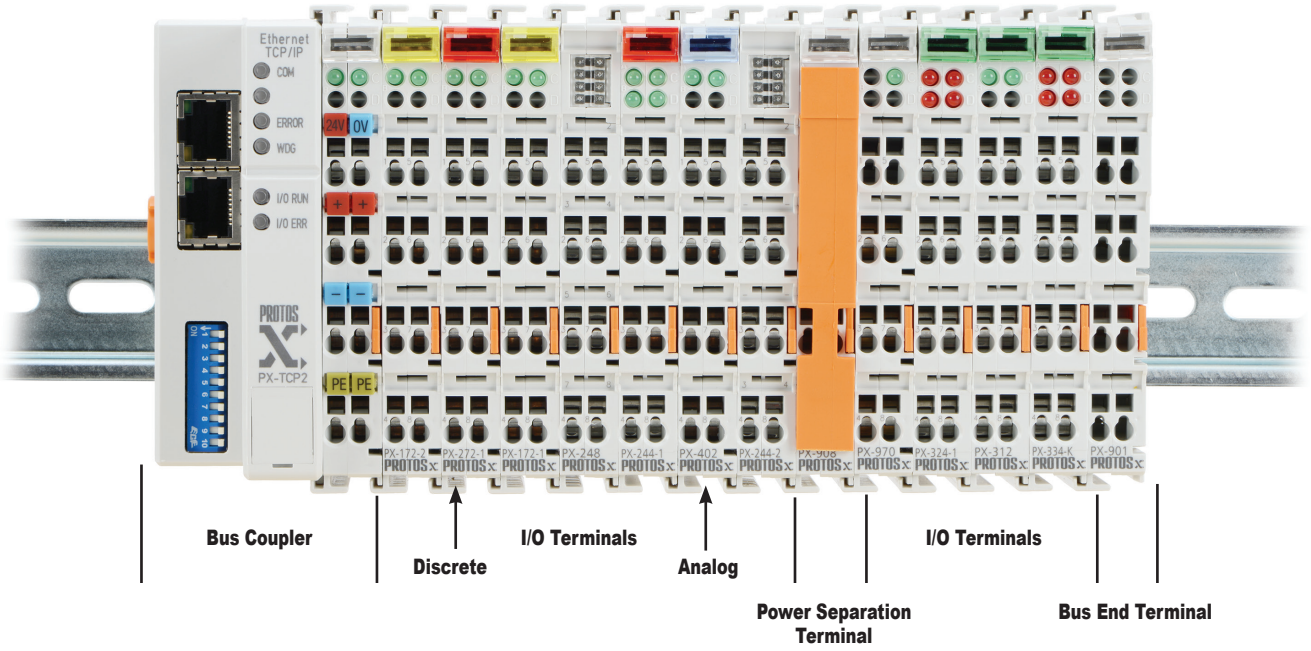
Protos X I/O

The Protos XTM I/O system (seen below) is a modular, field I/O system consisting of a Bus Coupler and its associated input/output terminals. The Protos X field I/O series offers

- 2, 4, 8, and 16-point discrete I/O terminals,
- 2, 4 and 8-channel analog I/O terminals,
- Three Bus Couplers that utilize the Modbus protocol with Modbus RTU/ASCII and Modbus TCP option,
- One Bus Coupler that utilizes EtherNet/IP and network addressing,
- Bus expansion terminals for expansion up to 255 I/O terminals per specific Bus Couplers,
- A variety of power supply options.

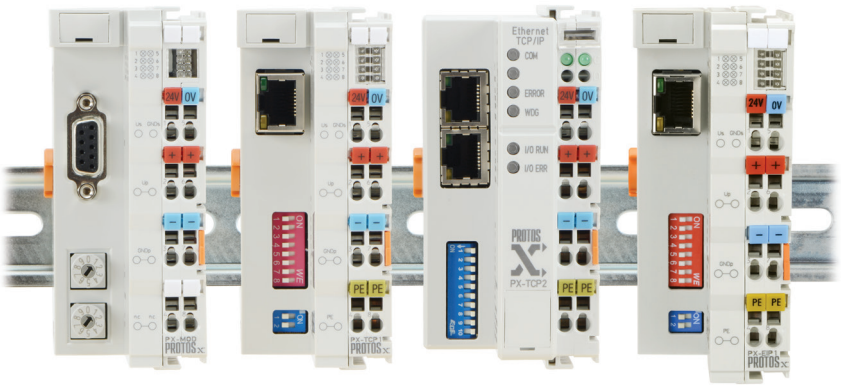


Bus Couplers

Bus Couplers are available in four configurations. The PX-MOD provides Modbus RTU/ASCII over RS-485. The PX-EIP1 provides EtherNet/IP; PX-TCP1 and PX-TCP2 offer Modbus TCP over Ethernet. The PX-TCP2 provides an additional port which can act as a switch to other couplers of the same type.

Protos X Bus Couplers

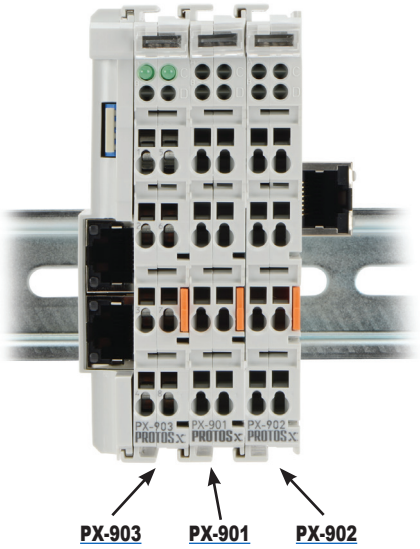
Part Number	Description	Price
PX-MOD	Modbus RTU/ASCII Bus Coupler	$;00?f9:
PX-TCP1	Modbus TCP Bus Coupler (1 port)	$;00?fa:
PX-TCP2	Modbus TCP Bus Coupler (2 ports)	$;00?fb:
PX-EIP1	EtherNet/IP Bus Co(1 port)	$01nne:



Protos X I/O

Bus End Terminal/ Bus Expansion Coupler Terminals

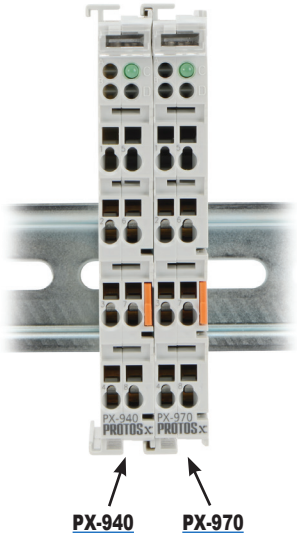
A Bus End Terminal, located at the end of a terminal assembly, is required for proper I/O bus communication. Bus expansion is available for the PX-MOD and PX-TCP1 Bus Couplers. Bus expansion requires that a Bus Expansion End Terminal be used in place of the Bus End Terminal and a Bus Expansion Coupler Terminal be used in place of the PX-MOD or PX-TCP1 at each expansion assembly.



Bus Expansion Terminals		
Part Number	*Description*	*Price*
PX-901	Bus End Terminal	$;0?f1:
PX-902	Bus Expansion End Terminal	$;0?f2:
PX-903	Bus Expansion Coupler Terminal	$;00?f3:

Power Feed Terminals

Two Power Feed Terminals, 24VDC or 120–230 VAC, are available to add or change supply power to the Terminal Power Bus.



Power Feed Terminals		
Part Number	*Description*	*Price*
PX-940	24VDC Power Feed Terminal	$;0?f5:
PX-970	120–230 VAC Power Feed Terminal	$;0?f7:

Power Distribution Terminal

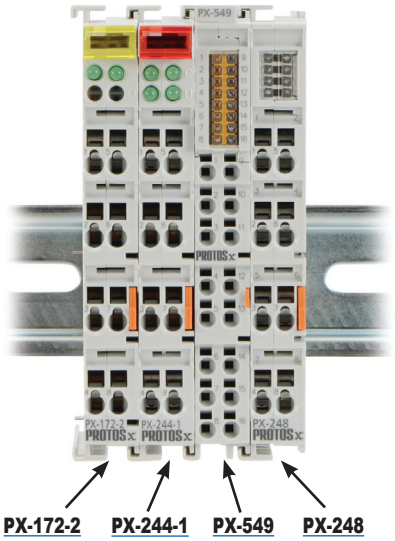
A Power Distribution Terminal provides access to the integrated 24VDC Terminal Power Bus. The terminal provides 8 connection points each of 24V and 0V.

Power Distribution Terminal		
Part Number	*Description*	*Price*
PX-949	24VDC Power Distribution Terminal	$;0?f6:

Protos X I/O

Discrete I/O Terminals

There are twelve discrete input and output terminals available offering 2 points, 4 points, 8 points or 16 points per terminal and include AC, DC and relay form factors.

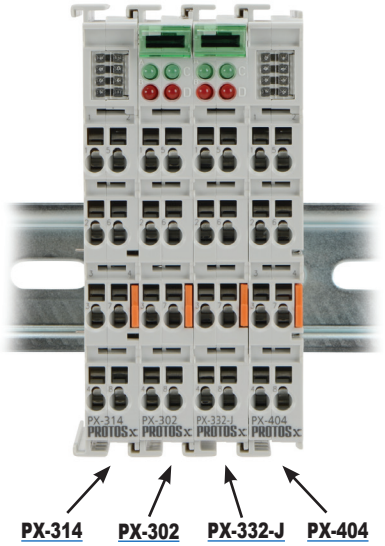


Discrete Input/Output Terminals

Part Number	Description	Price
PX-144	24VDC 4-point Input Terminal	$0?ea:
PX-148	24VDC 8-point Input Terminal	$0?eb:
PX-149	24VDC 16-point Input Terminal	$00?ec:
PX-172-1	120–230 VAC 2-point Input Terminal	$0?ed:
PX-172-2	120 VAC/VDC 2-point Input Terminal	$;0?ef:
PX-244-1	24VDC 4-point Output Terminal (0.5 A per point)	$0?eg:
PX-244-2	24VDC 4-point Output Terminal (2A per point)	$0?eh:
PX-248	24VDC 8-point Output Terminal	$-0?ei:
PX-249	24VDC 16-point Output Terminal	$-00?ej:
PX-272-1	230 VAC/VDC 2-point Output Terminal (0.3 A per point)	$0?ek:
PX-272-2	230VAC/30VDC 2-point Output Terminal (2A per point)	$-0?el:
PX-549	24VDC 8-point Input/ 24VDC 8-point Output Combination Terminal	$;00?f0:

Analog I/O Terminals

There are eighteen analog input and output terminals available offering 2 channels, 4 channels or 8 channels per terminal and include 4–20 mA, PT100 RTD, Type J and K thermocouple and 0–10 or ±10 VDC form factors.



Analog Input/Output Terminals

Part Number	Description	Price
PX-302	4–20 mA 2-channel Current Input Terminal	$00?en:
PX-304	4–20 mA 4-channel Current Input Terminal	$00?eo:
PX-308	4–20 mA 8-channel Current Input Terminal	$00?ep:
PX-312	±10VDC 2-channel Voltage Input Terminal	$00?eq:
PX-314	±10VDC 4-channel Voltage Input Terminal	$00?es:
PX-318	±10VDC 8-channel Voltage Input Terminal	$;00?et:
PX-322-1	2 Channel RTD Terminal	$00?eu:
PX-324-1	4 Channel RTD Terminal	$00?ev:
PX-332-J	2 Channel Thermocouple Terminal (J type)	$00?ex:
PX-332-K	2 Channel Thermocouple Terminal (K type)	$00?ey:
PX-334-J	4 Channel Thermocouple Terminal (J type)	$00?ez:
PX-334-K	4 Channel Thermocouple Terminal (K type)	$;00?e]:
PX-402	4-20 mA 2-channel Current Output Terminal	$;00?e[:
PX-404	4–20 mA 4-channel Current Output Terminal	$00?e_:
PX-408	4–20 mA 8-channel Current Output Terminal	$00?e#:
PX-412	0–10 VDC 2-channel Voltage Output Terminal	$;00?e!:
PX-414	0–10 VDC 4-channel Voltage Output Terminal	$00?e?:
PX-418	±10VDC 8-channel Voltage Output Terminal	$;00?e,:

Protos X I/O

Power Separation Terminal

A Power Separation Terminal is available to provide interruption of power along the Terminal Power Bus.

Power Separation Terminal		
Part Number	***Description***	***Price***
PX-908	Power Separation Terminal	$;0?f4:

Configuration Cable (USB v2.0)

A communications cable is available for configuration of the Bus Couplers. The cable has a USB type A connector for the PC and a 4-pin custom micro connector for the bus coupler.

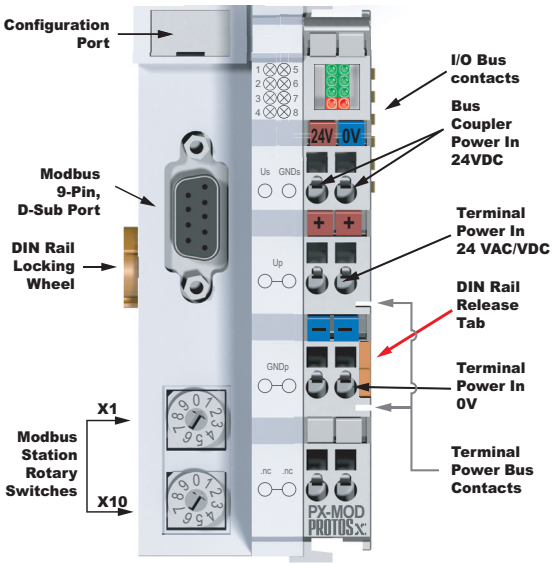
Configuration Cable (USB)		
Part Number	***Description***	***Price***
PX-USB-232	Configuration Cable 3m (9.8 ft.)	$;0?fc:

Bus Couplers PX-MOD

PX-MOD $;00?f9:

The PX-MOD Modbus RTU/ASCII Slave Bus Coupler allows connection of up to 64 terminals per assembly, 255 terminals total, in a Modbus RTU/ ASCII serial network. The PX-MOD communicates using high-level Modbus commands and supports 512 bytes of input data and 512 bytes of output data.

The PX-MOD includes one RS-485 D-sub 9-pin port that functions in half duplex for connection to a Modbus master.



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	10A Max
I/O Bus Current Supply	1000mA Max
Number of Bus Terminals Supported	64 per assembly, 255 w/ 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

*** Total number of terminals cannot exceed 512 input bytes and 512 output bytes.**

PX-MOD Terminal Power Bus Specifications	
Supply Power for Terminal Bus	24 VAC/VDC
Maximum Current	10A
Number of Power Contacts	2 (+24 VAC/DC, 0V)

PX-MOD Modbus Port Specifications	
Number of Stations	99
Station Configuration	Rotary Switches
Protocol	Modbus RTU/ASCII (default = RTU)
Data Transfer Rates	150, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400 baud
Maximum Cable Length	4000 ft. (1,200m)
Connector Type	9-pin, D-Sub, RS-485
Recommended Cable	24AWG, Shielded, Twisted Pair

General Specifications	
Operating Temperature	32° to 131°F (0° to 55 °C)
Storage Temperature	-13° to 185°F (-25° to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27
Noise Immunity	Conforms to EN 61000-6-2
Protection Class	IP20
Weight	100g (3.5 oz)
Dimensions (WxHxD)	44mm x 100mm x 66.4 mm (1.73 in x 3.94 in x 2.61 in)
*Agency Approvals**	UL/cUL File No. E157382, CE

***** To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

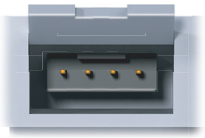
IMPORTANT!

Hot-Swapping Information

Note: This device cannot be Hot Swapped.

Bus Couplers PX-MOD

Configuration Port

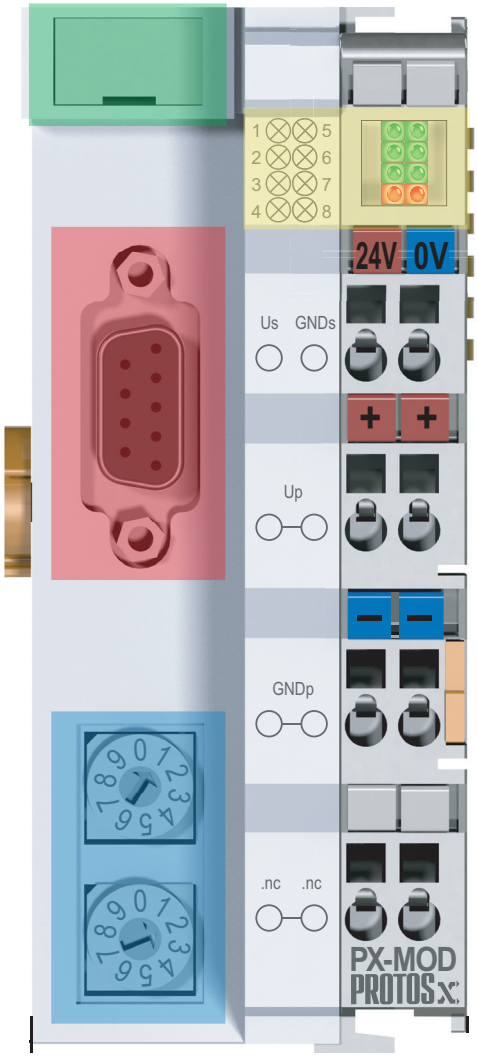


The Service Port connector is located under the flip-cover shown. This port is used for communication with the software configuration tool. The software configuration tool auto-configures the Modbus addresses of the I/O terminals and the interface allows the user to:

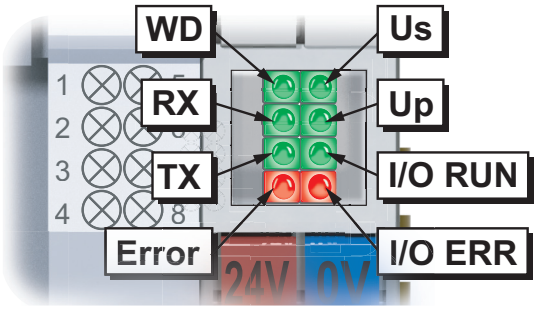
• Run the configurator • View the configured Modbus addresses • Modify the baud rate

• Change the Modbus offset • Reboot the coupler • Disable or modify Watchdog timer

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

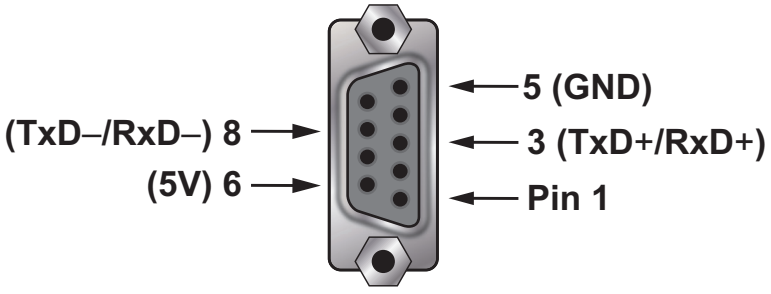


Status LEDs



LED Descriptions		
LED	***Status: ON***	***Status: OFF***
Green LED 1: WD	Watchdog is active	Watchdog error
Green LED 2: RX	Data being received	No data being received
Green LED 3: TX	Data being transmitted	No data being transmitted
Red LED 4: ERROR	Data Error, communications with the master device has been lost	No data error or checksum error
Green LED 5: Us	Bus Coupler power on	Bus Coupler power off
Green LED 6: Up	Terminal power on	Terminal power off
Green LED 7: I/O RUN	I/O bus data active	Watchdog-timer overflow
Red LED 8: I/O ERR	I/O bus error, blinking code	No I/O bus error

D-sub 9-pin, RS-485 Connector



Address Selection - Rotary Switches

The Modbus node address for the PX-MOD is set using both rotary switches on the front of the Coupler. The address is configured within the 01 to 99 range. The configured value of 00 is reserved for programming and configuration.

