PlantCruise by Experion Specification
Series 8 I/O

PC03-490-100
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Honeywell

Revision History

Revision	Date	Description
1.0	October 2011	Release Publication

Table of Contents

1.   Product Introduction

1.1.   PlantCruise by Experion System

As a member of Honeywell's Experion family, PlantCruise by Experion is specifically designed to meet the customer needs in emerging markets, through integrating state-of-the-art technology from the award-winning Experion Process Knowledge System (PKS) with innovative design of Series 8 I/O modules and cabinets, validated wider range of COTS options, easier engineering and maintenance capabilities, and integrator-friendly programs and tools. PlantCruise is the perfect platform for process, asset and business management with small to medium complexity, and enables customers to increase their profitability and productivity and accessibility to local support without sacrificing quality and reliability in an increasingly competitive environment.

1.2.   Architecture Overview

The PlantCruise platform comprises many different integrated hardware and software solutions depending upon the needs of the application. This pictured architecture is a representation of many of the possible nodes that can be used in the PlantCruise architecture. Note that the architecture is highly scalable and not all nodes are necessary or required.
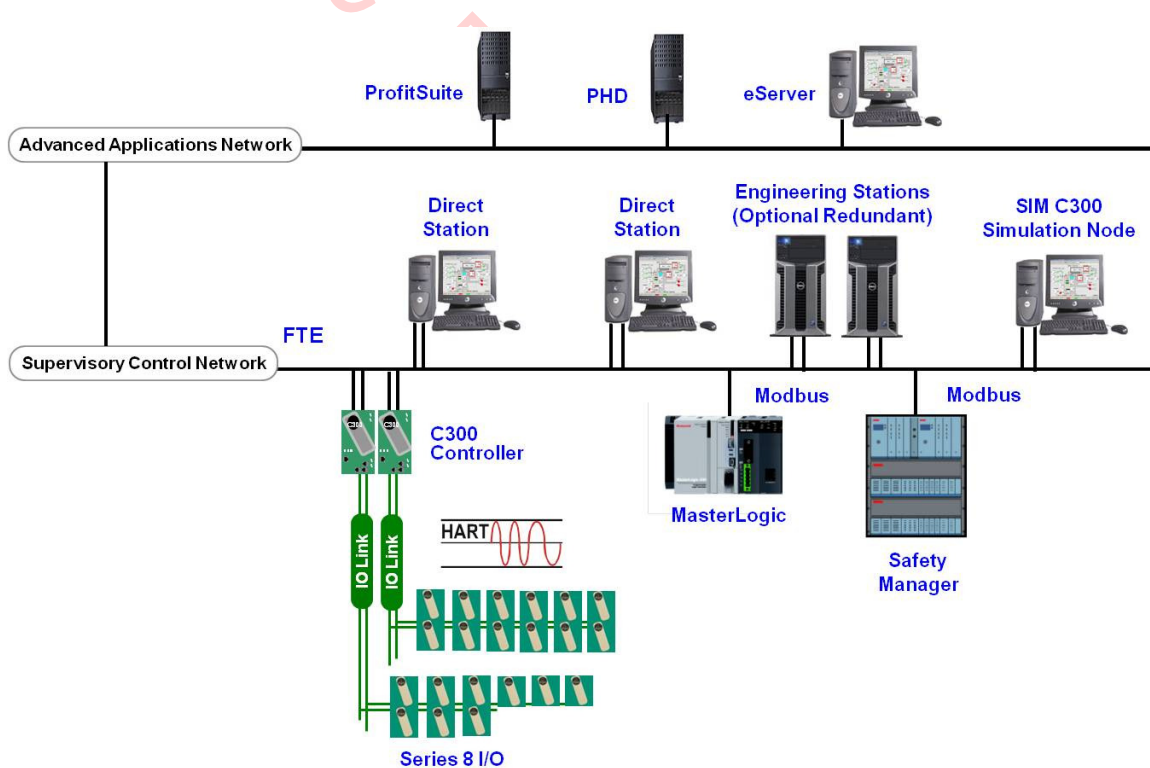

Figure 1. Sample PlantCruise Architecture

1.3.   PlantCruise Series 8 I/O Overview

This document provides technical information to configure the PlantCruise Series 8 I/O and the C300 Controller, released with PlantCruise. The following Series 8 I/O items are included in this document.

