Honeywell 8C-PDODA1 51454472-175

32-Channel 24 VDC Digital Output Module

Honeywell 8C-PDODA1 51454472-175 is the Series 8 bussed digital output module for 32 discrete 24 VDC control signals. Its documented applications include other process equipment, solenoid valves and interposing relays. All outputs share a common return and are supplied from the same selected internal or external field-power source.



Technical Specifications

Product Identity	
Manufacturer	Honeywell
Complete part number	8C-PDODA1 51454472-175
Product family	Series 8 I/O
Functional Configuration	
I/O function	Bussed 24 VDC digital output
Output channels	32
Output modes	Latched, pulsed or pulse-width modulated, per channel
System-to-field isolation	1000 VAC RMS or ±1500 VDC; external user-supplied field power required
Nonredundant IOTA	8C-TDODA1, coated, 9 in
Redundant IOTA	8C-TDODB1, coated, 12 in
Relay extension	8C-SDOX01, separate relay extension board
Performance & Power	
Voltage rating	24 VDC
Module current rating	105 mA
Maximum load voltage	30 VDC
Maximum load current	100 mA per channel; 3.2 A per module
Typical ON-state voltage	24 VDC at up to 0.1 A load current
Maximum OFF-state leakage	5 μA
Maximum turn-on / turn-off time	10 ms
Environment	
Protection of electronics	Conformal coating

Selected original manufacturer material follows on pages 3–8.

Compatibility & Selection Guide

System compatibility. The 8C-PDODA1 is part of Honeywell's Series 8 I/O and C300 controller platform. It supports optional redundancy, direct or reverse output operation, and latched, pulsed or pulse-width-modulated operation per channel. FAILOPT can hold the last output value or move to a configured safe value. For applications requiring isolated dry contacts, Honeywell documents the separate 8C-SDOX01 relay extension used with the DO IOM and IOTA; the base module does not itself provide those relay contacts.

Wiring & Installation Reference

Field connection checks

The module plugs onto its IOTA, where the field terminals and power distribution are located. Confirm the installed termination assembly before moving wiring.

IOTA and configuration

Match the termination assembly. Use the specified 8C-TDODA1 nonredundant IOTA or 8C-TDODB1 redundant IOTA. Confirm the actual IOTA wiring arrangement before replacement.

Check field power and return. All outputs share a return and selected power source. An IOTA wiring option selects the Series 8 system supply or external field supply; system-to-field isolation requires external user-supplied power.

Check loads, fusing and safe states. Keep loads within 30 VDC, 100 mA per channel and 3.2 A per module. Honeywell's detailed note specifies four series fuses for the 32 channels on the DO IOTA. Review each channel's FAILOPT setting for the connected equipment.

Installation precautions. Dry-contact applications use the separately specified 8C-SDOX01 relay extension with the DO IOM and IOTA. Do not apply the relay board's higher contact ratings to the module's 100 mA outputs. The documented isolation option is conditional on external user-supplied power; a common internal supply does not provide the same system-to-field isolation arrangement.

View field connection reference (PDF) · PDF page 6 | View IOTA installation reference (PDF) · PDF page 4

Manufacturer sources: Honeywell Series 8 Controller and I/O Specification — model-specific specification / Honeywell Series 8 Controller and I/O Specification — platform, field connections and IOTA selection / Honeywell Series 8 Controller and I/O Specification — module and IOTA function matrix / Honeywell Series 8 Controller and I/O Specification — relay extension specification.

2. Platform Environmental Specifications

2.1. General Environmental Characteristics

This section relates to the physical characteristics applicable to Series 8 C300 controller and all Series 8 I/O components. Where applicable, specifications state limits within an approved cabinet and to the cabinet skin.

