

ComfortPoint™ Open

CPO-PC410 PLANT CONTROLLER

PRODUCT DATA

Trademark Information

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APPLICATION

CPO-PC410 is an advanced and advanced plant controller of the ComfortPoint™ Open (CPO) Plant Controller platform. It is an Ethernet-based, freely programmable, and native BACnet® Building Controller (B-BC).

CPO-PC410 is designed for a wide variety of complex applications. This device features numerous RS485 communication interfaces, two standard Ethernet interfaces, an MMI interface, and two USB interfaces.

CPO-PC410 can be mounted on either a DIN rail or remote mounted in a horizontal or vertical position.

FEATURES

- **Conforms to BACnet Standard 135 protocol version 1.14 (ISO 16484-5).**
- **Three pairs of LEDs indicating the transmission and reception (respectively) of data via the RS485 interfaces 1,2, and 3.**

- **Ring LED to show the operational status of the controller.**
- **Internal Ethernet switch with two external ports and status LEDs to allow quick connection of local Ethernet-based tools, remote IO, or additional IP based controllers and devices to reduce the number of IP drops.**
- **An MMI interface to connect with the CPO-MMI device which helps to monitor and manage the controller data.**
- **Four RS485 interfaces to support Panel bus, BACnet MS/TP, Field Bus, Modbus, M-Bus, CP-IO protocols, and C-Bus global data sharing.**
- **Dual Core Processor to isolate BACnet IP network communications from DDC application and device communications.**
- **Built-in advanced diagnostics software facilitating troubleshooting.**
- **FRAM to store the live data for the controller including storing last known values when power is removed.**
- **DDR3L for Random Access Memory to achieve twice the rate of data transfer with low power consumption.**
- **EMMC for program storage and boot flash memory.**
- **BACnet Trending with Backfill and storage up to 1M data samples.**
- **UTF-8 and UCS-2 character encoding formats are supported.**
- **Supports Peer-to-Peer communication.**
- **A reset button to restore the factory default settings.**
- **Removable screw-type terminal block.**
- **Built-in Webserver with HTML5 graphics support.**
- **Watchdog relay to enhance system reliability and safety.**
- **A micro USB and USB Type A ports to quickly connect with a laptop and mobile/tablet devices.**

NOTE: The USB Type A port is only available for use with a future firmware release.

