**OVERVIEW**

- **PX-MOD I/O Bus Specifications**
  - Supply Power for I/O Bus: 24VDC (+15%/-20%)
  - Input Current from Power Supply: 70mA (+ total I/O bus current)/4
  - Recommended Fuse: 15A Max
  - I/O Bus Current Supply: 1000mA Max
  - Number of Bus Terminals Supported: 64 per assembly, 255 at I/O Bus Expansion (based on power budget)
  - Number of Discrete Inputs/Outputs: 1020 Inputs and 1020 Outputs with 255 terminals
  - Number of Analog Inputs/Outputs: 256 Inputs and 256 Outputs
  - Maximum Number of Data Bytes*: 512 Input Bytes and 512 Output Bytes

- **PX-MOD Terminal Port Specifications**
  - Number of Stations: 99
  - Station Configuration: Rotary Switches
  - Protocol: Modbus RTU/ASCII (default = RTU)
  - Data Transfer Rates: 1200, 2400, 4800, 9600, 19200, 38400 baud

- **PX-MOD Terminal Power Bus Specifications**
  - Supply Power for Terminal Bus: 24VAC/VDC
  - Maximum Current: 10A
  - Number of Power Contacts: 2 (+24 VAC/VDC, 0V)
  - Maximum Number of Data Bytes: 512 Input Bytes and 512 Output Bytes
  - Number of Analog Inputs/Outputs: 256 inputs and 256 outputs
  - Number of Discrete Inputs/Outputs: 1020 Inputs and 1020 Outputs with 255 terminals

- **Number of Bus Terminals Supported**: 64 per assembly, 255 at I/O Bus Expansion (based on power budget)

- **Restrictions**: 35mm DIN rail/None

- **Operating Temp**: 0° to 55°C

- **Weight**: 100g

- **Shock**: conforms to EN 60068-2-27

- **Protection Class**: IP20

- **Dimensions (WxHxD)**: 44 x 100 x 68.4 mm (1.73 x 3.34 x 2.61 in)

- **Rotary Switches**: PX-MOD Modbus Port Specifications
  - Number of Power Contacts: 2 (+24 VAC/VDC, 0V)
  - Maximum Current: 10A
  - Number of Power Contacts: 2 (+24 VAC/VDC, 0V)
  - Maximum Current: 10A
  - Maximum Number of Data Bytes*: 512 Input Bytes and 512 Output Bytes
  - Number of Analog Inputs/Outputs: 256 inputs and 256 outputs
  - Number of Discrete Inputs/Outputs: 1020 Inputs and 1020 Outputs with 255 terminals

**WIRING DIAGRAMS**

- **Bus Coupler Power**
  - Label: Us, GND
  - Terminal Supply Power: 24VDC

- **Terminal Bus Power**
  - Label: Up
  - Terminal Supply Power: 24VDC

- **Modbus Station Rotary Switch**
  - Modbus Slave Station Address is set via two rotary switches. Address range is from 01 to 99. Switch X1=1’switch X10 = 10. Set address to 00 and use PX-CFGSW software for Coupler configuration. See PX-CFGSW-M manual for full details.

**Configuration Port**

- Requires cable PX-USB-232, with a USB 2.0 type A connector for the PC and a 4-pin custom micro connector for the bus coupler. Works with PX-CFGSW software.

**RS-485**

- Modbus communication requires termination resistors at the beginning and end of a network.

**Note**: Use 1/4 Watt or better resistors.
SYSTEM CONSIDERATIONS
The PX-MOD performs as a Modbus RTU slave in a Modbus network. Communication to the master is via a 9-pin D-sub RS485 port. The maximum distance from master to the PX-MOD is 4000 feet (1200 meters) using 24 AWG shielded, twisted pair. Termination resistors are required at the beginning and end of the network. It is highly recommended that a dedicated network be used for the Protons X system.

The PX-MOD Bus Coupler supports up to 64 terminals per assembly. 256 with Bus Expansion Couplers. A minimal assembly consists of a PX-MOD Bus Coupler, I/O Terminals and a Bus End Terminal.

The PX-MOD automatically assigns Modbus addresses for connected devices. For expansion beyond a 64 terminal assembly, a Bus Expansion End Terminal (PX-903) is used in place of a standard Bus End Terminal (PX-901). The PX-903 Bus Expansion Coupler Terminal is used at each expansion assembly in place of a PX-MOD Bus Coupler. Up to 31 Expansion couplers can be used in a group of assemblies. Connection is made between the PX-MOD Bus Coupler and the Bus Expansion Coupler Terminals via two power contacts; 24V and 0V. A power source of 24VAC is required for terminal wiring. Both I/O Bus communication and terminal bus power are passed through to adjoining terminals. To connect field power to the Terminal Power Bus, or to change from one voltage to another, Power Feed Terminals (PX-995 & PX-976) are used. Power Feed Terminals are available in 24VAC, 120-250VAC, and provide power to I/O Terminals located to the right of the Power Feed Terminal. This terminal passes I/O Bus communication. Power Terminals do not consume any addresses.

For expansion beyond a 64 terminal assembly, a Bus Expansion End Terminal (PX-902) is used in place of a standard Bus End Terminal (PX-901). A Power Expansion Coupler Terminal (PX-903) is used at each expansion assembly in place of a PX-MOD Bus Coupler. Up to 31 Expansion couplers can be used in a group of assemblies. Connection is made between the Expansion Coupler Terminals via standard RJ45 Ethernet cable. It is important to stay within the following three specifications:

1. Do not exceed the total number of 64 Terminals allowed per Assembly.
2. Do not exceed the total number of 512 Input Bytes and 512 Output Bytes.
3. Do not exceed the Coupler I/O Bus Power Budget of 1000mA as there is no internal current protection.