Consideration	Operating Limit [1]	Transportation and Storage Limits [1a]
Ambient Temp Range	External: 0 to 50°C [2] Internal : 0 to 60°C [3]	-40 to 85°C
Temp. Rate of Change	<= 1°C/min	<=5°C/min
Relative Humidity [3]	5 to 95% (non-condensing) [4]	5 to 95% (non-condensing) [4]
Barometric Pressure Altitude	-300 to +3000 m	Any
Corrosives	G3 Standard (ISA S71.04) - Denoted by “8C-“ model number in this doc	G3 Standard (ISA S71.04) - Denoted by “8C-“ model number in this doc
Vibration (3 axes)	Sinusoidal (5 to 10 Hz) 2.54mm/0.100in Max (10 to 150 Hz) 0.5 g max. (0-Pk)	Random Vertical Shipping Axis 5 to 300 Hz 1.07 g (rms) Longitudinal and Transverse 10 to 500 Hz, 0.74 g (rms) 60 Minutes each axis
Mechanical Shock (3 Axes)	Site Induced: Terminal Peak Sawtooth waveform 4g max. @25ms	N/A

Note 1 – Operating Limits define the range of operating conditions within which the system is designed to operate. Performance characteristics are defined when operating in this state. Please see ANSA/ISA D 51.1 Process Instrumentation Terminology for more information.

Note 1a – Transportation and Storage Limits define the range of conditions to which the system may be subjected without permanent damage to the equipment. Performance is not guaranteed in this state. Please see ANSA/ISA D 51.1 Process Instrumentation Terminology for more information.

Note 2 – This rating applies to the external ambient temperature of the Standard 2000mm enclosure with doors closed.

Note 3 – This rating applies to the internal ambient temperature of the Standard 2000mm enclosure with the doors closed. New version of the C300 controller(8C-PCNT05) and Memory Backup Assembly module (50182539-001) support an extended temperature range from 0°C to 70°C.

Note 4 – The maximum relative humidity spec applies up to 40°C. Above 40°C the RH spec is de-rated to 55% to maintain constant moisture content.

A note on the transportation of Batteries:

Some Government agencies have regulations that may prohibit air transport of Lithium Batteries.

4. Series 8 I/O Hardware

4.1. Overview and Features

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

Both Series 8 IOM and IOTA are available with Conformal Coated feature. The term ‘Coated’ stands for hardware with conformal coating material applied to electronic circuitry for protection against moisture, dust, chemicals, and temperature extremes. Coated IOM and IOTA are recommended when electronics must withstand harsh environments and need to have added protection.

The unique features of the 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 can be supplied through the IOTA, with no need for extra power supplies and the associated craft wired marshalling
- Redundancy is available directly on the IOTA without any external cabling or redundancy control devices, by simply adding a second IOM to an IOTA
- The innovative styling is one of its unique features. This styling includes features to facilitate the effective use of control hardware in a systems environment. These features include:
    - Vertical mounting for more effective wiring since most field wiring applications require entry from the top or bottom of the systems cabinet
    - An “information circle” for a quick visual cue to draw the Maintenance Technician’s eye to important status information
    - “Tilted” design for effective heat management within the cabinet enclosure. Since Series C 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 through cables from header board



4.3.2. 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. Below section also provides an overview of various available IO modules, IOTA, IOTA size and redundancy features.

I/O Module (Coated)	IOTA (Coated)	Description	Circuits	Size (in “)	Red.
8C-PAIH54		High-level AI HART, Differential	16		√
	8C-TAIDA1	AI IOTA		9	
	8C-TAIDB1	AI IOTA Redundant		12	√
8C-PAIHA1		High-level AI HART, Single-ended	16		√
8C-PAINA1		High-level AI w/o HART, Single-ended	16		√
	8C-TAIXA1	AI IOTA		6	
	8C-TAIXB1	AI IOTA Redundant		12	√
8C-PAIMA1		Low-level AI – RTD & TC	16		
	8C-TAIMA1	Low-level AI IOTA		9	
8C-PAOHA1		Analog Output HART	16		√
8C-PAONA1		Analog Output w/o HART	16		√
	8C-TAOXA1	AO IOTA		6	
	8C-TAOXB1	AO IOTA Redundant		12	√
8C-PDILA1		Digital Input 24V	32		√
8C-PDISA1		Digital Input Sequence of Events	32		√
8C-PDIPA1		Digital Input 24V Pulse Accumulation	32		√
	8C-TDILA1	DI 24V IOTA		9	
	8C-TDILB1	DI 24V IOTA Redundant		12	√
8C-PDODA1		DO 24V Bussed Out	32		√
	8C-TDODA1	DO 24V Bussed IOTA		9	
	8C-TDODB1	DO 24V Bussed IOTA Redundant		12	√
	8C-SDOX01	DO Relay Extension [1]		15	√