The lower rotary switch is used to set the tens digit (x10) of the node address. The upper rotary switch is used to set the ones digit (x1) of the node address. The switch address is accepted only when power is cycled. The example shown is configured for a node address of 21.

Bus Couplers PX-MOD

System Considerations

The PX-MOD performs as a Modbus RTU/ASCII slave in a Modbus network. Communication to the master is via a 9-pin D-sub RS-485 port. The maximum distance from the 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 Protos X system.

The PX-MOD Bus Coupler supports up to 64 terminals per assembly, 255 with Bus Expansion Couplers. A minimal assembly consists of a PX-MOD Bus Coupler, I/O Terminals and a Bus End Terminal.

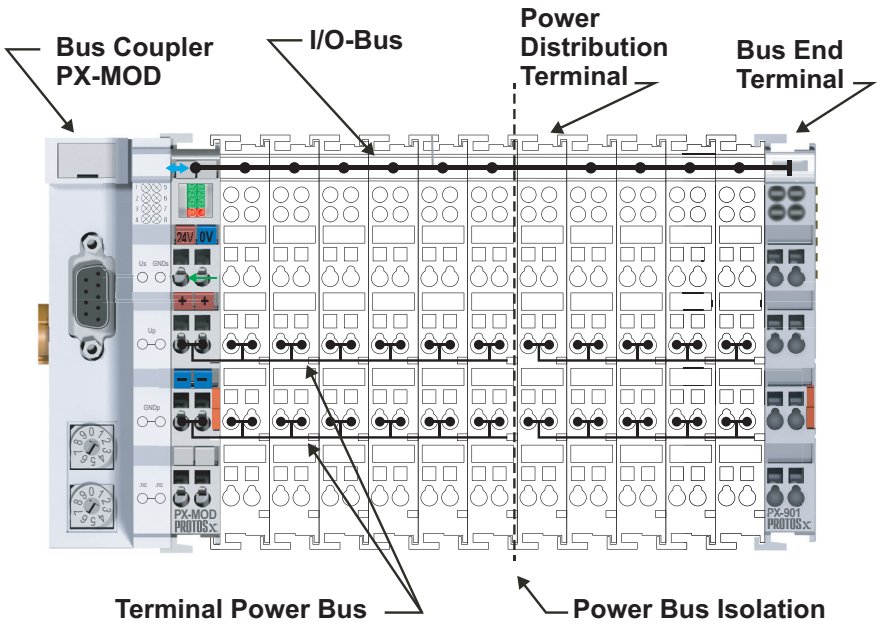
An I/O Bus, powered through the Bus Coupler, provides data communication across the terminal assembly via six contacts located on the side walls of the terminals. A Terminal Power Bus provides power for the I/O terminals via two power contacts. A power source of 24VAC or 24VDC must be connected to the Bus Coupler from an external supply.

If additional 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 must be mounted to 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.

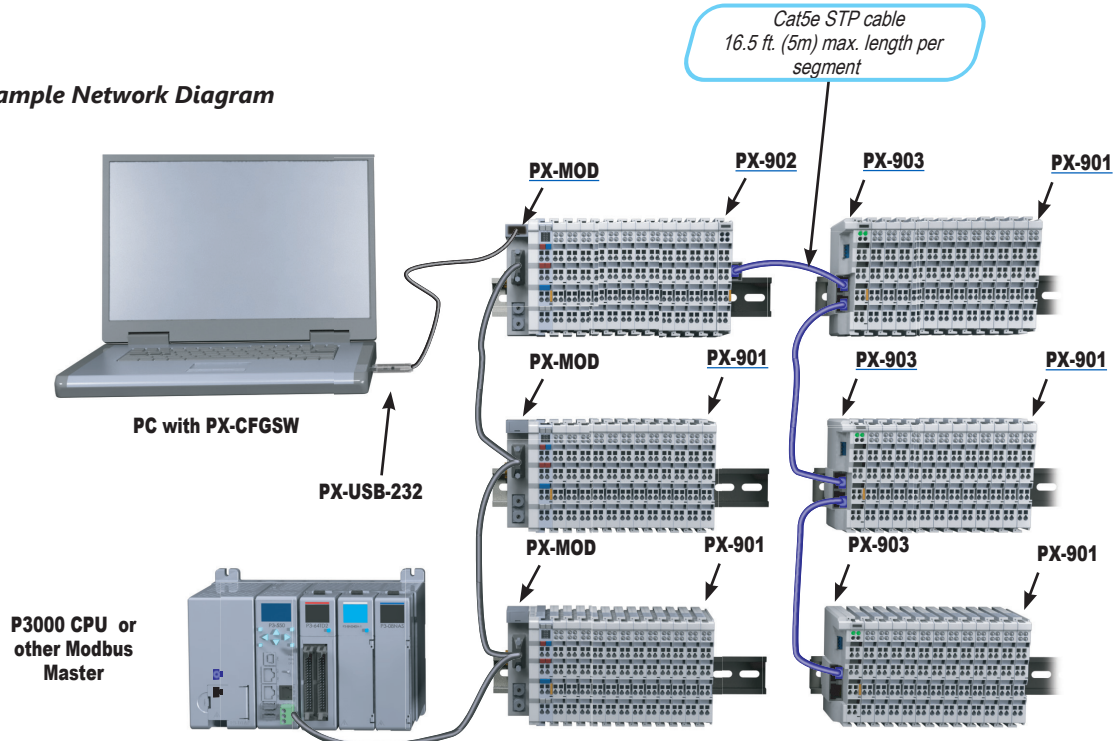
For expansion beyond a 64-terminal assembly, a Bus Expansion End Terminal (PX-902) is used in place of a standard Bus End Terminal (PX-901). A Bus Expansion Coupler Terminal (PX-903) is used at each expansion assembly in place of a PX-MOD Bus Coupler. Up to 31 Expansion couplers can be used in a group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

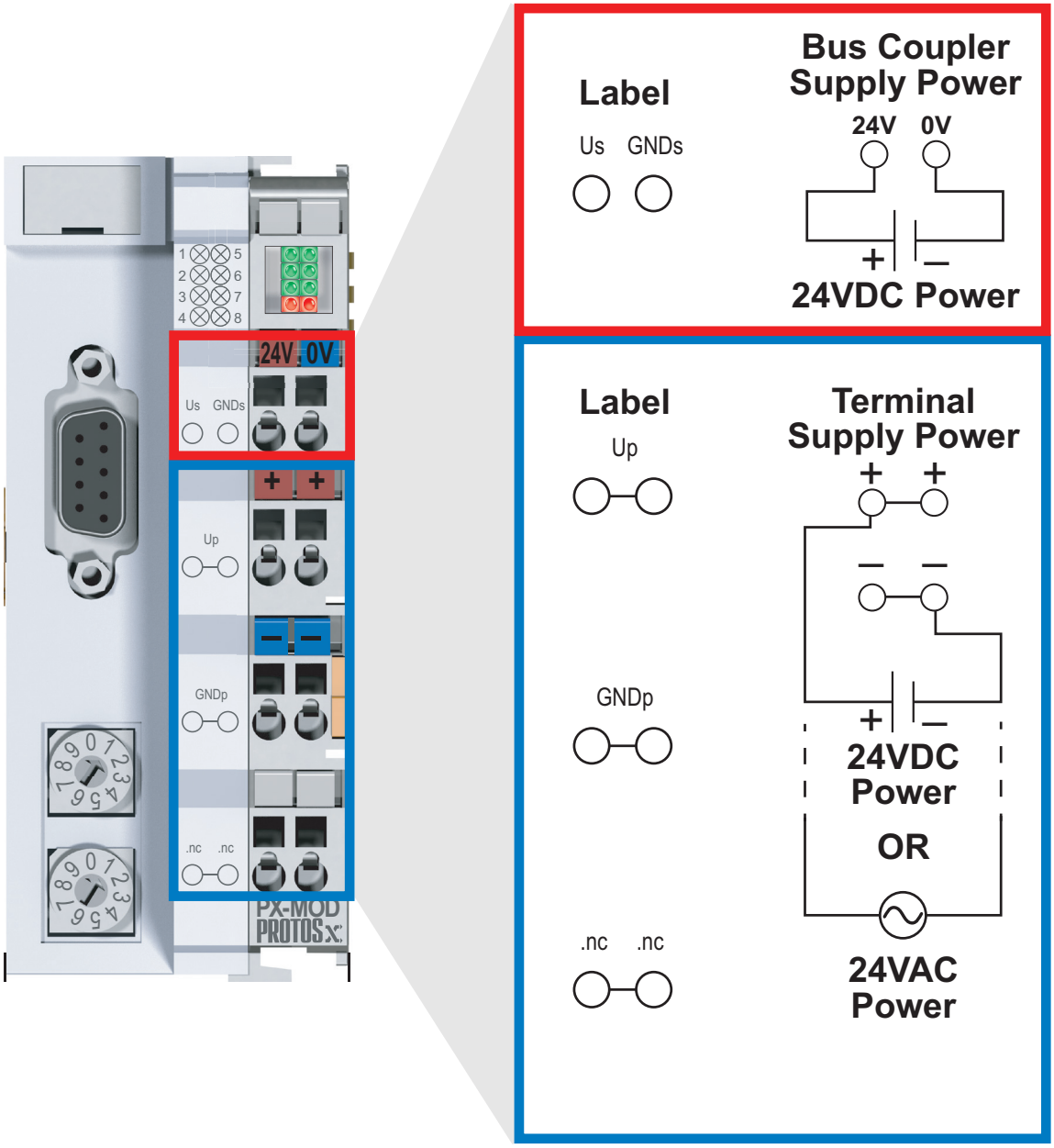


PX-MOD Example Network Diagram



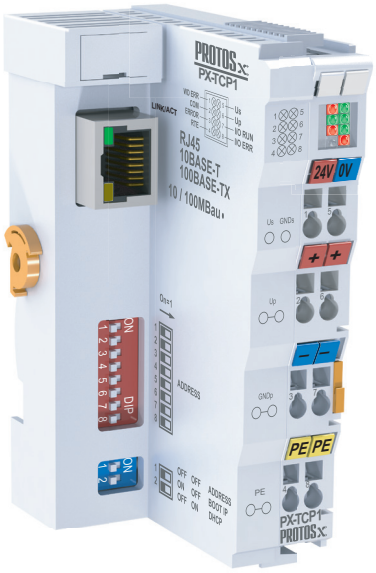
Bus Couplers - PX-MOD

PX-MOD Wiring Connections



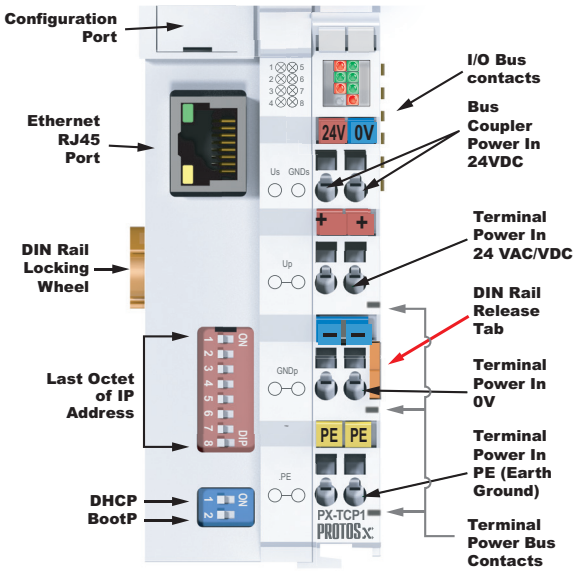
Bus Couplers - PX-TCP1

PX-TCP1 $;00?fa:



The PX-TCP1 Modbus TCP Server Bus Coupler allows connection of up to 64 terminals per assembly, 255 terminals total, in a Modbus TCP network. The PX-TCP1 communicates using high-level Modbus commands and supports 512 bytes of input data and 512 bytes of output data.

The PX-TCP1 includes one RJ45 Ethernet 10/100 Base-T port for connection to a Modbus client.



PX-TCP1 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	10A Max
I/O Bus Current Supply	1000mA Max
Number of Bus Terminals Supported	64 per assembly, 255 w/ 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	128 total
*Maximum Number of Data Bytes**	512 Input Bytes and 512 Output Bytes

*** Total number of terminals cannot exceed 512 input bytes and 512 output bytes.**

PX-TCP1 Terminal Power Bus Specifications	
Supply Power for Terminal Bus	24 VAC/VDC
Maximum Current	10A
Number of Power Contacts	3 (+24 VAC/VDC, 0V, PE)

PX-TCP1 Modbus Port Specifications	
Configuration	DIP switches and PX-CFGSW software
Protocol	Modbus TCP
Data Transfer Rates	10/100 Mbaud
Maximum Cable Length	100m between Coupler and switch
Connector Type	Ethernet, RJ45
Recommended Cable	Shielded, Twisted Pair, Cat5e

General Specifications	
Operating Temperature	32° to 131°F (0° to 55 °C)
Storage Temperature	-13° to 185°F (-25° to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27
Noise Immunity	Conforms to EN 61000-6-2
Protection Class	IP20
Weight	100g (3.5 oz)
Dimensions (WxHxD)	44mm x 100mm x 66.4 mm (1.73 in x 3.94 in x 2.61 in)
*Agency Approvals**	UL/cUL File No. E157382, CE

*** To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

IMPORTANT!

Hot-Swapping Information
Note: This device cannot be Hot Swapped.

Bus Couplers - PX-TCP1

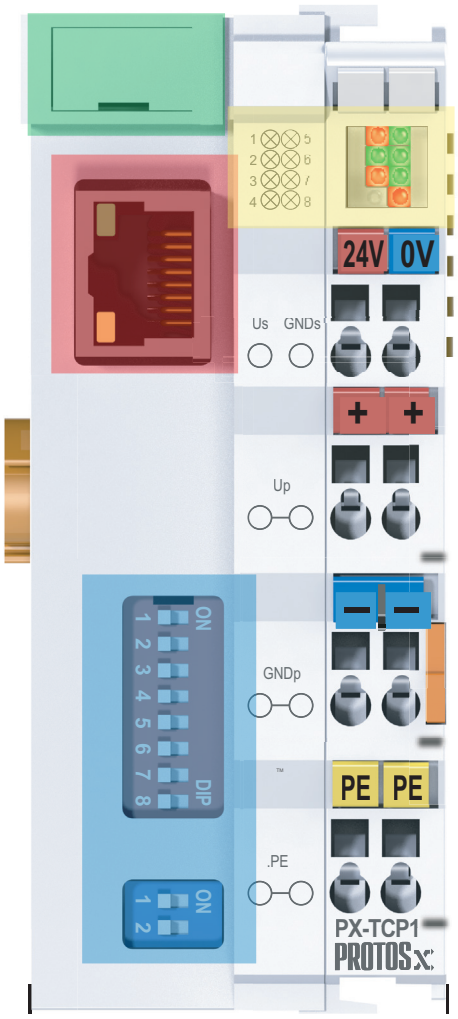
Configuration Port

The Service Port connector is located under the flip-cover shown. This port is used for communication with the software configuration tool. The software configuration tool autoconfigures the Modbus addresses of the I/O terminals and the interface allows the user to:

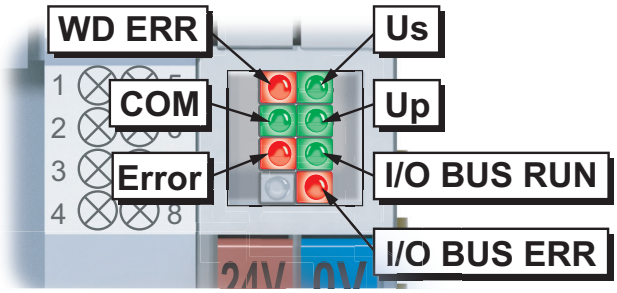
• Run the configurator • View the configured Modbus addresses • Modify the baud rate • Reboot the coupler

• Change the Modbus offset • Configure first three octets of the IP address • Disable or modify Watchdog timer

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



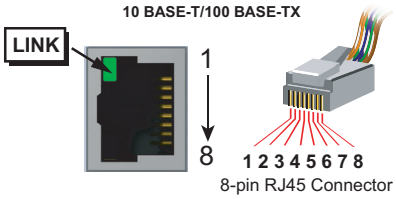
Status LEDs

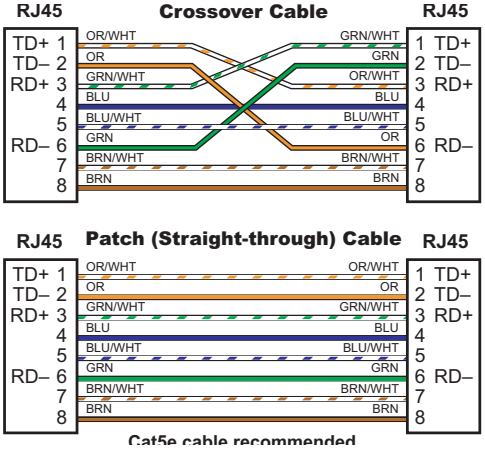


LED Descriptions

LED	Status: ON	Status: OFF
Red LED 1: WD ERR	Watchdog error	Watchdog is active after first Modbus write
Green LED 2: COM	Ethernet data is active (On or Flashing)	No data being received
Red LED 3: ERROR	Flashing: waiting for IP address if set to DHCP or BootP	No error
Green LED 4: RTE	Not used	
Green LED 5: Us	Bus Coupler power on	Bus Coupler power off
Green LED 6: Up	Terminal power on	Terminal power off
Green LED 7: I/O-Bus RUN	I/O bus data active (On or Flashing)	No I/O bus activity
Red LED 8: I/O-Bus ERR	I/O bus error, blinking code	No I/O bus error

RJ45 Connector





Address Selection - DIP Switches

The last octet or byte of the IP Address for the PX-TCP1 is set using the large bank of DIP switches on the front of the coupler. The smaller bank of DIP switches is used to select the type of address assignment (DHCP, BootP, firm setting).

