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

Analog Output Modules for Compact FieldPoint

NI cFP-AO-200, NI cFP-AO-210

- 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 autoconfiguration
- -40 to 70 °C operating range



Module	Input Channels	Resolution	Output Types	Output Ranges (Software Configurable per Channel)	All Channel Update Rate[1]
cFP-AO-200	8	12 bits	Current	0 to 20 mA, 4 to 20 mA	200 Hz
cFP-AO-210	8	12 bits	Voltage	0 to 10 V (up to 10 mA/ch)	200 Hz

[1]The all-channel update rate refers to the time the module takes to sample all channels. The overall system update rate is affected by other factors, such as the aggregate module update rate and software loop rate. To calculate the system update rate, visit **ni.com/info** *and enter "systemrate."*

Overview

National Instruments cFP-AO-2xx devices are versatile analog output modules for Compact FieldPoint that you can use to control valves, gauges, and other industrial actuators. All modules include overranging and onboard diagnostics to ensure trouble-free installation and maintenance. The NI cFP-AO-2xx modules come with NIST-traceable calibration certificates, ensuring accurate and reliable analog control.

Smart I/O Modules

With cFP-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 perform self-diagnostics to detect problems with the module or with the wiring such as open current loops. With cFP-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 cFP-AO-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 cFP-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 features a monitoring circuit and LED indicator for open current loop detection. The cFP-AO-200 requires an external power supply that provides 5 to 24 VDC.

The cFP-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 cFP-AO-210 with an optional external power supply of 15 to 30 VDC.

Isolation

The cFP-AO-2xx modules feature optical bank isolation with 2,300 V_{rms} of breakdown isolation. They do not have channel-to-channel isolation.

Field I/O Connections

Compact 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 offers additional breakout terminals for voltage supply (V_{SUP}) and common (COM). These terminals deliver a convenient way to distribute power to field devices that require external power.

The cFP-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 cFP-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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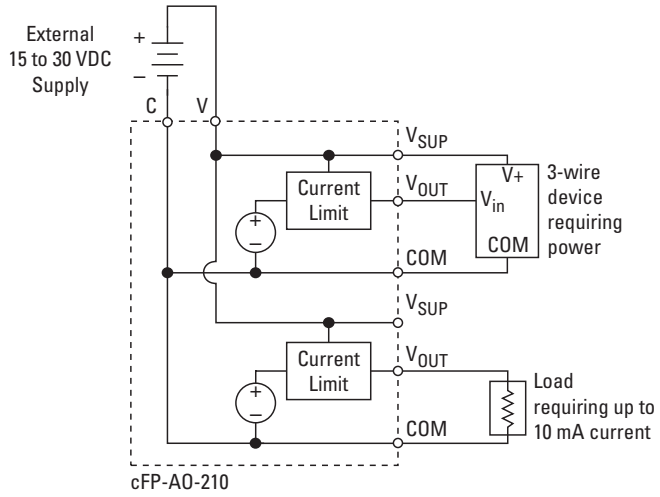


Figure 1. Wiring Schematic for the cFP-AO-210 Module

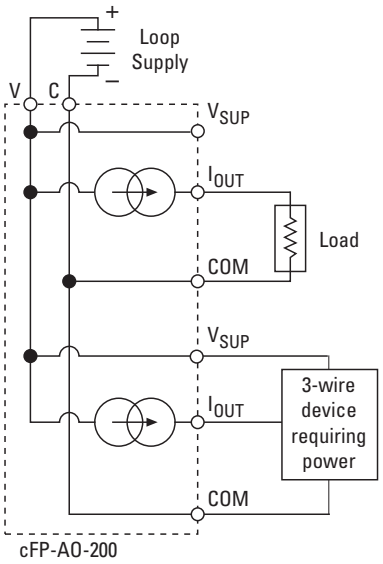


Figure 2. Wiring Schematic for the cFP-AO-200 Module

Ordering Information

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

Recommended Compact FieldPoint System Products

NI cFP-2120 777317-2120
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

BUY NOW!

For complete product specifications, pricing, and accessory information, call 800 813 3693 (U.S.) or go to **ni.com/compactfieldpoint**.

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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 (cFP-AO-200)

Output range	0 to 20 or 4 to 20 mA, programmable (0 to 21 or 3.5 to 21 mA with overranging)
Output type	Current source (external loop power required)
External loop power	5 to 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 (cFP-AO-210)

Output range	0 to 10 V (0 to 10.2 V with overranging)
Output type	Voltage source (external power optional)
External power supply	15 to 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 (cFP-AO-200)	0.1% typ, 0.3% max
Gain error (cFP-AO-210)	0.2% typ, 0.4% max
Offset error (cFP-AO-210)	4 mV typ, 14 mV max
Monotonicity	Guaranteed over temperature range
Offset temperature coefficient	
cFP-AO-200	50 nA/°C
cFP-AO-210	70 µV/°C
Gain temperature coefficient	
cFP-AO-200	40 ppm/°C
cFP-AO-210	20 ppm/°C

Dynamic Characteristics

Maximum update rate	200 updates/s
Slew rate	
cFP-AO-200	0.4 mA/µs
cFP-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 (cFP-AO-200) or current limit (cFP-AO-210) on channel
Dimensions	127.0 by 65.9 by 23.9 cm (5.00 by 2060 by 0.94 in.)
Weight	
cFP-AO-200	113 g (4.0 oz)
cFP-AO-210	115 g (4.1 oz)

Power Requirement

Power from network module	
cFP-AO-200	350 mW

Environment

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

Shock and Vibration

Operating vibration, random	
(IEC 60068-2-64)	10 to 500 Hz, 5 grms
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

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Safety and Compliance

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 61010-1, CSA 61010-1

Note: For UL and other safety certifications, refer to the product label or visit **ni.com/certification**, search by model number or product line, and click the appropriate link in the Certification column.

Electromagnetic Compatibility

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

- EN 61326 EMC requirements; Minimum Immunity
- EN 55011 Emissions; Group 1, Class A
- CE, C-Tick, ICES, and FCC Part 15 Emissions; Class A

Note: For EMC compliance, operate this device according to product documentation.

CE Compliance

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

- 2006/95/EC; Low-Voltage Directive (safety)
- 2004/108/EC; Electromagnetic Compatibility Directive (EMC)

Note: 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/certification**, search by model number or product line, and click the appropriate link in the Certification column.

Waste Electrical and Electronic Equipment (WEEE)

EU Customers: At the end of their life cycle, all products must be sent to a WEEE recycling center. For more information about WEEE recycling centers and National Instruments WEEE initiatives, visit **ni.com/environment/weee.htm**.

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