Honeywell CC-PAIN01 51410069-176

Analog Input Module



Honeywell CC-PAIN01 51410069-176 is a Series C high-level analog input module for bringing current-loop measurements into an Experion PKS control system. Its sixteen single-ended channels accept 4–20 mA signals from two-wire or self-powered transmitters, converting field measurements into input data for the control application. The module combines analog acquisition with self-diagnostics, a 50 ms input scan and individually protected transmitter-power circuits. It serves standard analog loops without HART communication and supports a redundant arrangement when the corresponding Series C termination assembly and system configuration are used.

Technical Specifications

Product Identity	
Manufacturer / model	Honeywell / CC-PAIN01 51410069-176
Product family	Experion PKS Series C high-level analog input
Functional Configuration	
Input channels	16, single-ended
Nominal input signal	4–20 mA; non-HART
Supported transmitter arrangements	Two-wire and self-powered transmitters
Sense resistance	200 ohms, internal
Input filter	Single pole; –3 dB at 6 Hz
Common-mode rejection	70 dB from DC to 60 Hz with 500-ohm source imbalance
Non-redundant IOTA	CC-TAIN01, 6-inch assembly
Redundant IOTA	CC-TAIN11, 12-inch assembly; redundant system requirements apply
Performance & Power	
ADC resolution / scan rate	16 bits / 50 ms
Accuracy at reference temperature	±0.075% of full scale at 23.5 ±2°C
Accuracy over operating range	±0.15% of full scale from 0 to 60°C
Maximum normal-mode input voltage	±30 V
Environment	
Enclosure requirement	Series C open equipment for subpanel mounting inside a suitable enclosure.

Selected original manufacturer material follows on pages 3–6.

Compatibility & Selection Guide

Series C I/O modules mount onto an I/O Termination Assembly that provides field connections and power distribution. CC-PAIN01 uses CC-TAIN01 for a non-redundant arrangement or CC-TAIN11 for a redundant arrangement; redundancy also requires the corresponding second module and system configuration. Verify the termination assembly and Experion release requirements for the installed system rather than assuming that other Series C analog modules are interchangeable.

Wiring & Installation Reference

Field wiring and transmitter checks

Two-wire transmitter · Use the specified signal and return terminals · All 16 channels support two-wire instruments

System-ground self-powered transmitter · Confirm the system-ground wiring arrangement · For loop-powered or three-wire system-ground arrangements, channels 1–12 need a Series C ground terminal; the OEM recommends channels 13–16 for the three-wire example

Three-wire example · OEM example uses channel 13 · TB1-25, TB1-26 and TB2-1 refer to the illustrated IOTA example, not a universal pinout

Mounting sequence

1. Isolate and prepare Remove power as instructed by the manufacturer. Use ESD protection and verify the installation area is safe before installing or removing modules.

2. Secure the termination assembly Install the correct IOTA on its backplane before attaching the I/O module. Confirm the assembly and primary/redundant module positions against the system design.

3. Seat and fasten the module Mate the module to the IOTA and secure the side and front screws. Use a No. 2 Phillips hand screwdriver; do not use a No. 1 tip or a power driver.

Installation precautions

Power and hazardous areas: Do not connect or disconnect wiring, or install or remove equipment, with power applied unless the area is known to be non-hazardous and the manufacturer procedure permits the operation.

Use designated test points: Never probe the 24 V screw hole of an unattached IOTA to test the busbar. Follow the OEM test-point procedure and the complete warning on the following source page.

Match the exact assembly: Confirm terminal numbers, grounding, loop resistance and the redundant/non-redundant IOTA before energizing. Consult the complete OEM guide for terminal drawings and conditions outside the selected PDF pages.

Open the OEM three-wire example (PDF pages 5–6) · Open OEM mounting and power warnings (PDF pages 3–4)

Manufacturer reference 1 · Manufacturer reference 2

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.

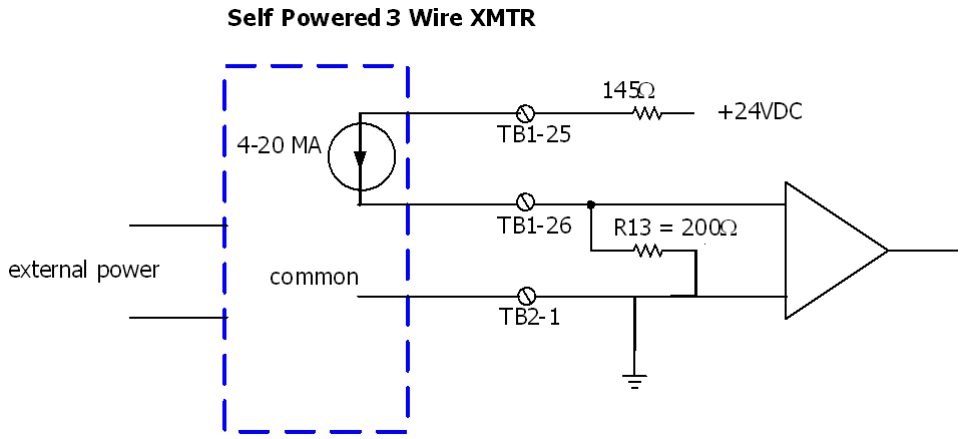
   Insert the test probe at the center of the screw to the COM ground terminal.
3. Replace the both caps.

5.3.4 Self-powered 3-wire transmitter (system ground) - non-HART Analog Input module

It is recommended to use channels 13 through 16, since these channels have 3 screws per channel (although it is possible to use channels 1 through 12).

For the following example:

- Channel 13 is used
- The three wires are terminated to TB1-25, TB1-26 and TB2-1



NOTE

TB1: This is done through a 145 ohm resistor inline with a Positive Temperature Coefficient (PTC) device that acts like a fuse (but never needs replacement). Thus, these field terminals can be permanently shorted to ground without damage. This is an improvement over Process Manager due to the inclusion of the PTC device.

5.3.5 Non-HART Analog Input module wiring reference table

The following table summarizes the possible Analog Input wiring connections.

Table 5.11 Summary - Analog Input wiring connections

Input style	*Connection characteristics*
Standard 2-wire transmitter	• Can use any of the 16 channels. • No custom wiring required.
Standard self-powered transmitter	• Can use any of the 16 channels. • No custom wiring required.
Self-powered transmitter with loop power(system ground)	• Can use any of the 16 channels. • Custom wiring is required for channels 1-12: you must find a screw terminal at Series C ground for one leg of the transmitter.
Self-powered 3-wire	• Can use any of the 16 channels.

Input style	*Connection characteristics*
transmitter (system ground)	• Custom wiring is required for channels 1-12: you must find a screw terminal at Series C ground for one leg of the transmitter.

5.3.6 Allowable field wiring resistance - non-HART Analog Input module

The maximum allowable field wiring resistance between the transmitter and the IOTA connection terminal is dependent upon the voltage requirement of the transmitter. The formula for calculating the max wiring resistance for the Series C Analog Input is given by the following equation.

Rmax = [(13.0 - Vtx) / (0.022)]

where: Vtx = Voltage required at the transmitter terminal

5.3.7 IOTA board and connections - non-HART Analog Input module

Series C Analog Input 6 inch, non-redundant IOTA and field wiring connection is displayed in the following image.