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Digital Input Modules for Compact FieldPoint

NI cFP-DI-300, NI cFP-DI-301, NI cFP-DI-304, NI cFP-DI-330

- 8-, 16-, or 32-channel inputs
 - 24 VDC inputs
 - 4 to 250 VDC inputs
 - 15 to 250 VAC inputs (50/60 Hz AC)
 - 3 to 250 VAC inputs (1 kHz AC)
- 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	Input Type	Compatibility Examples	Separate Ground Plane per Channel	All Channel Update Rate ¹	Additional Features
cFP-DI-300	8	18 to 30 VDC	Sinking	24 VDC sourcing devices	—	1 kHz	—
cFP-DI-301	16	18 to 30 VDC	Sinking	24 VDC sourcing devices	—	1 kHz	—
cFP-DI-304	32	10 to 30 VDC	Sinking	24 VDC sourcing devices	—	1 kHz	Hysteresis
cFP-DI-330	8	5 to 48 VDC 5 to 250 VAC	Sinking or sourcing	TTL, CMOS, 12 VDC, 24 VDC, 48 VDC, 120/240 VAC/VDC	✓	1 kHz	Input current limiting (1.5 mA)

¹The 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-DI-3xx devices are versatile digital input modules available for Compact FieldPoint systems. You can use these modules to monitor digital signals ranging from low-voltage levels up to 250 V. They are commonly used to monitor proximity and limit switches, pushbutton switches, thermostat outputs, relay closures, power circuits, and TTL devices. All the modules include onboard diagnostics to ensure trouble-free installation and maintenance.

Digital Input Modules

The cFP-DI-3xx modules provide built-in module-to-module isolation to protect your Compact FieldPoint system and controller or communication interface from high voltage levels. The cFP-DI-300, cFP-DI-301, and cFP-DI-304 modules use a common ground plane for all the input channels. Each channel on the cFP-DI-300, cFP-DI-301, and cFP-DI-304 modules includes current-limiting circuitry to prevent module damage when connected directly to a 24 VDC source. The cFP-DI-330 uses eight optically isolated input channels so that each digital input has a separate ground plane, and you can use each channel with a different voltage potential. Thus, you can connect one channel to a 5 VDC TTL signal and another signal on the same cFP-DI-330 module to a 250 VAC line voltage.

Each channel on the cFP-DI-330 includes circuitry that limits the total current to 1.5 mA to prevent damaging the module. All channels on the cFP-DI-3xx modules feature LEDs that indicate the input state of each channel. The modules include an all-channel update rate of 1 kHz. Overall data throughput depends on software loop speeds and network speeds.

Isolation

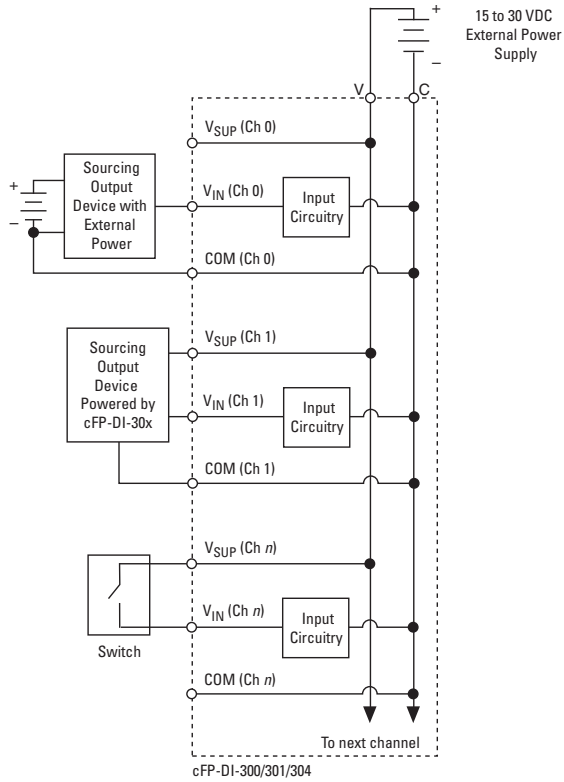
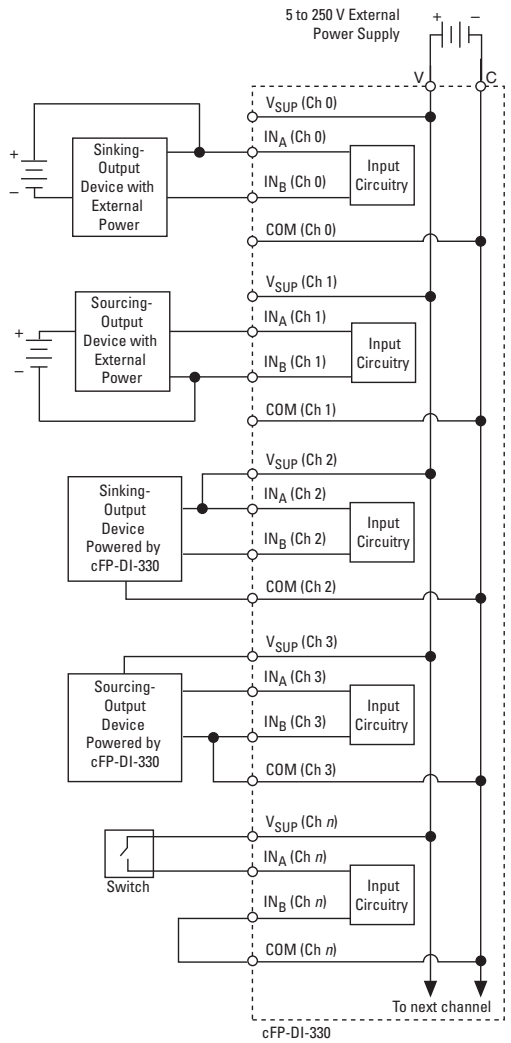
The cFP-DI-3xx modules feature bank isolation with 2,300 V_{rms} of breakdown isolation. In addition, the cFP-DI-330 provides double insulation for up to 250 V_{rms} of operational isolation. You can safely use Compact FieldPoint with the cFP-CB-1 connector block in applications where hazardous voltages are present. These Compact FieldPoint modules 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 delivers 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.



