Honeywell CC-PAOH51 51410070-275

HART Analog Output Module



Honeywell CC-PAOH51 51410070-275 is a Series C HART analog output module for driving actuators and recording or indicating instruments from an Experion PKS control application. Its sixteen 4–20 mA channels carry the commanded process outputs, while HART communication supports field-device configuration and status information. Open-wire indication and internal self-diagnostics help identify channel or module problems. Each output can be configured to hold its last value or move to a selected safe value under the applicable failure condition, and the module supports the corresponding redundant Series C arrangement.

Technical Specifications

Product Identity	
Manufacturer / complete model	Honeywell / CC-PAOH51 51410070-275
Product family	Experion PKS Series C high-level analog output
Functional Configuration	
Output channels / nominal signal	16 / 4–20 mA
HART function	Configuration and status; model-specific function matrix applies
Maximum resistive load	800 ohms with 22–28 VDC supply
Redundant switchover output gap	10 ms maximum; redundancy only
Non-redundant / redundant IOTA	CC-TAOX51, 6-inch / CC-TAOX61, 12-inch
Channel failure behavior	FAILOPT: hold last value or shed to safe value; IOM electronics failure drives output to zero
Performance & Power	
Directly settable output current	0 mA; 2.9–21.1 mA
Calibrated output accuracy	±0.35% of full scale at 25°C, including linearity
Output current linearity	±0.05% of full scale, nominal
Output readback accuracy	±4% of full scale
Output temperature drift	0.005% of full scale per °C
Maximum output compliant voltage	16 V with 22–28 VDC supply
Maximum open-circuit voltage	22 V
Output response	Settles within 1% of final value in 80 ms
Environment	
Enclosure requirement	Series C open equipment for subpanel mounting inside a suitable enclosure.

Selected original manufacturer material follows on pages 3–5.

Compatibility & Selection Guide

The Series C specification covers Experion I/O and the C300 controller. CC-PAOH51 uses the 6-inch CC-TAOX51 non-redundant IOTA or the 12-inch CC-TAOX61 redundant IOTA; a redundant arrangement also requires the corresponding module pair and configuration. Its HART function is configuration/status, so do not infer HART control-variable or fast-control support from other Series C models.

Wiring & Installation Reference

Output loop and protection checks

Load budget · Include the field device and wiring resistance · Maximum 800 ohms with 22–28 VDC supply

Signal polarity · Match the IOTA OUT+ and OUT– terminals · Use the terminal drawing for the actual non-redundant or redundant IOTA

External reverse polarity · Follow the OEM protection condition · A reverse-polarity external source requires current limited to 500 mA to protect IOTA surge diodes

Mounting sequence

1. Isolate and prepare Turn off power at the installation location as required by the OEM procedure. Apply ESD precautions and confirm that the area and work permit the installation.

2. Check the termination assembly Mount the correct IOTA on its backplane before fitting the module. Confirm primary and redundant positions against the system design; do not choose an IOTA by physical fit alone.

3. Seat and secure Mate the circuit board and IOTA connector, then secure the side screws and long front plastic screw. Use a No. 2 Phillips hand screwdriver; a No. 1 tip or power driver can damage the plastic screw.

Installation precautions

Power and hazardous areas: Do not connect or disconnect cables, or install or remove components, while the control system is powered unless the location is known to be non-hazardous and the applicable OEM procedure permits the operation.

Busbar measurements: Never probe the 24 V screw hole of an unattached IOTA. The probe can contact the back channel assembly and short the carrier supply; use the designated OEM test points.

Commissioning and replacement: Verify channel mapping, load resistance, HART requirements and configured FAILOPT behavior before returning the loop to service. Use the complete OEM guide for terminal drawings and redundant wiring.

Open OEM HART output-protection reference (PDF page 5) · 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.

5.6.1 Field wiring and module protection - Analog Output HART module

The Analog Output module provides an output current range of 0ma, and 2.9 mA through 21.1 mA based on the requested Analog Output by the Series C controller. The output current including the HART modulated signal, does not exceed 22.5mA.

- Short circuit protection of field short circuits. Protection suitable for Division 2 non-incendive / Zone 2 non-arcing.
- Each field wiring pair can be shorted together without damage to the module or IOTA. Other channels in the same module(s) will not be affected.
- A +30 Vdc source can be continuously applied across the OUT+ to OUT- terminals of the IOTA without damage to either module(s) or IOTA (i.e. with the positive lead of the source connected to OUT+ and the negative lead connected to OUT-). To prevent damage to the IOTA surge protection diodes, the current must be limited to 500 mAdc if the source is applied in the reverse polarity (i.e. with the positive lead of the source attached to OUT-, negative lead attached to OUT+). This 500 mAdc restriction does not apply in the positive polarity case.

5.6.2 IOTA board and connections - Analog Output HART module

Series C Analog Output 6 inch, non-redundant IOTA is displayed.