Note 1- DO Relay Extension board is used along with DO IO module with IOTA (Redundant or non-redundant). Refer Section 4.4.11 for more details.

4.4.10. 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
- Direct/Reverse output support
- Latched, pulsed or pulse-width modulated output (per channel)
- Galvanic Isolation

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.

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.

Detailed Specification – Digital Output 24VDC (8C-PDODA1)

Parameter	Specification		
Input / Output Module	8C-PDODA1 - Digital Output 24 VDC, Field Isolated, Bussed output, Coated		
IOTA Modules	8C-TDODA1	Non Redundant, Coated	9”
	8C-TDODB1	Redundant, Coated	12”
Relay Extension Board	Supported, details in section 4.4.11		
Output Channels	32		
Output Type	Source		
Voltage Rating	24 VDC		
Module current rating	105mA		
Load Voltage	30 VDC Maximum		
Load Current [1]	100mA per channel (Max) and 3.2A per module (Max)		
Galvanic Isolation [2]	1000 VAC RMS or ±1500 VDC		

Parameter	Specification
On-State Voltage	24 VDC (typ) (load current @ 0.1A max)
Off-State Leak Current	5 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)
Module Removal and Insertion Under Power	Supported
Note 1 – Short circuit protection for DO channel would be using series FUSEs in the output channel. Total four (4) fuses for 32 channels on DO IOTA Note 2 – System to Field type isolation, option available only with external user supplied power. A wiring option on the IOTA determines if outputs are referenced to the Series 8 system power or an external field power source	

4.4.11. DO Relay Extension Board

Function

The Digital Output Relay provides a dry contact for isolated low voltage / low current or high voltage / high current discrete output applications. Each relay supports a Form-C output contact. The Relay extension board connects the Digital Output 24V (DO24V) IOM with DO IOTA to support the Relay output.

Notable Features

- Galvanic isolation
- Isolated Dry Contact
- Counter EMF Snubbing Circuit
- LED indication for each channel ON condition

Detailed Specification – DO Relay Extension Board (8C-SDOX01)

Parameter	Specification		
Relay Extension Board	8C-SDOX01	Relay Extension, Coated	15”
Output Channels	32 isolated Form C (SPDT) contacts. Three screws per channel (NC, NO, COM) for Normal Open or Normal Close usage.		
Contact Type	Au over AgSnO2		
Maximum Load Voltage	250 VAC (RMS)/125 VDC		
Maximum Steady State Load Current per Output	Current	Voltage	
	5A	125 / 250 VAC (resistive)	
	3 A	30 VDC (resistive)	
	1 A	48 VDC (resistive)	
	0.2 A	125 VDC (resistive)	
	2 A	125 / 250 VAC (inductive = 0.4 power factor)	
	1 A	30 VAC (inductive L/R = 100 ms)	
	0.3 A	48 VAC (inductive L/R = 100 ms)	
	0.1 A	125 VAC (inductive L/R = 100 ms)	
Minimum Load Voltage	5 VDC [1]		
Minimum Load Current	10 mA or 100mA [1]		
Inrush Current (Max)	10A for 4s at a 10% duty cycle		
Voltage Rating	24 VDC		
Module current rating	1010 mA		
Isolation (Channel-to-channel, and channel-to-logic common)	1500 VAC RMS or ±1500 VDC		
Turn On Time	20 ms maximum		
Turn Off Time	20 ms maximum		