

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Amikon cover with selected official Honeywell pages

HONEYWELL

CC-TSP411-51306669-175

SPEED PROTECTION IOTA

Selected official pages provide applicable identification, safety, configuration, installation and technical specification context.

Technical Information

Experion Series C Turbomachinery I/O
Specification



EP03-540-511

Release 511

October 2019, Version 1.0

4. Series C Field Connections



Series C 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 C field connectors accept up to 12ga AWG/2.5 mm stranded wire.

A mass termination cable (also known as the bulk cable) is available to support marshalling applications. Mass termination eliminates individual wiring to Series-C field connections. Series-C I/O installations do not require separate marshalling. However, when marshalling is desired, the mass termination cable provides an easy and efficient connection from the I/O to the marshalling cabinet. Mass termination also supports other atypical wiring needs. Cables can be ordered from various Honeywell partners. Contact your local account manager for specific partner information.

IOTA sizing is nominal (6 in = 152 mm, 9 in = 228 mm, 12 in = 304 mm, 18 in = 457 mm).

I/O modules are associated with their respective IOTAs in the table below. The I/O module is supported by one or more IOTAs.

5. I/O Module Sizes

I/O Module	IOTA	Description	Circuits	Size	Red.
CC-PSV201		Servo Valve Positioner, 2 valves (SVPM IOM)	2		
	CC-TSV211	Servo Valve Positioner IOTA Red, 2 valves (SVPM IOTA)		18	√
CC-PSP401		Speed Protection, 4 channels (SPM IOM)	4		
	CC-TSP411	Speed Protection IOTA Red, 4 channels (SPM IOTA)		18	√

6. Specifications

Specifications for the various Series C Turbomachinery I/O modules are given below.

For information on environmental specifications, please refer to the Series C Turbomachinery IO Platform Specification and Technical Data Sheet EP03-540-400.

7. Servo Valve Positioner Module (SVPM) – CC-PSV201

7.1. Function

This Series C I/O module provides an onboard PID positioning loop for positioning a servo valve typically used in a turbomachinery control application. It can accept LVDT/RVDT/4-20 mA position feed back signals from the control valve, receive a control valve demand remote set point from a C300-20msCEE controller and execute onboard PID positioning loop to issue current output to servo valve coil to control the control valve position.

7.2. Notable Features

- Onboard PID positioning loop execution with overall loop latency within 10 mS
- Onboard excitation supply for LVDT and support for various configurations of LVDT connections
- LVDT input channel can be optionally configured to accept 4-20 mA analog input signal
- Supports wide range of unidirectional/bidirectional current output to servo valve coil
- Servo valve output channel can optionally be configured for 4-20 mA analog output signal
- Accepts two digital inputs, which can be configured to drive servo valve output to safe value
- PID execution using the position measurement and remote set point received from the C300 20 ms controller
- Extensive module level diagnostics (PV qualification for AI & AO, LVDT excitation frequency drift check, internal reference check, power supply diagnostic, memory diagnostics, etc.)
- Extensive field level diagnostics (open wire detection for Servo, LVDT, AI [4-20 mA] and DI; LVDT core fallout; read back current diagnostics for Servo and AO [4-20 mA])
- Drive Servo output to safe value on detecting abnormal condition of control components
- Point processing at 2.5 mS period for "LVDT/RVDT signal" and PID execution
- Provides digital dither (current modulation) to compensate stiction in the controlled device (servo valve)
- Supports servo valve position calibration
- Supports redundant solution
- Supplies non-incendive field power

7.3. SVPM supports the following I/O interfaces

- LVDT/RVDT/analog input – 2 channels
- Digital input – 2 channels
- Servo/analog output – 2 channels
- 2 PID blocks

8. Speed Protection Module (SPM) – CC-PSP401

8.1. Function

This Series C I/O module accepts up to four speed probe signals in the form of electrical pulses. It provides onboard signal conditioning and two out of three voting. Voted speed signal takes part in speed regulation through a control loop built into the C300 controller. It also provides onboard limit value monitoring to trigger the over speed trip protection relay provided on the same module IOTA. It is intended for use in over-speed protection of turbomachinery. General purpose I/Os provided on this module may also be used in fast applications such as centrifugal compressor anti surge control

8.2. Notable Features

- Accepts up to four pulse input signals with two out of three voting and computes the speed and acceleration
- Accepts up to eight digital input signals which can be configured as "trip" input in protection logic
- Provides up to four digital output signals on activation of protection criteria
- Multiple configurable trip limits for speed and acceleration
- Overall loop latency from input change to triggering protection device within 40 mS
- Accepts up to eight analog input signals
- Provides one analog output signal
- Point processing at 2.5 mS and 10 mS period for pulse and analog inputs, respectively
- Supports redundant solution
- Supplies non-incendive field power
- Field diagnostic (zero speed, reverse rotation, missing/deformed tooth, open wire detection for AI and DI, and current read back for AO) supported
- HW/SW diagnostics - PV qualification for AI & DI

SPM supports the following I/O interfaces:

- Analog inputs – 8 channels
- Analog outputs – 1 channel
- Digital inputs – 8 channels
- Digital outputs – 4 channels
- Speed (active/passive probes) inputs – 4 channels

8.3. Detail Specifications – SPM

Parameter	Specification		
Input/Output Model	CC-PSP401 - Speed Protection Module		
	CC-TSP411	Redundant	18"
<u>Speed (Active/Passive Probes) Inputs</u>			
Input Channels	4		
Galvanic Isolation (any input terminal voltage referenced to common)	±1000 VDC for passive probes interface		