INTERFACES AND TERMINALS

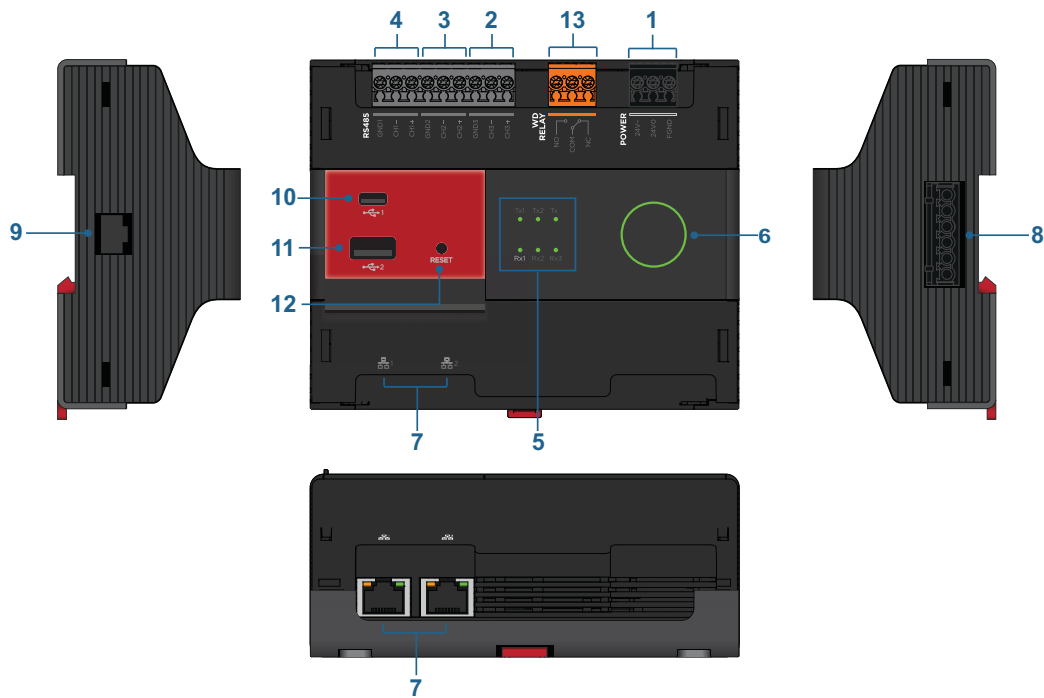


Table 1. Controller Terminals

Type	Legend	Signal	Comment
Power Supply Terminals	1	FGND	Connect to earth ground in the field
		24V0	Power supply common
		24V~	Power supply (24 Vac/dc)
RS485 Interface 3 Terminals	2	CH3+	(+) for RS485 interface 3
		CH3-	(-) for RS485 interface 3
		GND3	GND3 for RS485 interface 3
RS485 Interface 2 Terminals	3	CH2+	(+) for RS485 interface 2
		CH2-	(-) for RS485 interface 2
		GND2	GND2 for RS485 interface 2

Table 1. Controller Terminals (Continued)

Type	Legend	Signal	Comment
RS485 Interface 1 Terminals	4	CH1+	(+) for RS485 interface 1
		CH1-	(-) for RS485 interface 1
		GND1	GND1 RS485 interface 1
LED	5	Tx1 LED (green)	Transmit and receive an indication for RS485 interfaces 1 to 3
		Rx1 LED (green)	
		Tx2 LED (green)	
		Rx2 LED (green)	
LED	6	Tx3 LED (green)	Indicates the operational status of the controller
		Rx3 LED (green)	

Table 1. Controller Terminals (Continued)

Type	Legend	Signal	Comment
RJ45 Interface	7	Ethernet 1	10/100 base-T/TX
		Ethernet 2	
RS485 Interface 4 Terminals	8	~ (24V~)	Accessory power supply output (24 Vac/dc)
		0 (24V0)	Accessory power supply output common
		FGND	Connect to earth ground in the field
		GND	GND RS485 interface 4
		- (CH4-)	(-) for RS485 interface 4
		+ (CH4+)	(+) for RS485 interface 4
RJ11 Interface	9	(+) for RS485 interface 5	MMI interface for power supply(5 Vdc) to MMI device, and RS485 interface for communication with MMI.
		(-) for RS485 interface 5	
		output 5Vdc	
		GND	
USB Interface	10	Micro USB port	Temporary connection for laptops, tablets, and mobiles. For programming and temporary use only.
	11	USB Type A port	
Reset Button	12		Reset button to reset the device to factory default
Watchdog Relay	13	NC	Open - Normal operation. Closed - Failed due to: <ul style="list-style-type: none"> No power to unit, or Controller failure.
		COM	Common
		NO	Closed - Normal operation. Open - Failed due to: <ul style="list-style-type: none"> No power to unit, or Controller failure.

Tx LED and Rx LED

CPO-PC410 is equipped with three Tx LEDs and three corresponding Rx LEDs. These LEDs indicate the transmission and reception of data by the three RS485 interfaces.

Table 2. Behavior and meaning of RS485 LEDs

LED Status	Description
OFF	No communication over the given RS485 interface.
Tx ON	Transmit data over the given RS485 interface.
Rx ON	Receive data over the given RS485 interface.

Interfaces and Bus Connections

Via its various interfaces and bus connections, CPO-PC410 can be connected to a variety of devices and systems.

Ethernet 1 and 2 Interfaces

The two Ethernet interfaces 1 and 2 are internally connected to a single Ethernet switch.

Both Ethernet 1 and 2 can connect the controller with a laptop/PC using Ethernet crossover cable. The user can upload, download, and debug the controller application using ComfortPoint™ Open Studio from the laptop/PC. This connection also establishes Internet connectivity.

CPO-PC410 can be operated via a standard browser. By default, an integrated web-server provides all operation pages for full browser-based operation. While browsing, the controller can remain connected in the Ethernet network without interruption.

USB Interfaces

CPO-PC410 is built with USB ports that support USB 2.0.

Table 3. USB Interfaces

USB Port Types	Purpose
Micro USB	To connect with laptops and mobile/tablet devices by using a USB cable for monitoring and troubleshooting the controller.
USB Type A	This option is only available for use with a future firmware release.

