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FieldPoint™

FP-1000/1001 FieldPoint Quick Start Guide

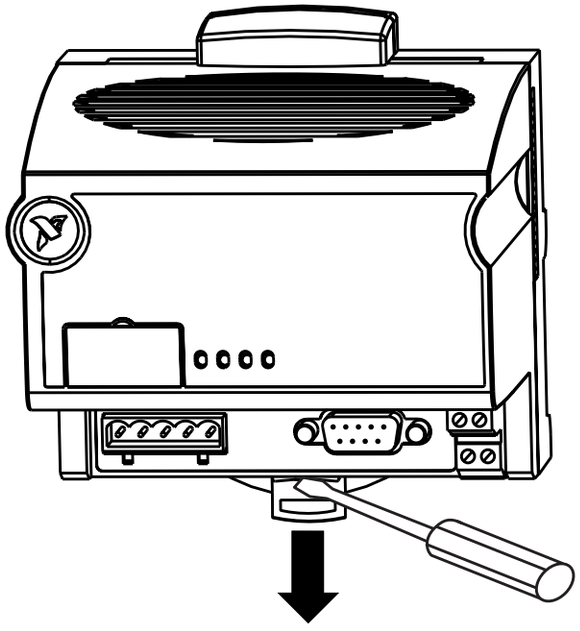
What You Need to Get Set Up

- Network module
- 35 mm DIN rail
- Two DIN rail locks (included)
- Terminal base(s)
- I/O module(s)
- 11–30 VDC power supply
- Accessories: serial cable, flathead screwdriver
- PC running Windows
- National Instruments FieldPoint Software CD

1 Install the Network Module

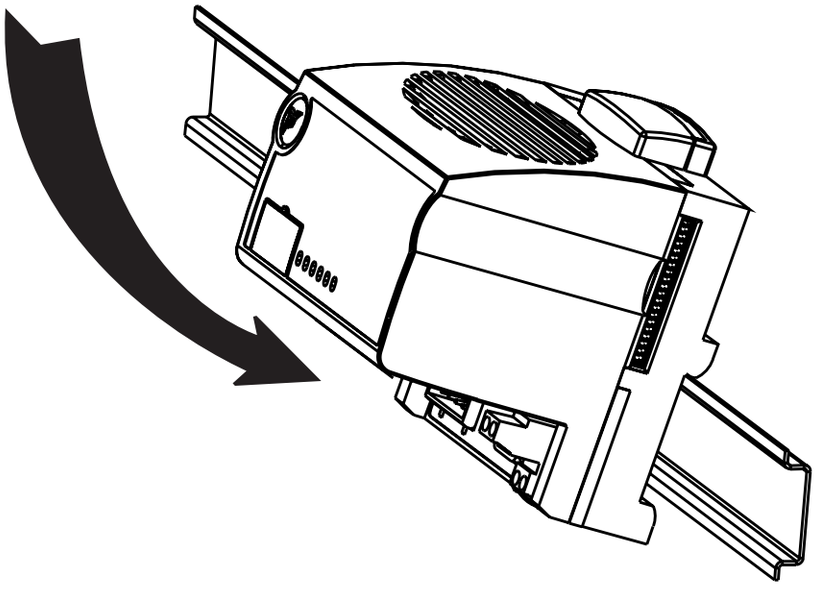
Mount the module on a DIN rail.

A. Unlock rail clip.

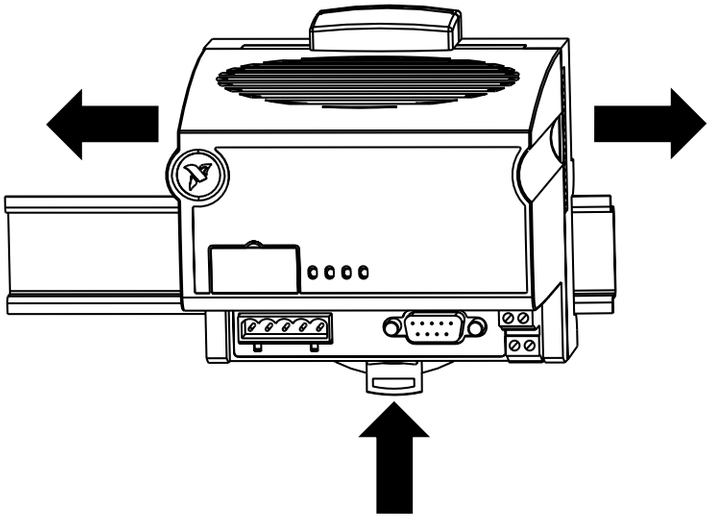


NOTE Do not use spliced DIN rails. Use only a single DIN rail.

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



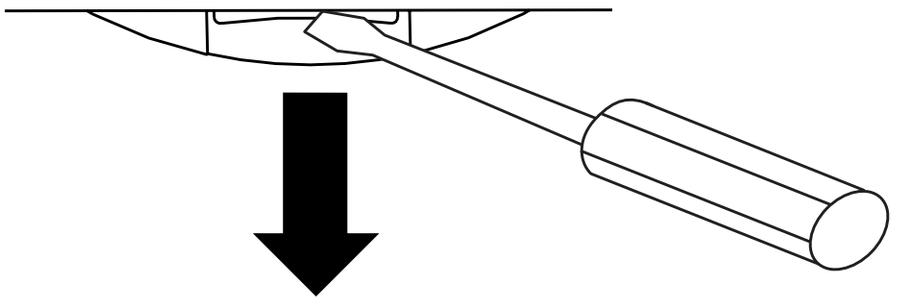
C. Slide module into position and lock rail clip.