•   Digital Input Sequence of Events

•   Digital Input

- 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.

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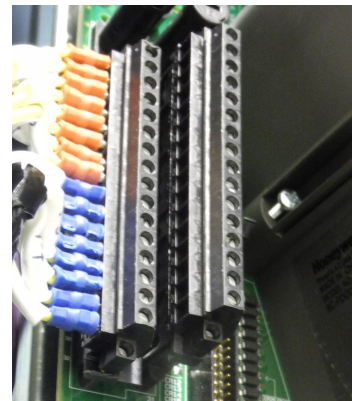
- **Digital Output 24 VDC (32 pt)** – Current sinking digital outputs. Outputs are electronically short-circuit protected.

- **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	√

I/O Module	IOTA	Description	Circuits	Size	Red.
8C-PDOD51 8U-PDOD51		Digital Output	32		√
	8C-TDOD51	DO IOTA, Coated		9	
	8U-TDOD51	DO IOTA, Uncoated		9	
	8C-TDOD61	DO IOTA Red, Coated		12	√
	8U-TDOD61	DO IOTA Red, Uncoated		12	√
8C-PDIS01 8U-PDIS01		Digital Input Sequence of Events	32		√
	8C-TDIL01	DI SOE IOTA, Coated		9	
	8U-TDIL01	DI SOE IOTA, Uncoated		9	
	8C-TDIL11	DI SOE IOTA Red, Coated		12	√
	8C-TDIL11	DI SOE IOTA Red, Uncoated		12	√

2.   Specifications

Specifications for Series-8 I/O modules are shown below.

2.1.   Low Level Analog (Temperature) Input - LLMUX

Function

The LLMUX IOP module supports up to 64 channels of temperature inputs. Low level inputs use the Honeywell PMIO LLMUX FTA. Each FTA supports 16 channels. Two types of LLMUX FTA are supported. One provides 16 RTD inputs. The other provides 16 TC or MV inputs. Any combination of FTAs may be used to provide the mix of TC, mV or RTD points required.

Notable Features

• TC and RTD operation

• Remote cold junction capability

• 1 Second PV scanning with OTD protection

• Configurable OTD protection (See below)

• Temperature points can be added in 16 point increments

Temperature Support

The Temperature Input LLMUX supports the existing solid state PMIO LLMUX FTA. The PMIO LLMUX FTA supports RTD and Thermocouple (TC) inputs. The Temperature variable is collected from all points at a 1 second rate. The 1 second update includes a configurable check for Open Thermocouple Detection (OTD) (see below) before propagation of the temperature variable. All TC inputs are compensated using a Cold Junction Compensation (CJT) device.

Sampling and Open Sensor Detect

The Temperature multiplexer supports RTD and Thermocouples with Open Sensor Detect before PV delivered if so configured. With the OTD configuration active, the PV is sampled and held while an OTD cycle is performed within the same measurement window. If the OTD is negative, the PV is propagated up through the system. If the OTD is positive, the PV is set to NAN and the input channel soft failure is set. In this way, no inappropriate control action occurs for PV values that are invalid due to an open thermocouple. PV sampling/reporting incurs no added delays from OTD processing.

