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FP-AI-110

FP-1300 FieldPoint Quick Start Guide

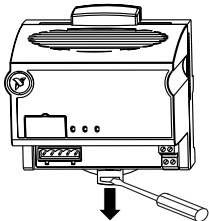
What You Need to Get Set Up

- FP-1300 network module
- DIN rail mounting hardware
- Terminal base(s) and I/O module(s)
- 10–30 VDC power supply to power the CAN bus
- 11–30 VDC power supply to power the FieldPoint bus
- Accessories: shielded twisted-pair cable, Combicon-style connector, flathead screwdriver
- Optional accessories: two 120 Ω resistors
- Installed and configured NI-CAN card

1 Install the Network Module

Mount the module on a DIN rail.

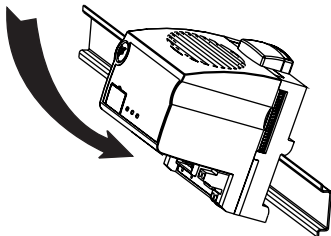
A. Unlock rail clip.



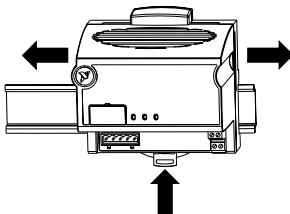


NOTE Do not use spliced DIN rails. Use only a single DIN rail.

B. Hook lip on back of module onto top of DIN rail, press down, and snap into place.



C. Slide module into position and lock rail clip.

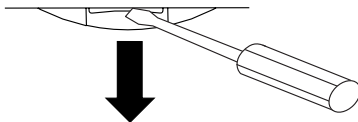


2 Install the Terminal Base(s)

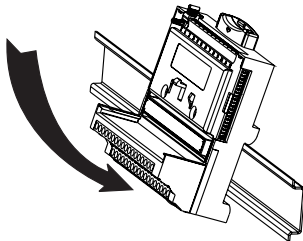


CAUTION Connect the terminal bases to the network module before applying power to the module. Do not connect or disconnect terminal bases while power is applied to the network module.

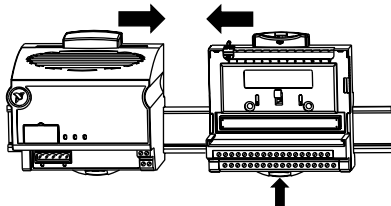
A. Unlock rail clip.



B. Press base onto rail.

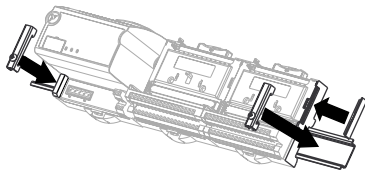


C. Slide into position and lock the rail clip. Be careful not to bend any pins.



D. Repeat for each terminal base, up to nine for each network module in most cases. You can use one or two extender cables (which you can order separately) if the FieldPoint bank is too long for the available space.

E. Place protective cover on last base, and install rail locks at each end.



Install the I/O Module(s)

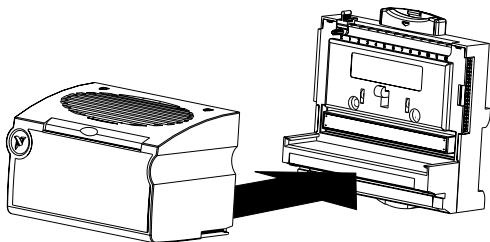
It does not matter where you install each I/O module, except in the following cases:

- If you plan to cascade power between any I/O modules using the V and C terminals, those modules should be grouped together.



CAUTION Cascading power defeats isolation.

- For more accurate measurements, place thermocouple modules away from heat sources, including network modules or relay modules.
- A. Align slots on the module with the guide rails on the base, and press the module onto base until the terminal base latch locks the module in place.
- B. Repeat for each I/O module.



4 Configure the Arbitration ID

The FP-1300 ships with the standard base arbitration ID 0x0. The FP-1300 sequentially allocates the I/O channel arbitration IDs from the base arbitration ID of the FP-1300. If you are not using the FP-1300 software and need to configure a different base arbitration ID, use the DIP switches on the FP-1300 module. For more information about using DIP switches to configure the arbitration ID, refer to the *FP-1300 User Manual*.

