACnet IP to MS/TP Router

FX-PCG Series technical specifications

Table 4: FX-PCG Series technical specifications

Product Code Numbers	**FX-PCG1611-1** – 10-Point General Purpose Programmable Controller **FX-PCG1621-1** – 10-Point General Purpose Programmable Controller with Integral Display and Pushbutton User Interface **FX-PCG2611-0** – 17-Point General Purpose Programmable Controller **FX-PCG2621-0** – 17-Point General Purpose Programmable Controller with Integral Display and Pushbutton User Interface
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 for FX-PCG1611, FX-PCG2611 (no integral display) 20 VA maximum for FX-PCG1621 and FX-PCG2621 (with integral display) ⓘ **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°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 ⓘ **Note:** FX-PCG models with an -0ET suffix have an operating temperature range of -40°C to 70°C (-40°F to 158°F).
Controller Addressing	**BACnet/MS/TP Controller** DIP switch set; valid controller device addresses 4–127 (Device addresses 0–3 and 128–255 are reserved and not valid controller addresses.) **N2** DIP switch set; valid controller device addresses 1–255
Communications Bus [1]	**RS-485, software selectable between BACnet MS/TP or N2:** 3-wire FC Bus between the supervisory controller and FX-PC controllers 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
Processor	RX631 Renesas® 32-bit microcontroller
Memory	**FX-PCG16 and FX-PCG26:** 1 MB Flash Memory and 512 KB RAM

Table 4: FX-PCG Series technical specifications

Input and Output Capabilities	**FX-PCG16: 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 **FX-PCG26 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
Analog Input/ Analog Output Resolution and Accuracy	**FX-PCG16 and FX-PCG26:** Analog Input: 16-bit resolution Analog Output: 16-bit resolution and ±200 mV in 0–10 VDC applications
Terminations	**FX-PCG16 and FX-PCG26:** FC Bus Port and Sensor 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	**FX-PCG16 and FX-PCG26:** ABS and polycarbonate UL94 5VB; self-extinguishing; Plenum-rated protection class: IP20 (IEC529)
Dimensions (Height x Width x Depth)	**FX-PCG16 Models:** 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 **FX-PCG26 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 FX-PC 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	**FX-PCG16 Models:** 0.4 kg (0.9 lb) **FX-PCG26 Models:** 0.5 kg (1.1 lb)
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
	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

Table 4: FX-PCG Series technical specifications

	FX-PCG16 and FX-PCG26: BACnet Testing Laboratories (BTL) Protocol Revision 4 Listed BACnet Application Specific Controller (B-ASC)

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

Conformance Disclaimer

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