

Dual-Channel I/O Modules for FieldPoint

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Analog I/O Modules

- 2 single-ended or 1 differential channels per module
- 12-bit resolution
- V, mV, A, mA inputs and outputs
- RTD inputs
- Thermocouple inputs

Digital I/O Modules

- 2-channel
- Variety of AC/DC inputs and outputs
- Channel-to-channel isolation
- Fused outputs

FP-TB-10 Terminal Base

- Accommodates up to 6 dual-channel modules
- Any combination of I/O types

Common Features

- HotPNP (plug and play) operation
- DIN rail mounting
- -40 to 70 °C operating range
- 2,300 V_{rms} transient overvoltage protection



Overview

National Instruments offers a series of dual-channel modules for flexibility in configuring a FieldPoint I/O systems. You can mount up to six dual-channel modules on FP-TB-10 terminal base. You can use dual-channel modules in the same bank with standard 8 and 16-channel modules. You can configure FieldPoint system to closely match specific I/O needs. The dual-channel modules also provide a flexible solution for applications requiring channel-to-channel isolation. All the modules include onboard diagnostics to ensure trouble-free installation and maintenance.

Analog I/O Modules

Dual-channel I/O modules are designed for mA, voltage, millivolt, thermocouple, and RTD signals. Each module includes two single-ended inputs, signal conditioning, 12-bit ADC or DAC, and module-to-module optical isolation. You can use one channel per module for applications requiring differential inputs or channel-to-channel isolation. The 3 and 4-wire dual-channel RTD input module includes a top-mounted pluggable screw terminal connector and the TC modules feature a minithermocouple jack.

Digital I/O Modules

Dual-channel digital I/O modules are designed for a variety of AC/DC inputs and outputs. Each module includes two channels, which provide channel-to-channel optical isolation from each other, the power supply, and the backplane. Two LEDs located on the module indicate the instantaneous on/off state of each input or output.

Digital output modules can switch AC and DC loads, such as solenoids, motors, or lamps. Each output channel is individually optically isolated to 2,300 V_{rms} and includes a replaceable glass fuse. AC output modules feature zero-crossing turn-on and RC snubber networks for inductive loads. Digital input modules can sense either AC or DC loads. These FieldPoint modules have channel-to-channel isolation.

FP-TB-10 Terminal Base for Dual-Channel Modules

Dual-channel I/O modules mount on the FP-TB-10 terminal base, which holds up to six in any combination. The FP-TB-10, like other FieldPoint terminal bases, plugs into adjacent terminal bases to form the local backplane bus that provides power and communications from the network interface module. You can use up to nine FP-TB-10, FP-TB-1, FP-TB-2, or FP-TB-3 bases with a single network interface module. The FP-TB-10 provides screw terminals for field wiring connections to the dual-channel modules. The 3 and 4-wire RTD input modules and the TC modules include top-mounted sensor connectors.

Power

Using the FP-TB-10 and dual-channel modules can limit the number of I/O modules that you can connect to a single network interface module. Controllers and network interface modules supply up to 9 W to power I/O modules. Refer to the specifications that follow for the power requirements of the FP-TB-10 and dual-channel modules.

Visit ni.com for part number and pricing information.

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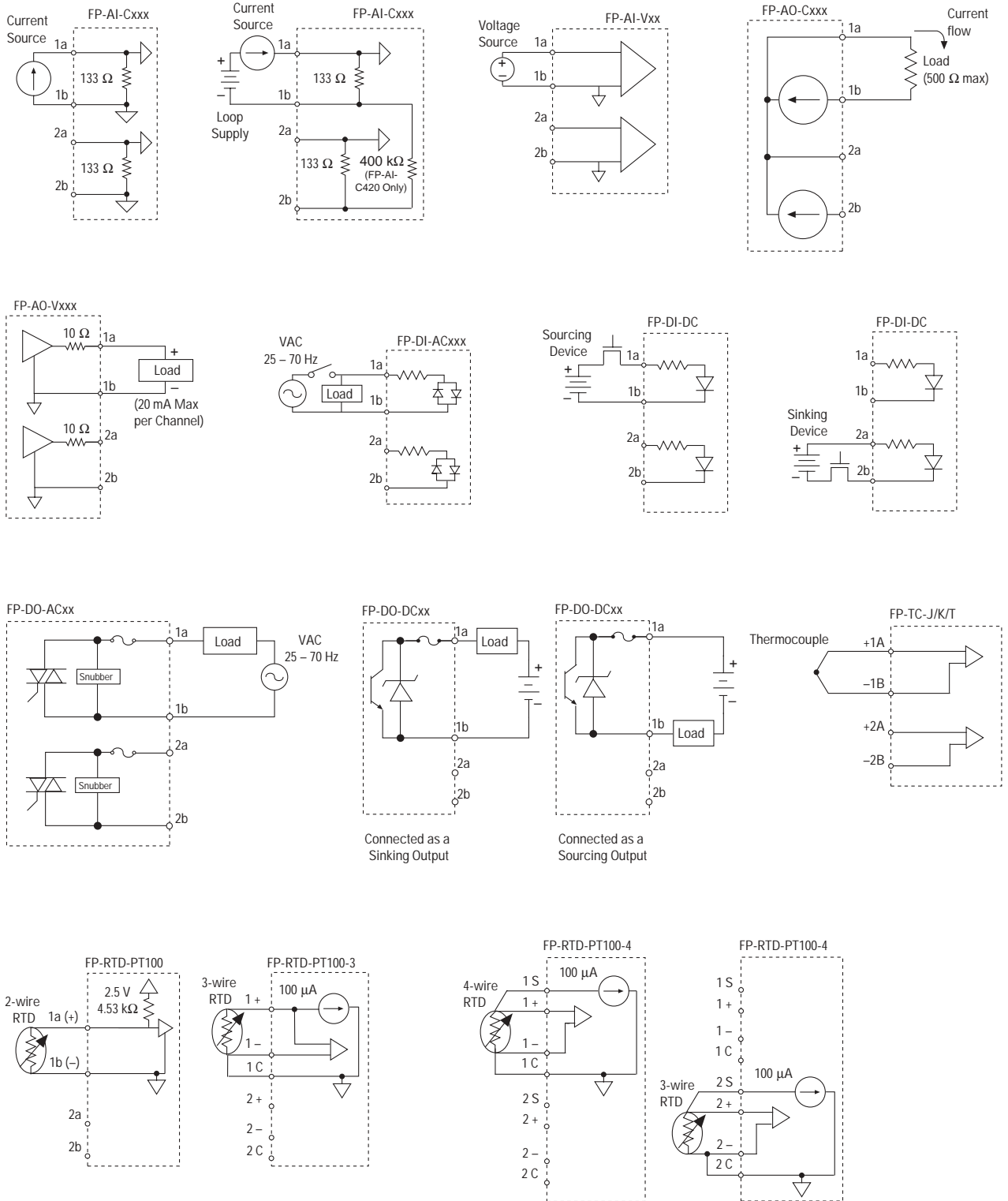


