Technical Information

PlantCruise by Experion Specification Series 8 I/O

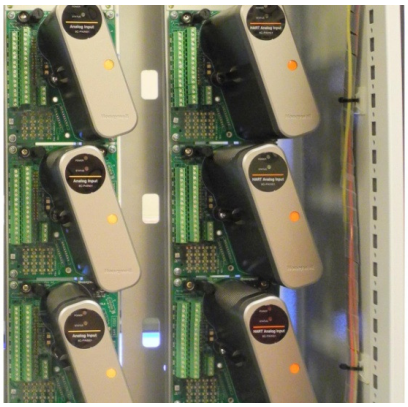


PC03-490-100
Release 100
October 2011, Version 1

Honeywell

WHATSAPP QUOTE >

- Digital Output
- Analog Input with HART
- Analog Input
- Analog Output with HART
- Analog Output
- Low Level Multiplexer – RTD & TC



Definitions

• Input Output Termination Assembly (IOTA): An assembly that holds the IOM and the connections for field wiring,

• Input Output Module (IOM): A device that contains most of the electronics required to perform a specific I/O function. The IOM plugs onto the IOTA.

Features

All Series 8 components feature an innovative design that supports enhanced heat management. This unique look provides a significant reduction in overall size for the equivalent function.

The unique features of Series 8 I/O include:

• I/O Module and field terminations are combined in the same area. The I/O Module is plugged into the IOTA to eliminate the need for a separate chassis to hold the electronics assemblies

• Two level “detachable” terminals for landing the field wiring in the enclosure, providing easier plant installation and maintenance.

• Field power is supplied through the IOTA, with no need for extra power supplies and the associated craft wired marshalling.

• Redundancy is accomplished directly on the IOTA without any external cabling or redundancy control devices, by simply adding a second IOM to an IOTA

• For both IOM and IOTA, coated (module numbers starting with 8C) and uncoated (module numbers starting with 8U) options are provided. Conformal coating material is applied to electronic circuitry to act as protection against moisture, dust, chemicals, and temperature extremes. Coated IOM and IOTA are recommended when electronics must withstand harsh environments and added protection is necessary.

The Series 8 inherits the innovative styling of Series C. This styling includes features to facilitate the effective use of control hardware in a systems environment. These features include:

• Vertical mounting allows for more effective wiring since most field wiring applications require entry from the top or bottom of the systems cabinet.

• An “information circle” allows for a quick visual cue to draw the Maintenance Technician’s eye to important status information.

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• "Tilted" design allows for effective heat management within the cabinet enclosure. Since Series 8 allows for a significant increase in cabinet density, an effective heat management system is critical for high systems availability.

• Input and output circuits are protected from shorts to alleviate the need for in- line fusing, reducing installation and maintenance costs

Series 8 IOTAs combine multiple functions into a single piece of equipment:

• Single and redundant configurations

• On-board termination of process signals

• On-board signal conditioning

• On-board connection to appropriate networks (FTE, I/O LINK)

• Field power distribution without external marshalling

• IOM plugs into the IOTA and receives power from the IOTA

• The IOTA receives its power from a 24 VDC bus that is part of the IOTA carrier – the IOTA is simply screwed into the bussed power.

Series 8 I/O Sizing

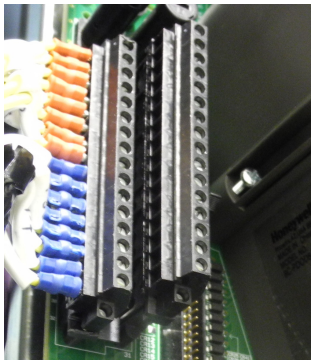
In virtually all configurations, the C300 controller and Series 8 I/O provides useful, maintainable process equipment connections in a smaller footprint than competitor systems. Installing Series 8 I/O modules contributes to overall total installed cost savings.

IOTA sizes vary based on the application. In general, an analog module has 16 points and resides on a 6-inch (152mm) IOTA for non-redundant applications and a 12-inch (304mm) IOTA for redundant applications. A discrete module has 32 points and resides on a 9-inch (228mm) IOTA for non-redundant applications and a 12-inch (304mm) IOTA for redundant applications. Specific information on the size of a particular module can be found in the Model Number Table.

I/O Module Functions

• **High Level Analog Input /HART Input Module (16pt)** – The High Level Analog Input Module supports both high level analog and HART inputs. Analog inputs are typically 4-20mA DC for both traditional and HART devices. HART data can be used for status and configuration. HART data, such as the secondary and tertiary variables, can also be used as process control variables.

• **High Level Analog Input (16pt)** - The High Level Analog Input Module supports high level analog inputs Analog inputs are typically 4-20mA DC for traditional devices.



• **Analog Output/HART Output Module (16pt**) – The Analog Output Module supports both standard 4-20mA DC outputs and HART transmitter outputs.

• **Analog Output (16pt**) – The Analog Output Module supports standard 4-20mA DC outputs.

• **Digital Input 24 VDC (32pt)** – Digital input sensing for 24V signals

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- **Digital Output 24 VDC (32 pt)** – Current sinking digital outputs. Outputs are electronically short-circuit protected.

- **Temperature Multiplexer (64pt).** – Provides thermocouple (TC) and resistance temperature device (RTD) inputs.