The IP Address DIP switches are arranged so that switch 1 corresponds to bit 0 (LSB) and switch 8 to bit 7 (MSB). The base address used is configured using the PX-CFGSW software tool. With the original factory settings, the IP Address is configured to the value 0.0.0.0. by default.

Bus Couplers - PX-TCP1

System Considerations

The PX-TCP1 performs as a Modbus TCP server in a Modbus network. Communication to the client is via an RJ45 Ethernet port. The maximum distance from the client to the PX-TCP1 is 330 feet (100 meters) using 24 AWG shielded, twisted pair Cat5e cable. It is highly recommended that a dedicated network be used for the Protos X system.

The PX-TCP1 Bus Coupler supports up to 64 terminals per assembly, 255 with Bus Expansion Couplers. A minimal assembly consists of a PX-TCP1 Bus Coupler, I/O Terminals and a Bus End Terminal.

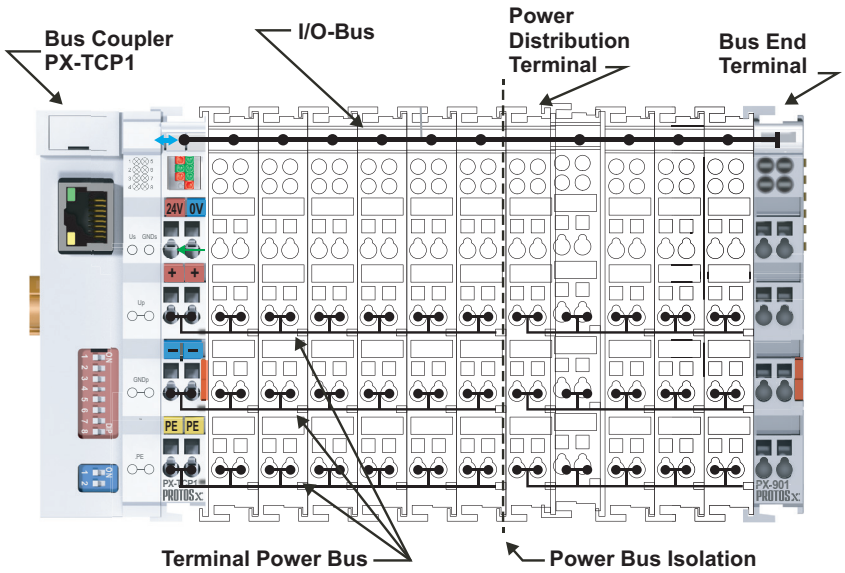
An I/O Bus, powered through the Bus Coupler, provides data communication across the terminal assembly via six contacts located on the side walls of the terminals. A Terminal Power Bus provides power for the I/O terminals via three contacts; 24V, 0V and PE. A power source of 24VAC or 24VDC must be connected to the Bus Coupler from an external supply. The PE Bus is available for terminals that support PE connectivity.

If additional 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 must be mounted to 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.

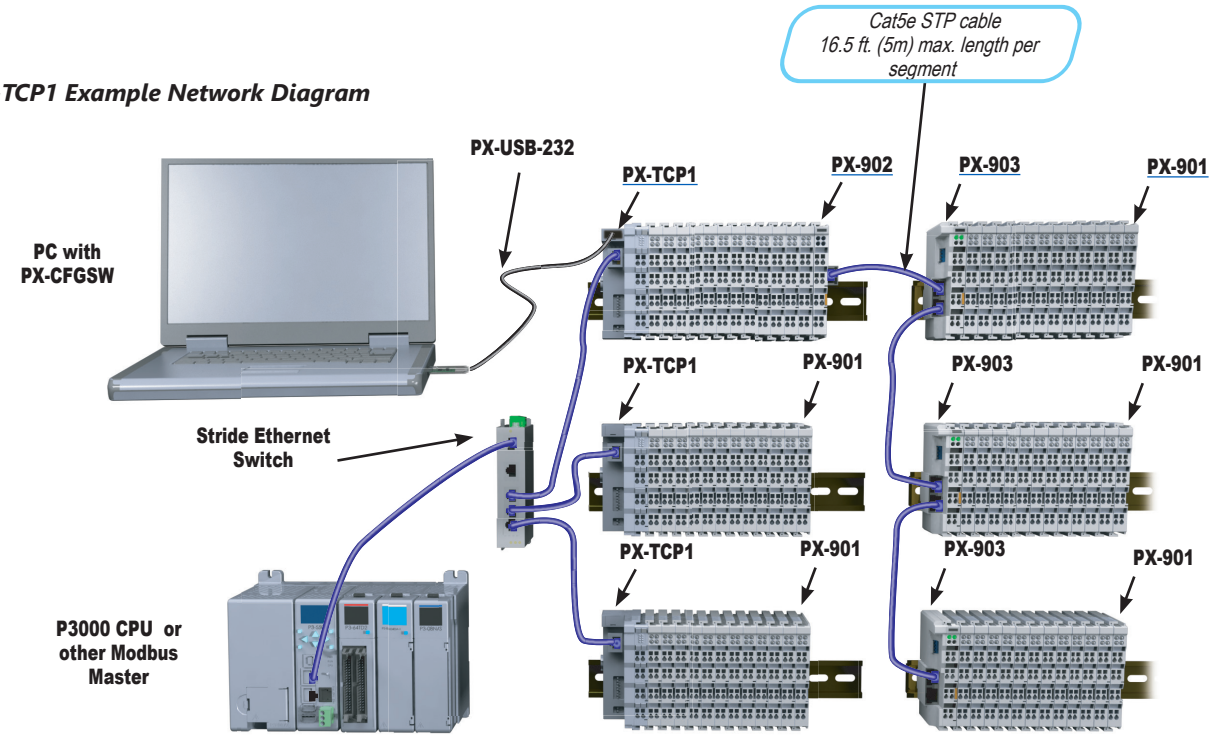
For expansion beyond a 64-terminal assembly, a Bus Expansion End Terminal (PX-902) is used in place of a standard Bus End Terminal (PX-901). A Bus Expansion Coupler Terminal (PX-903) is used at each expansion assembly in place of a PX-TCP1 Bus Coupler. Up to 31 Expansion couplers can be used in a group of assemblies. Connection is made between the Expansion Coupler Terminals via standard RJ45 Ethernet patch 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.

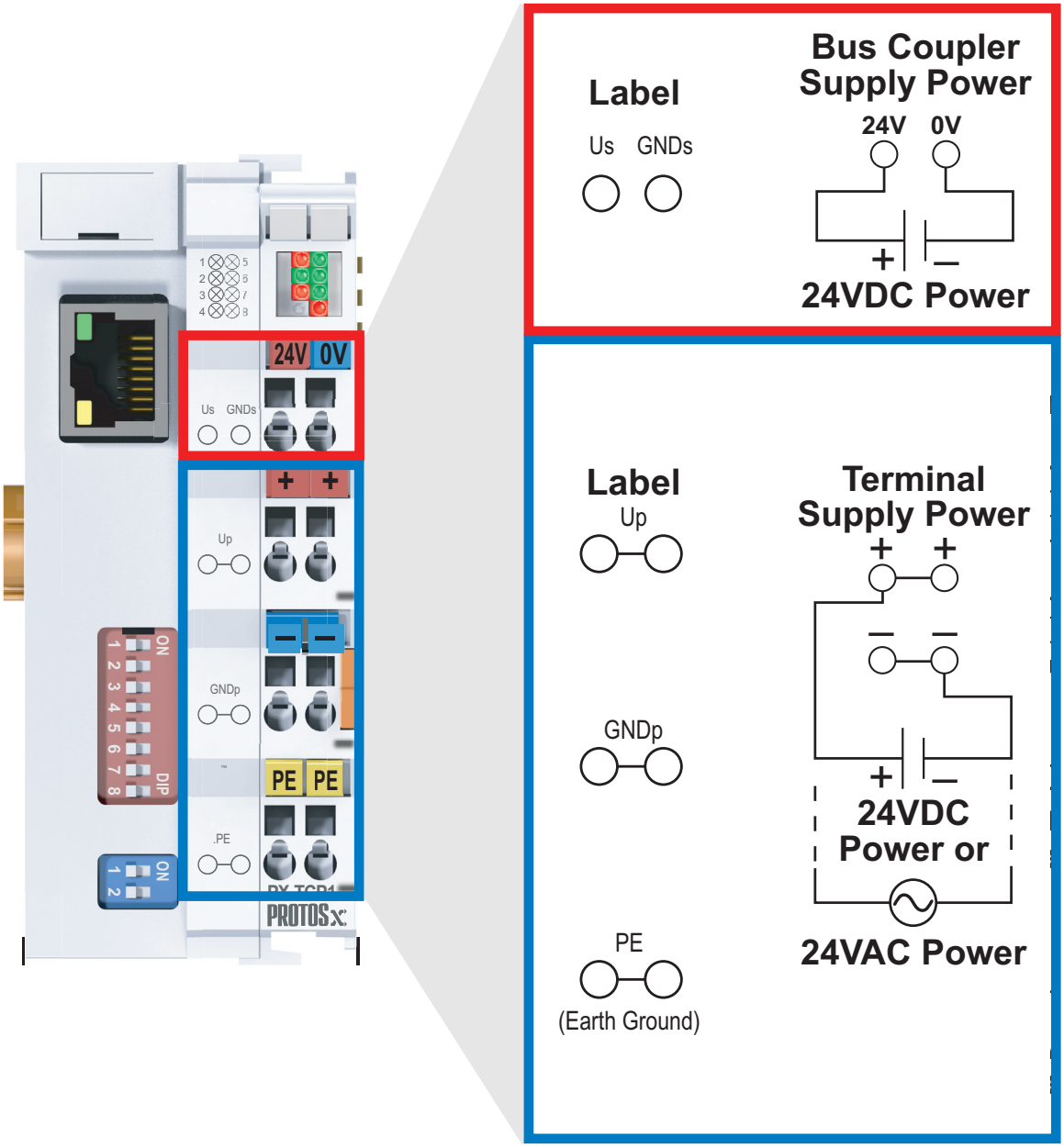


PX-TCP1 Example Network Diagram



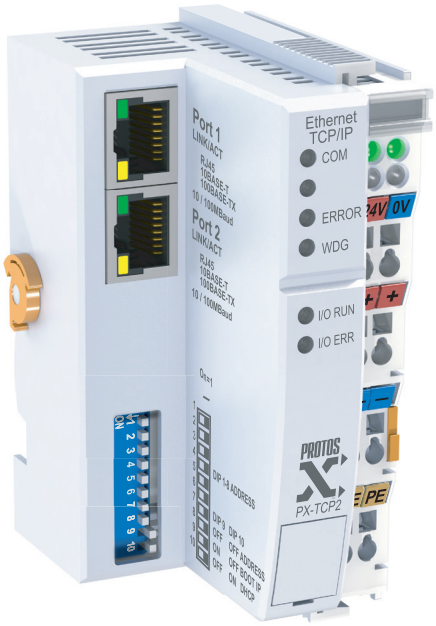
Bus Couplers - PX-TCP1

PX-TCP1 Wiring Connections



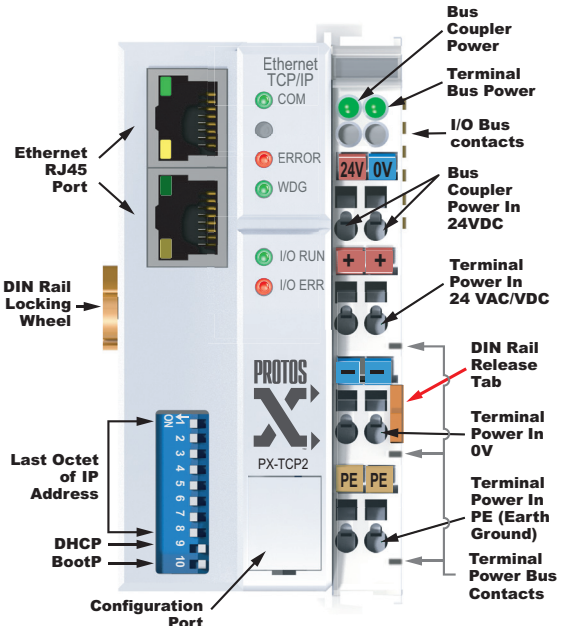
Bus Couplers - PX-TCP2

PX-TCP2 $;00?fb:



The PX-TCP2 Modbus TCP Server Bus Coupler allows connection of up to 64 terminals in a Modbus TCP network. The PX-TCP2 communicates using high-level Modbus commands and supports 512 bytes of input data and 512 bytes of output data.

The PX-TCP2 includes two RJ45 Ethernet 10/100 Base-T ports for connection to a Modbus client.



PX-TCP2 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	10A Max
I/O Bus Current Supply	1750mA Max
Number of Bus Terminals Supported	64 per assembly (based on power budget)
Number of Discrete Inputs/ Outputs	512 Inputs and 512 Outputs
Number of Analog Inputs/ Outputs	128 total
*Maximum Number of Data Bytes**	512 Input Bytes and 512 Output Bytes

*** Total number of terminals cannot exceed 512 input bytes and 512 output bytes.**

PX-TCP2 Terminal Power Bus Specifications	
Supply Power for Terminal Bus	24 VAC/VDC
Maximum Current	10A
Number of Power Contacts	3 (+24 VAC/VDC, 0V, PE)

PX-TCP2 Modbus Port Specifications	
Configuration	DIP switches and PX-CFGSW software
Protocol	Modbus TCP
Data Transfer Rates	10/100 Mbaud
Maximum Cable Length	100m between Client and Coupler to Coupler
Connector Type	Ethernet, 2 x RJ45 (2 Channel Switch)
Recommended Cable	Shielded, Twisted Pair, Cat5e

General Specifications	
Operating Temperature	32° to 131°F (0° to 55 °C)
Storage Temperature	-13° to 185°F (-25° to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27
Noise Immunity	Conforms to EN 61000-6-2
Protection Class	IP20
Weight	170g (6.0 oz)
Dimensions (WxHxD)	51mm x 100mm x 66.4 mm (2.01 in x 3.94 in x 2.61 in)
*Agency Approvals**	UL/cUL File No. E157382, CE

***** To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

IMPORTANT!

Hot-Swapping Information
Note: This device cannot be Hot Swapped.

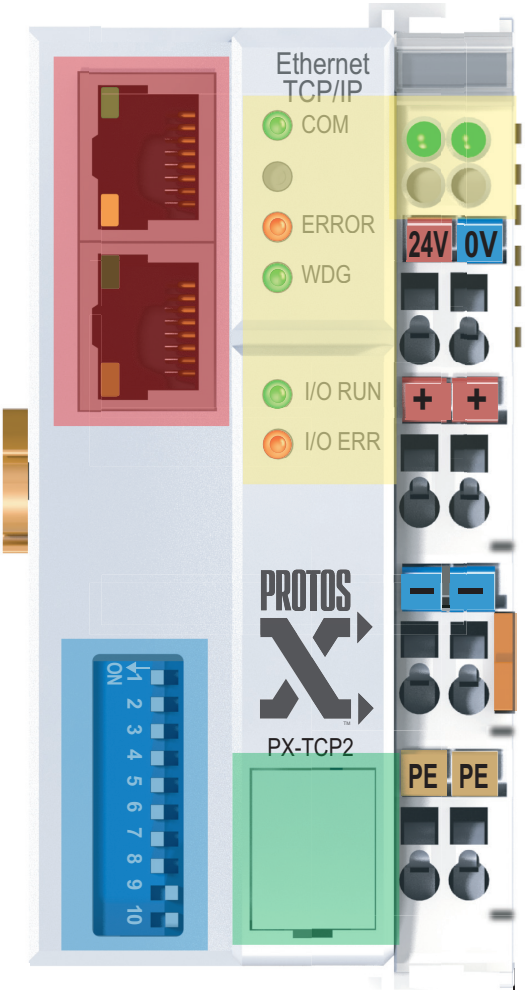
Bus Couplers - PX-TCP2

Configuration Port

The Service Port connector is located under the flip-cover shown. This port is used for communication with the software configuration tool. The software configuration tool autoconfigures the Modbus addresses of the I/O terminals and the interface allows the user to:

• Run the configurator • View the configured Modbus addresses • Modify the baud rate • Reboot the coupler • Change the Modbus offset • Configure first three octets of the IP address • Disable or modify Watchdog timer

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

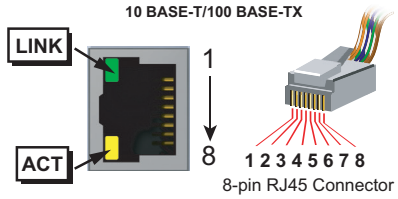


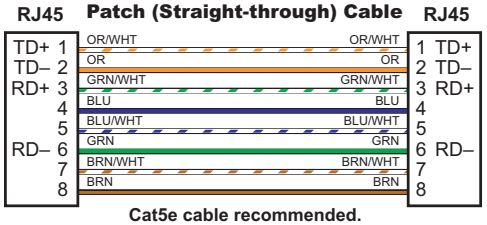
Status LEDs

LED Descriptions

LED	Status: ON	Status: OFF
Green Power LED (left): Bus Coupler	Bus Coupler power on	Bus Coupler power off
Green Power LED (right): Terminal Bus	Terminal Bus power on	Terminal Bus power off
Green Ethernet LED: COM	On/Flashing: Receiving Data	No data being received
Red Ethernet LED: ERROR	Flashing: waiting for IP address if set to DHCP or BootP	No Error
Green Ethernet LED: WDG	Watchdog is active	Watchdog error
Green I/O Bus LED: I/O RUN	I/O Bus Data Active (On or Flashing)	Terminal power off
Red I/O Bus LED: I/O ERR	I/O Bus error, blinking code	No I/O bus error

RJ45 Connectors





Cat5e cable recommended.

Address Selection - DIP Switches

The last octet or byte of the IP Address, as well as the type of address assignment (DHCP, BootP, firm setting), for the PX-TCP2 is set using the DIP switches on the front of the coupler.

The IP Address DIP switches are arranged so that switch 1 corresponds to bit 0 (LSB) and switch 8 to bit 7 (MSB). Switches 9 and 10 allow for the address assignment selection. The base address used is configured using the PX-CFGSW software tool. With the original factory settings, the IP Address is configured to the value 0.0.0.0. by default.

Bus Couplers - PX-TCP2

System Considerations

The PX-TCP2 performs as a Modbus TCP server in a Modbus network. Communication to the client is via an RJ45 Ethernet port. A second port allows expansion of up to 20 total PX-TCP2 Couplers in a network. The maximum distance from a client to a PX-TCP2, and between each additional PX-TCP2, is 330 feet (100 meters) for each segment, using 24 AWG shielded, twisted pair Cat5e cable. It is highly recommended that a dedicated network be used for the Protos X system.

