Valve control module (2100412)
XSeries products
Overview

The 2100412 TFIO module is a software-configurable combination I/O module specifically tailored for valve control applications. The module incorporates six general-purpose digital/pulse input/outputs. Two source mode digital outputs and one 4 to 20 mA sink/source mode analog output are also provided.

Point specifications

Electrical (each point)
- Open circuit voltage: 5VDC (internally up to 5VDC Nom.)
- Short circuit leakage current: -430uA typical
- Input capacitance: 1000pF typical
- Maximum allowable voltage range on input: -0.5VDC to 26.5VDC

General digital input/outputs
6 channels
Input: Dry contact or voltage type
- Minimum contact resistance to activate input: 150 KΩ
- Maximum voltage to activate the input: 3.8V (referenced to GND terminal.)
- Minimum voltage to deactivate the input: 4.75V (referenced to GND terminal.)

Output: Open Drain FET Sink
- RDS(ON): 0.060Ω Typical
- Maximum continuous sink current: 2A @ 24VDC

Source digital outputs
2 channels
IoVBB supply @ 2A Max

Analog output
1 channel
- Maximum allowable voltage range on VDC source, 1 sink or 1 source: 26.5 VDC.
- Maximum External Power Source: 26.5VDC
- Maximum load resistance (internal/external powered) 0 Ohms
- Maximum load resistance (internally powered) 350 Ohms
- Maximum load resistance RMAX (Calculated): (VDC External -4) x 50
Wiring requirements

Sufficient gauge wire should be used to handle total load current. Use shielded pair or twisted pair conductors to reduce the possibility of erroneous transitions on the inputs in high EMI/RFI environments. (Ground the shield at field device only).

When digital outputs are used to sink current, the sum total sink current for all points and modules should not exceed 5A total. If more than 5A are required, separate ground wires from module output ground to power source ground terminal (bus bar) are required. Failure to do so may cause erratic system operation.
**POINT CONNECTIONS**

**TYPICAL VOLTAGE INPUT FIELD**

**TYPICAL SINK OUTPUT FIELD WIRING**

**FIELD DEVICE**

- **24 VDC MAX.**
  - 3.0 VDC
  - 2.0 VDC
  - 0 VDC MIN.

**LOAD**

- **BATTERY (+) OR POWER SOURCE POSITIVE TERMINAL (24VDC MAX)**
- **BATTERY (-) OR POWER SOURCE COMMON OR GND TERMINAL**

**COMMON (GND)**

**GND**
POWER SUPPLY: TFIO MODULE CURRENT SINK MODE

POWER SUPPLY: TFIO MODULE CURRENT SOURCE MODE

POWER SUPPLY: EXTERNAL CURRENT SINK MODE

VDC INTERNAL
ioVBB
+
-
VDC SOURCE (Pin 1)
4–20mA
4–20mA
i SINK (Pin 2)
i SOURCE (Pin 3)
VDC COMMON (Pin 4)
VDC SOURCE
JUMPER
0 OHM <=RLOAD <=350 OHM
(+)
(-)
VDC COMMON
i SINK
i SOURCE
VDC SOURCE
0 OHM <=RLOAD <=350 OHM
JUMPER
VDC COMMON
VDC SOURCE
VDC COMMON
i SINK
i SOURCE
VDC SOURCE
0 OHM <=RLOAD <=350 OHM
JUMPER
VDC COMMON
VDC SOURCE
VDC COMMON
i SINK
i SOURCE
VDC SOURCE
VDC COMMON
RECOMMEND!
50mA
VDC SOURCE
VDC SOURCE
VDC COMMON
VDC COMMON
VDC SOURCE
VDC SOURCE
VDC COMMON
VDC COMMON
VDC SOURCE
VDC SOURCE
VDC COMMON
VDC COMMON
H/BB <= VDC EXTERNAL <= 26.5 VDC
### Valve control applications

<table>
<thead>
<tr>
<th></th>
<th>J1</th>
<th>J2</th>
<th>J3</th>
<th>J4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Point 1 SIG (DI or DO)</td>
<td>AO VDC source</td>
<td>Point 3 SIG (DI or DO)</td>
<td>Point 5 SIG (DO Output source)</td>
</tr>
<tr>
<td>2</td>
<td>Point 1 GND</td>
<td>AO I sink</td>
<td>Point 3 GND</td>
<td>Point 6 SIG (DI or DO) w/o GND</td>
</tr>
<tr>
<td>3</td>
<td>Point 2 SIG (DI or DO)</td>
<td>AO I source</td>
<td>Point 4 SIG (DI or DO)</td>
<td>Point 7 SIG (DO Output source)</td>
</tr>
<tr>
<td>4</td>
<td>Point 2 GND</td>
<td>AO VDC common</td>
<td>Point 4 GND</td>
<td>Point 6 SIG (DI or DO) w/o GND</td>
</tr>
</tbody>
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**M1 MOTOR ACTUATOR**

**EXTERNAL EVENT SWITCH**
- POINT 4 GND (J3-4)
- POINT 4 SIG (J3-3)

**LOCKOUT/TORQUE SWITCH**
- POINT 3 GND (J3-2)
- POINT 3 SIG (J3-1)

**FULL OPEN SWITCH**
- POINT 1 GND (J1-2)
- POINT 1 SIG (J1-1)

**FULL CLOSED SWITCH**
- POINT 2 GND (J1-4)
- POINT 2 SIG (J1-3)
Notes