Honeywell CC-PUIO01 51454205-175

Series C Universal I/O Module

Honeywell CC-PUIO01 51454205-175 is a Series C Universal I/O module for connecting process transmitters, current-loop outputs, switch contacts and digital loads to an Experion PKS control system. Its 32 configurable channels allow different signal types on the same module, making the exact I/O configuration as important as the module number when selecting a spare.



Technical Specifications

Product Identity	
Manufacturer	Honeywell
Model	CC-PUIO01 51454205-175
Product type	Series C Universal I/O module
Functional Configuration	
Channel capacity	32 configurable I/O channels; AI, AO, DI or DO
Analog input	0–20 mA or 4–20 mA; 2-, 3- or 4-wire current devices
Analog output	4–20 mA current loop; 12-bit resolution
HART	HART 7 on analog input/output
Pulse input	Channels 15–18 only; 0–10 kHz; minimum pulse width 50 µs
Digital output	Solid-state sourcing; 0.5 A maximum per channel; 9 A maximum per module, subject to configuration and ambient temperature
Digital output load caveat	Loads below 20 mA can incorrectly report Line Monitoring or OP Fail
Non-redundant IOTA	CC-TUIO01, nominal 12 in
Redundant IOTA	CC-TUIO11, nominal 18 in
Configuration environment	Experion Control Builder, Series C I/O library (UIO)
Performance & Power	
Analog input conversion / scan	16 bit; 50 ms input scan
Power arrangement	Module power and field connections via the matching IOTA; Series C IOTA power supplied from a 24 VDC carrier bus
Environment	
Module ambient temperature	–40 to +70 °C; apply the configuration-dependent thermal derating calculation

Selected original manufacturer material follows on pages 3–12.

Compatibility & Selection Guide

System compatibility. Configure CC-PUIO01 51454205-175 in the Series C I/O library of Experion Control Builder, using the matching CC-TUIO01 or CC-TUIO11 IOTA. Honeywell's May 2026 lifecycle notice lists this UIO family as Phase-out, with spares available for the installed base but not allowed for greenfield or brownfield expansion. For those expansions, Honeywell recommends CC-PUIO31 with CC-TUIO31 or CC-TUIO41 and Experion R432 or later. Assess the installed IOTA, redundancy, firmware and saved channel configuration before migrating; the recommendation does not establish an automatic drop-in exchange.

Wiring & Installation Reference

Field connections

Analog input. Use the documented 2-, 3- or 4-wire current-transmitter arrangement; check the transmitter power reference and allowable field-loop resistance.

Digital input. Fit the specified field resistor arrangement near the switch when open-wire detection is enabled.

Digital output. Check per-channel current, module total and thermal limits. Do not apply the module's maximum current rating to every channel simultaneously.

Mounting and configuration

Confirm the assembly. Identify CC-PUIO01 and the installed CC-TUIO01 or CC-TUIO11 IOTA. Confirm redundancy and the saved channel configuration.

Prepare the installation. Turn off all power at the installation location before the installation procedure. Mount and ground the correct IOTA/carrier assembly as described in the user guide.

Fit the module. Mate the module correctly with the IOTA connector and secure the specified screws. Use a #2 Phillips screwdriver for the long gray plastic screw; do not use a battery-powered screwdriver.

Check loading and temperature. Mount the module upright for natural-convection cooling and complete the applicable UIO thermal calculation before putting configured channels into service.

Installation precautions. UIO analog inputs measure current; do not connect a voltage, thermocouple, RTD or NAMUR signal directly as though it were a supported current loop. Channel settings, open-wire monitoring components and actual load must match. Follow all power-isolation, grounding and installation requirements in the manufacturer's complete guide. The published –40 to +70 °C module ambient range does not permit unrestricted output loading. Apply the current configuration and inlet-air temperature to the manufacturer's thermal calculation.

View terminal assignments (PDF) · PDF page 12 | View mounting and safety reference (PDF) · PDF page 8

Manufacturer sources: Series C I/O User's Guide (EPDOC-X126).

5.19. Universal Input Output – CC-PUIO01

Function

The Universal Input Output module interfaces with analog input, analog output, digital input, and digital output field devices.