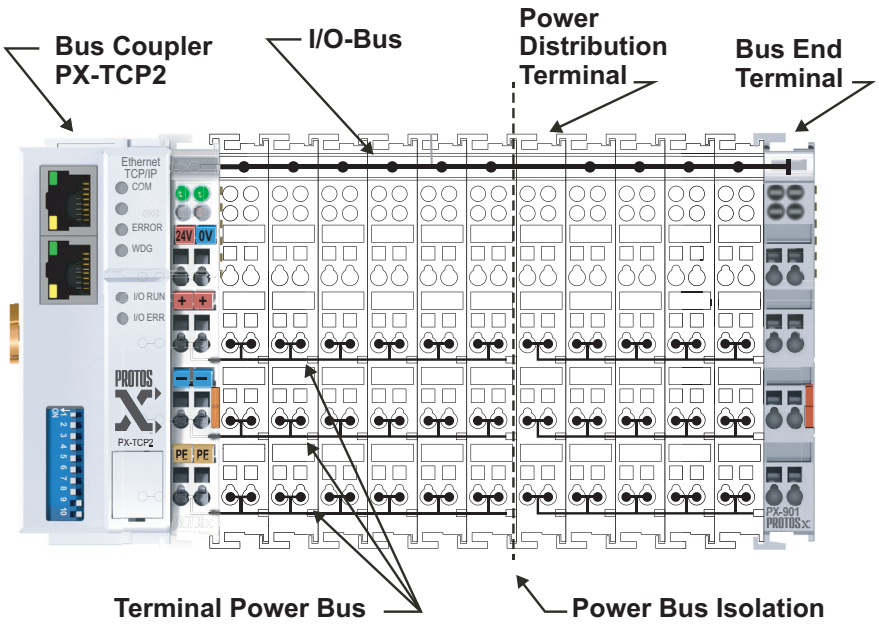
The PX-TCP2 Bus Coupler supports up to 64 terminals per assembly. It is not compatible with Bus Expansion Couplers. A minimal assembly consists of a PX-TCP2 Bus Coupler, I/O Terminals and a Bus End Terminal (PX-901).

An I/O Bus, powered through the Bus Coupler, provides data communication across the terminal assembly via six contacts located on the side walls of the terminals. A Terminal Power Bus provides power for the I/O terminals via three contacts; 24V, 0V and PE. A power source of 24VAC or 24VDC must be connected to the Bus Coupler from an external supply. The PE Bus is available for terminals that support PE connectivity.

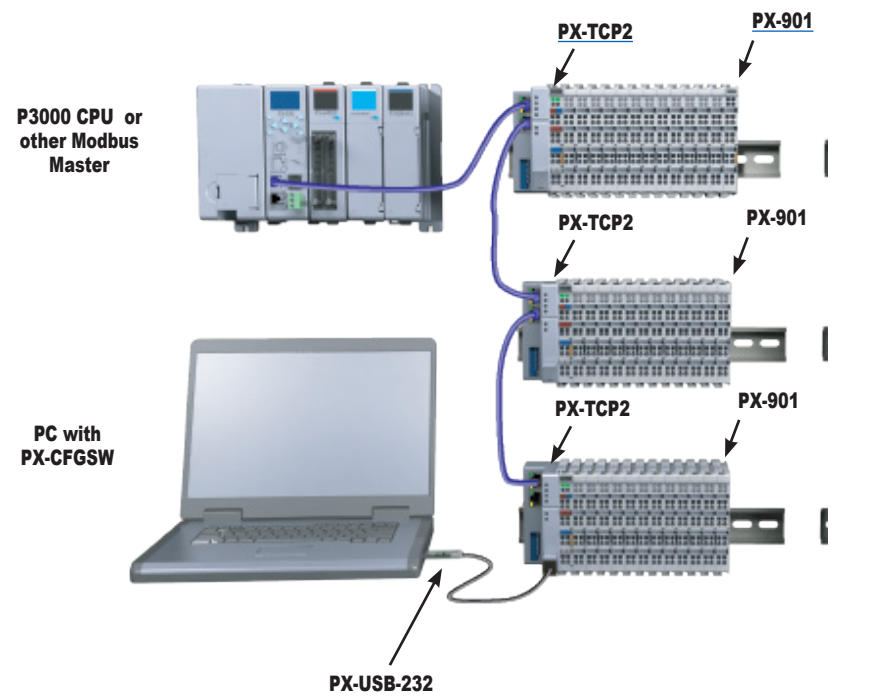
If additional 24VDC supply is required for terminal wiring, eight points of 24VDC power can be distributed from the Terminal Power Bus using a Power Distribution Terminal (PX-949). This terminal must be mounted to the right of a terminal that passes 24VDC on the power bus. Both I/O Bus communication and terminal bus power are passed through to adjoining terminals.

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 1750mA as there is no internal current protection.

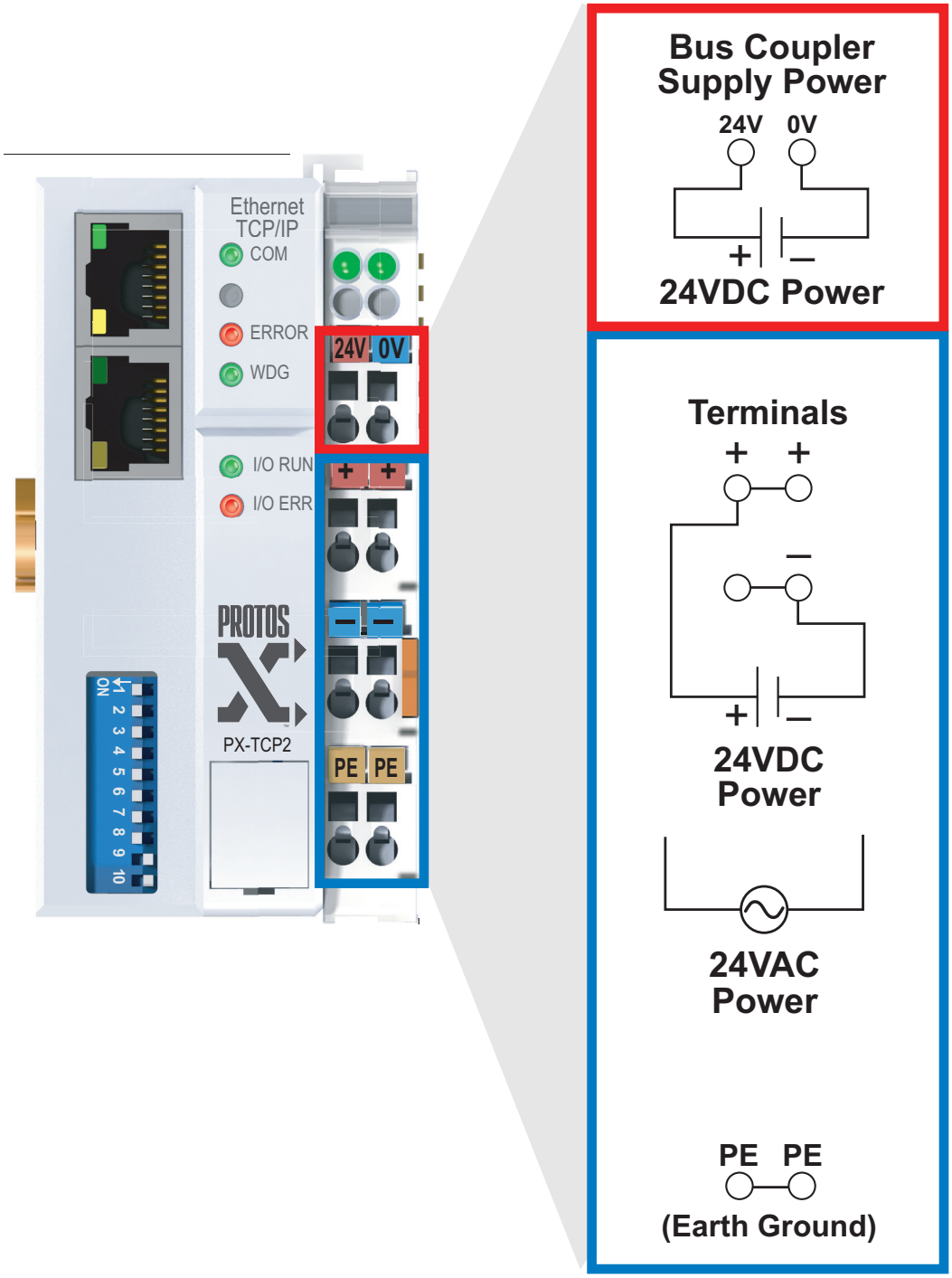


PX-TCP2 Example Network Diagram



Bus Couplers - PX-TCP2

PX-TCP2 Wiring Connections



Bus Couplers - PX-EIP1

PX-EIP1 $01nne:

The PX-EIP1 EtherNet/IP Bus Coupler server allows connection of up to 64 terminals per assembly, 255 terminals total with I/O bus expansion. The PX-EIP1 module has one RJ45 Ethernet 10/100 Base T port for connection to an Ethernet client. Use with the Protos X I/O System.

PX-EIP1 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	10A Max
I/O Bus Current Supply	1000mA Max
Number of Bus Terminals Supported	64 per assembly, 255 w/ 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	128 total
*Maximum Number of Data Bytes**	512 Input Bytes and 512 Output Bytes

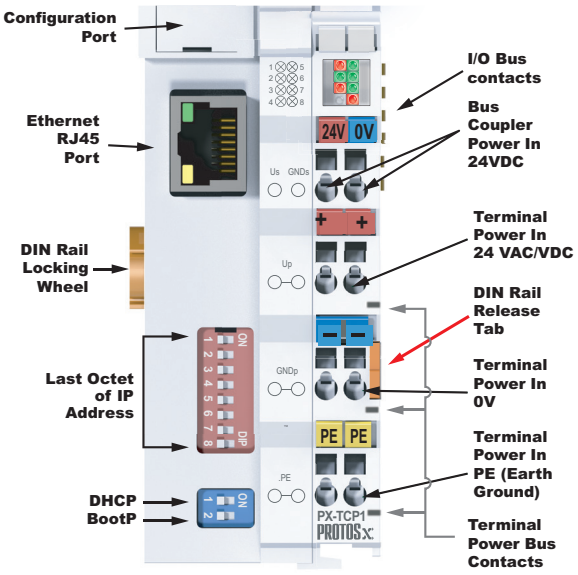
** Total number of terminals cannot exceed 512 input bytes and 512 output bytes.*

PX-EIP1 Terminal Power Bus Specifications	
Supply Power for Terminal Bus	24VDC
Maximum Current	10A
Number of Power Contacts	3 (+24 VAC/VDC, 0V, PE)

PX-EIP1 Ethernet Port Specifications	
Configuration	DIP switches and PX-CFGSW software
Protocol	EtherNet/IP (Supports Implicit Messaging only)
Scanner/Client Connections	1
Data Transfer Rates	10/100 Mbps (Auto-crossover)
Maximum Cable Length	100m between coupler and switch
Connector Type	Ethernet, RJ45
Recommended Cable	Shielded, Twisted Pair, Cat5e

PX-EIP1 General Specifications	
Operating Temperature	32° to 131°F (0° to 55 °C)
Storage Temperature	-13° to 185°F (-25° to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting / Orientation Restrictions	35mm DIN rail / None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27
Noise Immunity	Conforms to EN 61000-6-2
Noise Emission	Conforms to EN 61000-6-4
Protection Class	IP20
Weight	100g (3.5 oz)
Dimensions (WxHxD)	44 x 100 x 66.4 mm (1.73 x 3.94 x 2.61 in)
*Agency Approvals**	UL/cUL File No. E172151 (BK9055), CE

** To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.*

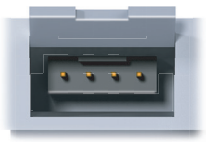


IMPORTANT!

Hot-Swapping Information
Note: This device cannot be Hot Swapped.

Bus Couplers - PX-EIP1

Configuration Port

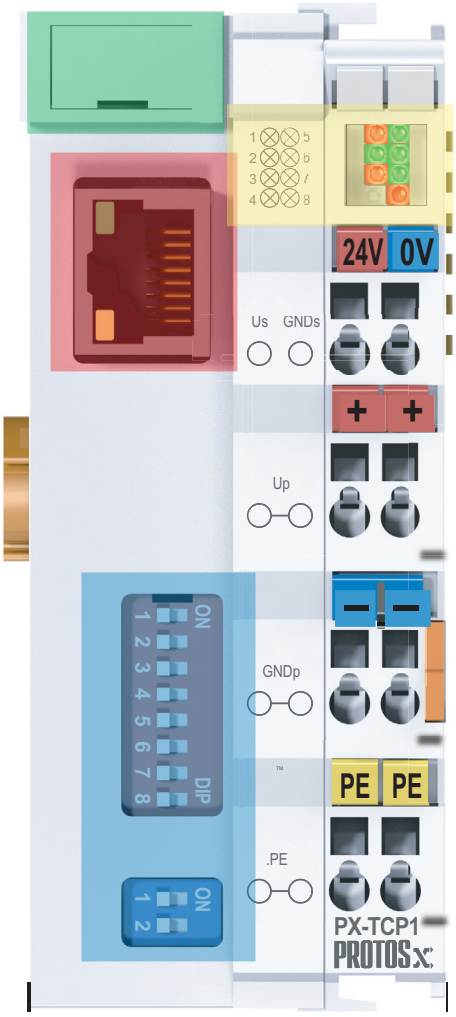


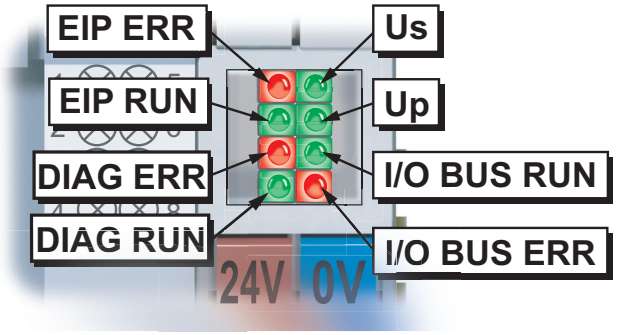
The Service Port connector is located under the flip-cover shown (previous page graphic). This port is used for communication with the software configuration tool. The software configuration tool auto-configures the EtherNet/IP addresses of the I/O terminals while the interface allows the user to:

• Run the configurator • View the configured EtherNet/IP addresses • Reboot the coupler • Configure first three octets of the IP address

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 configuration software.

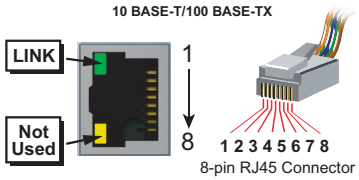
Status LEDs

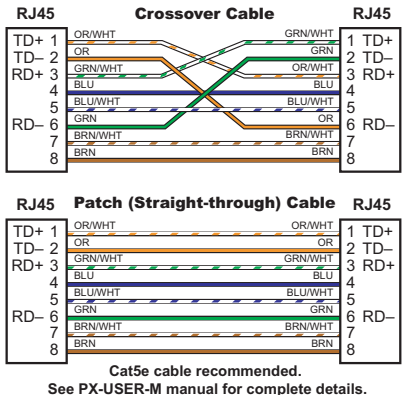




LED Descriptions		
LED	Status: ON	Status: OFF
Red LED 1: EIP ERR	See PX-CFGSW Help file or PX-USER-M manual for codes.	No EIP Error
Green LED 2: EIP Run	EIP Communication with Scanner (Client) Flashing: No active communication.	N/A
Red LED 3: DIAG Err	See PX-CFGSW Help File or PX-USER-M manual for codes.	No DIAG Err
Green LED 4: DIAG Run	Diagnostics active w/o error Flashing: Used in conjunction with Diag Error to determine fault.	N/A
Green LED 5: Us	Bus coupler power On	Bus coupler power Off
Green LED 6: Up	Terminal power On	Terminal power Off
Green LED 7: I/O Bus RUN	I/O bus data active (On or Flashing)	No I/O bus activity
Red LED 8: I/O Bus Err	I/O bus error, blinking code	No I/O bus error

RJ45 Connector





LED Status		
Green LINK LED	ON = Connection Good	Flashing = Comm Active

Address Selection - DIP Switches

The last octet or byte of the IP Address for the PX-EIP1 is set using the large bank of DIP switches on the front of the coupler. The smaller bank of DIP switches is used to select the type of address assignment (DHCP, BootP, firm setting).

The IP Address DIP switches set the fourth octet of the address and are arranged so that switch 1 corresponds to bit 0 (LSB) and switch 8 to bit 7 (MSB). The base address used is configured using the PX-CFGSW software tool. With the original factory settings, the IP Address is configured to the value 0.0.0.0. by default.

Bus Couplers - PX-EIP1

System Considerations

The PX-EIP1 performs as an EtherNet/IP server in an EtherNet/IP network. Communication to the client is via an RJ45 Ethernet port. The maximum distance from the client to the PX-EIP1 is 330 feet (100 meters) using 24 AWG shielded, twisted pair Cat5e cable. It is highly recommended that a dedicated network be used for the Protos X system.

The PX-EIP1 Bus Coupler supports up to 64 terminals per assembly, 255 with Bus Expansion Couplers. A minimal assembly consists of a PX-EIP1 Bus Coupler, I/O Terminals and a Bus End Terminal.

The PX-EIP1 automatically assigns EtherNet/IP addresses for inputs and outputs to the image register. The maximum number of data is 512 bytes of input data and 512 bytes of output data, with up to 1020 inputs, 1020 outputs, and 128 analog inputs or outputs, when using bus expansion.

An I/O Bus, powered through the Bus Coupler, provides data communication across the terminal assembly via six contacts located on the side walls of the terminals. This bus also supplies low voltage power to the I/O terminals. The I/O Bus supply is rated at a maximum of 1000mA that must be taken into consideration when planning an assembly. Each terminal has an I/O bus current consumption listing that can be used to determine the total I/O bus current. The maximum I/O bus current of the coupler must not be exceeded as there is no internal overcurrent protection.

A Terminal Power Bus provides power for the I/O terminals via three contacts; 24V, 0V and PE. A power source of 24VAC or 24VDC must be connected to the Bus Coupler from an external supply. The PE Bus is available for terminals that support PE connectivity.

A variety of Power Terminals are available for isolating, changing or supplying power to the I/O terminals.

For isolating voltages across the Terminal Power Bus, a Power Separation Terminal (PX-908) is used. This terminal separates the Terminal Power contacts but passes I/O Bus communication.

If additional 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 must be mounted to 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.

