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Find the *National Instruments cFP-AIO-600* at our website: ***Click HERE***

Analog Input/Output Combination Modules for Compact FieldPoint and FieldPoint

NI [c]FP-AIO-600

- 4 voltage or current inputs
  - ±30 V
  - 0 to 20, 4 to 20 mA
- 4 current outputs
  - 0 to 10 V
  - 0 to 20, 4 to 20 mA
- 12-bit resolution
- Input and 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	Input Ranges (Software Configurable per Channel)	Output Channels	Output Ranges (Software Configurable per Channel)	Resolution	All Channel Update Rate
[c}FP-AIO-600	4	Current: 0 to 20 mA, 4 to 20 mA Voltage: ±5 V, ±15 V, ±30 V, 0 to 5 V, 0 to 15 V, 0 to 30 V	4	Current: 0 to 20 mA, 4 to 20 mA	12 bits	1.7 kHz

Overview

The NI [c]FP-AIO-600 is a versatile combination analog input and analog output module for Compact FieldPoint and FieldPoint that you can use to measure voltages and 0 to 20 or 4 to 20 mA current loops from industrial sensors and transmitters and to control valves, gauges, and other industrial actuators. The [c]FP-AIO-600 is ideal for low-channel-count systems or for PID control with high-speed I/O. The module has overranging and onboard diagnostics to ensure trouble-free installation and maintenance. The [c]FP-AIO-600 measures and linearizes signals onboard to return scaled values to your control or monitoring software, accept engineering units from your control or monitoring software, and automatically scale and linearize output signals. The [c]FP-AIO-600 module comes with a NIST-traceable calibration certificate, ensuring accurate and reliable analog measurement and control.

Smart I/O Module

You can connect the [c]FP-AIO-600 directly to industrial actuators or units under test and achieve high-accuracy measurement and control. The module calibrates, scales engineering units to sensor signals, and performs self-diagnostics to look for problems with the module or with the wiring, such as open current loops. With the [c]FP-AIO-600 module, your software application reads and writes engineering values from the module, eliminating the error-prone step of converting voltage or current to binary values.

The module has an update rate of 1.7 kHz. Overall data throughput depends on the software loop speeds and the network speeds.

[c]FP-AIO-600

The [c]FP-AIO-600 includes four 0 to 30 V or 0 to 20/4 to 20 mA analog inputs and four 0 to 20/4 to 20 mA analog outputs. The analog inputs and outputs use a 12-bit DAC. Each output channel includes a monitoring circuit and LED indicator for open current loop detection. The [c]FP-AIO-600 requires an external power supply, providing 5 to 30 VDC.

Isolation

The [c]FP-AIO-600 features 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 offer a convenient way to distribute power to field devices that require external power.

The [c]FP-AIO-600 has:

- 4 voltage input terminals (V_{IN})
- 4 current input terminals (I_{IN})
- 4 current output terminals (I_{OUT})
- 12 common terminals (COM)
- 8 power connections for field devices or current loops (V_{SUP})

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Ordering Information

Compact FieldPoint

NI cFP-AIO-600 777318-600

Recommended Compact FieldPoint System Products

NI cFP-2220 777317-2220
NI cFP-BP-4 778617-04
NI cFP-CB-1 778618-01
PS-15 power supply 781093-01
NI Developer Suite Professional Control Edition 777906-03

FieldPoint

FP-AIO-600 777518-600

Recommended FieldPoint System Products

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

BUY NOW

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

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Specifications

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

Input and Output Characteristics

Number of input channels..... 4
Number of output channels 4
ADC resolution ..... 12 bits
Type of ADC..... Successive approximation
DAC resolution ..... 12 bits
Type of DAC..... R-2R
Update rate (all channels)..... 1.7 kHz (588 µs)

Voltage Inputs

Effective resolution ..... 11.3 bits
Input impedance..... 1.5 MΩ
Input signal bandwidth ..... 350 Hz

cFP-AIO-600 Gain Errors

Voltage Input Range	Gain Errors at 15 to 35 °C	Gain Errors at -40 to 70 °C
0-5 V	0.03% typ, 0.04% max	0.11% typ, 0.16% max
0-10 V	0.03% typ, 0.04% max	0.11% typ, 0.16% max
0-15 V	0.03% typ, 0.04% max	0.11% typ, 0.16% max
0-30 V	0.03% typ, 0.04% max	0.11% typ, 0.16% max
±5 V	0.03% typ, 0.04% max	0.13% typ, 0.19% max
±10 V	0.03% typ, 0.04% max	0.13% typ, 0.19% max
±15 V	0.03% typ, 0.04% max	0.13% typ, 0.19% max
±30 V	0.03% typ, 0.04% max	0.13% typ, 0.19% max