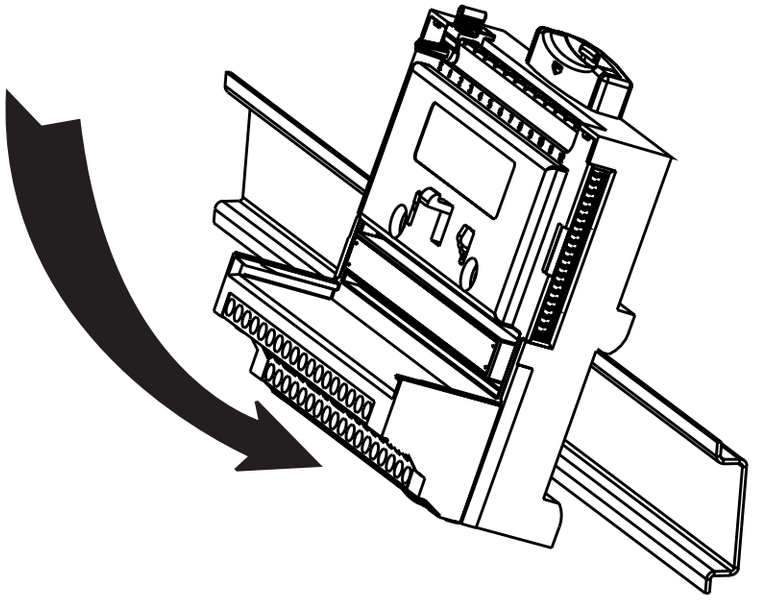
2 Install the Terminal Base(s)

CAUTION Terminal bases must be connected 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.

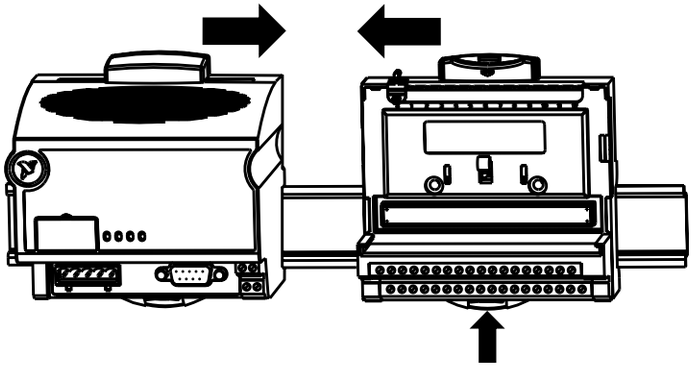
A. Unlock rail clip.



B. Press base onto rail.

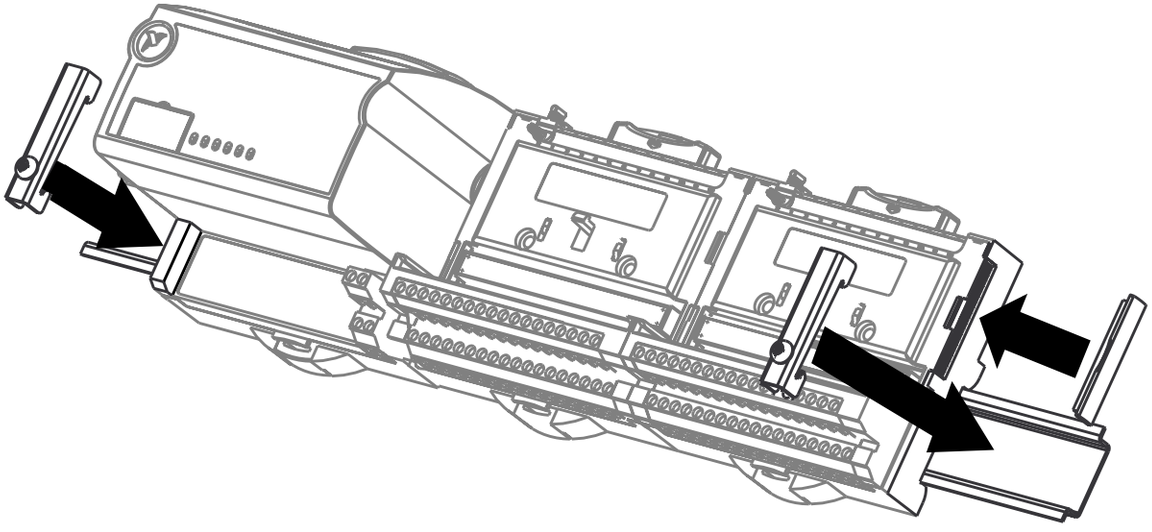


C. Slide base into position and lock rail clip. Be careful not to bend any pins.



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. Make sure there are no gaps between terminal bases.

E. You *must* install DIN rail locks at each end of the bank to ensure reliable connections between terminal bases and network module. Two rail locks are included with each network module. Place protective cover on last base.