5 Connect the FP-1300 to the CAN Network



CAUTION Before you connect the FP-1300 to a CAN network, make sure the baud rates of the FP-1300 and the CAN network are the same. The default baud rate of the FP-1300 is 500 Kbps. If you are configuring the FP-1300 for the first time and the CAN network is operating at a baud rate other than 500 Kbps, configure the FP-1300 to operate at the appropriate baud rate before you install it on the CAN network. If you do not, CAN network errors can occur, and other CAN devices on the network can go into an error state. For more information, refer to the *Configuring the Baud Rate* section of the *FP-1300 Configuration Utility Help*.

Connecting the CAN Cable to the FP-1300

To connect an FP-1300 bank to the CAN network, complete the following steps.

- A. Plug the Combicon-style connector into the CAN port.
- B. Connect a shielded twisted-pair cable to the C_H and C_L terminals. Connect the shield of this cable to the SH terminal. Refer to ISO 11898-2 for the maximum cable length between the FP-1300 and the CAN network. C_H and C_L carry the data on the CAN network. For noise immunity, solidly ground the shield of the cable as closely as possible to the FP-1300.
- C. Connect a 10–30 VDC power supply to the V+ and V– terminals. V+ and V– supply power to the CAN transceivers on the FP-1300.
- D. Connect the other end of the CAN cable to a connector on the CAN network.

Terminating the CAN Network

If you connect the FP-1300 to a multiple-device CAN network that is already terminated, go to the *Wire Power to the FieldPoint System* section next. If you connect the FP-1300 to a single-device CAN network, you need to terminate the network. To terminate the CAN network, follow these steps:

- A. Install a 120 Ω resistor between the C_H and C_L terminals on the FP-1300. The typical resistance is 120 Ω . The maximum resistance is 130 Ω . The minimum allowable resistance is 100 Ω .



NOTE The Combicon-style connector and the CAN cable must have a nominal impedance of 120 Ω . For more information, refer to ISO 11898-2.

- B. Install another 120 Ω resistor at the other end of the CAN cable between the C_H and C_L terminals.

When you terminate the CAN network, the effective resistance between C_H and C_L is 60 Ω .

Wire Power to the FieldPoint System

- A. Connect 11–30 VDC power supply leads to either set of the V and C terminals on the network module. If you want to verify that the power supply is sufficient for the modules and devices, refer to the FieldPoint hardware documents for instructions on calculating power requirements.

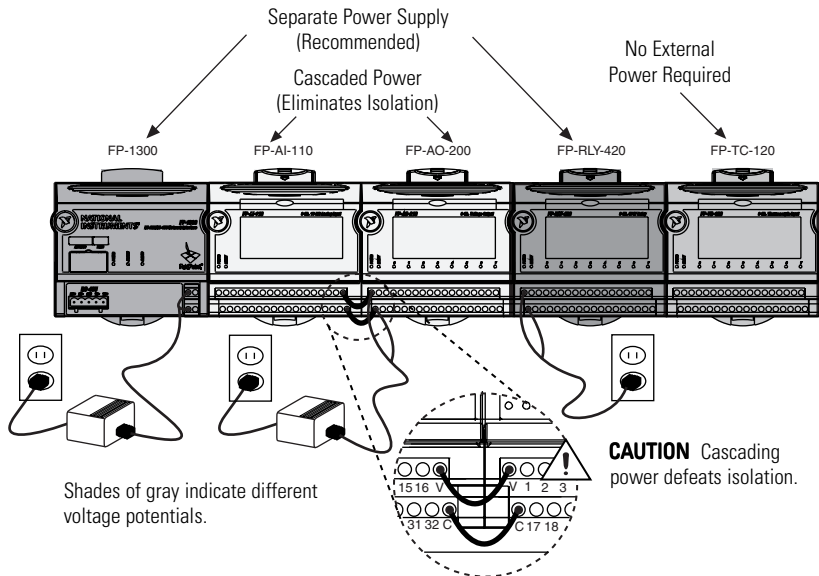
- B. Connect power to the FieldPoint modules that require external power for outputs (output modules, counter modules, PWM, PG, QUAD). Refer to the I/O module operating instructions for power consumption details. You can power a module by connecting the V and C inputs on its terminal base to a separate power supply, connecting the V and C outputs of a neighboring terminal base or network module, or using a combination of both methods.



CAUTION Cascading power defeats isolation between the cascaded modules.



CAUTION Cascading power from neighboring bases or network modules defeats isolation between cascaded modules.



7 Connect to Field Devices

Refer to the operating instructions for each I/O module or the diagram under the module label for help in connecting field devices.

