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Find the *National Instruments FP-AO-200* at our website: ***Click HERE***

Analog Output Modules for Compact FieldPoint and FieldPoint

NI [c]FP-AO-200, NI [c]FP-AO-210

NEW

- 8 voltage or current outputs
  - 0 to 10 V
  - 0 to 20, 4 to 20 mA
- 12 -bit resolution
- Output ranges software configurable per channel
- 2,300 V_{rms} bank isolation for transient overvoltage protection
- Hot swappable with auto-configuration
- -40 to 70 °C operating range



Module	Input Channels	Resolution	Output Types	Output Ranges (Software Configurable per Channel)	All Channel Update Rate
[c]FP-AO-200	8	12 bits	Current	0 to 20 mA, 4 to 20 mA	200 Hz
[c]FP-AO-210	8	12 bits	Voltage	0 to 10 V, (up to 10 mA/ch)	200 Hz

Overview

The National Instruments [c]FP-AO-2xx devices are versatile analog output modules for Compact FieldPoint and FieldPoint that can be used to control valves, gauges, and other industrial actuators. All modules include overranging and onboard diagnostics to ensure trouble-free installation and maintenance. The modules accept engineering units from you, control or monitoring software and linearize and output scaled signals. The NI [c]FP-AZ-2xx modules come with NIST-traceable calibration certificates, ensuring accurate and reliable analog control.

Smart I/O Modules

With AO-2xx modules, you can directly connect to your industrial actuators or units under test and get high-accuracy control. The I/O modules calibrate, and scale engineering units to sensor signals, as well as performing self-diagnostics to look for problems with the module or with the wiring such as open current loops. With AO-2xx modules, your software application writes an engineering value to the I/O module, eliminating the error-prone step of converting voltage or current to binary values. The A0-2xx modules have an update rate of 200 Hz. Overall data throughput to the controller or PC depends on the software loop speeds and the network speeds.

The [c]FP-AO-200 includes eight 0 to 20 mA or 4 to 20 mA analog output channels, generated with a 12-bit DAC. Each output channel includes a monitoring circuit and LED indicator for open current loop detection. The AO-200 requires an external power supply that provides 5 to 24 VDC.

The [c]FP-AO-210 includes eight 0 to 10 V output channels, generated with a 12-bit DAC. Each channel provides a voltage source capable of supplying up to 1 mA. You can obtain up to 10 mA by powering the AO-210 with an optional external power supply of 15 to 30 VDC.

Isolation

The AO-xx series modules feature optical bank isolation with 2,300 V_{rms} of breakdown isolation. These Compact FieldPoint and FieldPoint modules do not have channel-to-channel isolation.

Field I/O Connections

Compact FieldPoint and FieldPoint modules include a built-in power distribution bus that provides multiple power connections on the module. A field wired power supply connected to the voltage (V) and common (C) terminals is internally connected to a power distribution bus that provides additional breakout terminals for voltage supply (V_{SUP}) and common (COM). These terminals provide a convenient way to distribute power to field devices that require external power.

The AO-200 has:

- 8 current output terminals (I_{OUT})
- 16 common terminals (COM)
- 8 power connections for field devices or current loops (V_{SUP})

The AO-210 has:

- 8 voltage output terminals (V_{OUT})
- 16 common terminals (COM)
- 8 power connections for field devices or current loops (V_{SUP})

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Analog Output Modules for Compact FieldPoint and FieldPoint