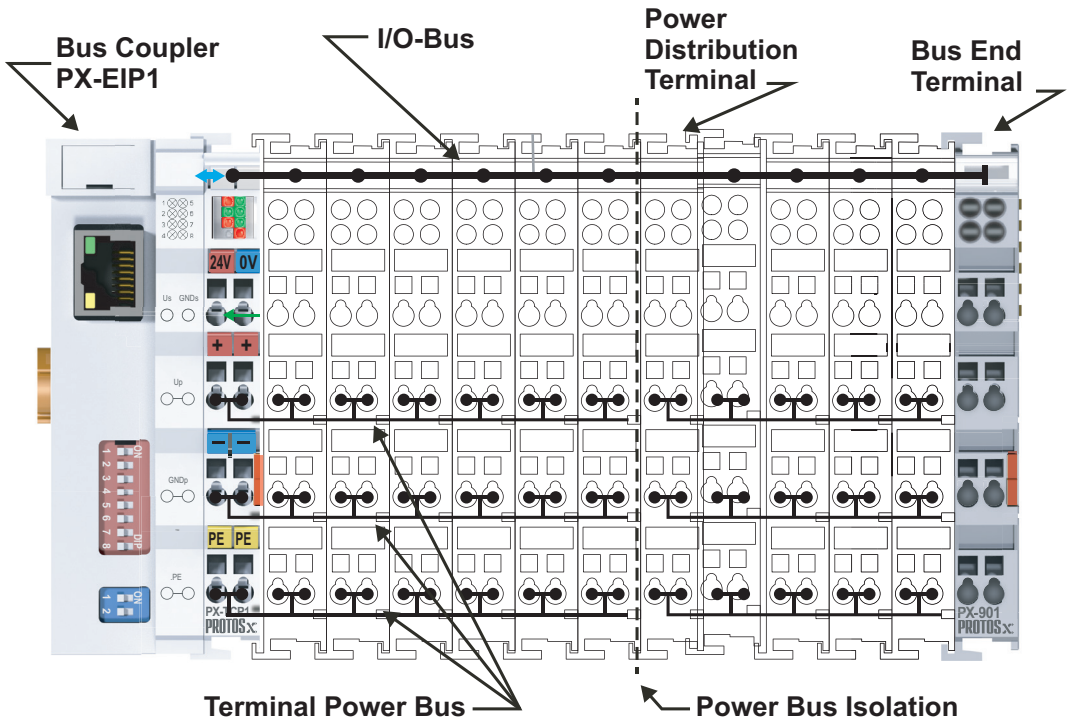
To connect field power to the Terminal Power Bus, or to change from one voltage to another, Power Feed Terminals (PX-940 & PX-970) are used. Power Feed Terminals are available in 24VDC or 120–230VAC, and provide power to I/O Terminals located to the right of the Power Feed Terminal. This terminal passes 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 Bus Expansion Coupler Terminal (PX-903) is used at each expansion assembly in place of a PX-EIP1 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 patch cable.

It is important to stay within the following three specifications:.

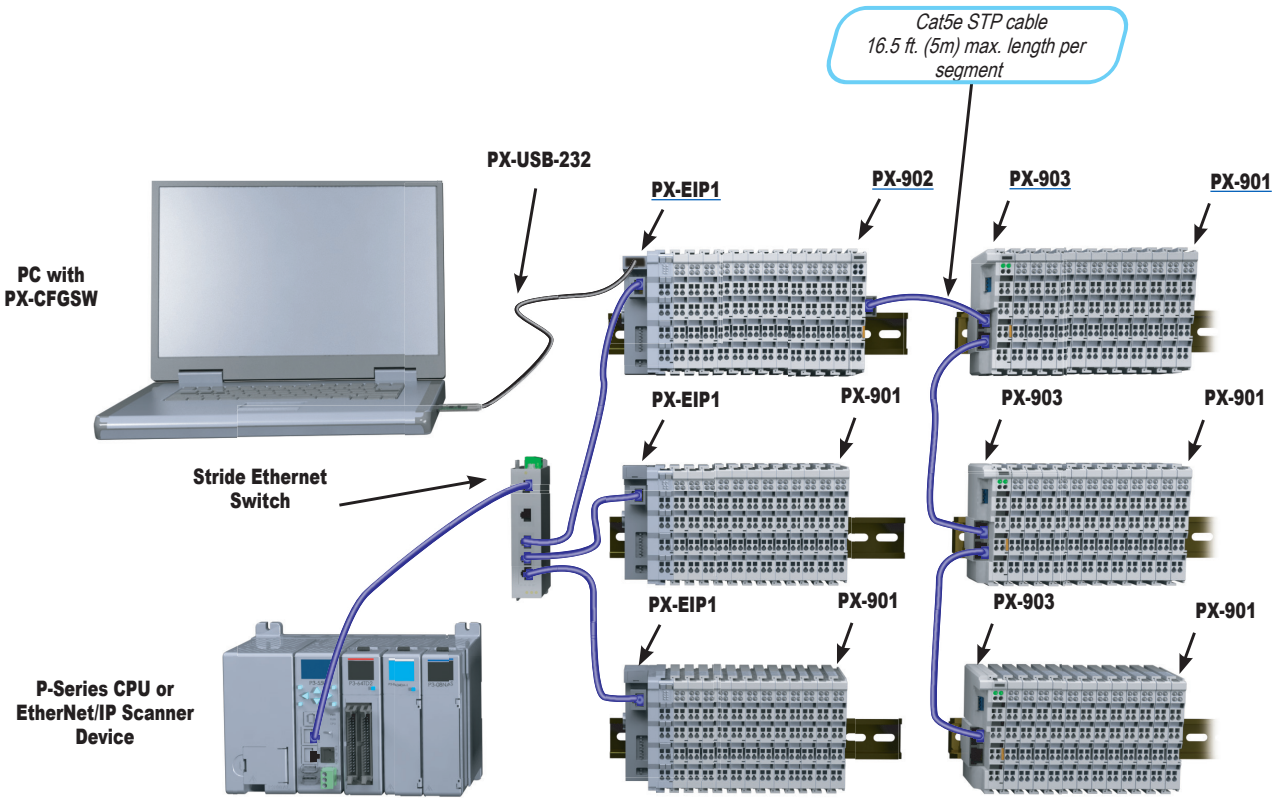
1. Do not exceed the total number of 64 Terminals allowed per Assembly.
2. Do not exceed the total number of 512 Input Bytes and 512 Output Bytes.
3. Do not exceed the Coupler I/O Bus Power Budget of 1000mA as there is no internal current protection.

For complete assembly instructions see the PX-USER-M manual.



Bus Couplers - PX-EIP1

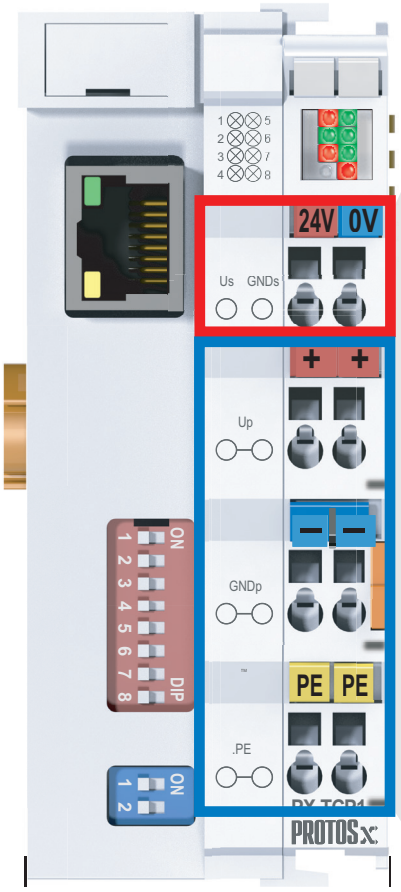
PX-EIP1 Example Network Diagram

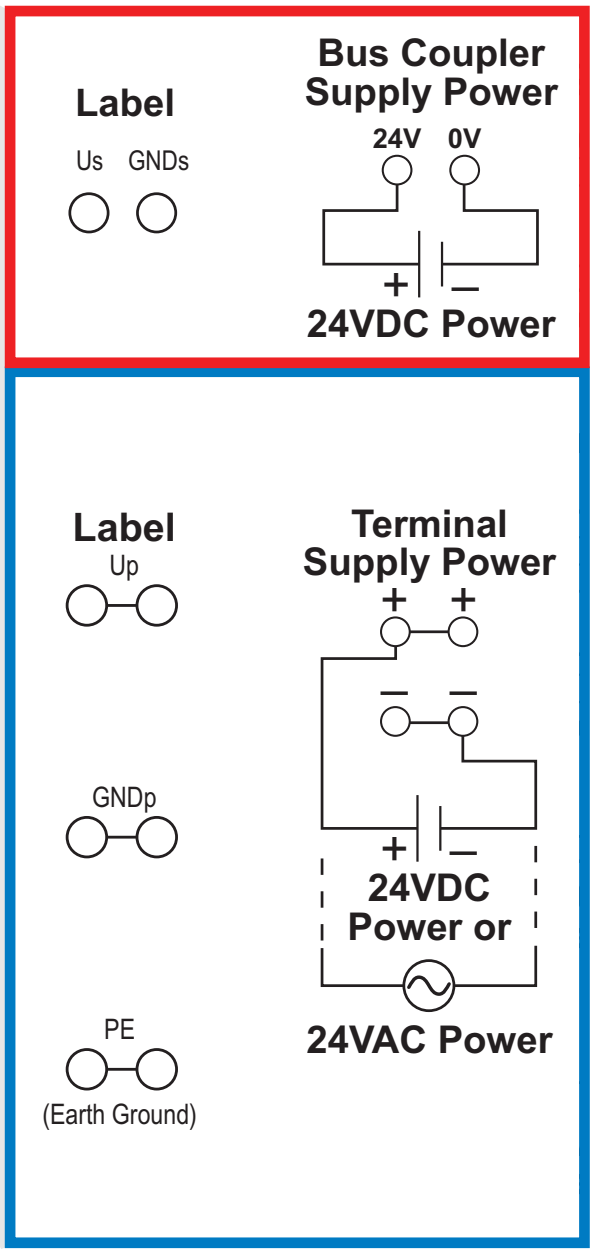


Bus Couplers - PX-EIP1

PX-EIP1 Wiring Connections

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.





Wiring Specifications	
Connection Type	Spring Clamp Terminals
Wire Gauge /Wire Cross-Section	28–14 AWG / 0.08–2.5 mm2
Screwdriver Width	Use screwdriver width 2.5 mm (0.10) such as our TW-SD-MSL-2
Wire Stripping Length	8mm (5/16 in)

Power Budget Planning

Managing Power Resources

When determining the types and quantity of terminals you will be using, it is important to remember there is a defined amount of I/O Bus Current supplied from the Bus Coupler. There are also defined limits for each external source.

The chart on the next page indicates the power supplied and used by each Protos X component. The chart below shows an example of how to calculate the power used by your particular system. These charts should make it easy for you to determine if the devices you have chosen will operate within the power budget of your system configuration.

If the I/O terminals you have chosen exceed the maximum power available from the Bus Coupler, you may be able to resolve the problem by using expansion terminals.

Power Budget Example

The example below shows how to calculate the power budget for a typical ProtosX system. This example is constructed using a PX-MOD Bus Coupler and six I/O Terminals. It is recommended you construct a similar table for your system. Follow the steps below to determine your power budget.

A	Column 1	Column 2	Column 3
	Terminal	***Terminal Type***	***I/O Bus (from Coupler)***
B	***CURRENT SUPPLIED***		
	PX-MOD	Bus Coupler	1000mA
C	***CURRENT REQUIRED***		
	PX-144 PX-172-1 PX-322-1 PX-312 PX-244-1 PX-412	4 pt DC Discrete Input 2 pt AC Discrete Input 2 ch RTD Input 2 ch DC Analog Input 4 pt DC Discrete Output 2 ch DC Analog Output	5mA 3mA 60mA 65mA 9mA 75mA
D	***Maximum Current Required***		217mA
E	***Remaining Current Available***		783mA

1. Using a chart similar to this one, fill in columns 1 and 2.
2. Using the tables on the next page enter the current supplied and current used by each device (column 3).
3. Add together the current used by the system (row C) for column 3 and put the total in the row labeled "Maximum Current Required" (row D).
4. Subtract the calculated "Maximum Current Required" (row D), from the "Current Supplied" and place the difference in the row labeled "Remaining Current Available" (row E).
5. If "Maximum Current Required" is greater than "Current Supplied" in column 3, the power budget will be exceeded. It will be unsafe to use this configuration, and you will need to restructure your I/O configuration.

Power Requirements

Power Supplied and Consumed

These tables show the amount of power supplied by each of the Bus Couplers and the amount of power consumed by each I/O device. The Power Consumed chart lists how much power is drawn from the I/O Bus, Terminal Power Bus (externally supplied) and from the Load (when using output terminals). Use this information when calculating the power budget for your system.

Power Supplied	
Device	***5V(mA) I/O Bus Supply***
Coupler	
PX-MOD	1000 Max
PX-TCP1	1000 Max
PX-TCP2	1750 Max
PX-EIP1	1000 Max
Bus Expansion Coupler	
PX-903	400 Max

Power Consumed			
Device	***5V(mA) from I/O Bus***	***(mA) from Terminal Power Bus***	***(mA) from Load***
Discrete Input Terminals			
PX-144	5	5	N/A
PX-148	5	2 (plus load)	
PX-149	20	N/A	
PX-172-1	3	6	
PX-172-2	3	6	
Discrete Output Terminals			
PX-244-1	9	N/A	30
PX-244-2	9		30
PX-248	18		60 (plus load)
PX-249	45		35 (plus load)
Analog Input Terminals			
PX-302	60	N/A	N/A
PX-304	85	Load	
PX-308	105	Load	
PX-312	65	N/A	
PX-314	100	N/A	
PX-318	140	N/A	
RTD/Thermocouple Input Terminals			
PX-322-1	60	N/A	N/A
PX-324-1	60		
PX-332-J	65		
PX-334-J	75		
PX-332-K	65		
PX-334-K	75		
Analog Output Terminals			
PX-402	60	N/A	50 (plus load)
PX-404	20		60 (plus load)
PX-408	25		50 (plus load)
PX-412	75		50 (plus load)
PX-414	75		50 (plus load)
PX-418	20		20
Relay Output Terminals			
PX-272-1	10	ON resistance max 100mV (plus load)	N/A
PX-272-2	80		
Combination In/Out Terminals			
PX-549	25 (additional 3mA for inputs)	15 (plus load)	N/A

System Installation and Removal

Bus Coupler and Bus Terminal Installation

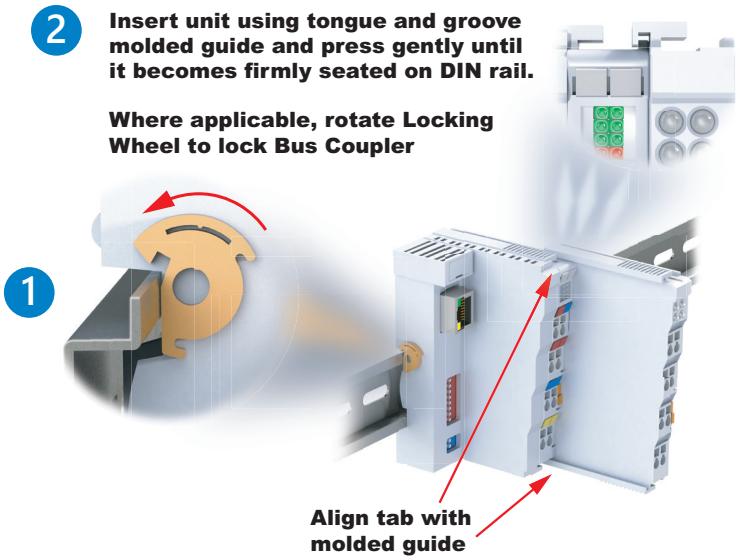
Bus Coupler Installation:

1. Attach a Bus Coupler by snapping it onto 35mm DIN rail and securing it into position using the DIN rail locking wheel (where applicable) located on the left side of the coupler.

Bus Terminal Installation:

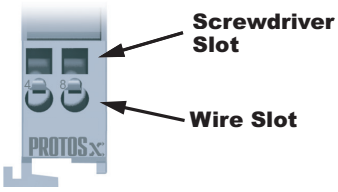
2. To add a bus terminal, insert unit onto right side of Bus Coupler using the tongue and groove at the top and bottom of the unit, pressing gently until it snaps onto the DIN rail.

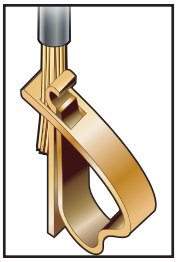
- A proper connection cannot be made by sliding the units together on the DIN rail. When correctly installed, no significant gap can be seen between the attached units. Bus connection is made through the six slide contacts located on the upper right side of the units. Add up to 64 bus terminals per Bus Coupler, including a bus end terminal.



Wiring Connections

- 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.



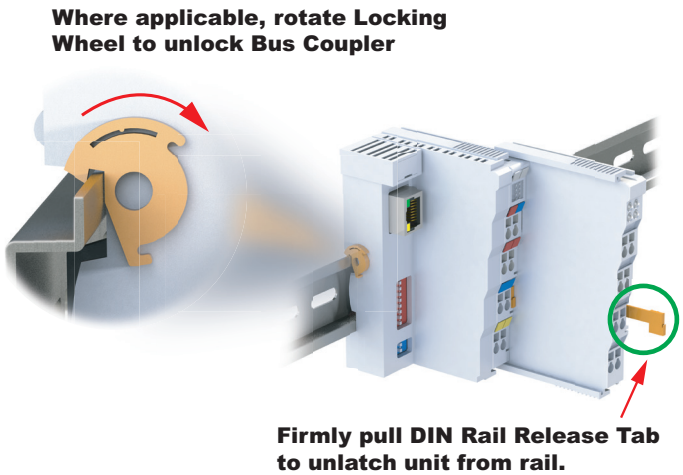


Wiring Specifications	
Connection Type	Spring Clamp Terminals
Wire Gauge	28–14 AWG (0.08–2.5 mm2)
Screwdriver Width	2.5 mm (0.10 in) such as P/N TW-SD-MSL-2
Wire Stripping Length	8mm

** For Thermocouple terminals, thermocouple extension wire is recommended*

Removing Bus Coupler and Bus Terminals

- 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 with locking wheels, release the DIN rail locking wheel, then pull firmly on DIN rail release tab.

