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FP-1001

FieldPoint RS-485 Network Module

Field**Point**™

Highlights

- Isolated RS-485 interface to host computer or to FP-1000 repeater port
- Simple ASCII protocol is compatible with industry standard Optomux protocol
- Built-in high efficiency power supply powers I/O modules
- Runs on 11 to 30 VDC power
- -40° to +70° C operation

Overview

The FP-1001 is a network module for the FieldPoint system. It provides connection to an RS-485 network using a simple ASCII protocol.

This document provides a quick guide to installing and configuring the FP-1001 network module. For more detailed information on using the network module, refer to the FP-1000/1001 user manual. For information on the ASCII protocol used by the network module, refer to the FP-1000/1001 programmer reference manual.

DIN Rail Mounting

☞ **NOTE:** *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.*

The FP-1001 has a simple rail clip for mounting reliably onto a standard 35 mm DIN rail. To install the FP-1001 to the DIN rail, follow these steps:

1. With a flat bladed screwdriver, open the DIN rail clip to the unlocked position as shown in Figure 1.
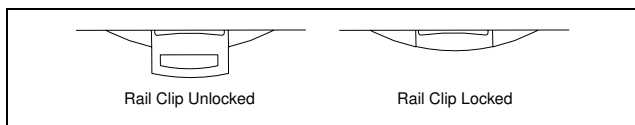

Figure 1. DIN Rail Clip

2. Hook the lip on the rear of the FP-1001 onto the top of a 35 mm DIN rail and press the FP-1001 down onto the DIN rail as shown in Figure 2.
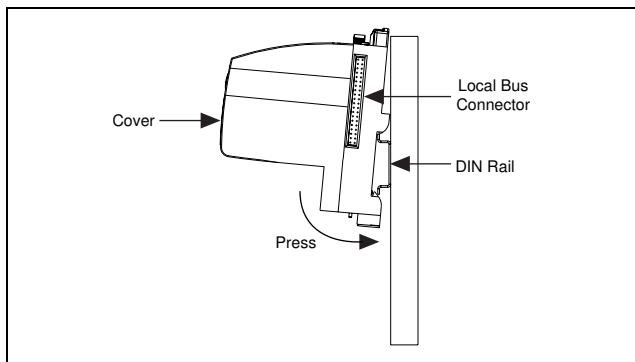
**Figure 2.** Installing the Network Module onto a DIN Rail

3. Slide the FP-1001 to the desired position along the DIN rail. After the FP-1001 is in position, lock it to the DIN rail by pushing the rail clip in.

4. Add terminal bases to the DIN rail with their local bus connectors firmly mated to the FP-1001 local bus connector. The FP-1001 is shipped with a protective cover over the local bus connector. Remove this protective cover, and place it over the local bus connector of the last terminal base in the stack as shown in Figure 3.
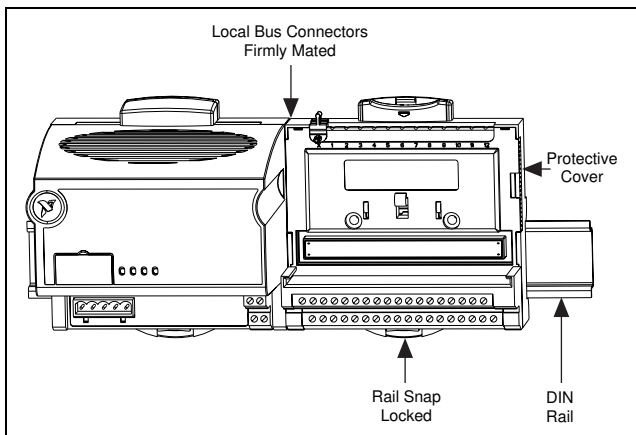
Figure 3. Installed Network Module

