Valve control module
XSeries, RMC, and XIO
**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
- Short circuit leakage current
- Input capacitance
- Maximum allowable voltage range on input
  - 5VDC (Internally up to 5VDC Nom.)
  - -430uA typical
  - 1000pF typical
  - -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

**Hot Pluggable**

This module is hot-pluggable and can be inserted, replaced or removed during the normal operation of the device with no restart required. The system will detect the changes in the TFIO bus and reflect the state of the modules that can be verified on PCCU. User should take power precaution measurements when execution this action.

**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.
### Power Supply: TFIO Module Current Sink Mode

- **VDC Source (Pin 1)**
- **I Sink (Pin 2)**
- **I Source (Pin 3)**
- **VDC Common (Pin 4)**

**Recommended**: 0 OHM <= R LOAD <= 350 OHM

### Power Supply: TFIO Module Current Source Mode

- **VDC Source (Pin 1)**
- **I Sink (Pin 2)**
- **I Source (Pin 3)**
- **VDC Common (Pin 4)**

**Recommended**: 0 OHM <= R LOAD <= 350 OHM

### Power Supply: External Current Sink Mode

- **VDC Source (Pin 1)**
- **I Sink (Pin 2)**
- **I Source (Pin 3)**
- **VDC Common (Pin 4)**

**Recommended**: 0 OHM <= R LOAD <= 350 OHM

**Note**: ioVBB <= VDC External <= 26.5 VDC

---

**Valve Control Module**

| XSeries, RMC, and XIO | DS/210119-EN |

---

**4–20mA**

**I Sink**

**I Source**

**0 OHM <= R LOAD <= 350 OHM**

---

**VDC Internal**

**ioVBB**

**Jumper**

---

**+**

**–**
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>
</table>

![Diagram of valve control module connections](image)
Notes