

Experion PKS Series C I/O User's Guide

EPDOC-X126-en-430K
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Release 430

5 Series C IOTA Pinouts

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5.12 Digital Output 24V IOTA Models CC-TDOB01, CC-TDOB11



CAUTION

When wiring the Digital Output 24V ensure that the **external power is not reversed** or the IOM will be damaged.

The Series C Digital Output 24V IOTA board is represented by the following information and graphics.

To access the parts information for the:

- module
- IOTA
- terminal plug-in assembly, and
- fuses

associated with this board and module, refer to Digital Output 24V in the Recommended Spare Parts section.

5.12.1 Field wiring and module protection - Digital Output 24V module (CC-TDOB01, CC-TDOB11)

The Digital Output 24Volt Module provides a unique and highly functional output power protection method. When a short occurs in the field, the following occurs:

- the output circuits sense the over-current condition and shut down the output
- the shut down of the point places the mode of the point into Manual
- an Over-current Soft Failure is generated

This failure is maintained until the short circuit condition is repaired and the point is again supplying the proper current.

Only one channel is affected at a time. If multiple channels are affected, they are individually shut down. Any channels that do not have a short circuit condition are unaffected.

- Thermal protection alarm if short in field of $> 0.5A$.

5.12.2 IOTA board and connections - Digital Output 24V module (CC-TDOB01, CC-TDOB11)

Series C 24V Digital Output 9 inch, non-redundant IOTA is displayed.

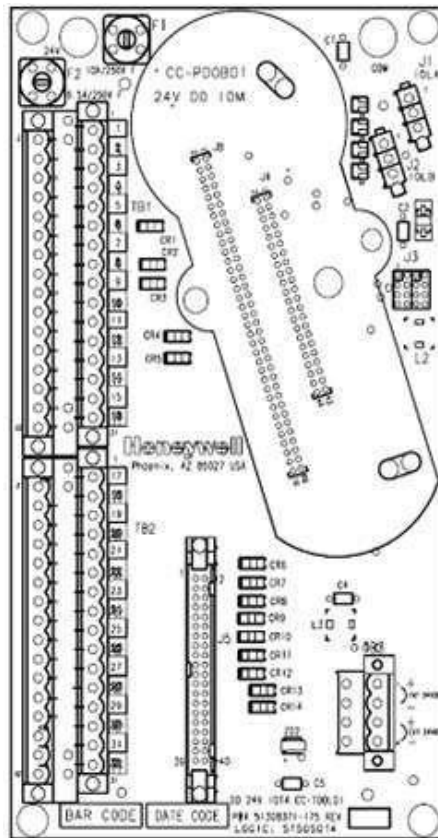


Figure 51: Series C 24V Digital Output 9 inch, non-redundant IOTA

To properly wire your module to the Series C 24V Digital Output IOTA board with terminal blocks 1 (TB1) and 2 (TB2), use the following table.

Table 50: 24V DO 9 inch, non-redundant - terminal block 1

Terminal block 1		
Channel	Return screw	Power screw
Channel 1	2	1
Channel 2	4	3
Channel 3	6	5
Channel 4	8	7
Channel 5	10	9
Channel 6	12	11
Channel 7	14	13
Channel 8	16	15
Channel 9	18	17
Channel 10	20	19
Channel 11	22	21
Channel 12	24	23
Channel 13	26	25

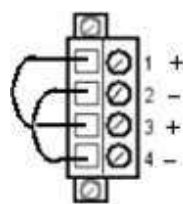
5 SERIES C IOTA PINOUTS

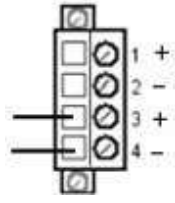
Terminal block 1		
Channel	Return screw	Power screw
Channel 14	28	27
Channel 15	30	29
Channel 16	32	31