Network Connection

Connect the FP-1001 to a host computer, or to the RS-485 repeater port of an FP-1000, using the 5 position Combicon screw terminal adapter of the RS-485 connector on the FP-1001. You may connect up to 25 FP-1001 network modules to a single RS-485 port of a host computer, or up to 24 FP-1001 network modules to the RS-485 repeater port of an FP-1000. The pinout of the RS-485 connector is shown in Figure 4.
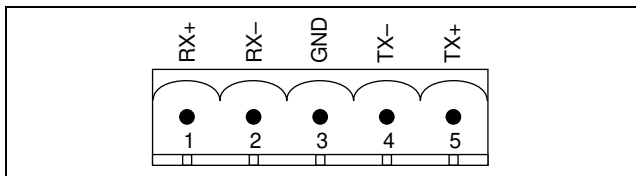

Figure 4. RS-485 Connector Pinout

The TX+ of the host port (or FP-1000 RS-485 repeater port) must be connected to the RX+ of all of the FP-1001 modules, and the TX- of the host port (or FP-1000 RS-485 repeater port) must be connected to the RX- of all of the FP-1001 modules. This pair of connections provides communication from the host computer to the FP-1001 modules.

The RX+ of the host port (or FP-1000 RS-485 repeater port) must be connected to the TX+ of all of the FP-1001 modules, and the RX- of the host port (or FP-1000 RS-485 repeater port) must be connected to the TX- of all of the FP-1001 modules. This pair of connections provides communication to the host computer from the FP-1001 modules.

These connections are shown in Figure 5.
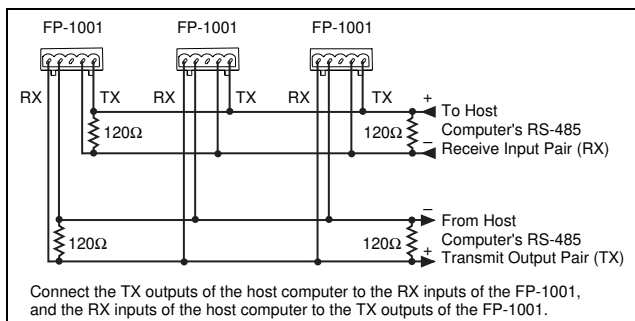
**Figure 5.** Typical Signal Connections with One FP-1001 Connected to Multiple FP-1001 Network Modules

Figure 5 also shows the use of 120 Ohm termination resistors. An RS-485 network must be terminated at each end of the network, but not anywhere else. Termination resistors should be installed between the RX pair and between the TX pair of the host RS-485 port and on the RS-485 port of the last FP-1001 on the network. A pair of terminating resistors are provided with the network modules. To install them, twist the resistor leads with the RS-485 signal wires and insert them into the RS-485 port terminals.

An RS-485 network also needs biasing resistors to protect the devices on the network against noise during intervals when no RS-485 drivers are transmitting on the network. The host computer's RS-485 interface normally has provisions for such biasing resistors. You should use this biasing feature for better reliability and noise immunity.

Setting the Address and Baud Rate

Figure 6 shows the 8-position switch on the FP-1001 network module. Switches 1-5 set the network address, and switches 6-8 set the baud rate. Every network module connected to one serial port of the host computer must be given a unique address; however,

modules on different serial ports may have the same address. Every module on one serial port of a host computer must have the same baud rate.
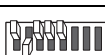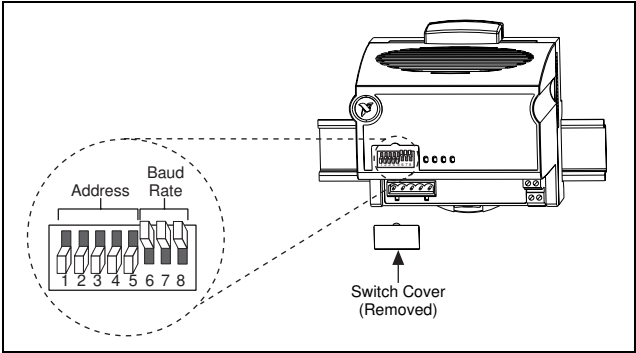

Figure 6. Address and Baud Rate Switch

Switches 1-5 set the network address of the FP-1001. The addresses of the terminal bases connected to the network module are automatically configured to be sequentially higher than the network module's address. For example, if the network module is set to address 20, the I/O module in the terminal base immediately connected the network module is at address 21, the next I/O module is at address 22, and so on. A terminal base is assigned a network address whether an I/O module is inserted into it or not. Table 1 shows the possible switch positions and the corresponding address of the FP-1001.