Isolation Technique	Isolation transformer (on IOTA) for passive probes interface
Input Type	Magnetic pickup - min. > 0.5 Vpk; max. < 42 Vpk Active pickup - OFF < 1 VDC; ON > 3.5 VDC for TTL, Off < 6V ; On >10V @ 24 V
Input Frequency Range	Magnetic pickup – 150 Hz to 25 kHz Active pickup – 1 Hz to 10 kHz
Active input Excitation	5 or 24 V DC
Input Channel	4 (either active or passive)
Resolution	0.015% of upscale
Accuracy	0.05% of the reading
Input Impedance	Passive: 2k Ohm @1 KHz Active: > 1.5 k Ohms
Input Scan Rate	2.5 ms
<u>Digital Outputs</u>	
Output Channels	4 isolated Form A (SPST/NO) or Form B (SPST/NC) contacts (jumper selectable per output)
Contact Type	Gold-clad silver nickel
Maximum Load Voltage	230 VAC (RMS)/24 VDC
Maximum Steady State Load Current per Output	Current → Voltage 0.5 A → 230 VAC (resistive load, inductive load with 0.4 power factor) 2 A → 24 VDC (resistive load)
Minimum Load Voltage	5 VDC (1)
Minimum Load Current	10 mA (1)
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
Contact Life	Operations → % of max. load 10,000,0000 → (mechanical life) 200,000 @ 3 A (100%)
Surge Absorber for Coil	120 Ω + 0.03°F for each channel
<u>Analog Inputs</u>	
Input Type	Voltage, current (2-wire or self-powered transmitters)
Input Channels	8
Common Mode Voltage, DC to 60 Hz	-6 to +5 V peak
A/D Converter Resolution	16-bits
Input Range ⁽¹⁾	0 to 5 V, 1 to 5 V, 0.4 to 2 V, 4-20 mA (through 250 Ω)
Maximum Normal Mode Input (differential inputs, no damage)	±30 V

Input Impedance (voltage inputs)	> 10 M Ω powered
Maximum Input Voltage (any input referenced to common, no damage)	± 30 V
Input Scan Rate	10 ms
Hardware Accuracy (@ CMV = 0 V)	$\pm 0.075\%$ of full scale ($23.5^{\circ}\pm 2^{\circ}\text{C}$) $\pm 0.15\%$ of full scale (0 to 60°C)
<u>Analog Output</u>	
Output Type	4-20 mA
Output Channels	1
Output Ripple	< 100 mV across 250 Ω load
Output Temperature Drift	0.005% of full scale/ $^{\circ}\text{C}$
Output Readback Accuracy	$\pm 4\%$ of full scale
Output Current Linearity	$\pm 0.05\%$ of full scale nominal
Resolution	$\pm 0.05\%$ of full scale
Calibrated Accuracy	$\pm 0.35\%$ of full scale (25°C) including linearity
Directly Settable Output Current Range	0 mA, 2.9 mA to 21.1 mA
Maximum Resistive Load (24 V supply = 22 VDC through 28 VDC)	760 ohms
Maximum Output Compliant Voltage (24 V supply = 22 VDC through 28 VDC)	16 V
Maximum Open Circuit Voltage	18 V
Response Time (DAC input code to output)	1 mS
Gap (0 mA) of Output to Field on Switchover	15 mS max.
<u>Digital Inputs</u>	
Input Channels	8
DI Power Voltage Range	22 to 28 VDC
ON Sense Voltage/Current	13 VDC (min.) or 6.12 mA (min.)
OFF Sense Voltage/Current	5 VDC (max.) or 2.1 mA (max.)
Input Impedance	4.6K
Absolute Delay Across Input Filter and Isolation	1.78 mS
Field Resistance for Guaranteed ON Condition	300 Ω max. @ 15 VDC
Field Resistance for Guaranteed OFF Condition	30 K Ω min. @ 30 VDC
1) The minimum 10 mA load current and 5 VDC load voltage specified are only valid if the contact has not been previously used in high current/high voltage applications.	

Experion® is a registered trademark of Honeywell International Inc.

All other products and brand names shown are trademarks of their respective owners.

This document contains Honeywell proprietary information. It is published for the sole usage of Honeywell Process Solutions' customers and prospective customers worldwide. Information contained herein is to be used solely for the purpose submitted, and no part of this document or its contents shall be reproduced, published, or disclosed to a third party without the express permission of Honeywell International Sàrl

While this information is presented in good faith and believed to be accurate, Honeywell disclaims the implied warranties of merchantability and fitness for a particular purpose and makes no express warranties except as may be stated in its written agreement with and for its customer.

In no event is Honeywell liable to anyone for any indirect, special or consequential damages. The information and specifications in this document are subject to change without notice.

For more information

To learn more about Honeywell's products or solutions visit our website
www.honeywellprocess.com or contact your Honeywell account manager.

Automation & Control Solutions

Process Solutions
Honeywell

1250 West Sam Houston Parkway South
Houston, TX 77042

Honeywell House, Arlington Business Park,
Bracknell, Berkshire, England RG12 1EB UK

Shanghai City Centre, 100 Junyi Road
Shanghai, China 20051

www.honeywellprocess.com

EP03-540-511
October 2019
© 2019 Honeywell International Sàrl

The Honeywell logo, consisting of the word "Honeywell" in a bold, red, sans-serif font.