3 Install the I/O Module(s)

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

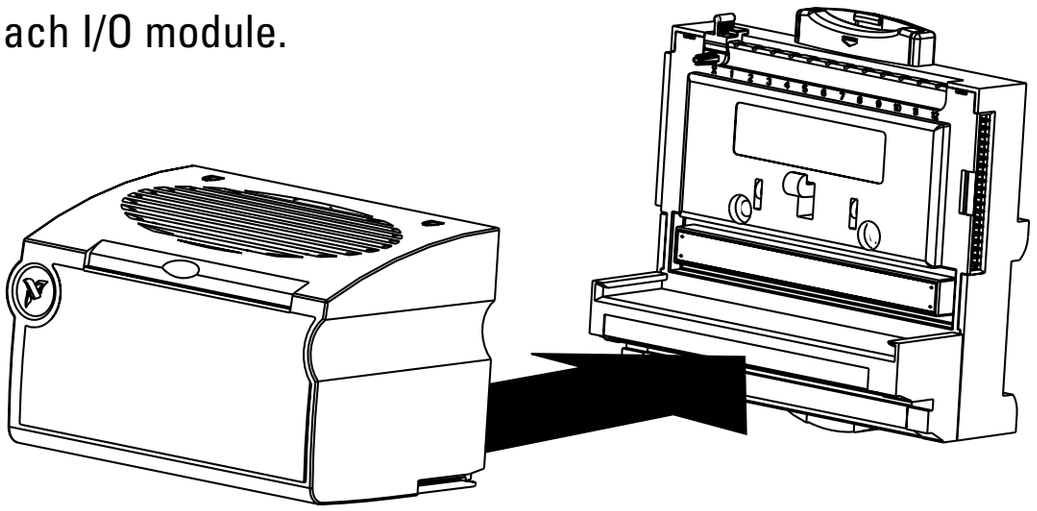
- If you plan to cascade power between any I/O modules using the V and C terminals, those modules should be grouped together.

CAUTION Cascading power defeats isolation.

- For more accurate measurements, place thermocouple modules away from heat sources, including network modules and relay modules.

A. Align slots on module with guide rails on base, and press module onto base until base latch locks module in place.

B. Repeat for each I/O module.

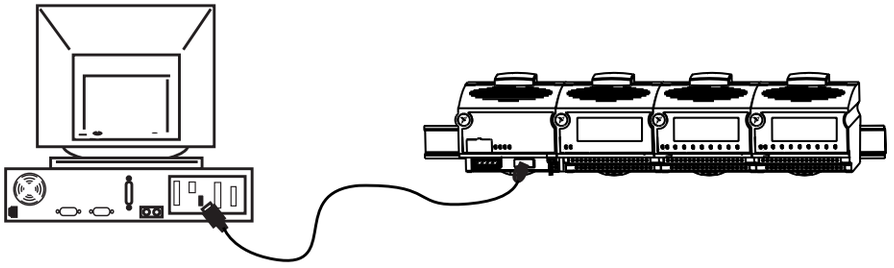


4 Connect the Network Cables

You have several network connection options with the FP-1000 and FP-1001, as shown here.

Connecting the FP-1000 to a Computer's RS-232 Serial Port

Use a male-to-female (straight through) cable to connect the computer's RS-232 port to the 9-position DSub RS-232 connector on the FP-1000.



NOTE You cannot connect the RS-485 port of the FP-1000 directly to an RS-485 port on the computer. You must use an FP-1001 for this network connection.

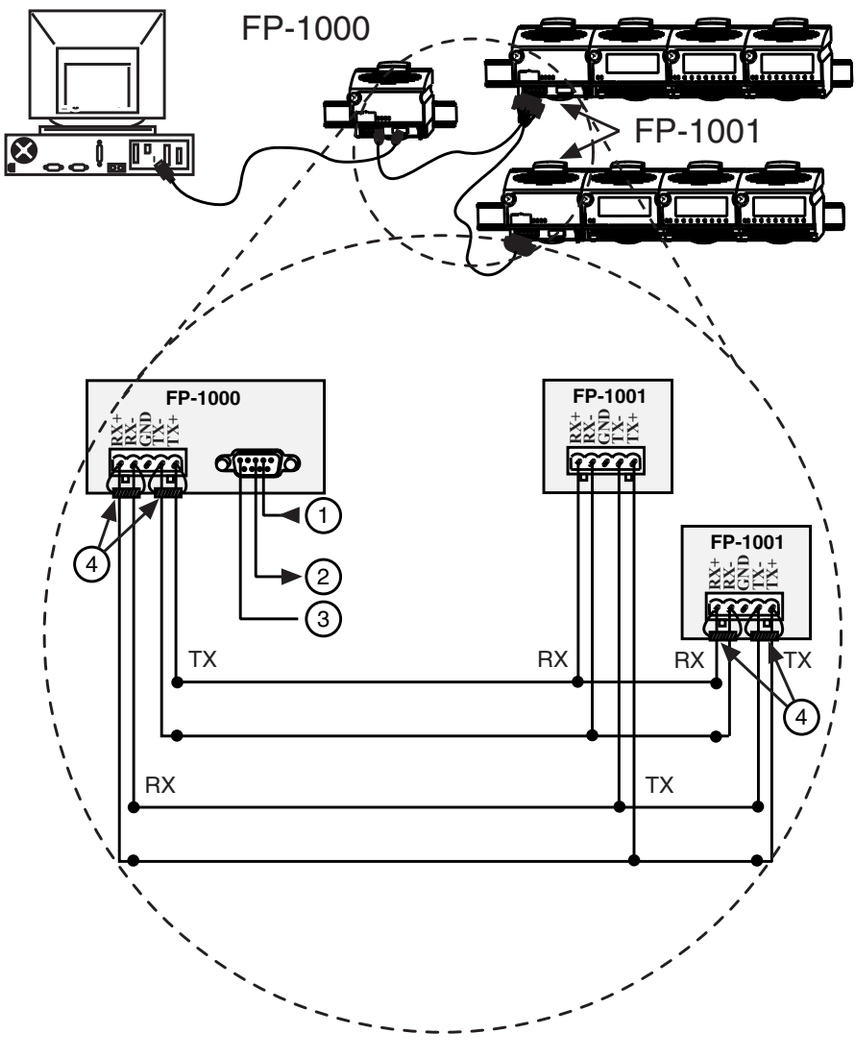
If you are using multiple FieldPoint serial network modules, you may need to connect the grounds of the RS-485 communication ports to each other to prevent damage from differences in ground potentials.