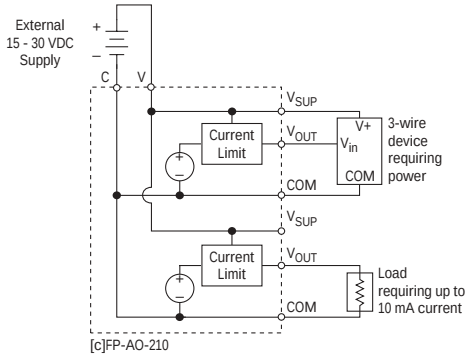


Figure 1. Wiring Schematic for [c]FP-AO-210 modules

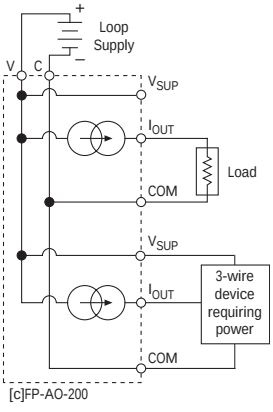


Figure 2. Wiring Schematic for [c]FP-AO-200 modules

Ordering Information

Compact FieldPoint

NI cFP-AO-100 777318-200
NI cFP-AO-210 777318-210

Recommended Compact FieldPoint System Products

NI cFP-2020 777317-2020
NI cFP-BP-4 778617-04
NI cFP-CB-1 778618-01
NI PS-5 Power Supply 778805-90
NI Developer Suite Professional Control Edition 777906-03

FieldPoint

NI FP-AO-100 777518-200
NI FP-AO-210 777518-210

Recommended FieldPoint System Products

NI FP-1601 777792-01
NI FP-TB-1 777519-01
NI PS-4 Power Supply 778586-90
NI Developer Suite Standard Control Edition 777905-03

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Analog Output Modules for Compact FieldPoint and FieldPoint

Specifications

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

Output Characteristics

Number of channels	8 single-ended
DAC resolution	12 bits, 1 in 4,096

Current Output ([c]FP-AO-200)

Output range	0-20 or 4-20 mA, programmable (0-21 or 3.5-21 mA with overranging)
Output type	Current source (external loop power required)
External loop power	5-24 VDC
Internal voltage drop	3 V
Resistive load	Up to 1 kΩ with 24 VDC supply, up to 100 Ω with 5 V supply
Protection and error detection	Short-circuit and open-circuit
Default power-up state	0 mA
Resolution	6 µA

Voltage Output ([c]FP-AO-210)

Output range	0-10 V (0-10.2 V with overranging)
Output type	Voltage source (external power optional)
External power supply	15-30 VDC
Internal voltage drop	3 V
Current drive	1 mA sourcing or sinking, 10 mA sourcing with external power supply
Overvoltage protection	-10 to 20 V
Default power-up state	0 V
Resolution	2.5 mA

Isolation Voltage

Maximum isolation voltage	250 V_{rms}, Installation Category II
Channel-to-channel isolation	No isolation between channels
Transient overvoltage	2,300 V_{rms}

Accuracy

Absolute accuracy ([c]FP-AO-200)	0.1% typ, 0.3% max
Gain error ([c]FP-AO-210)	0.2% typ, 0.4% max
Offset error ([c]FP-AO-210)	4 mV typ, 14 mV max
Monotonicity	Guaranteed over temperature range
Offset temperature coefficient	
[c]FP-AO-200	50 nA/°C
[c]FP-AO-210	70 µV/°C
Gain temperature coefficient	
[c]FP-AO-200	40 ppm/°C
[c]FP-AO-210	20 ppm/°C

Dynamic Characteristics

Maximum update rate	200 updates/s
Slew rate	
[c]FP-AO-200	0.4 mA/µs
[c]FP-AO-210	0.5 V/µs

Physical Characteristics

LED indicators	
POWER (green)	Power on and self-test passed
READY (green)	Module configured and ready
Fault status (red)	Open circuit ([c]FP-AO-200) or current limit ([c]FP-AO-210) on channel
Dimensions	
(FP only, including terminal base)	10.7 by 10.9 by 9.1 cm (4.2 by 4.3 by 3.6 in.)
Weight	
FP-AO-200	143 g (5.0 oz)
cFP-AO-200	113 g (4.0 oz)
FP-AO-210	145 g (5.1 oz)
cFP-AO-210	115 g (4.1 oz)

Power Requirement

Power from network module	
[c]FP-AO-200	350 mW
[c]FP-AO-210	600 mW

Environment

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

Shock and Vibration

These specifications apply only to Compact FieldPoint. NI recommends Compact FieldPoint if your application is subject to shock and vibration.

Operating vibration, random	
(IEC 60068-2-64)	10 to 500 Hz, 5 g_{rms}
Operating vibration, sinusoidal	
(IEC 60068-2-6)	10 to 500 Hz, 5 g
Operating shock	
(IEC 60068-2-27)	50 g, 3 ms half sine, 18 shocks at 6 orientations; 30 g, 11 ms half sine, 18 shocks at 6 orientations

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.

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