Notable Features

- Each channel user configurable as:
- Analog Input
- Analog Output
- Digital Input
- Digital Output
- Pulse Input (channels 15-18)
- Open Wire Detection
- Fast Scan (Priority I/O Module Scan)
- Electronic short circuit protection[1]
- Safe-state (FAILOPT) behaviors configurable on a per channel basis for Digital / Analog Output
- HART 7 support (analog IO)
- Extended Temperature Range -40 to +70°C module ambient

Parameter	Specification		
Universal Process IO Module	CC-PUIO01		
IOTA Model Numbers	CC-TUIO01	Non Redundant	12”
	CC-TUIO11	Redundant	18”
Note 1: Each signal can be shorted in the field with no damage to the IOM or IOTA. Other channels on the same IOM will not be affected. AI, AO and DI channels are further protected and certified to support energy limited / nonincendive field wiring connections to Zone 2 / Division 2 hazardous locations.			

Detail Specifications – Analog Input with HART

Parameter	Specification
Input type	Current (2, 3, or 4 wire devices)
Input Channels	32 Maximum per module (with or without open wire detect)
A/D Converter Resolution	16 bit
Input Range	0-20 mA or 4-20 mA
Normal Mode Rejection Ratio, at 60 Hz	12 dB
Normal Mode Filter Response	Single pole, -3 dB @ 16 Hz
Crosstalk, dc to 60 Hz (channel-to-channel)	60 dB
Input Impedance	250 Ω nominal
Maximum Input Voltage (any input referenced to common, no damage)	+36 VDC to -1.1 VDC (1)
Input Scan Rate	50 ms
Hardware accuracy	0.1% of full-scale (23.5 ± 2°C) 0.17% of full-scale (-40 to +70°C)
Transmitter Field Power Conditioning	Current limited to 24 mA
Input Filter	First-order low-pass 16 Hz
Note 1: Return terminal is connected directly to Common (Ground)	

Detail Specifications – Pulse Input

Parameter	Specification
Channels	15, 16, 17, 18
Frequency	0-10KHz
Minimum Pulse Width	50 µs
Duty Cycle	Any Duty Cycle that meets the Minimum Pulse Width specification above.

Detail Specifications – Analog Output with HART

Parameter	Specification
Output Type	4-20 mA current loop
Output Channels	32 Maximum per module [1] (with or without open wire detect)
Output Ripple	< 125 mV peak-to-peak at power line frequency, across 250 Ω load
Output Temperature Drift	0.001% of Full Scale/°C
Output Readback Accuracy	0.25% of full scale
Output Current Linearity	± 0.05% of Full Scale nominal
Resolution	12 bit
Calibrated Accuracy	<0.5% of Full Scale (25ºC) including linearity
Directly Settable Output Current Range	0 mA to 23 mA
Maximum Resistive Load (24 V supply = 22 VDC through 28 VDC)	700 ohms
Maximum Output Compliant Voltage (24 V supply = 22 VDC through 28 VDC)	14 VDC
Maximum Open Circuit Voltage	24 VDC
Response Time (DAC input code to output)	2 ms
Gap (0 mA) of Output to Field on Switchover	0 ms (both partners continuously active)
Note 1: Please refer to the User's Guide for calculation method to determine channel usage versus operating temperature.	

Detail Specifications – Digital Input with OWD

Parameter	Specification
Open Voltage	24 VDC
Short Circuit Current	7 mA
Open Contact	15 kΩ > 0.1 W
Closed Contact	5 kΩ > 0.25 W
Closed contact detection	1.8mA < I < 6 mA [1]
Open contact detection	0.7 mA < I < 1.8 mA [2]
Open wire detect	I < 0.7 mA
Input filter	First-order low-pass 16 Hz
Note 1: At 24 VDC, equates to 8.57 KΩ > R > 4 KΩ (where R = total loop resistance) Note 2: At 24 VDC, equates to 26.7 KΩ > R > 10 KΩ	

Detail Specifications – Digital Input without OWD

Parameter	Specification
Open Voltage	24 VDC
Closed contact current	7 mA ± 5%, after open state detection
	3.5 mA ± 5%, after closed state detection
Closed contact detection	I > 2.81mA [1]
Open contact detection	I < 1.8mA [2)]
Input filter	First-order low-pass 16 Hz
Note 1: At 24 VDC, equates to R < 8.57 KΩ (where R = total loop resistance) Note 2: At 24 VDC, equates to 26.7 KΩ > R > 10 KΩ	

Detail Specifications – Digital Output

Parameter	Specification
Output Channels	32 Maximum per module (with or without open wire detect) [4]
Output Type	Solid state source, short circuit proof [3]
Load Current Off Load Current On	0mA 1mA Minimum to 0.5A Maximum per channel [2] 9 A Maximum per module [1]
On-State Voltage	24 V (typ), load current @ 0.5A
Off-State Voltage	0v VDC (max)
Off-State Leak Current	< 0.1 mA
Gap (0 current) of Output to Field on Switchover	None (0ms) (applies to Redundancy only)

Note 1: Dependent on actual channel configuration for the module and the environment. Please refer to the User's Guide for calculation method.