Table 51: 24V DO 9 inch, non-redundant - terminal block 2

Terminal block 2		
Channel	Return screw	Power screw
Channel 17	2	1
Channel 18	4	3
Channel 19	6	5
Channel 20	8	7
Channel 21	10	9
Channel 22	12	11
Channel 23	14	13
Channel 24	16	15
Channel 25	18	17
Channel 26	20	19
Channel 27	22	21
Channel 28	24	23
Channel 29	26	25
Channel 30	28	27
Channel 31	29	28
Channel 32	32	31

Table 52: 24V DO 9 inch, non-redundant - terminal block 3

Terminal block 3	
Internal	Used with Honeywell's provided 24v power supply
Screw 1 - internal 24V	
Screw 2 - internal return	
Screw 3 - external 24V	
Screw 4 - external return	
External	Used with customer's provided 24v power supply

Terminal block 3	
Screw 1 - internal 24V	
Screw 2 - internal return	
Screw 3 - external 24V	
Screw 4 - external return	



CAUTION

When wiring the Digital Output 24V ensure that the **external power is not reversed** or the IOM will be damaged.

Series C 24V Digital Output 9 inch, non-redundant IOTA and field wiring connection is displayed

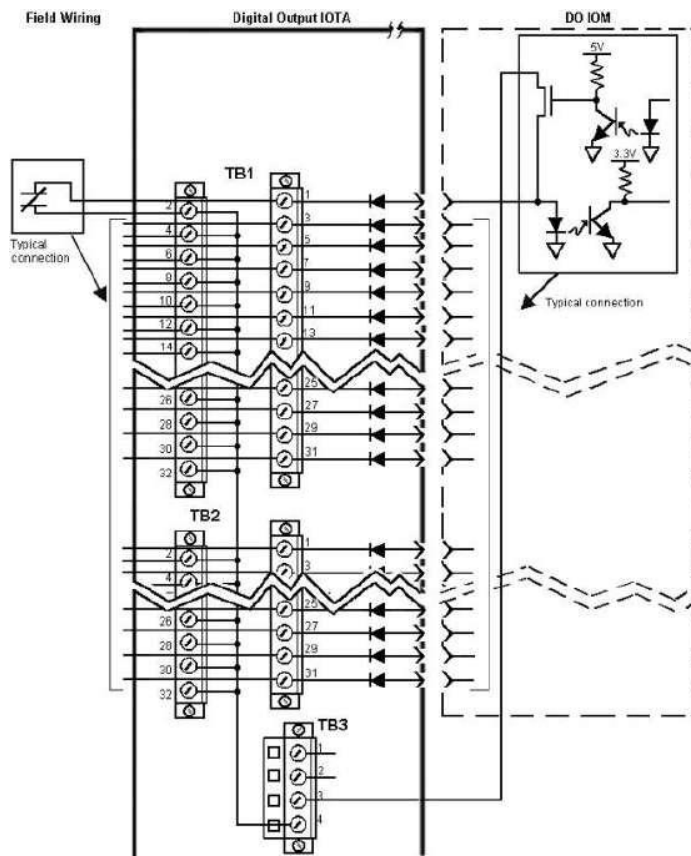


Figure 52: Series C 24V Digital Output 9 inch, non-redundant IOTA and field wiring connections