Table 1. Network Address Switch Settings

Switch Positions 1-5	Network Module Address (Decimal)	Switch Positions 1-5	Network Module Address (Decimal)
	0		130
	10		140
	20		150
	30		160

Table 1. Network Address Switch Settings (Continued)

Switch Positions 1-5	Network Module Address (Decimal)	Switch Positions 1-5	Network Module Address (Decimal)
	40		170
	50		180
	60		190
	70		200
	80		210
	90		220
	100		230
	110		240
	120	Other Settings	Not Allowed

Switches 6-8 set the baud rate of the FP-1001. Table 2 shows the switch positions and the corresponding network baud rates.

Table 2. Baud Rate Switch Settings

Switch Positions 6-8	Network Module Baud Rate	Switch Positions 6-8	Network Module Baud Rate
	300		19200
	1200		38400
	2400		57600
	9600		115200

Powering the FP-1001

☞ **NOTE:** *Terminal bases must be connected to the FP-1001, and the baud rate switch must be set, before power is applied to the FP-1001.*

An 11-30 VDC power supply is required by each FieldPoint stack. The network module filters and regulates this supplied power and provides power for all the I/O modules in the stack. Therefore you need not provide power separately to each FieldPoint I/O module in the stack. If your field I/O device needs to be powered separately, you can use the terminals provided on each terminal base for such power supply connections.

The power connector is a 4-pin screw terminal connector whose pinout is shown in Figure 7.
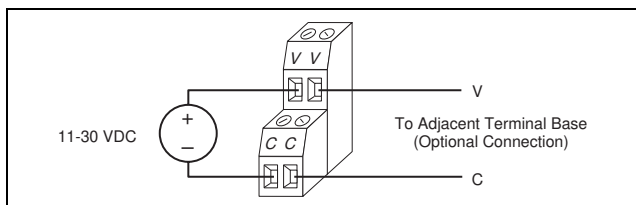
Figure 7. FP-1000 and FP-1001 Power Connector Pinout

The two terminals labeled V are internally connected on the network module, as are the two terminals labeled C. Power must be applied to one V and C pair for operation of the FieldPoint system. If you want to power your field I/O devices from the same power supply, the second V and C pair provides a convenient means of connecting power to the V and C terminals of a terminal base. Figure 7 shows this optional connection.

Specifications

Network ports	1 RS-485 port
Baud Rates	300, 1200, 2400, 9600, 19200, 38400, 57600, 115200 (switch selectable)
Communication parameters	1 start bit, 8 data bits, 1 stop bit, No parity

RS-485 isolation	2500 Vrms breakdown, 250 Vrms operational
Power Consumption	1 W + 1.15 * ∑(I/O module power requirements)
Operating Temperature	-40 °C to +70 °C
Storage Temperature	-55 °C to + 100 °C
Relative Humidity	5% to 90% non-condensing
Weight	240 g (8.4 oz.)

CE Mark Compliance

This product meets applicable EU directive(s) as follows:

Safety isolation	EN 61010 (double insulation for 250 Vrms working isolation, installation category II)

EMC Directive

Immunity	EN 50082-1:1994
Emissions	EN 55011:1991 Group I Class A at 10 meters

Mechanical Dimensions

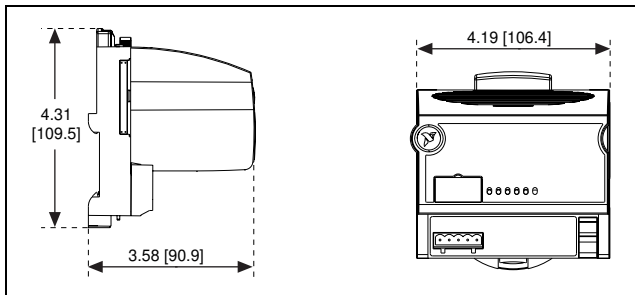Figure 8 shows the mechanical dimensions of the FP-1001.

Figure 8. Mechanical Dimensions