Note 2: A Universal IO Channel configured for Digital Output can incorrectly report a Line Monitoring or "OP Fail" failure if the load current is less than 20mA.

Note 3: Short circuit will be limited to less than 1.4 Amps within 2 microseconds, and to 750 mA within 10 microseconds. If the short period persists more than 10 mili seconds, the DO channel will be shutoff

Note 4: Please refer to the User's Guide for calculation method to determine channel usage versus operating temperature.

4.3 Mounting the I/O module on the IOTA

4.3.1 Prerequisites

It is recommended to attach the IOTA board to the Backplane prior to mounting the module to the IOTA. Ensure the following:

- IOTA is mounted on the Backplane.
- Power supply is installed.
- Control firewall is installed.
- All wiring and pre-fabricated cables are available and labeled as applicable.
- All power is turned off at the installation location.
- You have the mounting hardware supplied with the components.

4.3.2 Mounting the module

1. Insert the module onto the IOTA board making sure that the circuit board mates properly with the IOTA board connector.
2. Secure the module to the:
   - IOTA board - with two screws located on each side of the plastic cover.
   - Backplane - with the long gray plastic screw located on the module's face.

> **CAUTION**
> Use only a #2 Phillips screw-driver to carefully loosen or tighten the long gray plastic screw. Do not use either a #1 Phillips screw-driver or a battery-powered screw-driver to remove or install the plastic screw as this can damage the screw head.

4.4 Grounding and power considerations - IOTA boards

4.4.1 Attaching the IOTA board

The Series C cabinet allows mounted carriers that support the attachment of the IOTA boards. By making these connections, power, and chassis, grounding is provided to the IOTA board.

- Testing for power

4.4.2 Testing for power

> **CAUTION**

Extreme care must be taken when testing for power at the Series C bus bars. Improper testing can result in an electrical short circuit, which will impact all modules attached to the channel carrier assembly.

Never use a test probe at an unattached IOTA's 24V screw hole. The probe can potentially touch the back channel assembly causing a short circuit.

The following locations are recommended for testing power:

Preferred location if IOTAs are attached

- Center of the screw that attaches the IOTA to the 24V bus bar.

Preferred location if IOTAs are NOT attached.

- Center of the screw of top connection terminal for power cable.

Testing for power at IOTA screw

1. Insert the test probe at the center of the screw that attaches the IOTA to the 24V power connection.
2. This concludes this procedure.

Testing for power at 24V bus bar top terminal

1. Carefully pull the red cap from the top of the terminal. It remains attached to the power cable.
   - Insert the test probe at the center of the screw to the 24V power terminal.
2. Carefully pull the black cap from the top of the terminal. It remains attached to the ground cable.

   Insert the test probe at the center of the screw to the COM ground terminal.
3. Replace the both caps.

3.4.5 Temperature Derating for UIO

The maximum outside module temperature must be limited depending on the internal dissipation.

> **ATTENTION**
>
> - Airflow through the module is assumed to be natural convection.
> - Ensure that the UIO modules are installed in the correct position. A UIO module must be mounted in the upright position.

To determine the maximum acceptable outside module temperature for a typical configuration, perform the following steps.

1. Perform the **Internal Dissipation Calculation for UIO**.
   a. Determine and record the actual configuration data.
   b. Calculate the totals per dissipation contributor.
   c. Add the totals of the previous step to determine the internal dissipation.
2. Using the **Temperature Derating Curves for UIO**, determine the maximum acceptable outside module temperature.

3.4.6 Internal dissipation calculation for UIO

To calculate the maximum outside module temperature, you require the IO configuration. The maximum dissipation caused by the kernel logic of the UIO module is a fixed value. The other dissipation contributions depend on the channel configuration.