Series C 24V Digital Output 12 inch, redundant IOTA is displayed

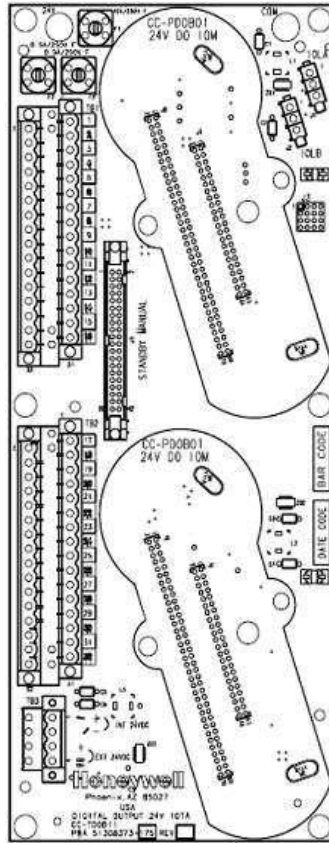


Figure 53: Series C 24V Digital Output 12 inch, redundant IOTA

10.13 Electronic Short-Circuit Protection (DO-24V only)

The behavior of the Series C Digital Output - 24V with Electronic Short Circuit Protection (in the presence of wiring faults) causes a DO channel that draws more current than is permitted, to activate the IOM hardware's electronic short-circuit protection mechanism causing that channel to go unpowered. The feature applies to these specific model numbers:

- CC-PDOB01 Digital Output IO Module (IOM) (32 channels at 24V)
- CC-TDOB01 DO IOTA (32 channels at 24V)
- CC-TDOB11 DO IOTA Redundant (32 channels at 24V)



Attention

Output short circuit detection is not supported if channel is configured for pulse output type

10.13.1 Non-redundant Configuration

When the electronic short-circuit protection mechanism activates and the channel goes unpowered the non-redundant IOM:

- detects the output inconsistency and generates Soft Failure 23 - Failure in OP circuit/field wiring detected by AO/DO
- detects the over current and generates: Soft Failure 180 - Output Short Circuit Detected
- sets:
 - the output to unpowered
 - Shed Mode to Manual control.
 - Shed ModeAttr to Operator.

You should expect to see:

- Two Soft Failures
 - Soft Failure 23 - Failure in OP circuit/field wiring detected by AO/DO
 - Soft Failure 180 - Output Short Circuit Detected
- The output unpowered
- The channel in Manual mode

10.13.2 Redundant Configuration

The firmware in a Primary IOM of a redundant pair notices the output miscompare and signals the Secondary IOM to assume the role of the Primary IOM (assuming the Secondary is synced).

The most common cause for the DO over-current is a failure in the field there is a minor probability that the IOM itself might be the cause of the problem. Given this, it is a common behavior for Series C IOMs to always switchover in an attempt to localize the fault.



Tip

Note that the Primary switchover in most cases is done before actually experiencing the over current condition.

If the cause for the DO over-current is a failure in the field, then the new Primary will see the same output miscompare problem, and react like a non-redundant module would - it will:

- Detect the output miscompare generate Soft Failure 23 - Failure in OP circuit/field wiring detected by AO/DO.
- Detect the over current and generate Soft Failure 180 - Output Short Circuit Detected
- Set the output to unpowered.

- Shed Mode to Manual control.
- Shed ModeAttr to Operator.

You should expect to see:

- One Soft Failure posted from the former Primary:
- Soft Failure 23 - Failure in OP circuit/field wiring detected by AO/DO
- A IOM Failover event

The following are likely if the fault was in the field:

- Two Soft Failures posted by the new Primary:
Soft Failure 23 - Failure in OP circuit/field wiring detected by AO/DO Soft Failure 180 - Output Short Circuit Detected
- The output unpowered
- The channel in Manual mode
- The former Primary's output miscompare Soft Failure will Return To Normal once both modules synchronize.

10.13.3 Electronic Short-Circuit Fault Recovery

To return the channel to normal operation the shorted device or shorted wiring must be corrected.

10.13.4 To clear the short-circuit fault:



CAUTION

Immediately after the IOM detects the fault and the DO Channel is set to OFF, it should be safe to perform maintenance action.

Once the DO channel is set ON, no maintenance action can occur.

- 1 Find and clear the wiring fault. This must be done prior to attempting to restore the DO channel to on-control.
NOTE: The fault may exist at various locations including the IOM, IOTA, external field devices and wiring connecting these devices. After attempting to clear the fault at any of these locations, Step 2 below should be followed.
- 2 Once the actual fault has been cleared, your appropriate plant personnel can restore the DO Channel to normal operation by setting the DO while still in Manual or setting the mode to Cascade and resuming DO writes (programmatically based on user strategy).
- 3 This concludes this procedure.