cFP-AIO-600 Offset Errors

Voltage Input Range	Offset Errors at 15 to 35 °C	Offset Errors at -40 to 70 °C
0-5 V	4 mV typ, 9 mV max	6 mV typ, 15 mV max
0-10 V	6 mV typ, 14 mV max	8 mV typ, 20 mV max
0-15 V	8 mV typ, 18 mV max	10 mV typ, 24 mV max
0-30 V	13 mV typ, 32 mV max	15 mV typ, 37 mV max
±5 V	6 mV typ, 14 mV max	8 mV typ, 20 mV max
±10 V	10 mV typ, 23 mV max	12 mV typ, 29 mV max
±15 V	14 mV typ, 32 mV max	16 mV typ, 38 mV max
±30 V	25 mV typ, 59 mV max	28 mV typ, 64 mV max

Current Inputs

Effective resolution ..... 11.3 bits
Input impedance..... 105 Ω
Overcurrent protection ..... ±100 mA
Overvoltage protection..... ±10 V
Input signal bandwidth ..... 400 Hz
Gain errors
  15 to 35 °C ..... 0.08% typ, 0.18% max
  -40 to 70 °C ..... 0.25% typ, 0.66% max

cFP-AIO-600 Offset Errors

Voltage Input Range	Offset Errors at 15 to 35 °C	Offset Errors at -40 to 70 °C
0-20 mA	9 µA typ, 20 µA max	9 µA typ, 20 µA max
4-20 mA	9 µA typ, 20 µA max	9 µA typ, 20 µA max
±20 mA	16 µA typ, 38 µA max	17 µA typ, 38 µA max

Current Outputs ([c]FP-AIO-600)

Output ranges..... 0-20 or 4-20 mA, programmable (0-21 or 3.5-21 mA with overranging)
Output type..... Current source (external power supply required)
External power supply..... 10-30 VDC, 125 mA for four output channels
Internal voltage drop..... 3 V
Resistive load..... Up to 1 kΩ with 24 VDC power supply
Protection ..... Short-circuit and open-circuit
Default power-up state ..... 0 mA Isolation Voltage

Current Output Range (with Overrange)	Accuracy at 15 to 35 °C (% of Output Value; % of Full Scale)	Accuracy at -40 to 70 °C (% of Output Value; % of Full Scale)
0 to 21 mA	±0.03%; ±0.13%	±0.14%; ±0.2%
3.5 to 21 mA	±0.03%; ±0.16%	±0.14%; ±0.23%

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}

Dynamic Characteristics

Maximum update rate..... 1,700 updates/s
Slew rate..... 0.4 mA/µs

Physical Characteristics

LED indicators
  POWER (green) ..... Power on and self-test passed
  READY (green) ..... Module configured and ready
  Fault status (red)..... Open circuit
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-AIO-600..... 141 g (4.9 oz)
  cFP-AIO-600..... 111 g (3.9 oz)

Power Requirement

Power from network module..... 350 mW

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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 meets 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 the *Online Product Certification* section.

Electromagnetic Compatibility

This product meets the requirements of the following EMC standards for electrical equipment for measurement, control, and laboratory use:

- EN 61326 (IEC 61326): Class A emissions; Industrial immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- AS/NZS CISPR 11: Group 1, Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions

Note: For the standards applied to assess the EMC of this product, refer to the *Online Product Certification* section.

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

CE Compliance

This product meets the essential requirements of applicable European Directives as follows:

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

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Hardware Services

System Assurance Programs

NI system assurance programs are designed to make it even easier for you to own an NI system. These programs include configuration and deployment services for your NI PXI, CompactRIO, or Compact FieldPoint system. The NI Basic System Assurance Program provides a simple integration test and ensures that your system is delivered completely assembled in one box. When you configure your system with the NI Standard System Assurance Program, you can select from available NI system driver sets and application development environments to create customized, reorderable software configurations. Your system arrives fully assembled and tested in one box with your software preinstalled. When you order your system with the standard program, you also receive system-specific documentation including a bill of materials, an integration test report, a recommended maintenance plan, and frequently asked question documents. Finally, the standard program reduces the total cost of owning an NI system by providing three years of warranty coverage and calibration service. Use the online product advisors at **ni.com/advisor** to find a system assurance program to meet your needs.

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