Detailed Specs – Low Level Input Multiplexer

Parameter	Specification
Input / Output Model	8C-PAIM01, LLMUX, Coated 8U-PAIM01, LLMUX, Uncoated
IOTA (64pt) PWA	8C-TAIM01, Coated 8U-TAIM01, Uncoated
FTA Models(1)	MC-TAMT04 MC-TAMR04
Input Type	Thermocouple and / or RTD
Input channels	64 fully-isolated channel-to-channel, channel-to-PM, and channel-to-power supply common in 16 channel increments.
Input scan rate	1 Second fixed by IOM (up to 64 channels/sec max.)
Channel bandwidth	0 to 4.7 Hz (-3 dB)
Nominal input range (TC only)	-20 to +100 millivolts
Maximum normal mode continuous input non-damaging (any thermocouple type configured)	-10 to +10 volts (TC) -1 to +2 Volts @ 100 milliamps (RTD)
Gain error (-20 to +100 millivolt range)	0.050% full scale max
Temperature stability	
TC, Millivolt inputs	+/-20 ppm per deg C max
RTD inputs	+/-20 ppm per deg C max
Long term drift	500 ppm
Input impedance	1 megohm at dc (TC only)
CMV with respect to Power System common, dc to 60 Hz	+/-250 VDC or VAC RMS
CMRR, 50 or 60 Hz (with 1000 ohms source impedance max.)	120 dB min
Voltage, channel-to-channel, dc to 60 Hz	+/-250 VDC or VAC RMS
Crosstalk, dc to 60 Hz	80 dB (120 dB at 50 and 60 Hz)
NMRR at 50/ 60 Hz	60 dB min
Line frequency integration	Fixed selection of 50 Hz or 60 Hz
RTD sensor excitation current	1 milliamp
Cold junction compensation range	-20 to +60 deg C (+/-0.5 deg C typical)
TC Linearization Accuracy (2)	$\pm$ 0.05 Ω / deg C
Open Thermocouple Detection	Each conversion qualified, $\leq$ 1000 Ω = guaranteed no-trip $\geq$ 1500 Ω guaranteed trip.
RTD Max Lead Resistance	15 Ω
Surge protection (sensor terminals)	EN 61000-4-5 (for Industrial locations, 1kV line to line, 2kV line to gnd.)
Surge protection (power/serial link with cable adapter option)	EN 61000-4-5 (for Industrial locations, 1kV line to line, 2kV line to gnd.)

Parameter		Specification
Maximum cable distance IOTA to FTA using cable adapter		1000 feet 16 gauge wire, two twisted pair per FTA
Supported types (RTD)		
	Pt: 100 ohm DIN 4376	-180 to +800 deg C
	Pt: 100 ohm JIS C-1604	-180 to +650 deg C
	Ni: 120 ohm ED #7	-45 to +315 deg C
	Cu: 10 ohm SEER	-20 to +250 deg C
Supported thermocouple types		
	ANSI specification **J**	-200 to +1200 deg C
	ANSI specification K	-100 to +1370 deg C
	ANSI specification E	-200 to +1000 deg C
	ANSI specification T	-230 to +400 deg C
	ANSI specification B	+100 to +1820 deg C
	ANSI specification S	0 to +1700 deg C
	ANSI specification R	0 to +1700 deg C
	JAPAN TYPE R'	0 to +1770 deg C
Supported millivolt types		-20 to +100 millivolts
FTA dimensions (1)		2.5 D x 4.9 W x 12.1 L (inches) 63.5 D x 124.46 W x 307.34 L (millimeters)

(1) :FTAs must be installed in FTA channels.
(2):Linearization polynomials are 4th order and based on NIST Monograph 175, ITS90 and JIS C-1602-1995.

2.2.   Analog Input

Function

The Analog Input Module accepts high level current inputs from transmitters and sensing devices.

Notable Features

- Extensive self diagnostics

- Optional redundancy

- Supplies non-incendive field power (No external user supplied field power)

- Fast loop scan

Non-Incendive Power

Non-incendive power is provided with no external marshalling to support the 4-20mA loop and still provide for channel power protection. This protection supports the Division 2 hazardous protection non-incendive power rating.

Detail Specifications – Analog Input

Parameter	Specification		
Input / Output Model	8C-PAIN01 - Analog Input, Coated		
	8U-PAIN01 - Analog Input, Uncoated		
IOTA Models	8C-TAIX51	Non Redundant, Coated	6"
	8U-TAIX51	Non Redundant, Uncoated	6"
	8C-TAIX61	Redundant, Coated	12"
	8U-TAIX61	Redundant, Uncoated	12"
Input Type	current (2-wire or self-powered transmitters)		
Input Channels	16 Channels (All 16 Single Ended)		
A/D Converter Resolution	16 bits		
Input Range	4-20 mA (through 200 Ω)		
Normal Mode Rejection Ratio, at 60 Hz	19 dB		
Normal Mode Filter Response	Single-pole RC, -3 dB @ 6.5 Hz		
Crosstalk, dc to 60 Hz (channel-to-channel)	-60 dB		
Maximum Input Voltage (any input referenced to common, no damage)	± 30 Volts		
Input Scan Rate	50 ms		

Hardware Accuracy (@ CMV = 0 V)	± 0.075% of full-scale (23.5℃± 2℃) ± 0.15% of full-scale (0 to 60℃)
Transmitter Field Power Conditioning	Individually Protected Current Limiting Circuits for Class 1, Div 2 non-incendive interfacing. No fusing required

2.3.   Analog Input with HART

Function

The Analog Input Module accepts high level current inputs from transmitters and sensing devices.