Digital Input Modules for Compact FieldPoint



Wiring Schematics for the cFP-DI-3xx Modules

Ordering Information

NI cFP-DI-300	777318-300
NI cFP-DI-301	777318-301
NI cFP-DI-304	777318-304
NI cFP-DI-330	777318-330

Recommended Compact FieldPoint System Products

NI cFP-2120	777317-2120
NI cFP-BP-4	778617-04
NI cFP-BP-8	778617-08
NI cFP-CB-1	779618-01
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.

BUY ONLINE at ni.com or CALL 800 813 3693 (U.S.)

Digital Input Modules for Compact FieldPoint

Specifications

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

Digital Input Channels

cFP-DI-300, cFP-DI-330	8
cFP-DI-301	16
cFP-DI-304	32

Input Characteristics

Input impedance	
cFP-DI-300, cFP-DI-301	5 kΩ
cFP-DI-304	30 kΩ
Input current limiting cFP-DI-330	1.5 mA

Input Voltages

cFP-DI-300, cFP-DI-301, cFP-DI-304	0 to 30 VDC
cFP-DI-330	0 to 250 VDC or 0 to 250 VAC (50/60 Hz AC) or 0 to 250 VAC (1 kHz AC)

Digital Logic Levels

	cFP-DI-300		cFP-DI-301		cFP-DI-304		cFP-DI-330	
	OFF State	ON State	OFF State	ON State	OFF State	ON State	OFF State	ON State
Input Voltage (V)	<5	>15	<5	>15	≤5	≥10	≤1 VDC, ≤1 VAC	≥4 VDC, ≥15 VAC (50/60 Hz AC), ≥3 VAC (1 kHz AC)
Input Current (μA)	≤1000	≥3000	≤1000	≥3000	≤150	≥330		

Hysteresis (cFP-DI-304)

Input voltage	2 V min
Input current	60 μA min

Isolation Voltage

cFP-DI-30x	
Channel-to-ground	
Continuous	250 V _{rms}
Withstand	2,300 V _{rms} , 5 s max
Channel-to-backplane	
Continuous	250 V _{rms}
Withstand	2,300 V _{rms} , 5 s max
Channel-to-channel	None
cFP-DI-330	
Maximum isolation voltage	250 V _{rms} , Installation Category II
Transient overvoltage	2,300 V _{rms}

Physical Characteristics

LED indicators	
Power (green)	Power on and self-test passed
Ready (green)	Module configured and ready
<0..31>, <0..15>, or <0..7> (green)	Input state of each channel
Dimensions	127.0 by 65.9 by 23.9 mm (5.00 by 2.60 by 0.94 in.)
Weight	
cFP-DI-300/301	100 g (3.6 oz)
cFP-DI-330	103 g (3.7 oz)
cFP-DI-304	193 g (6.81 oz)

Digital Input Modules for Compact FieldPoint

Power Requirements (from Network Module)

cFP-DI-300	185 mW
cFP-DI-301	325 mW
cFP-DI-304	1 W
cFP-DI-330	200 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 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 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)

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