TECHNICAL DATA

Hardware Specifications

Table 4. Hardware Specifications

Feature	Specifications
FRAM	768 KBytes
DDR3L	1 GByte
EMMC	4 GBytes
CPU	Dual core: Arm Cortex-A9 Frequency: 800 MHz Arm Cortex-M4 Frequency: 227MHz
Operating System	LINUX/RTOS
Real-Time Clock Timekeeping Accuracy	+/- 5 ppm: +/- 2.63 minutes per year (+/- 0.43 seconds per day)
Real-Time Clock Retention	Buffered for 72 hours by gold capacitor

System Data

Table 5. System Data

Operating Voltage (AC)	19 to 29 Vac (50/60Hz)
Operating Voltage (DC)	19 to 29 Vdc
Overvoltage Protection	Protected against overvoltages of max. 29 Vac or 40 Vdc. Terminals protected against short-circuiting.

Power Consumption

Table 6. Power Consumption

Controller	Power	
	24 Vac	24 Vdc
CPO-PC410	Max. 12 VA	Max. 12 W
CPO-PC410 and CPO-MMI	Max. 15 VA	Max. 15 W
CPO-PC410 w/ 2.1A Accessory Load	Max. 65 VA	Max. 65 W


Current Consumption

Table 7. Current Consumption

Controller	Power	
	24 VAC	24 VDC
CPO-PC410	500 mA	500 mA
CPO-PC410 and CPO-MMI	800 mA	800 mA
CPO-PC410 w/ 2.1A Accessory Load	2.6 A	2.6 A

Standards

Table 8. Standards

Protection Class	IP20
Product Standards	UL60730-1, UL60730-2-9, UL916, EN60730-1, EN60730-2-9, CAN/CSA-E60730-1:02
Testing Electrical Components	IEC68
Certification	cUL60730-1, UL916, CE, BTL B-BC, BACnet Standard 135 version 1.14, ISO 16484-5, FCC Part15, Subpart B, CAN ICES-3 (B)/NMB-3(B), BQB, RCM, AMEV AS-B, KBOB, EAC, RoHS II, Ethernet Protocol version IEEE802.3, EN-1434-3, EN-13757-3, UUKL, and  Class III equipment per IEC 61140.
System Transformer	The system transformer(s) must be safety isolating transformers according to IEC 61558-2-6. In the U.S.A. and Canada, NEC Class 2 transformers must be used.

Operating Environment

Table 9. Operating Environment

Ambient Operating Temperature	0 to 50 °C (32 to 122 °F)
Ambient Operating Humidity	5 to 95% relative humidity (non-condensing)
Storage Temperature	-28.9 to +70 °C (-20 to 158 °F)
Ambient Storage Humidity	5 to 95% relative humidity (non-condensing)
Vibration Under Operation	0.024" double amplitude (2 to 30 Hz), 0.6 g (30 to 300 Hz)
Dust, Vibration	According to EN60730-1
RFI, EMI	Residential, commercial, and light-industrial environments
MTBF (Mean Time Between Failure)	11.5 years

Controller Parameters

Table 10. Controller Parameters

Parameters	Max. Number
Hardware Points (AI, AO, BI, BO, MI, MO, ACC)	500
Software Points (AV, BV, MV, AF, BF)	1500
Time Schedules	100
Calendar Objects	100
Control Loops	64
Loop Objects	60
Trend Objects	500
Event Enrollment Objects	500
Event Log Object	1
Event Log Object Associated Records	70000
Point Name Characters	64
Description Characters	95

Connection to Buses

Table 11. Connection to Buses

Protocols	Max. No. of Devices per Channel	RS485-1	RS485-2	RS485-3	RS485-4
Panel Bus	16	Yes	Yes	Yes	Yes
CP-IO Bus	16	No	No	No	Yes
Field Bus	31	Yes	Yes	Yes	No
MSTP	30	Yes	Yes	Yes	No
Modbus	30	Yes	Yes	Yes	No
M-Bus**	60	Yes**	Yes**	Yes**	No
C-Bus*	30	Yes*	Yes*	Yes*	No

NOTES:

- The communication rate across each communication interface is dependent upon the given communication protocol.
- *Not more than one channel can be configured as C-Bus channel.
- **Not more than one channel can be configured as M-Bus channel.
- **The CPO-PC410 controller can function as an M-Bus Master. It uses a standard level converter (e.g. PW60) to connect to the M-Bus devices.