Notable Features

• Extensive self diagnostics

• Optional redundancy

• Supplies non-incendive field power (No external user supplied power)

• HART-capable, multivariable instruments and multiple modems for fast collection of control variables

• Fast loop scan

Non-Incendive Power

Non-incendive power is provided with no external marshalling to support the 4-20mA loop and still provide for channel power protection. This protection supports the Division 2 hazardous protection non-incendive power rating.

Detail Specifications – Analog Input with HART

Parameter	Specification		
Input / Output Model	8C-PAIH51 - Analog Input with HART, Coated		
	8U-PAIH51 - Analog Input with HART, Uncoated		
IOTA Models	8C-TAIX51	Non Redundant, Coated	6"
	8U-TAIX51	Non Redundant, Uncoated	6"
	8C-TAIX61	Redundant, Coated	12"
	8U-TAIX61	Redundant, Uncoated	12"
Input Type	current (2-wire or self-powered transmitters)		
Input Channels	16 Channels (All 16 Single Ended)		
A/D Converter Resolution	16 bits		
Input Range	4-20 mA (through 200 Ω)		
Normal Mode Rejection Ratio, at 60 Hz	19 dB		
Normal Mode Filter Response	Single-pole RC, -3 dB @ 6.5 Hz		
Crosstalk, dc to 60 Hz (channel-to-channel)	-60 dB		

Maximum Input Voltage (any input referenced to common, no damage)	± 30 Volts
Input Scan Rate	50 ms
Hardware Accuracy (@ CMV = 0 V)	± 0.075% of full-scale (23.5°± 2°C) ± 0.15% of full-scale (0 to 60°C)
Transmitter Field Power Conditioning	Individually Protected Current Limiting Circuits for Class 1, Div 2 non-incendive interfacing. No fusing required

2.4.   Analog Output

Function

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

Notable Features

- Extensive self diagnostics

- Optional redundancy

- Safe-state (FAILOPT) behaviors configurable on a per channel basis

- Non-incendive output (No external user supplied power)

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

Parameter	Specification		
Input / Output Model	8C-PAON01 - Analog Output, Coated 8U-PAON01 - Analog Output, 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 frequency, 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
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)

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		

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)

2.6.   Digital Input Sequence of Events

Function

The Digital Input Sequence of Events (DISOE) accepts 24VDC discrete signals as discrete inputs. The inputs can be time tagged to support 1ms resolution Sequence of Events

Notable Features

•   Three modes of operation:

      o   Normal (20ms PV scan)

      o   Sequence of Events (1ms resolution SOE,20ms PV scan)

      o   Low Latency (5ms PV scan)

•   Extensive internal diagnostics for data integrity

•   Open Wire Detection (in Normal mode only)

•   Optional redundancy

•   Internal or external field power selection

•   On board excitation power (no need for marshalling power)

•   Supplies Non-incendive field power

•   Direct / Reverse Input Indication

•   Galvanic Isolation

Open-Wire Bad PV Detection

This Series 8 IO function can detect and annunciate an open field wire. In addition, a seemingly valid PV from a channel diagnosed as having an open wire will provide a status of "invalid" (thus preventing incorrect control action).

Detail Specifications – DISOE

Parameter	Specification		
Input / Output Model	8C-PDIS01 - Digital Input Sequence of Events, Coated 8U-PDIS01 - Digital Input Sequence of Events, Uncoated		
IOTA Models	8C-TDIL01	Non Redundant, Coated	9"
	8U-TDIL01	Non Redundant, Uncoated	9"
	8C-TDIL11	Redundant, Coated.	12"
	8U-TDIL01	Redundant, Uncoated	12"
Input Channels	32		
Input Channel Scanning (PV)	Normal = 20ms ; Fast = 5ms		
Digital Input Resolution for Sequence of Events (SOE)	1ms		
Galvanic Isolation (any input terminal voltage referenced to common)	1500 VAC RMS or ±1500 VDC		
Isolation Technique	Optical (in IOM)		

Parameter	Specification
DI Power Voltage Range	18 to 30 VDC
ON Sense Voltage/Current	13 VDC (min) or 3 mA (min)
OFF Sense Voltage/Current	5 VDC (max) or 1.2 mA (max)
Input Impedance	4.2 KΩ
Absolute Delay Across Input Filter and Isolation	5 ms ± 20%
Field Resistance for Guaranteed ON Condition	300 Ωmax @ 15 VDC
Field Resistance for Guaranteed OFF Condition	30 KΩmin @ 30 VDC

2.7.   Digital Input 24VDC

Function

The Digital Input 24VDC accepts 24VDC signals as discrete inputs.