The Multiplexer supports up to four, field proven termination assemblies FTAs.

- **Digital Input Sequence of Events -** Accepts 24VDC discrete signals as discrete inputs. The inputs can be time tagged to support 1ms resolution Sequence of Events

Series 8 Field Connections

Series 8 Field connections use a standard modular connector. The connector modularity allows for removal and insertion of the field wiring. This significantly reduces installation and maintenance procedures and can assist in field check out. Series 8 field connectors accept up to 12ga AWG / 2.5mm stranded wire.

I/O Module Sizes

IOTA Sizing is nominal (6in = 152mm, 9in =228mm, 12in =304mm). I/O modules are associated with their respective IOTAs in the table below. The I/O Module is supported by one or more IOTAs.

I/O Module	IOTA	Description	Circuits	Size	Red.
8C-PAIH51 8U-PAIH51 8C-PAIN01 8U-PAIN01		High-level AI HART High-level AI w/o HART	16		√
	8C-TAIX51	AI IOTA, Coated		6	
	8U-TAIX51	AI IOTA, Uncoated		6	
	8C-TAIX61	AI IOTA, Red, Coated		12	√
	8U-TAIX61	AI IOTA, Red, Uncoated		12	√
8C-PAIM01 8U-PAIM01		PMIO LL Mux	64		
	8C-TAIM01	PMIO LL Mux IOTA, Coated		6	
	8U-TAIM01	PMIO LL Mux IOTA, Uncoated		6	
	FTA				
	MC-TAMT04	LL Mux TC FTA	16	12	
	MC-TAMR04	LL Mux RTD FTA	16	12	
8C-PAOH51 8U-PAOH51 8C-PAON01 8U-PAON01		Analog Output 16pt HART Analog Output 16pt w/o HART	16		√
	8C-TAOX51	AO IOTA, Coated		6	
	8U-TAOX51	AO IOTA, Uncoated		6	
	8C-TAOX61	AO IOTA Red., Coated		12	√
	8U-TAOX61	AO IOTA Red., Uncoated		12	√
8C-PDIL51 8U-PDIL51		Digital Input 24V	32		√
	8C-TDIL51	DI 24V IOTA, Coated		9	
	8U-TDIL51	DI 24V IOTA, Uncoated		9	
	8C-TDIL61	DI 24V IOTA Red. Coated		12	√
	8C-TDIL61	DI 24V IOTA Red. Uncoated		12	√

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2.5. Analog Output with HART

Function

The Analog Output (AO) Module delivers high-level constant current to actuators and recording/indicating devices.

Notable Features

- Extensive self diagnostics
- Optional redundancy
- HART-capable, multivariable instruments
- Safe-state (FAILOPT) behaviors configurable on a per channel basis
- Non-incendive output (No external user supplied power)

Safe-state Behavior (FAILOPT)

Series 8 AO module supports the FAILOPT parameter on a per channel basis. The user can configure each channel to either HOLD LAST VALUE, or SHED to a SAFE VALUE. The Output will always go to zero, the safe state, if the IOM device electronics fails.

Open-wire Detection

This Series 8 IO function can detect and annunciate open field wire with a Channel Soft Failure indication.

Detail Specifications – Analog Output with HART

Parameter	Specification		
Input / Output Model	8C-PAOH51 - Analog Output with HART, Coated 8U-PAOH51 - Analog Output with HART, Uncoated		
IOTA Models	8C-TAOX51	Non-Redundant, Coated	6”
	8U-TAOX51	Non-Redundant, Uncoated	6”
	8C-TAOX61	Redundant, Coated	12”
	8U-TAOX61	Redundant, Uncoated	12”
Output Type	4-20 mA		
Output Channels	16		
Output Ripple	< 100 mV peak-to-peak at power line freq, across 250 Ω load		
Resolution	± 0.05% of Full Scale		
Calibrated Accuracy	± 0.35% of Full Scale (25°C) including linearity		
Directly Settable Output Current Range	0 mA, 2.9 mA to 21.1 mA		

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Maximum Open Circuit Voltage	22 V
Response Time(DAC input code to output)	settles to within 1% of final value within 80 ms
Gap (0 mA) of Output to Field on Switchover	10 ms maximum (applies to Redundancy only)

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Function Matrix

The following tables assist in selecting I/O Modules and IOTAs with similar functional characteristics

AI Function Matrix

IOM	NR IOTA	Red IOTA	Function	
			AI 4-20 mA	HART
8C-PAIH51 8U-PAIH51	8C-TAIX51 8U-TAIX51	8C-TAIX61 8U-TAIX61	♦ ♦	♦ ♦
8C-PAIN01 8U-PAIN01	8C-TAIX51 8U-TAIX51	8C-TAIX61 8U-TAIX61	♦ ♦	

AO Function Matrix

IOM	NR IOTA	Red IOTA	Function	
			AIO 4-20 mA	HART
8C-PAOH51 8U-PAOH51	8C-TAOX51 8U-TAOX51	8C-TAOX61 8U-TAOX61	♦ ♦	♦ ♦
8C-PAON01 8U-PAON01	8C-TAOX51 8U-TAOX51	8C-TAOX61 8U-TAOX61	♦ ♦	

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PRODUCT: 8C-PAOH51 51454355-175 / Honeywell Series 8 Analog Output with HART Module

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