For complete assembly instructions see the PX-MOD-MSL manual. For a free download at www.automationdirect.com.

MOUNTING
For system assembly, first attach a bus coupler by snapping onto 25mm DIN rail and securing into position using the DIN rail locking wheel located on the left side of the coupler. To add a bus terminal, insert unit onto right side of bus coupler using the tongue and groove at the top and bottom of the unit, pressing gently until it snaps onto the DIN rail. A proper connection cannot be made by sliding the units together on the DIN rail. When correctly installed, no significant gap can be seen between the attached units. Bus connection is made through the six slide contacts located on the upper right side of the units. Add up to 64 bus terminals per bus coupler, including a bus end terminal. For system assembly, first attach a bus coupler by snapping onto 25mm DIN rail and securing into position using the DIN rail locking wheel located on the left side of the coupler. To add a bus terminal, insert unit onto right side of bus coupler using the tongue and groove at the top and bottom of the unit, pressing gently until it snaps onto the DIN rail. A proper connection cannot be made by sliding the units together on the DIN rail. When correctly installed, no significant gap can be seen between the attached units. Bus connection is made through the six slide contacts located on the upper right side of the units. Add up to 64 bus terminals per bus coupler, including a bus end terminal. IMPORTANT: For complete assembly instructions and compatibility between terminals see the PX-MOD-MSL manual available for free download at www.automationdirect.com.

REMOVAL
A locking mechanism prevents individual units from being pulled off. For bus terminal removal, pull the orange DIN rail release tab firmly to unlatch the unit from the rail. If attached to other terminal units, slide unit forward until released. For bus couplers, release the DIN rail locking wheel, then pull firmly on DIN rail release tab. Where applicable, rotate Locking Wheel to unlock Bus Coupler.

SAFETY
To minimize the risk of potential safety problems, you should follow all applicable local and national codes that regulate the installation and operation of your equipment. These codes vary from area to area and it is your responsibility to determine which codes should be followed to verify that the equipment, installation, and operation are in compliance with the latest revision of these codes.

WIRING SPECIFICATIONS
Power Separation Terminal (PX-908) is used. This terminal separates the Terminal Power contacts but passes I/O Bus communication. A 24VDC supply is required for terminal wiring. Eight points of 24VDC power can be distributed from the Terminal Power Bus using a Power Distribution Terminal (PX-949). This terminal is used to mount the right of a terminal that passes 24VDC on the power bus. Both I/O Bus communication and terminal bus power are passed through to adjoining terminals. To connect field power to the Terminal Power Bus, or to change from one voltage to another, Power Feed Terminals (PX-995 & PX-976) are used. Power Feed Terminals are available in 24VAC, 120-250VAC, and provide power to I/O Terminals located to the right of the Power Feed Terminal. This terminal passes I/O Bus communication. Power Terminals do not consume any addresses.

WIRING CONNECTION
Wire connection is made through a spring clamp style terminal. This terminal is designed for a single-conductor solid or stranded wire. Wire connection is made by firmly pushing the screwdriver into the screwdriver slot, inserting the wire into the wire slot and removing the screwdriver, locking the wire into position.

For system assembly, first attach a bus coupler by snapping onto 25mm DIN rail and securing into position using the DIN rail locking wheel located on the left side of the coupler. To add a bus terminal, insert unit onto right side of bus coupler using the tongue and groove at the top and bottom of the unit, pressing gently until it snaps onto the DIN rail. A proper connection cannot be made by sliding the units together on the DIN rail. When correctly installed, no significant gap can be seen between the attached units. Bus connection is made through the six slide contacts located on the upper right side of the units. Add up to 64 bus terminals per bus coupler, including a bus end terminal. Where applicable, rotate Locking Wheel to unlock Bus Coupler.

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HOT SWAP NOT PERMITTED
Always remove power from the system before inserting or removing bus terminals or couplers as failure to do so could cause malfunction or damage to the terminals, couplers or other connected devices.

SAFETY
To minimize the risk of potential safety problems, you should follow all applicable local and national codes that regulate the installation and operation of your equipment. These codes vary from area to area and it is your responsibility to determine which codes should be followed to verify that the equipment, installation, and operation are in compliance with the latest revision of these codes.

Equipment damage or serious injury to personnel can result from the failure to follow all applicable codes and standards. We do not guarantee the products described in this publication are suitable for your particular application, nor do we assume any responsibility for your product design, installation, or operation.

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MODBUS FEATURES
The PX-MOD Bus Coupler functions as a slave in a Modbus RTU network. For complete details see the PX-MOD-MSL manual.

WIRING CONNECTION
Wire connection is made through a spring clamp style terminal. This terminal is designed for a single-conductor solid or stranded wire. Wire connection is made by firmly pushing the screwdriver into the screwdriver slot, inserting the wire into the wire slot and removing the screwdriver, locking the wire into position.

Power Separation Terminal (PX-908) is used. This terminal separates the Terminal Power contacts but passes I/O Bus communication. A 24VDC supply is required for terminal wiring, eight points of 24VDC power can be distributed from the Terminal Power Bus using a Power Distribution Terminal (PX-949). This terminal is used to mount the right of a terminal that passes 24VDC on the power bus. Both I/O Bus communication and terminal bus power are passed through to adjoining terminals. To connect field power to the Terminal Power Bus, or to change from one voltage to another, Power Feed Terminals (PX-995 & PX-976) are used. Power Feed Terminals are available in 24VAC, 120-250VAC, and provide power to I/O Terminals located to the right of the Power Feed Terminal. This terminal passes I/O Bus communication. Power Terminals do not consume any addresses.

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3. Do not exceed the Coupler I/O Bus Power Budget of 1000mA as there is no internal current protection.

For complete system assembly instructions see the PX-MOD-MSL Manual.