Connecting the FP-1000 to an FP-1001

You can connect up to 24 FP-1001 RS-485 serial network modules to an FP-1000. Use the RS-485 repeater port of the FP-1000, with the connection shown in this figure.

A. Connect the TX outputs of the FP-1001 to the RX inputs of the FP-1000, and the RX inputs of the FP-1001 to the TX outputs of the FP-1000.

B. Install the termination resistors. Terminate each end of your RS-485 network using the 120 Ω termination resistors included with the FP-1001. Install them between the RX and TX pair of the FP-1000 RS-485 port, and between the RX and TX pair on the last FP-1001 RS-485 port, as shown. Twist the resistor leads with the RS-485 signal wires and insert them into the RS-485 port terminals.



1	From the Computer's RS-232 Transmit Output
2	To Host Computer's RS-232 Receive Input
3	Ground
4	120 Ω Termination Resistors

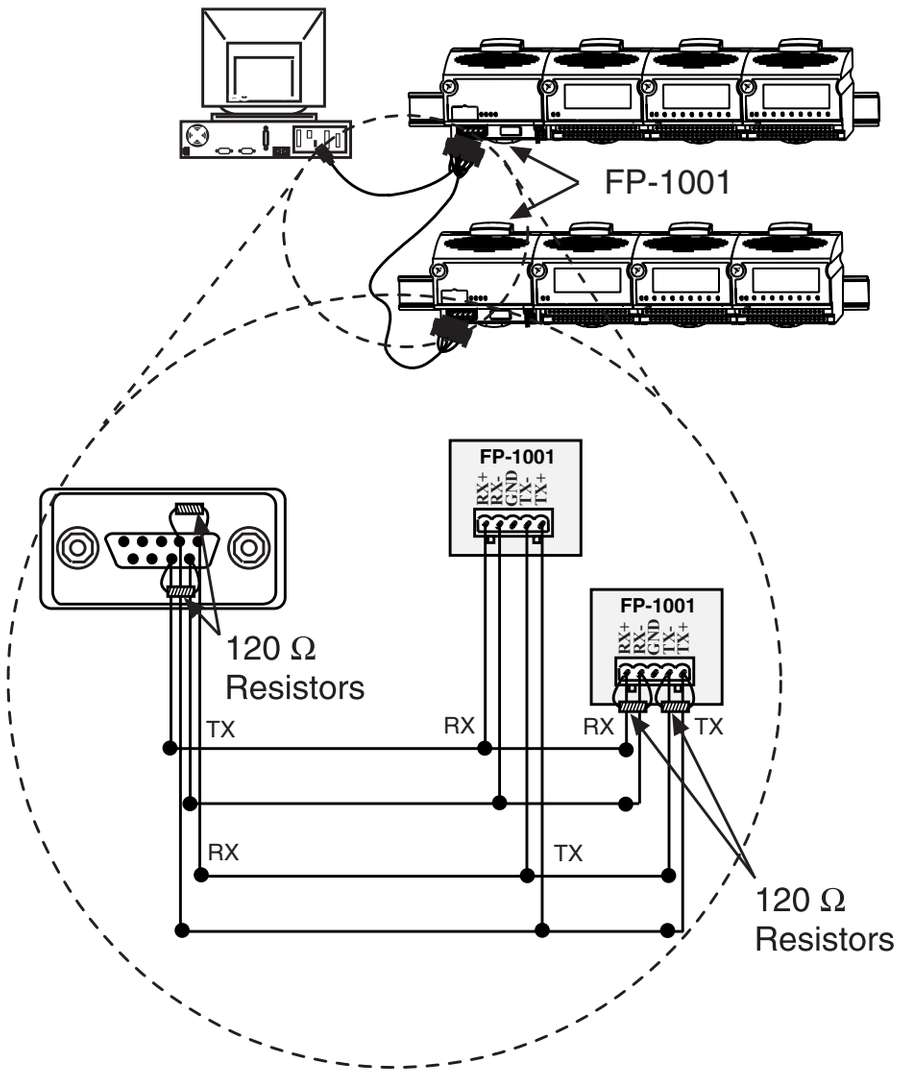
Connecting the FP-1001 to a Computer's RS-485 Serial Port

You may connect up to 25 FP-1001 network modules to a single RS-485 port of a host computer. Use the connection shown in this figure.

A. Connect the FP-1001 to a host computer using the 5-position Combicon screw terminal adapter of the RS-485 connector on the FP-1001.

B. Install the 120 Ω termination resistors included with the FP-1001. Install them between the RX and TX pair of the host computer RS-485 port, and between the RX and TX pair on the RS-485 port of the last FP-1001 in the system, as shown. Twist the resistor leads with the RS-485 signal wires and insert them into the RS-485 port terminals.