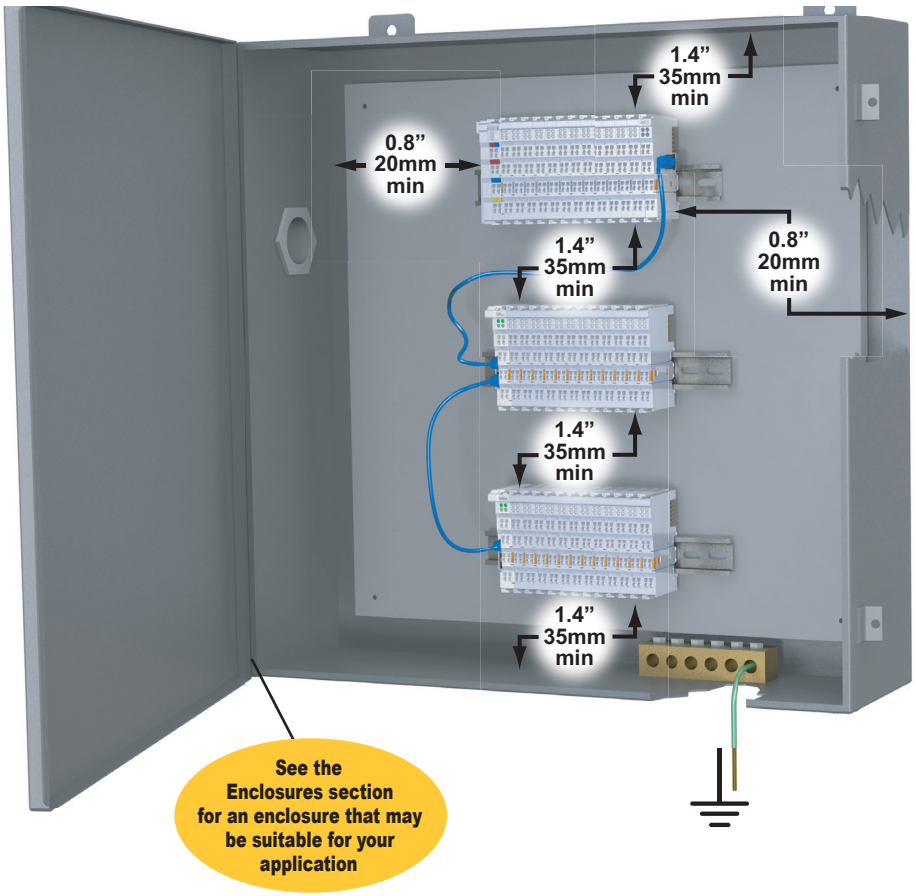


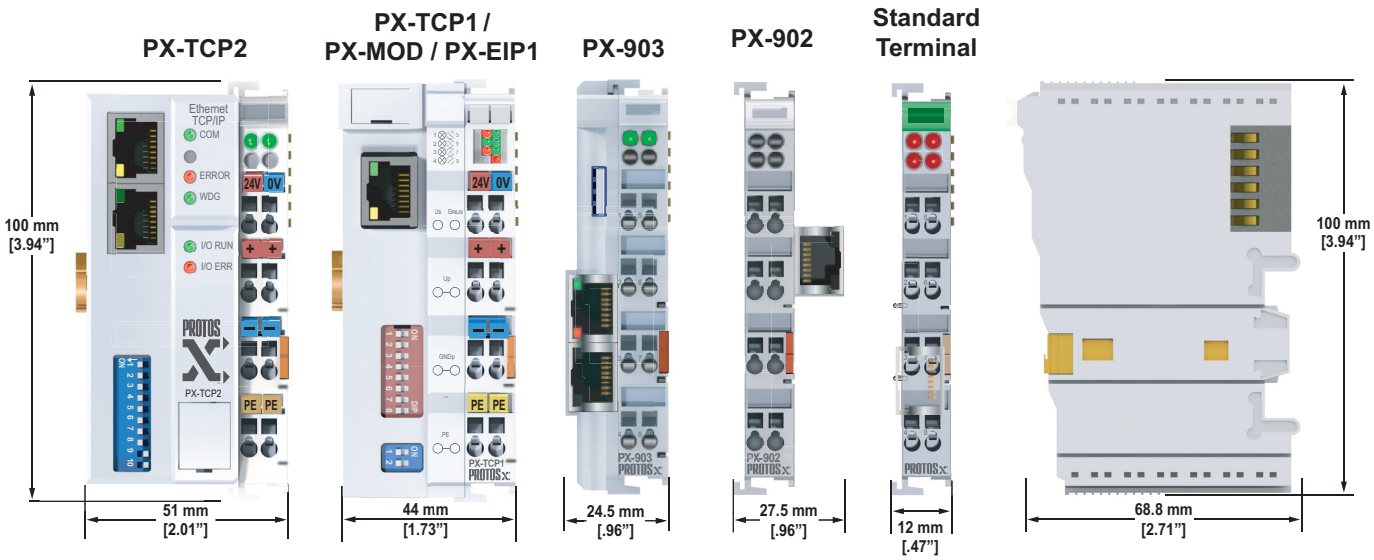
Installation Considerations

Terminal Dimensions and Spacing Requirements

Use the following diagrams to make sure the Protos X system can be installed in your application. Protos X terminals require 35mm DIN rail for mounting; there are no orientation restrictions.

To ensure proper airflow for cooling purposes, units should be spaced, at a minimum, as shown. It is also important to check the Protos X dimensions against the conditions required for your application.

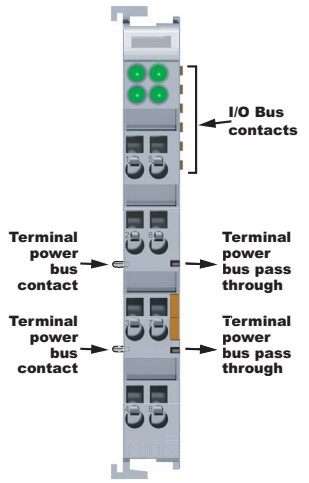




Installation Considerations

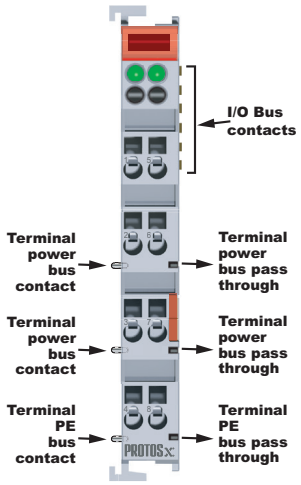
Terminal Types

TYPE 1



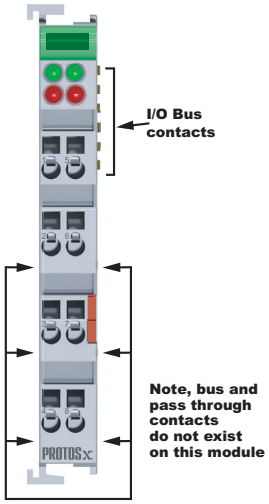
Type 1: This terminal passes the terminal power bus from the preceding terminal to the next terminal and therefore it must be mounted to a preceding terminal that passes bus power.

TYPE 2



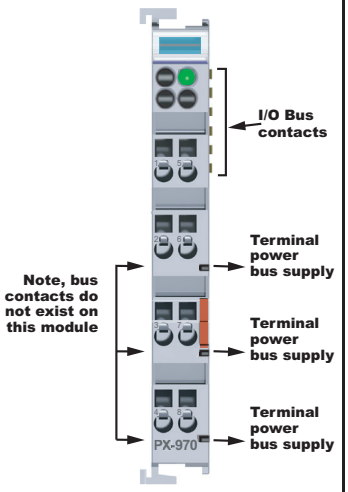
Type 2: This terminal passes the terminal power bus and PE from the preceding terminal to the next terminal and therefore it must be preceded by a terminal that passes both terminal power bus and PE.

TYPE 3



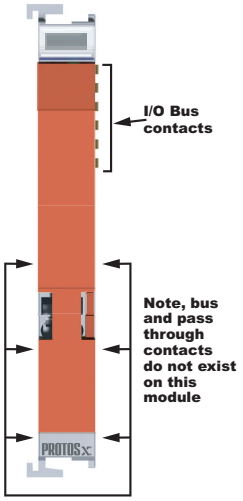
Type 3: This terminal does not pass the terminal power bus or PE and can be preceded by any terminal, however it will interrupt the terminal power bus and PE.

TYPE 4



Type 4: This terminal requires external voltage connection and supplies the terminal power bus to terminals located to its right. The terminals to its right must support the same power bus of 120/230 VAC or 24VDC. This terminal will not pass terminal power or PE from any preceding terminals.

TYPE 5



Type 5: This terminal is used to separate the terminal power bus and PE from other terminals and can mounted next to any terminal.

Bus End/Expansion Terminals

PX-901 $;0?f1:

Bus End Terminal

The PX-901 (type 3) Bus End Terminal is installed at the end of a terminal assembly and is required for proper I/O Bus communication.

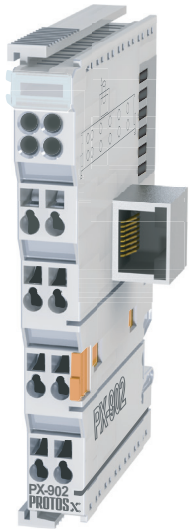
PX-901 Terminal Specifications	
Current Consumption (from I/O Bus)	None
Electrical Isolation	500Vms (I/O bus/signal voltage)

PX-901 General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	50g (1.7 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes
Adjacent Mounting on Bus Terminals without Power Contact	Yes
Passes Terminal Bus Power	No
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

** To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.*

PX-902 $;0?f2:

Bus Expansion End Terminal



The PX-902 (type 3) Bus Expansion End Terminal enables expansion of terminal assemblies. The PX-902 is installed at the end of a coupler terminal block and connects the I/O Bus to a PX-903 Bus Expansion Coupler Terminal via the RJ45 port. No configuration is required.

PX-902 Terminal Specifications	
Power Source	I/O Bus power (approx. 6V)
Current Consumption (from I/O Bus)	70mA
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
Status Indicators	None
Number of Expansion Coupler Terminals Supported	31 max. (Using PX-903)
Configuration	Automatic
Maximum Distance Between Each Expansion Coupler	16.5 ft. (5m)
Connection Type	Ethernet, RJ45
Recommended Cable	Shielded, Twisted Pair, Cat5e
Placement	Used only with Bus Coupler, replaces a PX-901 End Terminal

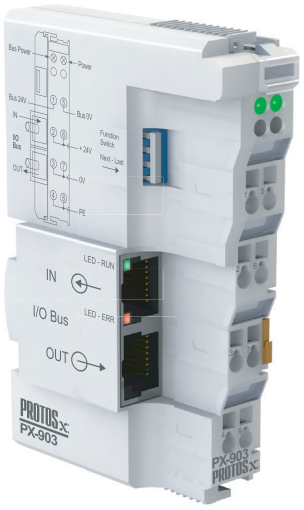
PX-902 General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27
Noise Immunity	Conforms to EN 61000-6-2
Protection Class	IP20
Weight	146g (5.1 oz)
Dimensions (WxHxD)	27.5 x 100 x 68.8 mm (1.08 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes
Adjacent Mounting on Bus Terminals without Power Contact	Yes
Passes Terminal Bus Power	No
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

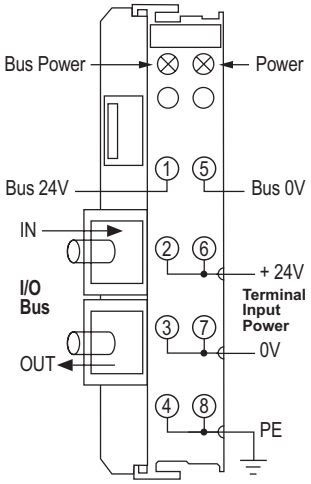
** To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.*

Bus Expansion Terminals

PX-903 $;00?f3:

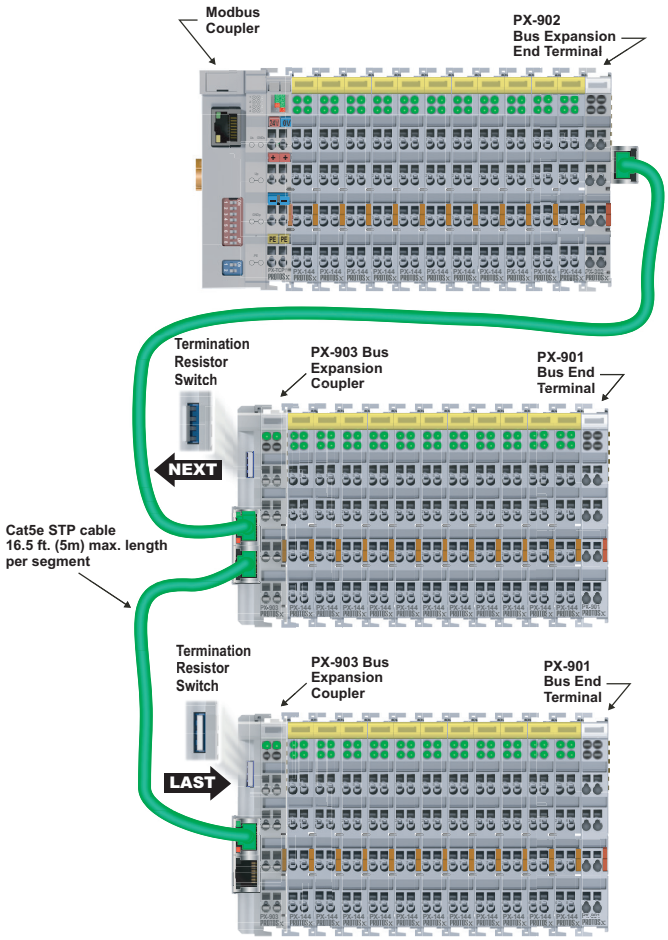
Bus Expansion Coupler Terminal





The PX-903 (type 4) Bus Expansion Coupler Terminal enables expansion of terminal assemblies. The PX-903 is installed at the beginning of an expansion terminal assembly and connects to a PX-902 Bus Expansion End Terminal or other PX-903 terminals.

Use of the PX-902 and PX-903 allows expansion of up to 31 PX-903 couplers in a group. Communication is through the RJ45 ports. No configuration is required.



PX-903 Terminal Specifications	
Supply Power for I/O Bus	24VDC (-15%/+20%)
Current Consumption (from I/O Bus)	200mA Max, 70mA + (total I/O bus current) / 4
Recommended Fuse	10A max
I/O Bus Current Supply	400mA max
Starting Current	2.5 x continuous current
Number of Bus Terminals Supported	64
Supply for Terminal Power Bus	24 VAC/VDC
Maximum Terminal Power Bus Current	10A
Number of Terminal Power Bus Contacts	3 (+24 VAC/VDC, 0V, PE)
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
Status Indicators	2 Power LEDs
Number of Expansion Couplers in a Terminal Group	31 max
Configuration	Automatic
Maximum Distance Between Each Expansion Coupler	16.5 ft. (5m)
Connection Type	Ethernet, 2 x RJ45
Recommended Cable	Shielded, Twisted Pair, Cat5e
Termination Resistor Switch	Dip Switch, set to Last for last coupler in expansion group, otherwise set to Next

PX-903 General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27
Noise Immunity	Conforms to EN 61000-6-2
Protection Class	IP20
Weight	146g (5.1 oz)
Dimensions (WxHxD)	24.5 x 100 x 68.8 mm (0.96 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes (Supply)
Adjacent Mounting on Bus Terminals without Power Contact	Yes (Supply)
Passes Terminal Bus Power	Yes (Supply)
Passes PE Bus	Yes (Supply)
Agency Approvals*	CE

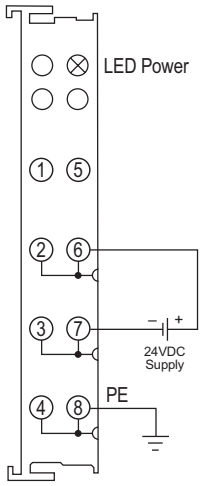
** To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.*

Bus Expansion Connection LED Status	
LED	LED ON
Green I/O Bus In	I/O Bus is transferring data
Red I/O Bus In	I/O Bus fault

Power Feed Terminals

PX-940 $;0?f5:

Power Feed Terminal, 24VDC



The PX-940 (type 4) Power Feed Terminal allows adding or changing power voltage sources within a terminal assembly. Terminals mounted to the right of the PX-940 receive 24VDC through the terminal input connections.

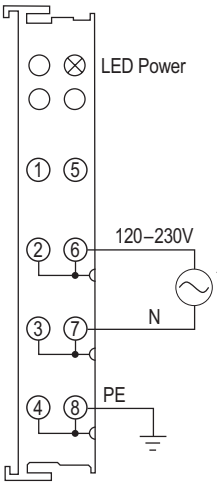
PX-940 Terminal Specifications	
Supply Power to Terminal	24VDC
Maximum Current	10A
Number of Power Contacts	3 (+24VDC, 0V, PE)
Current Consumption (from I/O Bus)	None
Electrical Isolation	500Vms (I/O bus/signal voltage)
Heat Dissipation	1W max
Status Indicators	1 Power LED

PX-940 General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	50g (1.7 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes
Adjacent Mounting on Bus Terminals without Power Contact	Yes
Passes Terminal Bus Power	Yes (Supply)
Passes PE Bus	Yes (Supply)
Agency Approvals*	UL/cUL File No. E157382, CE

** To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.*

PX-970 $;0?f7:

Power Feed Terminal, 120–230 VAC



The PX-970 (type 4) Power Feed Terminal allows adding or changing power voltage sources within a terminal assembly. Terminals mounted to the right of the PX-970 receive 120–230 VAC through the terminal input connections.

PX-970 Terminal Specifications	
Supply Power to Terminal	120–230 VAC
Maximum Current	10A
Number of Power Contacts	3 (120–230 VAC, 0V, PE)
Current Consumption (from I/O Bus)	None
Electrical Isolation	500Vms (I/O bus/signal voltage)
Heat Dissipation	1W max
Status Indicators	1 Power LED

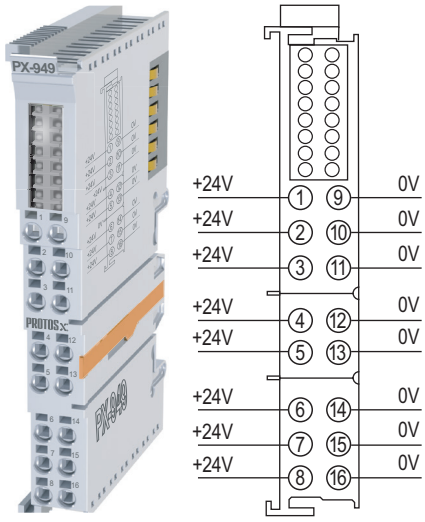
PX-970 General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	50g (1.7 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes
Adjacent Mounting on Bus Terminals without Power Contact	Yes
Passes Terminal Bus Power	Yes (Supply)
Passes PE Bus	Yes (Supply)
Agency Approvals*	UL/cUL File No. E157382, CE

** To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.*

Power Distribution/Separation Terminals

PX-949 $;0?f6:

Power Distribution Terminal, 24VDC



The PX-949 (type 1) Power Distribution Terminal provides eight 24VDC and eight 0V connections powered by the terminal power bus.