FP-AI-110
8 Channel, 16-Bit Analog Input Module

Highlights

- Eight analog channels on integral signal channels
- 13 input ranges: ±10 V, ±1 V, ±1 V, ±1 V, ±100 mV, auto rati, 0 to 5 V, 0 to 1 V, 0 to 1 V, 0 to 1 V, 0 to 1 V, 0 to 1 V, 0 to 1 V
- 16-bit resolution
- 5000 V input to output isolation
- Electrically isolated for 250 V rms overvoltage
- 487 to 177 V operation

Overview

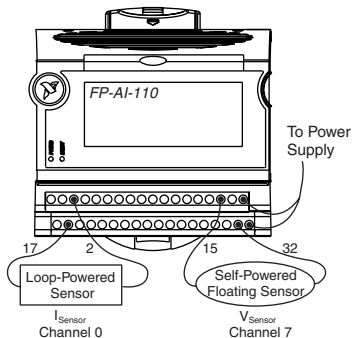
The FP-AI-110 is a 16-bit/8-ch analog input module with eight analog input channels. The FP-AI-110 can be used to input 16-bit digital input signals. The FP-AI-110 is a dual line bus interface module and has three coin-operated flow meters in the front panel and three separate safety features. Also, it supports various flow meters and transmitters as shown.

These operating instructions describe connections to the FP-AI-110 according to the FP-AI-110 and the FP-AI-110.

FP-AI-110 8-Ch, 16-Bit Analog Input

CH	1	2	3	4	5	6	7	8
CH1	1	17	15	13	11	9	7	5
CH2	3	19	17	15	13	11	9	7
CH3	5	21	19	17	15	13	11	9
CH4	7	23	21	19	17	15	13	11
CH5	9	25	23	21	19	17	15	13
CH6	11	27	25	23	21	19	17	15
CH7	13	29	27	25	23	21	19	17
CH8	15	31	29	27	25	23	21	19

Wiring Diagram: Shows a sensor connected to terminals 17, 2, 15, and 32. The sensor is labeled 'SOURCE' and 'VOLTAGE SOURCE'. The terminals are labeled 'I Sensor Channel 0' and 'V Sensor Channel 7'.



NOTE Either the self-powered sensor or the power supply should be floating (not connected to earth ground).

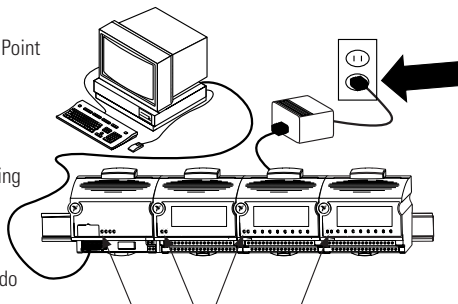
8 Power On the FieldPoint System



CAUTION Terminal bases must be connected to the FP-1300 before power is applied to the FP-1300.

Plug in each power supply to the FieldPoint bank. You should see the FP-1300

POWER LED turn on. After about 5 seconds, the **MODULE STATUS** and **CAN STATUS** LEDs flash green, then red, and then turn solid green, indicating that the FP-1300 is transmitting messages. In default mode, the FP-1300 transmits CAN messages at a periodic rate of 500 ms. If the LEDs do not follow this sequence, refer to the *FP-1300 User Manual* for troubleshooting instructions.



POWER and READY LEDs Stay Lit



NOTE The module status LED may blink red if the saved I/O configuration does not match the modules currently connected to the FP-1300.

After the hardware is installed, you should verify communication, configure the modules, configure the power-up states and watchdog settings, and configure the CAN messages.



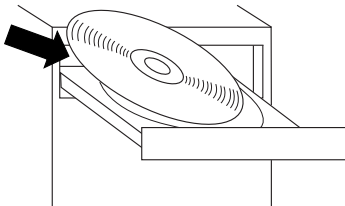
NOTE If you are not using an NI-CAN card when configuring the FP-1300, you cannot use the FP-1300 software and the installation is complete.

Install the FP-1300 Software

The host computer must be running Windows 2000/NT/XP/Me/9x. Windows NT must be version 4.0 service pack 3.0 or later. Follow these steps to install the FP-1300 software on the host computer:

- A. Close all other applications.
- B. Insert the FP-1300 Software CD into the CD-ROM drive on the host computer.

Follow the onscreen instructions to complete the installation.



NOTE If the setup does not launch automatically, select **Start»Run** from Windows, enter **x:\setup**, where **x** is the letter of the CD-ROM drive, and select **OK**.



NOTE The FP-1300 software requires NI-CAN 2.0 (for configuration) which is included on the CD and is installed during the installation process.