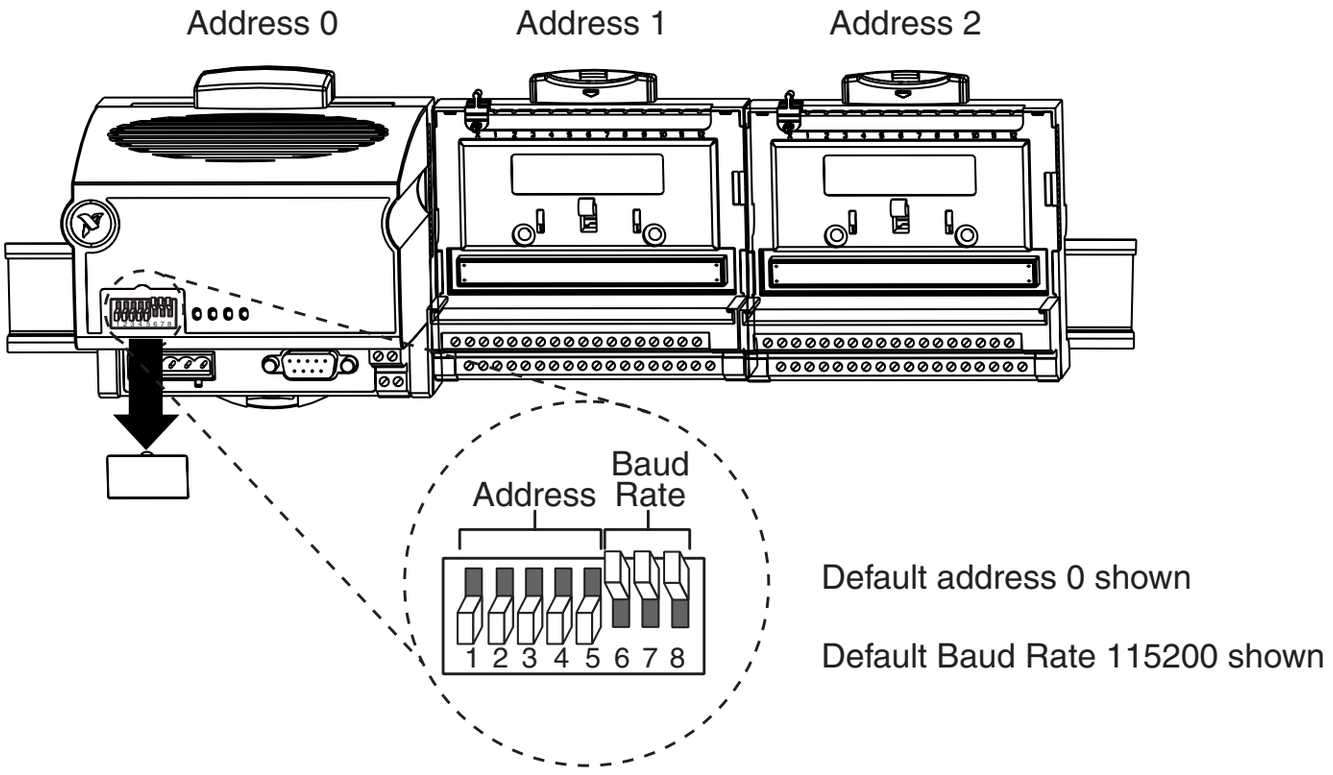
C. Check the biasing feature. The host computer RS-485 interface usually provides for biasing resistors, which are required on an RS-485 network. You should use this biasing feature for better reliability and noise immunity.



NOTE The pinout shown for the RS-485 DB-9 connector is for National Instruments RS-485 cards. Please refer to the manuals that came with your RS-485 card, as the pinout may vary by manufacturer.

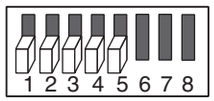
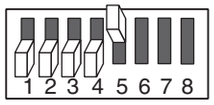
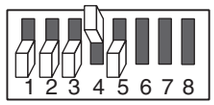
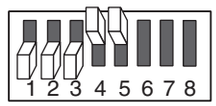
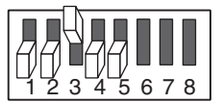
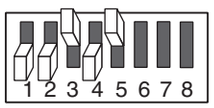
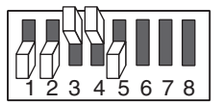
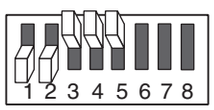
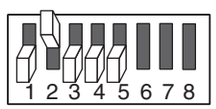
5 Set the Network Address and Baud Rate

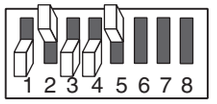
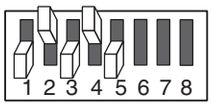
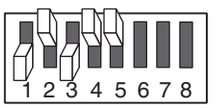
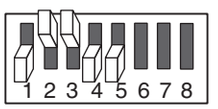
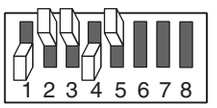
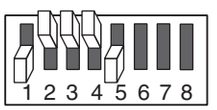
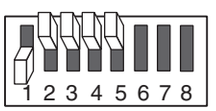
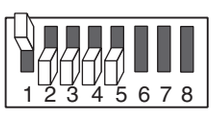
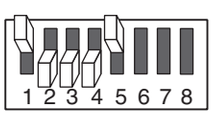
If the default values do not work for you, remove the switch cover from the 8-position switch on the front of the FP-1000/1001 to set the network address and baud rate.

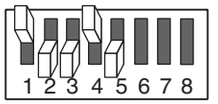
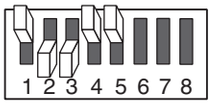
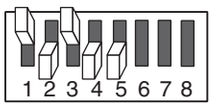
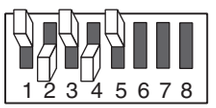
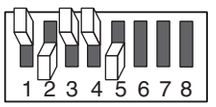
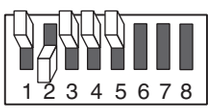
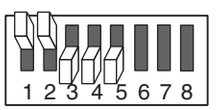


A. Check/Set the Network Address

Give every network module connected to one serial port of the host computer a unique address. Modules on different serial ports may have the same address. The addresses of the terminal bases connected to the network module are automatically configured to be sequentially higher than the network module address, moving out from the network module. The default network address for the FP-1000/1001 is 0.

