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Compact FieldPoint Real-Time Controllers

NI cFP-2220, NI cFP-2210, NI cFP-2200

- Execution target for NI LabVIEW Real-Time applications
- 400 MHz real-time processor with up to 256 MB of SDRAM
- Up to 512 MB of nonvolatile storage, removable CompactFlash and USB ports
- Up to 2 Ethernet ports for communication for distributed real-time systems
- Dual redundant 11 to 30 VDC power supply inputs, low power
- Up to 4 serial ports (3 RS232 and 1 RS485) for communication
- Industrial certifications, -40 to 70 °C operating temperature range

Operating Systems

- LabVIEW Real-Time (VxWorks)

Recommended Software

- LabVIEW Real-Time Module 8.5.1 or later
- NI-FieldPoint driver 6.0.1 or later



Controller	DRAM Memory (MB)	Internal Nonvolatile Storage (MB)	Removable CompactFlash	Removable USB	Ethernet Ports	RS232 Ports	RS485 Ports
cFP-2220	256	256	✓	✓	2	3	1
cFP-2210	256	128	–	–	1	2	0
cFP-2200	128	128	–	–	1	1	0

Table 1. NI cFP-22xx Selection Guide

Overview

The NI Compact FieldPoint programmable automation controller (PAC) is designed for industrial control applications performing advanced embedded control, data logging, and network connectivity.

It combines the packaging, specifications, and reliability of a programmable logic controller (PLC) with the software, flexibility, connectivity, and functionality of a PC. Compact FieldPoint, a reliable platform designed for rugged industrial environments, features 2,300 V transient overvoltage protection, -40 to 70 °C temperature range, and backup power supply connections to protect against primary power failure.

The cFP-22xx controllers include an industrial 400 MHz Freescale MPC5200 real-time processor for intelligent distributed applications requiring industrial-grade reliability – such as process and discrete control systems – to open and close valves, run control loops, log data on a centralized or local level, and perform real-time simulation and analysis. The cFP-22xx controllers also offer up to 256 MB of SDRAM and onboard memory, plus CompactFlash and USB slots on the cFP-2220 for external storage. With the 10/100 Mb/s Ethernet and serial ports, you can communicate via TCP/IP, UDP, Modbus, and serial protocols, as well as take advantage of the built-in Web (HTTP) and file (FTP) servers.

The Compact FieldPoint real-time controller connects to a 4- or 8-slot solid backplane and controls a wide variety of hot-swappable I/O modules. The modular I/O architecture with built-in signal conditioning and isolation provides direct connectivity to industrial sensors such as analog voltage, 4 to 20 mA current, thermocouples, RTDs, pressure, strain, flow, pulse-width modulation (PWM), and 24 V digital I/O.

Software

NI LabVIEW is a graphical development environment that delivers unparalleled flexibility and ease of use in demanding industrial measurement, automation, and control applications. With LabVIEW, you can quickly create user interfaces for interactive software system control and easily construct simple or complex applications using an extensive palette of functions and tools – from simple analog PID process control loops to high-channel-count hybrid control systems. For extreme reliability and determinism, cFP-22xx controllers run the LabVIEW Real-Time Module on the Wind River VxWorks real-time operating system (RTOS), providing the functionality, connectivity, and flexibility of LabVIEW software on a small industrial platform.

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Expansion I/O with NI cFP-1808

For systems that require more than eight Compact FieldPoint modules, the cFP-1808 expansion chassis provides an easy way to add expansion I/O over Ethernet or serial. A single cFP-22xx controller can connect to as many additional cFP-1808 network interface systems as the Ethernet network allows.

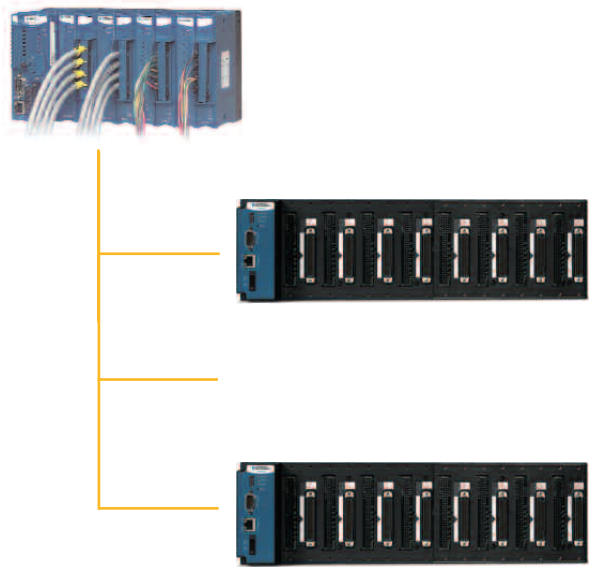


Figure 1. Expansion I/O for Compact FieldPoint Controllers with NI cFP-1808 Network Interface