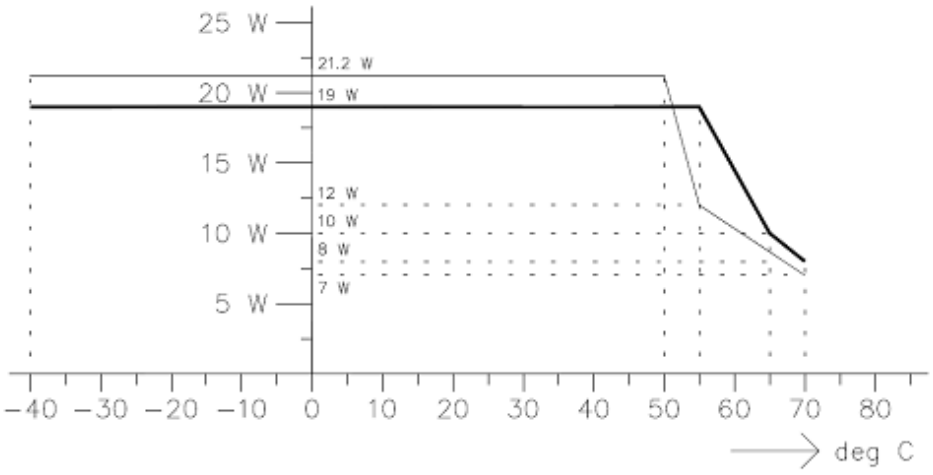
Table 3.5 Dissipation Calculation

Dissipation contributor	Max. dissipation per channel (W)	Number of configured channels	Dissipation (W)
Kernel logic			5.5
DI w/ OWD; field impedance ≥ 5 kΩ	0.01		
DI; closed contact; 3.5mA	0.085		
AI; I < 24mA; Current limited by field	0.05		
AI; I > 24mA; Current limited by UIO *	0.49		
DO; I < 0.3A	0.115		
DO; I < 0.5A	0.305		
AO; 500 Ω field impedance; I < 23mA	0.225		
AO; 250 Ω field impedance; I < 23 mA	0.335		
AO; field impedance < 250 Ω; I < 23 mA	0.47		
AO; field impedance < 250 Ω; I < 20 mA	0.42		
Total Power Dissipation (W)			
Max. outside module temperature °C			

* Analog input current above 24mA must be avoided. Field devices for the analog input must be configured to drive current below 24mA. For example, 3.5mA, for sensor fault conditions to minimize the UIO internal power dissipation. The thin-line derating curve needs to be taken when you are using current above 24mA.

3.4.7 Temperature Derating curves for UIO

The following graph displays the maximum outside module temperature versus the internal power dissipation.



Thick line: applicable for most applications having AO<=20mA and AI<=24mA

Thin line: applicable if one or more channels have AO>20mA or AI>24mA

3.4.8 Maximum Temperature Alarm for UIO-2

The alarm threshold safe operating temperature is determined based on the I/O channel configuration of the module and the anticipated module inlet air temperature.

ATTENTION

- Airflow through the module is assumed to be natural convection.
- Ensure that the UIO modules are installed in the correct position. A UIO module must be mounted in the upright position.

To determine the maximum acceptable outside module temperature for a typical configuration, perform the following steps:

1. Perform the **High Temperature Limit Calculation for UIO-2**.
   a. Determine and record the actual configuration data and the **Estimated Ambient** inlet air temperature.
   b. Calculate the totals per dissipation contributor. For each channel type, multiply the total number of configured channels by the corresponding **Maximum Temperature Rise per**

Table 5.46 Terminal block 1

Terminal block 1		
Channel	Return screw	Power screw
Channel 1	-1	+1
Channel 2	-2	+2
Channel 3	-3	+3
Channel 4	-4	+4
Channel 5	-5	+5
Channel 6	-6	+6
Channel 7	-7	+7
Channel 8	-8	+8
Channel 9	-9	+9
Channel 10	-10	+10
Channel 11	-11	+11
Channel 12	-12	+12
Channel 13	-13	+13
Channel 14	-14	+14
Channel 15	-15	+15
Channel 16	-16	+16

Table 5.47 Redundant - Terminal Block 2

Terminal block 2		
Channel	Return screw	Power screw
Channel 17	-17	+17
Channel 18	-18	+18
Channel 19	-19	+19
Channel 20	-20	+20
Channel 21	-21	+21
Channel 22	-22	+22
Channel 23	-23	+23
Channel 24	-24	+24
Channel 25	-25	+25
Channel 26	-26	+26
Channel 27	-27	+27
Channel 28	-28	+28
Channel 29	-29	+29
Channel 30	-30	+30
Channel 31	-31	+31
Channel 32	-32	+32

Table 5.48 Redundant - Terminal Block 3

Signal	Screw Number
+24V	1
+24V	2
+24V	3
+24V	4