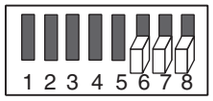
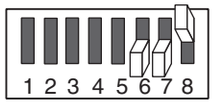
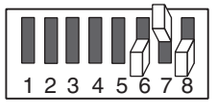
Switch Positions 1-5	Network Module Address (Decimal)
	0 Default
	10
	20
	30
	40
	50
	60
	70
	80

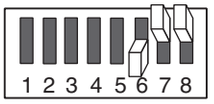
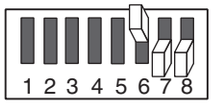
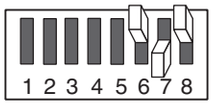
Switch Positions 1-5	Network Module Address (Decimal)
	90
	100
	110
	120
	130
	140
	150
	160
	170

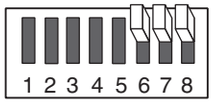
Switch Positions 1-5	Network Module Address (Decimal)
	180
	190
	200
	210
	220
	230
	240
Other Settings	Not Allowed

B. Check/Set the Baud Rate

Every module on one serial port of the host computer must have the same baud rate, which must be less than or equal to the baud rate of the computer serial port. The default baud rate for the FP-1000/1001 is 115200, which provides the fastest performance. You should not need to change this setting unless you experience communication problems.

Switch Positions 6-8	Network Module Baud Rate
	300
	1200
	2400

Switch Positions 6-8	Network Module Baud Rate
	9600
	19200
	38400

Switch Positions 6-8	Network Module Baud Rate
	57600
	115200 (Default)

C. Apply the New Settings

1. Note the new settings on the FP-1000/1001 label so that you can refer to them when you configure the software.

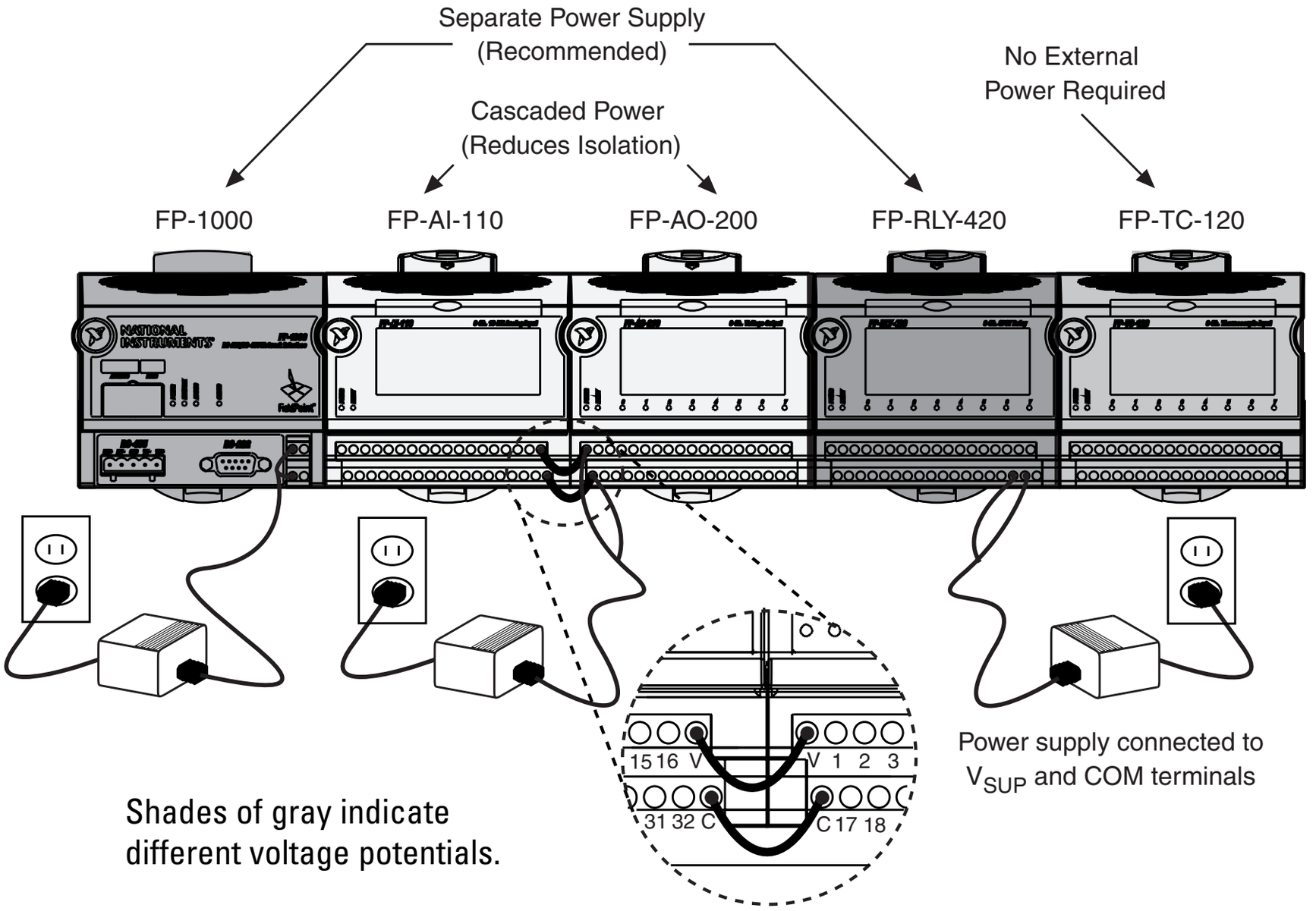
2. If power is applied to the network module, cycle it off and back on again to enable the new settings.