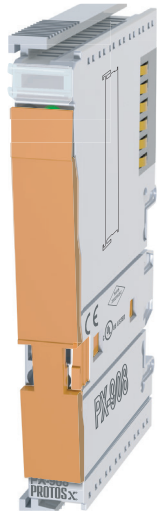
PX-949 Terminal Specifications	
Nominal Voltage	≤ 60VDC
Maximum Current	10A
Number of Power Contacts	(8) 24V and (8) 0V
Connection Voltage	24VDC
Current Consumption (from I/O Bus)	None
Electrical Isolation	500Vms (I/O bus/signal voltage)
Heat Dissipation	1W max

PX-949 General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	60g (2.1 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes
Adjacent Mounting on Bus Terminals without Power Contact	No
Passes Terminal Bus Power	Yes
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

** To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.*

PX-908 $;0?f4:

Power Separation Terminal



The PX-908 (type 5) Power Separation Terminal provides interruption of power along the terminal power bus while passing I/O bus data. It is easily identified by the orange cover.

PX-908 General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	50g (1.7 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes
Adjacent Mounting on Bus Terminals without Power Contact	Yes
Passes Terminal Bus Power	No
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

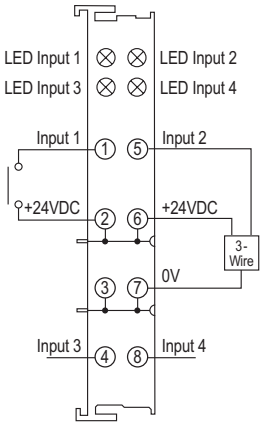
** To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.*

Discrete Input Terminals

PX-144 $0?ea:

Four-point, 24VDC Discrete Input Terminal

The PX-144 (type 1) DC Input Terminal provides four electrically isolated 24VDC sinking inputs with LED status. For use with 3-wire and 2-wire sensors.



General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	55g (1.9 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes, DC only
Adjacent Mounting on Bus Terminals without Power Contact	No
Passes Terminal Bus Power	Yes
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

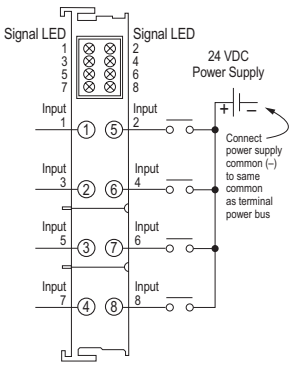
Terminal Specifications	
Inputs Per Terminal	4
Input Type	Sinking
Input Data Bytes Used	1/2 byte (4 bits)
Input Power Source	24VDC provided via terminal power bus
Current Consumption (from Terminal Power Bus)	5mA typical
Operating Voltage Rating	24VDC (-15%/+20%)
Peak Voltage Rating	30VDC
ON Voltage Level	15 to 30 VDC
OFF Voltage Level	-3 to +5 VDC
Minimum ON Current	50mA
Maximum OFF Current	100mA
Current Consumption (from I/O Bus)	5mA typical
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
OFF to ON Response	3ms
ON to OFF Response	3ms
Status Indicators	4, indicates input is ON

****To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.***

PX-148 $0?eb:

Eight-point, 24VDC Discrete Input Terminal

The PX-148 (type 1) DC Input Terminal provides eight electrically isolated 24VDC sinking inputs with LED status.



General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	55g (1.9 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes, DC only
Adjacent Mounting on Bus Terminals without Power Contact	No
Passes Terminal Bus Power	Yes
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

Terminal Specifications	
Inputs Per Terminal	8
Input Type	Sinking
Input Data Bytes Used	1 byte
Input Power Source	Requires external 24VDC power source
Current Consumption (from Terminal Power Bus)	2mA + load, typical
Operating Voltage Rating	24VDC (-15%/+20%)
Peak Voltage Rating	30VDC
ON Voltage Level	15 to 30 VDC
OFF Voltage Level	-3 to +5 VDC
Minimum ON Current	2mA
Maximum OFF Current	1.5 mA
Current Consumption (from I/O Bus)	5mA typical
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
OFF to ON Response	3ms
ON to OFF Response	3ms
Status Indicators	8, indicates input is ON

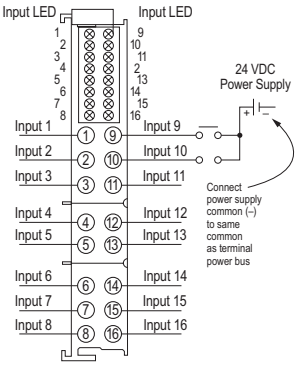
****To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.***

Discrete Input Terminals

PX-149 $00?ec:

Sixteen-point, 24VDC Discrete Input Terminal

The PX-149 (type 1) DC Input Terminal provides sixteen electrically isolated 24VDC sinking inputs with LED status.



General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	60g (2.1 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes, DC only
Adjacent Mounting on Bus Terminals without Power Contact	No
Passes Terminal Bus Power	Yes
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

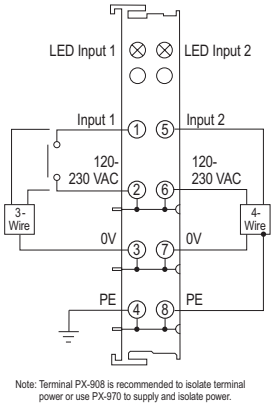
Terminal Specifications	
Inputs Per Terminal	16
Input Type	Sinking
Input Data Bytes Used	2 bytes
Input Power Source	Requires external 24VDC power source
Current Consumption (from Terminal Power Bus)	NA
Operating Voltage Rating	24VDC (-15%/+20%)
Peak Voltage Rating	30VDC
ON Voltage Level	11 to 30 VDC
OFF Voltage Level	-3 to +5 VDC
Minimum ON Current	2mA
Maximum OFF Current	40mA
Current Consumption (from I/O Bus)	20mA typical
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
OFF to ON Response	3ms
ON to OFF Response	3ms
Status Indicators	16, indicates input is ON

****To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.***

PX-172-1 $0?ed:

Two-point, 120–230 VAC Discrete Input Terminal

The PX-172-1 (type 2) DC Input Terminal provides two electrically isolated 120–230 VAC inputs with LED status. For use with 4-wire, 3-wire and 2-wire devices.



Note: Terminal PX-908 is recommended to isolate terminal power or use PX-970 to supply and isolate power.

General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	60g (2.1 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes, AC only
Adjacent Mounting on Bus Terminals without Power Contact	No
Passes Terminal Bus Power	Yes
Passes PE Bus	Yes
Agency Approvals*	UL/cUL File No. E157382, CE

Terminal Specifications	
Inputs Per Terminal	2
Input Type	NA
Input Data Bytes Used	1/4 byte (2 bits)
Input Power Source	Requires external 120–230 VAC power source. PX-908 terminal recommended to provide power to the terminal power bus.
Current Consumption (from Terminal Power Bus)	6mA typical
Operating Voltage Rating	120 to 230 VAC
Peak Voltage Rating	260VAC
ON Voltage Level	79 to 260 VAC
OFF Voltage Level	0 to 40 VAC
Minimum ON Current	250mA
Maximum OFF Current	500mA
Current Consumption (from I/O Bus)	3mA typical
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
OFF to ON Response	10ms
ON to OFF Response	10ms
Status Indicators	2, indicates input is ON

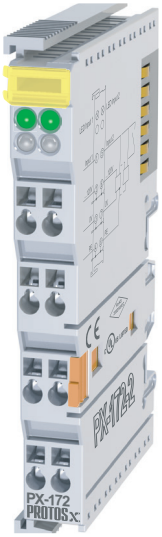
****To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.***

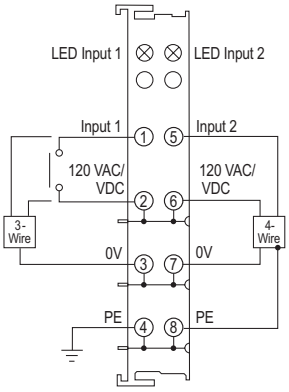
Discrete Input Terminals

PX-172-2 $;0?ef:

Two-point, 120 VAC/VDC Discrete Input Terminal

The PX-172-2 (type 2) DC Input Terminal provides two electrically isolated 120 VAC/VDC inputs with LED status. For use with 4-wire, 3-wire and 2-wire devices.





Note: Terminal PX-908 is recommended to isolate terminal power or use PX-970 to supply and isolate power.

General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	60g (2.1 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes, 120 VAC/VDC only
Adjacent Mounting on Bus Terminals without Power Contact	No
Passes Terminal Bus Power	Yes
Passes PE Bus	Yes
Agency Approvals*	UL/cUL File No. E157382, CE

**To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.*

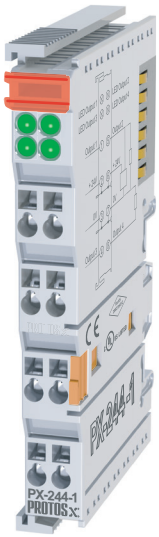
Terminal Specifications	
Inputs Per Terminal	2
Input Type	NA
Input Data Bytes Used	1/4 byte (2 bits)
Input Power Source	Requires external 120 VAC/VDC power source. PX-908 terminal recommended to provide power to the terminal power bus.
Current Consumption (from Terminal Power Bus)	6mA typical
Operating Voltage Rating	120 VAC/VDC
Peak Voltage Rating	140 VAC/VDC
ON Voltage Level	80 to 140 VAC/VDC
OFF Voltage Level	0 to 40 VAC/VDC
Minimum ON Current	250mA
Maximum OFF Current	500mA
Current Consumption (from I/O Bus)	3mA typical
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
OFF to ON Response	10ms
ON to OFF Response	10ms
Status Indicators	2, indicates input is ON

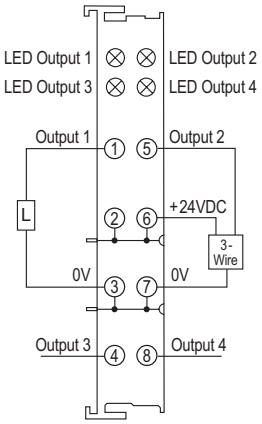
Discrete Output Terminals

PX-244-1 $0?eg:

Four-point, 0.5 A, 24VDC Discrete Output Terminal

The PX-244-1 (type 1) DC Output Terminal provides four 24VDC 0.5 A short-circuit protected sourcing outputs with LED status. For use with 3-wire and 2-wire devices.





General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	60g (2.1 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes, DC only
Adjacent Mounting on Bus Terminals without Power Contact	No
Passes Terminal Bus Power	Yes
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

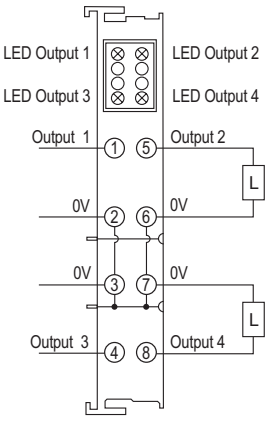
***To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

Terminal Specifications	
Outputs Per Terminal	4
Commons Per Terminal	2
Output Type	Sourcing
Output Data Bytes Used	1/2 byte (4 bits)
Output Power Source	24VDC provided via terminal power bus
Current Consumption (from Load Voltage)	30mA typical
Operating Voltage	24VDC (-15%/+20%)
Maximum Load Current	0.5 A per channel (Short-Circuit Protected)
On Voltage Drop	0.4 VDC @ 0.5 A
Maximum Leakage Current	300mA
Maximum Inrush Current	1.5 A
Maximum Short-Circuit Voltage	35V
Load Type	Resistive, inductive, lamp
Current Consumption (from I/O Bus)	9mA typical
Reverse Voltage Protection	No
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
OFF to ON Response	100ms max
ON to OFF Response	20ms max
Status Indicators	4, indicates output is ON

PX-244-2 $0?eh:

Four-point, 2A, 24VDC Discrete Output Terminal

The PX-244-2 (type 1) DC Output Terminal provides four 24VDC 2A short-circuit protected sourcing outputs with LED status.



General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	60g (2.1 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes, DC only
Adjacent Mounting on Bus Terminals without Power Contact	No
Passes Terminal Bus Power	Yes
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

***To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

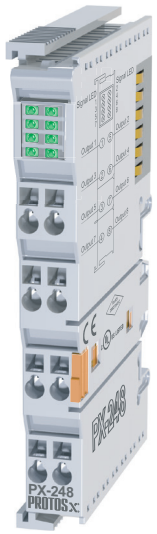
Terminal Specifications	
Outputs Per Terminal	4
Commons Per Terminal	4
Output Type	Sourcing
Output Data Bytes Used	1/2 byte (4 bits)
Output Power Source	24VDC provided via terminal power bus
Current Consumption (from Load Voltage)	30mA typical
Operating Voltage	24VDC (-15%/+20%)
Maximum Load Current	2A per channel (Short-Circuit Protected)
On Voltage Drop	0.14 VDC @ 2A
Maximum Leakage Current	60mA
Maximum Inrush Current	35A
Maximum Short-Circuit Voltage	52V
Load Type	Resistive, inductive, lamp
Current Consumption (from I/O Bus)	9mA typical
Reverse Voltage Protection	Yes
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
OFF to ON Response	160ms typ, 300ms max
ON to OFF Response	10ms min, 80ms max
Status Indicators	4, indicates output is ON

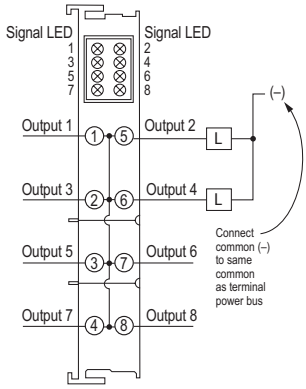
Discrete Output Terminals

PX-248 $-0?ei:

Eight-point, 0.5 A, 24VDC Discrete Output Terminal

The PX-248 (type 1) DC Output Terminal provides eight 24VDC 0.5 A short-circuit protected sourcing outputs with LED status.





General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	70g (2.4 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes, DC only
Adjacent Mounting on Bus Terminals without Power Contact	No
Passes Terminal Bus Power	Yes
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

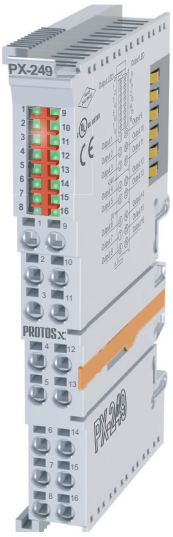
***To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

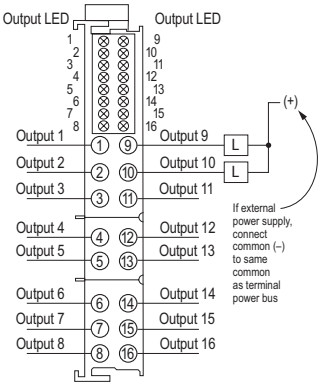
Terminal Specifications	
Outputs Per Terminal	8
Commons Per Terminal	Field wired
Output Type	Sourcing
Output Data Bytes Used	1 byte
Output Power Source	24VDC provided via terminal power bus
Current Consumption (from Load Voltage)	60mA + load typical
Operating Voltage	24VDC (-15%/+20%)
Maximum Load Current	0.5 A per channel (Short-Circuit Protected)
On Voltage Drop	0.4 VDC @ 0.5 A
Maximum Leakage Current	300mA
Maximum Inrush Current	1.5 A
Max. Short-Circuit Voltage	35V
Load Type	Resistive, inductive, lamp
Current Consumption (from I/O Bus)	18mA typical
Reverse Voltage Protection	Yes
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
OFF to ON Response	100ms max
ON to OFF Response	20ms max
Status Indicators	8, indicates output is ON

PX-249 $-00?ej:

Sixteen-point, 0.5 A, 24VDC Discrete Output Terminal

The PX-249 (type 1) DC Output Terminal provides sixteen 24VDC 0.5 A short-circuit protected sinking outputs with LED status.





General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	70g (2.4 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes, DC only
Adjacent Mounting on Bus Terminals without Power Contact	No
Passes Terminal Bus Power	Yes
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

Terminal Specifications	
Outputs Per Terminal	16
Commons Per Terminal	Field wired
Output Type	Sinking
Output Data Bytes Used	2 bytes
Output Power Source	Requires external 24VDC power source
Current Consumption (from Load Voltage)	35mA + load typical
Operating Voltage	24VDC (-15%/+20%)
Maximum Load Current	0.5 A per channel (Short-Circuit Protected)
On Voltage Drop	0.12 VDC @ 0.5 A
Maximum Leakage Current	75mA
Maximum Inrush Current	3.5 A
Max. Short-Circuit Voltage	36V
Load Type	Resistive, inductive, lamp
Current Consumption (from I/O Bus)	45mA typical
Reverse Voltage Protection	Yes
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
OFF to ON Response	0.45 ms
ON to OFF Response	3.3 ms
Status Indicators	16, indicates output is ON

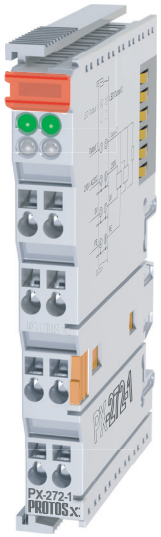
***To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

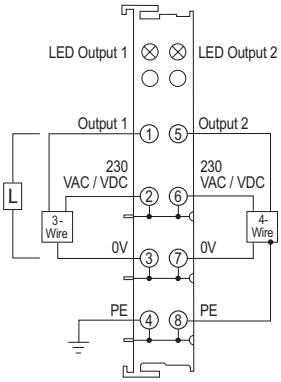
Discrete Relay Output Terminals

PX-272-1 $0?ek:

Two-point, 0-230 VAC/VDC Discrete Solid State Relay Output Terminal

The PX-272-1 (type 2) Solid State Relay Output Terminal provides two 230 VAC/VDC 0.3 A outputs with LED status. For use with 4-wire, 3-wire and 2-wire devices.





Note: Terminal PX-908 is recommended to isolate terminal power or use PX-970 to supply and isolate power.