Ordering Information

NI cFP-2220	777317-2220
NI cFP-2210	777317-2210
NI cFP-2200	777317-2200

Recommended Compact FieldPoint System Products

NI cFP-BP-4 (4-slot backplane)	778617-04
NI cFP-BP-8 (8-slot backplane)	778617-08
NI cFP-CB-1 (general connecter block)	778618-01
NI PS-5 power supply	778805-90

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

Specifications subject to change without notice. The following specifications are typical for the range -40 to 70 °C unless otherwise noted.

Memory

cFP-2200	128 MB nonvolatile; 128 MB DRAM
cFP-2210	128 MB nonvolatile; 256 MB DRAM
cFP-2220	256 MB nonvolatile; 256 MB DRAM
Memory lifetime (nonvolatile)	100,000 writes per block

Network

Network interface	10BASE-T and 100BASE-TX Ethernet
Compatibility	IEEE 802.3
Communication rates	10 Mb/s, 100 Mb/s, autonegotiated
Maximum cabling distance	100 m/segment

Serial Ports

cFP-2200	1 RS232 port
cFP-2210	2 RS232 ports
cFP-2220	3 RS232 ports; 1 RS485 port

RS232 (DTE) Ports

Baud rate	Up to 115,200 b/s
Data bits	5, 6, 7, 8
Stop bits	1, 1.5, 2
Parity	Odd, Even, Mark, Space
Flow control	RTS/CTS, XON/XOFF, DTR/DSR

RS485 (DTE) Port

Baud rate	9,600 to 115,200 b/s
Data bits	5, 6, 7, 8
Stop bits	1, 1.5, 2
Parity	Odd, Even, Mark, Space
Flow control	XON/XOFF
Wire mode	4-wire isolation voltage, port to earth ground
Continuous	100 V_{rms}
Dielectric withstand	740 V_{rms}, verified by 5 s test

USB Port (cFP-2220 only)

Maximum data rate	12 Mb/s
Maximum current	500 mA

Power Requirements

Caution: You must use a National Electric Code (NEC) UL-listed Class 2 power supply with cFP-22xx controllers.

Power supply range	11 to 30 VDC
Recommended power supply	
cFP-BP-4 system	15 W
cFP-BP-8 system	20 W
Power consumption	6.1 W + 1.1 (I/O module power requirements)

Physical Characteristics

If you need to clean the controller, wipe it with a dry towel.

Screw-terminal wiring	Use copper conductor wire with 10 mm (0.39 in.) of insulation stripped from the end
External digital I/O terminals	16 to 28 AWG
Power supply terminals	14 to 30 AWG
Torque for screw terminals	0.5 to 0.6 N•m (4.4 to 5.3 lb•in.)
Weight	278 g (9.8 oz)

Environmental

The cFP-22xx controllers are intended for indoor use only, but they may be used outdoors if mounted in a suitably sealed enclosure.

Operating temperature (IEC 60068-2-1, IEC 60068-2-2)	-40 to 70 °C
Storage temperature (IEC 60068-2-1, IEC 60068-2-2)	-55 to 85 °C
Operating humidity (IEC 60068-2-56)	10 to 90% RH, noncondensing
Storage humidity (IEC 60068-2-56)	5 to 95% RH, noncondensing
Maximum altitude	2,000 m
Pollution degree (IEC 60664)	2

Shock and Vibration

To meet these specifications, you must panel mount the Compact FieldPoint system and affix ferrules to the ends of the power terminal wires.

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

Safety Voltages

Connect only voltages that are within these limits

V terminal to C terminal	35 V max, Measurement Category I

Caution: Do not connect the system to signals or use for measurements within Measurement Category II, III, or IV.

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Safety Standards

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; Industrial 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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We also offer service programs that provide automatic upgrades to your application development environment and higher levels of technical support. Visit **ni.com/ssp**.

Hardware Services

NI Factory Installation Services

NI Factory Installation Services (FIS) is the fastest and easiest way to use your Compact FieldPoint systems right out of the box. Trained NI technicians install the software and hardware and configure the system to your specifications. NI extends the standard warranty by one year on hardware components (controllers, chassis, modules) purchased with FIS. To use FIS, simply configure your system online with **http://ohm.ni.com/advisors/cfp**.

Calibration Services

NI recognizes the need to maintain properly calibrated devices for high-accuracy measurements. We provide manual calibration procedures, services to recalibrate your products, and automated calibration software specifically designed for use by metrology laboratories. Visit **ni.com/calibration**.

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