6 Wire Power to the FieldPoint System

A. Connect power supply leads to the V and C terminals of the network module. For up to five I/O modules, use an 11–30 VDC, 15 W minimum power supply such as the FP-PS-4. If you have more than five modules, you need a 20 W power supply. Refer to the I/O module operating instructions for the power requirements of each module. Refer to the *Specifications* section of this document for instructions on calculating the power requirement of the FieldPoint bank.

B. Connect power to the I/O modules that require external power for outputs (examples include output, counter, relay, PWM, PG, and QUAD modules). It is generally best to power each such module by connecting an external power supply to the V_{SUP} and COM terminals. Refer to the I/O module operating instructions for power requirements, detailed wiring diagrams, and safe wiring practices.

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



CAUTION Cascading power defeats isolation.

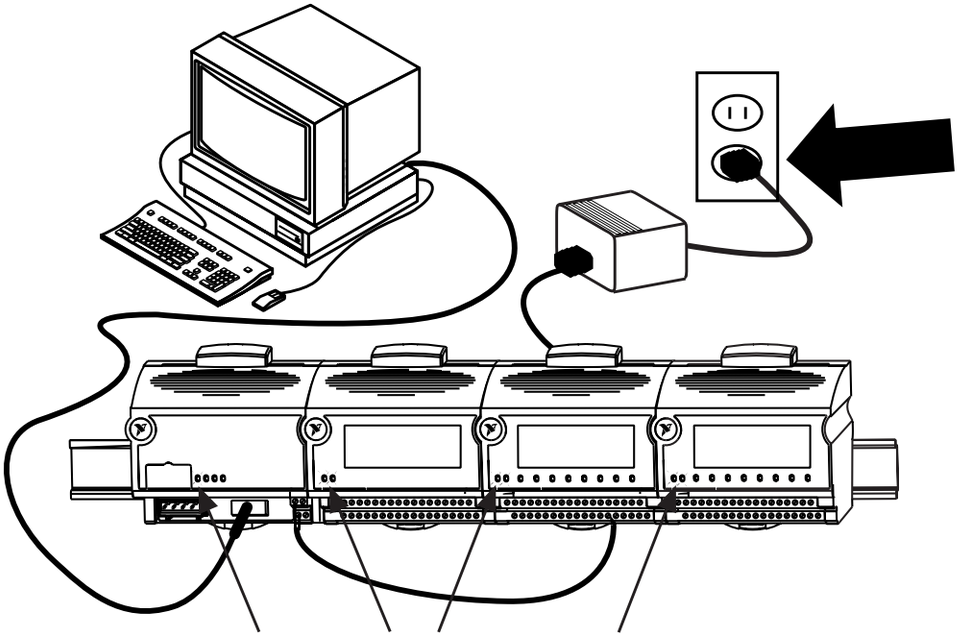
7 Connect to Field Devices

Use the operating instructions for each I/O module to help you connect field devices.

8 Power Up the FieldPoint System

CAUTION Terminal bases must be connected to the FP-1000/1001 before power is applied to the FP-1000/1001.

Plug in each power supply to the FieldPoint bank. You should see the FP-1000/1001 **ACCESS** and **STATUS** LEDs flash once and its **POWER** LED come on and stay on. After a few seconds, the **POWER** and **READY** LEDs should be lit on each I/O module. If the LEDs do not follow this sequence, refer to the *FP-1000/1001 User Manual* for troubleshooting instructions.



POWER and READY LEDs Stay Lit

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

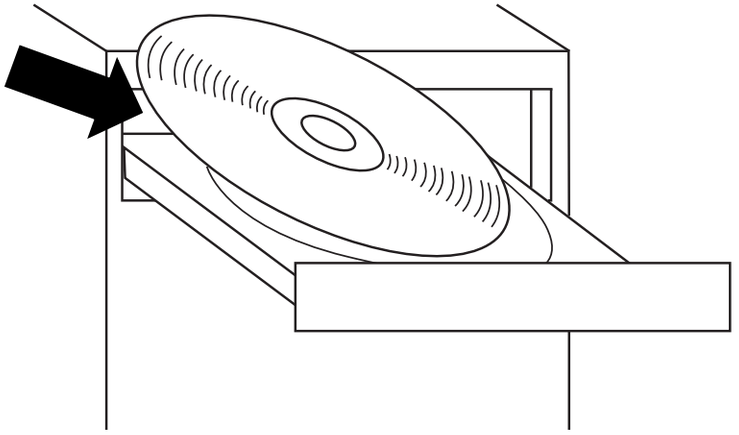
9 Install Software on the Host PC

A. Install the software packages you plan to use, such as LabVIEW, LabVIEW RT, Measurement Studio, VI Logger, or LabWindows™/CVI™, before you install the FieldPoint software. The FieldPoint software installation installs the LabVIEW VIs and examples and the LabWindows/CVI instrument driver only if it finds the corresponding development software installed.