Notable Features

• Extensive internal diagnostics for data integrity

• Optional redundancy

• Internal / External field power selection

• Can supply Non-incendive field power (For internal power only)

• Galvanic isolation (System to Field only with external user supplied power)

Detail Specifications – Digital Input 24VDC

Parameter	Specification		
Input / Output Model	8C-PDIL51 - 24Volt Digital Input, Coated 8U-PDIL51 - 24Volt Digital Input, Uncoated		
IOTA Models	8C-TDIL51	Non Redundant, Coated	9"
	8U-TDIL51	Non Redundant, Uncoated	9"
	8C-TDIL61	Redundant, Coated	12"
	8U-TDIL61	Redundant, Uncoated	12"
Input Channels	32		

Galvanic Isolation (any input terminal voltage referenced to common)	1000 VAC RMS for System – to – Field isolation for user supplied field Power
Isolation Technique	Optical (In IOM)
DI Power Voltage Range	18 to 30 VDC (For user supplied field power)
ON Sense Voltage/Current	13 VDC (min) or 3 mA (min)
OFF Sense Voltage/Current	5 VDC (max) or 1.2 mA (max)
Input Impedance	4.2 KΩ
Absolute Delay Across Input Filter and Isolation	5 ms ± 20%

2.8.   Digital Output 24VDC

Function

The Digital Output bussed 24VDC (DO24V) module can switch reliable 24V digital output signals to control other process equipment as well as solenoid valves and interposing relays.

Notable Features

- Extensive internal diagnostics to ensure data integrity

- Optional redundancy

- Safe-state (FAILOPT) behaviors

- Latched, pulsed or pulse-width modulated output (per channel)

- Galvanic Isolation (System to Field only with external user supplied power)

Bussed 24VDC DO

The Digital Output Bussed 24VDC has provisions for both internal and external field power excitation. As a bussed output device, all of the outputs share a common return (ground). All outputs get their power from the same source, which can be either the system power supply or an externally connected 24V power supply. When selection is from an external source, outputs can be galvanically isolated from the Series 8 power system. A wiring option on the IOTA determines if outputs are referenced to the Series 8 system power or an external field power source.

Safe-state Behavior (FAILOPT)

Series 8 DO module will support FAILOPT parameter on a per channel basis. The output can be directed by configuration to either HOLD THE LAST VALUE, or SHED to a SAFE VALUE. The safe value can be configured by the user.

Detail Specifications – Digital Output 24VDC

Parameter	Specification		
Input / Output Model	8C-PDOD51 - 24Volt Digital Output , Field Isolated, Bussed output, Coated 8U-PDOD51 - 24Volt Digital Output , Field Isolated, Bussed output, Uncoated		
IOTA Model Numbers	8C-TDOD51	Non Redundant, Coated	9"
	8U-TDOD51	Non Redundant, Uncoated	9"
	8C-TDOD61	Redundant, Coated	12"
	8U-TDOD61	Redundant, Uncoated	12"
Output Channels	32		

Parameter	Specification
Output Type	SINK
Load Voltage	30 VDC Maximum
Load Current Short circuit protection for DO channel would be using series FUSEs in the output channel. One FUSE per Eight channels. Total FOUR (4) fuses for 32 channels on DO IOTA	0.1 A per channel (Max)
Galvanic Isolation	1000 VAC RMS for System – to – Field isolation for user supplied field Power only
On-State Voltage	Max 1 VDC (load current @ 0.1A max)
Off-State Voltage	24 V (typ),
Off-State Leak Current	100 µA (max)
Turn-On/Turn-Off Time	10 ms (max)
Gap (0 current) of Output to Field on Switchover	None (0ms) (applies to Redundancy only)

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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