Communication Baud Rates

Table 12. Communication Baud Rates

Ethernet	10/100 Mbit/s, RJ45
BACnet MSTP	9.6, 19.2, 38.4, 76.8, 115.2 Kbps
Modbus RTU	0.3 to 115.2 Kbps
Panel Bus	115.2 Kbps
CP-IO Bus	56.7 Kbps
C-Bus	9.6, 38.4, and 76.8 Kbps
M-Bus	0.3 to 19.2 Kbps
Field Bus	38.4 Kbps
MMI Port	5 Vdc power output and RS485

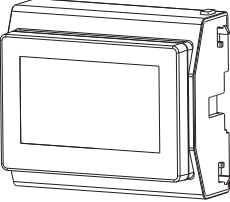
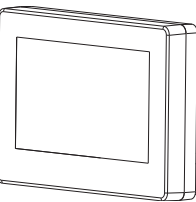

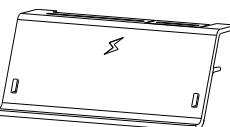
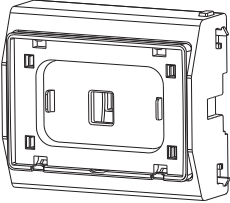
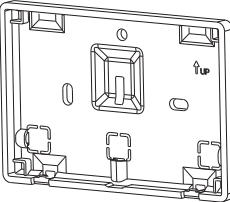
Controller Part Numbers

Table 13. Controller

Part Number	Description
CPO-PC410	CPO Controller
CPO-PC410-MMIDN	CPO Controller including MMI with DIN Rail Base
CPO-PC410-MMIWL	CPO Controller including MMI with Panel Door/Wall Base