B. Close all other applications.

C. Insert the National Instruments Device Drivers CD into the CD-ROM drive on your computer.

D. Follow the onscreen instructions to complete the installation.



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

10 Where to Go from Here

For information about configuring the FP-1000/1001 in software, refer to the *Measurement & Automation Explorer Help for FieldPoint* (**Start»Programs» National Instruments»FieldPoint»FieldPoint Help**).

Specifications

Network

Network ports

FP-1000	1 RS-232 port, 1 RS-485 repeater port
FP-1001	1 RS-485 port
Baud Rates	300, 1200, 2400, 9600, 38400, 57600, 115200 (switch selectable)
Communication parameters	1 start bit, 8 data bits, 1 stop bit, no parity
RS-485 isolation	2,300 V_{rms} breakdown

Power Requirements

Power supply range	11–30 VDC
Recommended power supply	
FP-1000/1001 with up to 5 I/O modules	15 W (FP-PS-4 or equivalent)
FP-1000/1001 with 6 to 9 I/O modules	20 W
Power consumption	1 W + 1.15(*I/O module power requirements*)

Physical Characteristics

Screw-terminal wiring	16–26 AWG copper conductor wire with 7 mm (0.28 in.) of insulation stripped from the end
Torque for screw terminals	0.5–0.6 N · m (4.4–5.3 lb · in.)

Environmental

FieldPoint modules are intended for indoor use only. For outdoor use, they must be installed in a suitable 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-1000/1001 is designed to meet the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:

- EN 61010-1, IEC 61010-1
- UL 3121-1, UL 61010C-1
- CAN/CSA C22.2 No. 1010.1

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

Electromagnetic Compatibility

CE, C-Tick and FCC Part 15 (Class A) Compliant
Emissions . . . . . EN 55011 Class A at 10 m. FCC Part 15A above 1 GHz
Immunity . . . . . EN 61326: 1997 + A2: 2001, Table 1

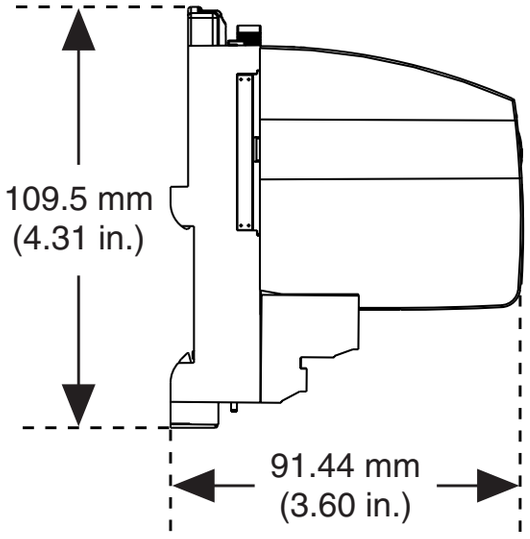
NOTE For EMC compliance, operate this device with shielded cabling.

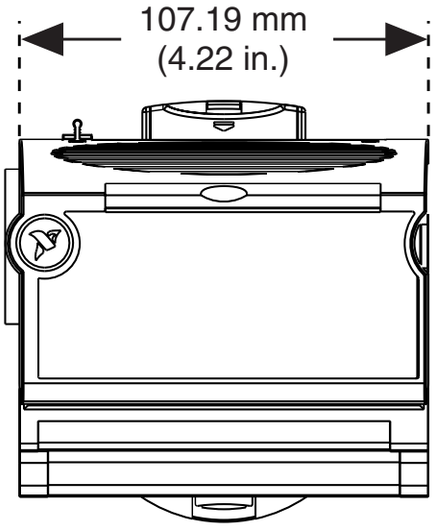
CE Compliance

This product meets the essential requirements of applicable European Directives, as amended for CE Marking, as follows:
Low-Voltage Directive (safety). 73/23/EEC
Electromagnetic Compatibility
Directive (EMC) 89/336/EEC

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

Mechanical Dimensions







Go to ni.com/support for the most current manuals, examples, and troubleshooting information. For telephone support in the United States, create your service request at ni.com/ask and follow the calling instructions or dial 512 795 8248. For telephone support outside the United States, contact your local branch office:

Australia 02 612 9672 8846, Austria 43 0 662 45 79 90 0, Belgium 32 0 2 757 00 20, Brazil 55 11 3262 3599, Canada (Calgary) 403 274 9391, Canada (Montreal) 514 288 5722, Canada (Ottawa) 613 233 5949, Canada (Québec) 514 694 8521, Canada (Toronto) 905 785 0085, Canada (Vancouver) 514 685 7530, China 86 21 6555 7838, Czech Republic 420 2 2423 5774, Denmark 45 45 76 26 00, Finland 385 0 9 725 725 11, France 33 0 1 48 14 24 24, Germany 49 0 89 741 31 30, Greece 30 2 10 42 96 427, India 91 80 51190000, Israel 972 0 3 6393737, Italy 39 02 413091, Japan 81 3 5472 2970, Korea 82 02 3451 3400, Malaysia 603 9131 0918, Mexico 001 800 010 0793, Netherlands 31 0 348 433 466, New Zealand 64 09 914 0488, Norway 47 0 32 27 73 00, Poland 48 0 22 3390 150, Portugal 351 210 311 210, Russia 7 095 238 7139, Singapore 65 6226 5886, Slovenia 386 3 425 4200, South Africa 27 0 11 805 8197, Spain 34 91 640 0085, Sweden 46 0 8 587 895 00, Switzerland 41 56 200 51 51, Taiwan 886 2 2528 7227, Thailand 662 992 7519, United Kingdom 44 0 1635 523545

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