10 Configure the FP-1300 Using the FP-1300 Software

Follow these steps to configure the FP-1300 using the FP-1300 software.

- A. Select **Start»Programs»National Instruments»Measurement & Automation** to launch MAX.
- B. In the MAX configuration tree, right-click the CAN port to which the FP-1300 connects and select **FP-1300 Config**.

Refer to the *FP-1300 Configuration Utility Help* and complete the following steps:

- A. Configure the baud rate.
- B. Configure the arbitration ID.
- C. Configure the I/O module attributes and settings.
- D. Configure the CAN messages.
- E. Save the configuration.

11 Where to Go from Here

Refer to the *FP-1300 User Manual* and *FP-1300 Configuration Utility Help* for information about features, configuration, and troubleshooting. You can find the *FP-1300 User Manual* and online help on the FP-1300 Software CD.

FP-1300 LED Indications

LED	Solid Green	Flashing Green	Solid Red	Flashing Red
POWER	Power is applied to the FP-1300.	—	—	—
MODULE STATUS	The FP-1300 is operating normally.	I/O data has stopped because the FP-1300 is communicating with the configuration utility.	The FP-1300 has had an unrecoverable fault. Cycle the power.	The FP-1300 has had a recoverable fault. Try using the FP-1300 configuration utility to resolve the issue.
CAN STATUS	The CAN bus is operating normally.	—	There is an error on the CAN bus and the CAN communication has stopped.	There is a message overflow on the FP-1300 CAN controller. In the configuration utility, select Reset Cycle Power .



NOTE Refer to the *FP-1300 User Manual* for more information on the FP-1300 LED indicators.

FP-1300 Specifications

Installation

Terminal wiring	16–26 AWG copper conductor wire with 7 mm (0.275 in.) strip length
Torque for screw terminals	0.5–0.6 N · m (4.4–5.3 lb · in.)

Network

Network interface	CAN
Compatibility	ISO 11898
Communication rates	Up to 1 Mbps
Maximum cabling distance	
at 1 Mbps	See ISO 11898-2
CAN bus power supply range	10 to 30 VDC
CAN bus power consumption	
Typical	0.72 W (30 mA at 24 VDC)
Maximum	3 W
CAN bus isolation	250 V _{rms} operational, 2,500 V _{rms} breakdown
FieldPoint bank power supply range	11 to 30 VDC
FieldPoint bank power consumption	1 W + 1.1 (Total power consumption of all I/O modules)
Maximum terminal bases per bank	9
Maximum number of banks	Determined by network topology
Weight	254 g (8.96 oz)

Isolation Voltage

For isolation voltage ratings, refer to the I/O module specifications and labels.

Environmental

FieldPoint modules are intended for indoor use only. For outdoor use, FieldPoint modules must be mounted inside a sealed enclosure.

Operating temperature	–40 to 70 °C
Storage temperature	–55 to 85 °C
Humidity	10 to 90% RH, noncondensing

Maximum altitude	2,000 m; at higher altitudes the isolation voltage ratings must be lowered
Pollution Degree	2

Safety

The FP-1300 is designed to meet the requirements of the following standards for safety and electrical equipment for measurement, control, and laboratory use:

- EN 61010-1, IEC 61010-1
- UL 3121-1



NOTE For UL and other safety certifications, refer to the product label or ni.com.

- CAN/CSA C22.2 No. 1010.1

Electromagnetic Compatibility

CE, C-Tick and FCC Part 15 (Class A) compliant

Emissions EN 55011, Class A @ 10 m

FCC Part 15A above 1 GHz



NOTE For EMC compliance, operate this device with shielded cabling.

Immunity EN 61326-1:1997 + A1:1998, Table 1

CE Compliance

The FP-1300 meets the following essential requirements of applicable European Directives as amended for CE Marking:

Low-Voltage Directive (safety) 73/23/EEC

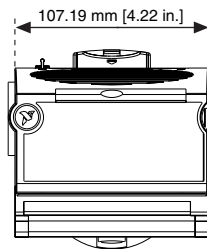
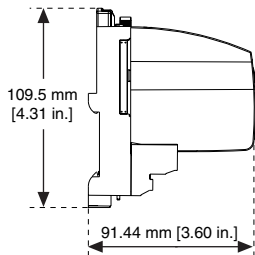
Electromagnetic Compatibility

Directive (EMC). 89/336/EEC



NOTE Refer to the Declaration of Conformity (DoC) for any additional compliance information. To obtain the DoC for an NI product, click **Declarations of Conformity Information** at ni.com/hardref.nsf/.

Mechanical Dimensions





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