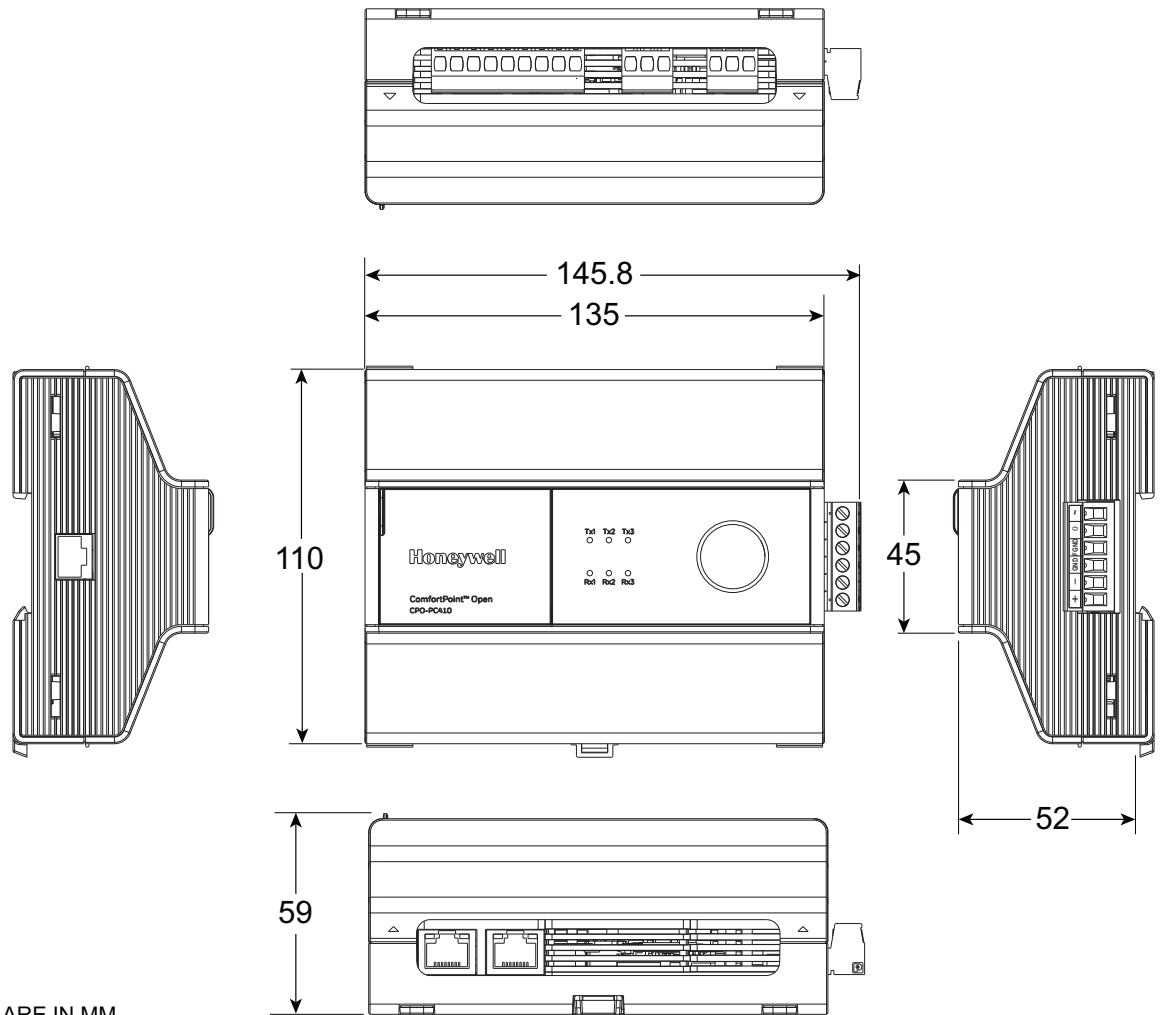
Accessories Part Numbers

Table 14. Accessories

	Part Number	Description
	CPO-MMI-DN	MMI with DIN Rail Base
	CPO-MMI-WL	MMI with Panel Door/Wall Base
	CPO-PC-TCVR	Replacement Terminal Covers (Small) (Pack Quantity of 4)
	CPO-PC-EXT-TCVR	Extended Terminal Covers (Large) (Pack Quantity of 4)
	CPO-MMI-ACCDN	DIN Rail Base Accessory for CPO MMI
	CPO-MMI-ACCWL	Panel Door/Wall Base Accessory for CPO MMI

DIMENSIONS

CPO-PC410



*ALL DIMENSIONS ARE IN MM

GENERAL SAFETY INFORMATION

- When performing any work (installation, mounting, start-up), all manufacturer instructions and in particular the Installation and Commissioning Instructions (EN1B-0077IE10) are to be observed.
- The ComfortPoint™ Open System (including the CPO-PC410 Plant Controller, Panel Bus I/O modules, manual disconnect modules, and the auxiliary terminal packages) may be installed and mounted only by authorized and trained personnel.
- Rules regarding electrostatic discharge should be followed.
- If the ComfortPoint™ Open System is modified in any way, except by the manufacturer, all warranties concerning operation and safety are invalidated.
- Make sure that the local standards and regulations are observed at all times. Examples of such regulations are VDE 0800 and VDE 0100 or EN 60204-1 for earth grounding.
- Use only accessory equipment that comes from or has been approved by Honeywell.
- It is recommended that devices be kept at room temperature for at least 24 hours before applying power. This is to allow any condensation resulting from low shipping/storage temperatures to evaporate.
- The ComfortPoint™ Open System must be installed in a manner (e.g., in a lockable cabinet) ensuring that uncertified persons have no access to the terminals.
- Investigated according to United States Standard UL-60730-1, UL-916, and UL60730-2-9.
- Investigated according to Canadian National Standard(s) C22.2, No. 205-M1983 (CNL-listed).
- Do not open the CPO-PC410, as it contains no user-serviceable parts inside!
- CE declarations according to LVD Directive 2014/35/EU and EMC Directive 2014/30/EU.
- Product standards are EN 60730-1 and EN 60730-2-9.
- The CPO-PC410 smoke control system is a Non-Dedicated system.
- The smoke-control system shall not activate an automatic smoke-control sequence as a result of a signal input generated by the activation of a manual fire alarm pull station.

Safety Information as per EN60730-1

The ComfortPoint™ Open System is intended for residential, commercial, and light-industrial environments.

The ComfortPoint™ Open System is an independently mounted electronic control system with fixed wiring.

The CPO-PC410 is suitable for mounting in fuse boxes conforming with standard DIN43880, and having a slot height of max. 45 mm.

It is suitable for panel rail mounting on 35 mm standard panel rail (both horizontal and vertical rail mounting possible).

The CPO-PC410 is used for the purpose of building HVAC control and is suitable for use only in non-safety controls for installation on or in appliances.

Table 15. Safety Information as per EN60730-1

Electric Shock Protection	PELV
Pollution Degree	Pollution Degree 2, suitable for use in industrial environments.
Installation	Class 3
Overvoltage Category	24 V-powered controls: Category I
Rated Impulse Voltage	330 Vac for Category I (SELV)
Automatic Action	Type 1.C (micro interruption for the relay outputs)
Software Class	Class A
Enclosure	IP20 according to EN-60529
Ball-pressure Test Temperature	>75 °C for all housing and plastic parts >125 °C in the case of devices applied with voltage-carrying parts, connectors, and terminals.
Electromagnetic Interference	Tested at 230 Vac, with the modules in normal condition.
System Transformer	Europe: safety isolating transformers according to IEC61558-2-6 U.S.A. and Canada: NEC Class-2 transformers

Honeywell Building Solutions

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