Figure 1. Wiring Schematics for Dual Channel Modules

Dual-Channel I/O Modules for FieldPoint

Specifications

Typical for -40 to 70 °C unless otherwise noted.

Analog Input Modules

Number of inputs	
Thermocouple modules	2 differential
Other types	2 single-ended
Measurement resolution	12 bits (1 part in 4,096)
Input impedance	
Voltage inputs	2.2 M Ω
Current inputs	133 Ω
Excitation current (RTDs)	
Four-wire	100 μ A
Three-wire	100 μ A
Two-wire	550 μ A

Measurement bandwidth

Voltage inputs	20 Hz or 2 kHz, programmable
Current inputs	20 Hz or 100 Hz
Thermocouple inputs	20 Hz
RTD inputs	15 Hz
Step response time	
Voltage and current inputs	1.5 ms
RTD inputs	42 ms
Thermocouple inputs	100 ms
Input protection	
Current inputs	38 mA
Voltage inputs	\pm 30 V
Thermocouple, RTD	\pm 6 V

Analog Output Modules

Number of outputs	2 single-ended
Output resolution	12 bits (1 part in 4,096)
Output impedance (voltage outputs)	10 Ω
Current drive (voltage outputs)	20 mA
Maximum load (current outputs)	500 Ω
Step response time	
Current outputs	500 μ s
Voltage outputs	800 μ s

Digital Input Modules

Number of channels	2 isolated inputs
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Digital Output Modules

Number of channels	2 isolated outputs
Replaceable fuses	(5 x 20 mm, 3.15 A, 250 V, fast-acting)
FP-DO-DC, FP-DO-AC	Littelfuse 217315

Power Requirements

FP-TB-10	200 mW
Analog input modules	
FP-AI-V50m, FP-AI-100m	300 mW
FP-AI-C020, FP-AI-C420, FP-AI-V1, FP-AI-V5, FP-AI-V10, FP-AI-V5B, FP-AI-V10B, FP-RTD-PT100, FP-RTD-PT100-3, FP-RTD-PT100-4, FP-TC-J, FP-TC-K, FP-TC-T	375 mW max

Analog output modules

FP-AO-C020, FP-AO-C420, FP-AO-C024	1100 mW at max output
FP-AO-V5, FP-AO-V10, FP-AO-V5B, FP-AO-V10B	1100 mW at max output

Digital input modules

FP-DI-DC, FP-DI-AC120, FP-DI-AC240	60 mW
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Digital output modules

FP-DO-DC60, FP-DO-DC200, FP-DO-AC120, FP-DO-AC240	70 mW
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Scan Times

Analog input/output modules	1.5 ms
Digital input/output modules and empty slots	0.2 ms

Physical Characteristics

Field-wiring diameter	24 to 12 AWG
Weight	
FP-TB-10	290 g (10.2 oz)
I/O module	60 g (2.1 oz)
Operating temperature	
FP-TB-10	-40 to 70 °C
Digital modules	-40 to 70 °C
Analog modules	-40 to 70 °C
Storage temperature	-40 to 85 °C

Environment

Operating temperature	-40 to 70 °C
Storage temperature	-55 to 85 °C
Relative humidity	10 to 90%, noncondensing

Safety

This product is designed to meet the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:

- IEC 61010-1, EN 61010-1
- UL 3121-1, UL 61010C-1
- CAN/CSA C22.2 No. 1010.1

For UL, hazardous location, and other safety certifications, refer to the product label or to ni.com.

Electromagnetic Compatibility

CE, C-Tick, and FCC Part 15 (Class A) Compliant	
Emissions	EN 55011 Class A at 10 m FCC Part 15A above 1 GHz
Immunity	EN 61326:1997 + A2:2001, Table 1

For EMC compliance, operate this device with shielded cabling.

CE Compliance

This product meets the essential requirements of applicable European Directives, as amended for CE Marking, as follows:

Low-Voltage Directive (safety)	73/23/EEC
Electromagnetic Compatibility Directive (EMC)	89/336/EEC

Refer to the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information. To obtain the DoC for this product, visit ni.com/hardref.nsf/ and search by model number or product line.