General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	55g (1.9 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes, 230 VAC/VDC only
Adjacent Mounting on Bus Terminals without Power Contact	No
Passes Terminal Bus Power	Yes
Passes PE Bus	Yes
Agency Approvals*	UL/cUL File No. E157382, CE

***To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

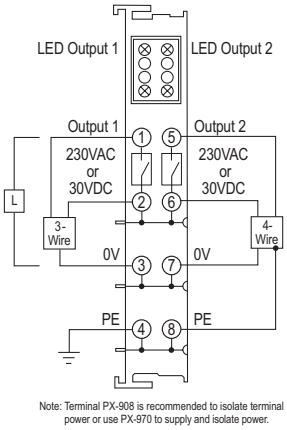
Terminal Specifications	
Outputs Per Terminal	2
Commons Per Terminal	2
Output Type	Solid State Relay (DC sourcing only)
Output Data Bytes Used	1/4 byte (2 bits)
Output Power Source	230 VAC/VDC provided via terminal power bus
Current Consumption (from Terminal Power Bus)	(ON resistance max 100mV) + load
Operating Voltage	0 to 230 VAC/VDC (DC 100Hz)
Maximum Load Current	0.3 A per point
Maximum Leakage Current	< 1mA (off state)
Maximum Inrush Current	0.5 A for 20s, 1.5 A for 100ms
Contact Resistance	2.1 V, typical 3.2 V, max.
Surge Voltage Protection	From 400VAC
Load Type	Resistive, inductive
Current Consumption (from I/O Bus)	10mA
Electrical Isolation	500Vms (I/O bus/field potential) 2500VDC (1 min.)
Heat Dissipation	1W max
Switch-ON Time	4 to 6 ms
Switch-OFF Time	0.05 to 0.1 ms
Switch-ON Delay	320ms
Switch-OFF Delay	6.2 ms
Status Indicators	2, indicates output is ON

Discrete Relay Output Terminals

PX-272-2 $-0?el:

Two-point, 230VAC / 30VDC Discrete Relay Output Terminal

The PX-272-2 (type 2) Relay Output Terminal provides two 230VAC / 30VDC 5A outputs with LED status. For use with 4-wire, 3-wire and 2-wire devices.



Note: Terminal PX-908 is recommended to isolate terminal power or use PX-970 to supply and isolate power.

General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	85g (3.0 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes, 230VAC or 30VDC only
Adjacent Mounting on Bus Terminals without Power Contact	No
Passes Terminal Bus Power	Yes
Passes PE Bus	Yes
Agency Approvals*	UL/cUL File No. E157382, CE

***To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

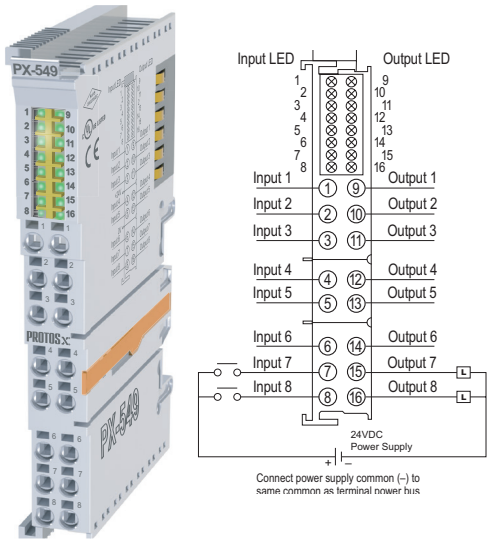
Terminal Specifications	
Outputs Per Terminal	2
Commons Per Terminal	2
Output Type	SPST Relay, normally open contact (DC sourcing only)
Output Data Bytes Used	1/4 byte (2 bits)
Output Power Source	230VAC/30VDC provided via terminal power bus
Current Consumption (from Terminal Power Bus)	(ON resistance typ 2.4 V, max 3.2 V) + load
Operating Voltage	230VAC/30VDC
Maximum Load Current	5A per point
Maximum Load Current with Resistive Load	AC: 5A @230VAC, 1250VA DC: 5A @ 30VDC, 150W
Maximum Load Current with Inductive Load, cosw = 0.4, L/R = 7ms	AC: 2A @230VAC DC: 2A @ 30VDC
Minimum Load (approximate)	10mA @ 5VDC (as supplied) 100mA @ 20VDC (after approx. ≥ 100mA has been switched at least once)
Load Type	Resistive, inductive, lamp
Switching Times	Reaction Time: 10ms max. Release Time; 4ms max. Bounce Time: 5ms max.
Contact Material	Silver Cadmium Oxide
Current Consumption (from I/O Bus)	80mA
Electrical Isolation	500Vms (I/O bus/field potential) 2500VDC (1 min.)
Heat Dissipation	1W max
Switching Frequency at Maximum Contact Load	10/minute
Maximum Contact Resistance	< 30mV
Minimum Insulation Resistance	100MV @ 500VDC
Mechanical Operating Life	20,000,000 switching operations
Electrical Operating Life	Minimum 100,000 switching operations with resistive loads
Test Voltage Between Open Contacts	750V for 1 minute
Status Indicators	2, indicates output is ON

Discrete Combination Terminal

PX-549 $;00?f0:

Eight inputs/Eight outputs, 24VDC Discrete Input/Output Terminal

The PX-549 (type 1) DC Input/Output Terminal provides eight 24VDC inputs and eight 24VDC 0.5 A outputs with reverse polarity protection and LED status.



General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	60g (2.1 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes, DC only
Adjacent Mounting on Bus Terminals without Power Contact	No
Passes Terminal Bus Power	Yes
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

***To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

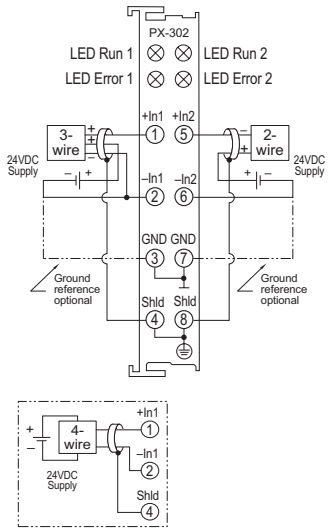
Terminal Specifications	
Inputs/Outputs Per Terminal	8 sinking inputs / 8 sourcing outputs
Data Bytes Used	1 byte (inputs) / 1 byte (outputs)
Input/Output Power Source	Requires external 24VDC power source
Operating Voltage Rating	24VDC (-15%/+20%)
Current Consumption (from I/O Bus)	25mA typical
Current Consumption (from Terminal Power Bus)	15mA + load typical
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
Status Indicators	8 input and 8 output, indicates ON
Input Specifications	
Peak Voltage Rating	30VDC
ON Voltage Level	15 to 30 VDC
OFF Voltage Level	-3 to +5 VDC
Minimum ON Current	2mA
Minimum OFF Current	40mA
Current Consumption (from I/O Bus)	3mA typical
OFF to ON Response	3ms
ON to OFF Response	3ms
Output Specifications	
Max. Load Current per Output	0.5 A (Short-Circuit Protected)
On Voltage Drop	0.14 VDC @ 2A
Maximum Leakage Current	5mA
Maximum Inrush Current	2A
Maximum Short-Circuit Voltage	45V
Load Type	Resistive, inductive, lamp
Reverse Voltage Protection	Yes
OFF to ON Response	50ms
ON to OFF Response	75ms

Analog Current Input Terminals

PX-302 $00?en:

Two-channel, 4-20 mA Analog Input Terminal

The PX-302 (type 3) Analog Input Terminal provides two electrically isolated 4-20 mA inputs with 12-bit resolution and Run and Error LED status.



General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	70g (2.4 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes
Adjacent Mounting on Bus Terminals without Power Contact	Yes
Passes Terminal Bus Power	No
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

***To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

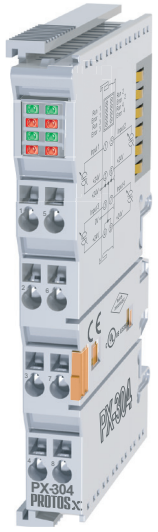
Terminal Specifications	
Number of Channels	2
Input Ranges	4 to 20 mA
Resolution	12 bits
Input Type	External ground reference
Data Format	Decimal: 0-32767
Data Bytes Consumed	PX-MOD: 4 bytes input PX-TCP1/TCP2: 8 bytes in/ 8 bytes out (not used)
Input Power Source	Loop power external
Current Consumption (from Terminal Power Bus)	NA
Input Impedance	50V internal resistor
Absolute Max Ratings	35VDC surge
Conversion Time	Approx. 2ms
Full Scale Calibration Error	± 0.3% of full scale
Current Consumption (from I/O Bus)	60mA
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
Status Indicators	4, see LED Status chart

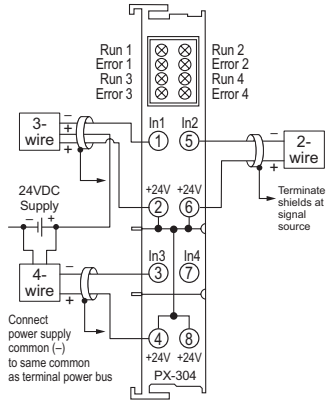
LED Status		
LED	***LED ON***	***LED OFF***
Green LED: RUN	Normal Operation	Watchdog-timer overflow if no data transmitted within WD set time.
Red LED: ERROR	Broken wire or current is > 21.5 mA	Normal Operation

PX-304 $00?eo:

Four-channel, 4-20 mA Analog Input Terminal

The PX-304 (type 1) Analog Input Terminal provides four electrically isolated 4-20 mA inputs with 12-bit resolution and Run and Error LED status.





General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	75g (2.6 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes, DC only
Adjacent Mounting on Bus Terminals without Power Contact	No
Passes Terminal Bus Power	Yes
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

***To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

Terminal Specifications	
Number of Channels	4
Input Ranges	4 to 20 mA
Resolution	12 bits
Input Type	Single-ended
Data Format	Decimal: 0-32767
Data Bytes Consumed	PX-MOD: 8 bytes input PX-TCP1/TCP2: 16 bytes in/ 16 bytes out (not used)
Input Power Source	24VDC provided via terminal power bus
Current Consumption (from Terminal Power Bus)	Load
Input Impedance	< 85V
Absolute Max Ratings	30VDC surge
Conversion Time	Approx. 2ms
Full Scale Calibration Error	± 0.3% of full scale
Current Consumption (from I/O Bus)	85mA
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
Status Indicators	8, see LED Status chart

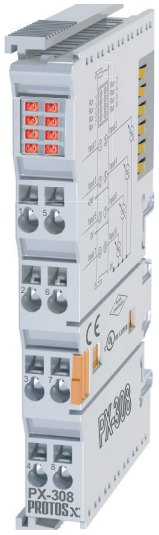
LED Status		
LED	***LED ON***	***LED OFF***
Green LED: RUN	Normal Operation	Watchdog-timer overflow if no data transmitted within WD set time.
Red LED: ERROR	Broken wire or current is > 20.8 mA	Normal Operation

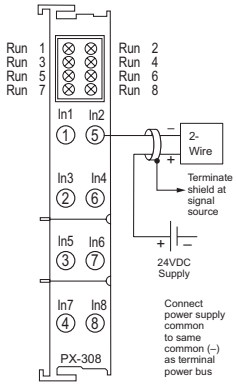
Analog Current Input Terminals

PX-308 $00?ep:

Eight-channel, 4-20 mA Analog Input Terminal

The PX-308 (type 1) Analog Input Terminal provides eight electrically isolated 4-20 mA inputs with 12-bit resolution and Error LED status.





General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	75g (2.6 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes, DC only
Adjacent Mounting on Bus Terminals without Power Contact	No
Passes Terminal Bus Power	Yes
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

***To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

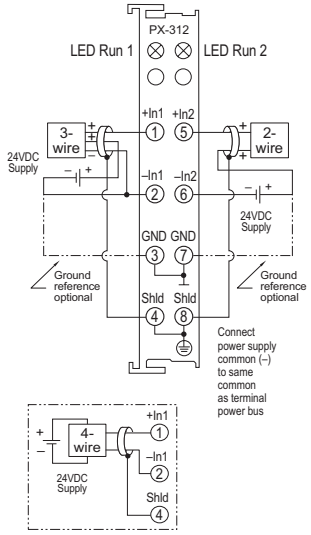
Terminal Specifications	
Number of Channels	8
Input Ranges	4 to 20 mA
Resolution	12 bits
Input Type	Single-ended
Data Format	Decimal: 0-32767
Data Bytes Consumed	PX-MOD: 16 bytes input
	PX-TCP1/TCP2: 32 bytes in/32 bytes out (not used)
Input Power Source	Requires external 24VDC power source
Current Consumption (from Terminal Power Bus)	Load
Input Impedance	< 85V
Absolute Max Ratings	30VDC surge
Conversion Time	Approx. 4ms
Full Scale Calibration Error	± 0.3% of full scale
Current Consumption (from I/O Bus)	105mA
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
Status Indicators	8, Red: Error, broken wire or current is > 20.8 mA

Analog Voltage Input Terminals

PX-312 $00?eq:

Two-channel, -10 to +10 VDC Analog Input Terminal

The PX-312 (type 3) Analog Input Terminal provides two electrically isolated -10 to +10 VDC inputs with 12-bit resolution and LED status.



General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	70g (2.4 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes
Adjacent Mounting on Bus Terminals without Power Contact	Yes
Passes Terminal Bus Power	No
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

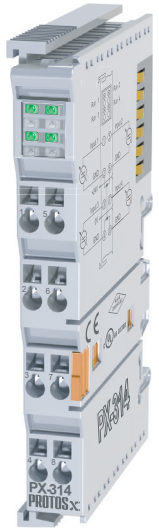
***To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

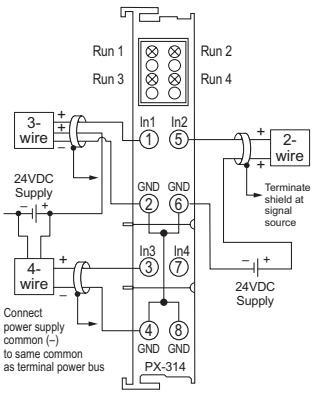
Terminal Specifications	
Number of Channels	2
Input Ranges	-10 to +10 VDC
Resolution	12 bits (11 bits between 0 to 10 VDC)
Input Type	External ground reference
Data Format	Decimal: -32767 to +32767
Data Bytes Consumed	PX-MOD: 4 bytes input PX-TCP1/TCP2: 8 bytes in/ 8 bytes out (not used)
Input Power Source	Voltage source external
Current Consumption (from Terminal Power Bus)	NA
Input Impedance	> 200kV
Absolute Max Ratings	35VDC surge
Conversion Time	Approx. 2ms
Full Scale Calibration Error	± 0.3% of full scale
Current Consumption (from I/O Bus)	65mA
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
Status Indicators	2, indicates I/O Bus activity

PX-314 $00?es:

Four-channel, -10 to +10 VDC Analog Input Terminal

The PX-314 (type 1) Analog Input Terminal provides four electrically isolated -10 to +10 VDC inputs with 12-bit resolution and LED status.





General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	75g (2.6 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes, DC only
Adjacent Mounting on Bus Terminals without Power Contact	No
Passes Terminal Bus Power	Yes
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

***To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

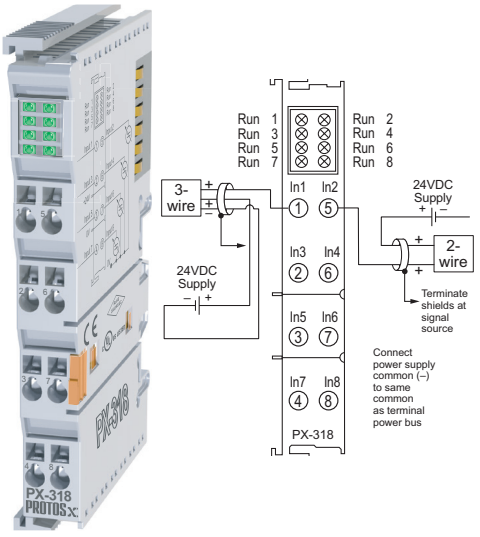
Terminal Specifications	
Number of Channels	4
Input Ranges	-10 to +10 VDC
Resolution	12 bits (11 bits between 0 to 10 VDC)
Input Type	Single-ended
Data Format	Decimal: -32767 to +32767
Data Bytes Consumed	PX-MOD: 8 bytes input PX-TCP1/TCP2: 16 bytes in/ 16 bytes out (not used)
Input Power Source	Voltage source external
Current Consumption (from Terminal Power Bus)	NA
Input Impedance	> 130kV
Absolute Max Ratings	30VDC surge
Conversion Time	Approx. 2ms
Full Scale Calibration Error	± 0.3% of full scale
Current Consumption (from I/O Bus)	100mA
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
Status Indicators	4, indicates I/O Bus activity

Analog Voltage Input Terminals

PX-318 $;00?et:

Eight-channel, -10 to +10 VDC Analog Input Terminal

The PX-318 (type 1) Analog Input Terminal provides eight electrically isolated -10 to +10 VDC inputs with 12-bit resolution and LED status.



General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	75g (2.6 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes, DC only
Adjacent Mounting on Bus Terminals without Power Contact	No
Passes Terminal Bus Power	Yes
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

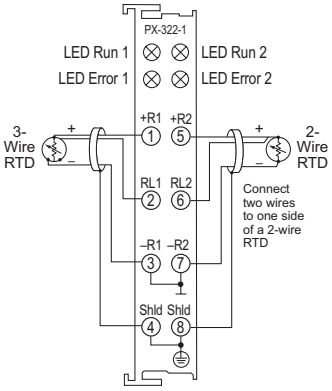
***To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

Terminal Specifications	
Number of Channels	8
Input Ranges	-10 to +10 VDC
Resolution	12 bits (11 bits between 0 to 10 VDC)
Input Type	Single-ended
Data Format	Decimal: -32767 to +32767
Data Bytes Consumed	PX-MOD: 16 bytes input
	PX-TCP1/TCP2: 32 bytes in/ 32 bytes out (not used)
Input Power Source	Voltage source external
Current Consumption (from Terminal Pwr Bus)	NA
Input Impedance	> 130kV
Absolute Max Ratings	30VDC surge
Conversion Time	Approx. 4ms
Full Scale Calibration Error	± 0.3% of full scale
Current Consumption (from I/O Bus)	140mA
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
Status Indicators	8, indicates I/O Bus activity

RTD Input Terminals

PX-322-1 $00?eu:

Two-channel RTD Input Terminal
The PX-322-1 (type 3) RTD Input Terminal provides two PT100 RTD inputs with full linearization and LED status.



General Specifications	
Operating Temp	0 to 55 °C
Storage Temp	-25 to 85 °C
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	70g (2.4 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes
Adjacent Mounting on Bus Terminals without Power Contact	Yes
Passes Terminal Bus Power	No
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

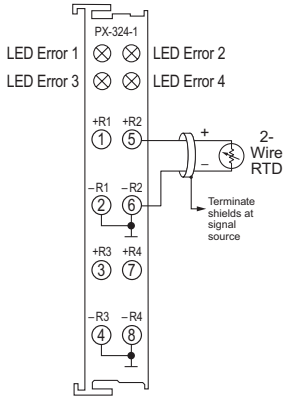
***To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

Terminal Specifications	
Number of Channels	2
Range	-200 to 850 °C
Resolution	0.1 °C per digit
Input Type	PT100
Data Bytes Consumed	PX-MOD: 4 bytes input PX-TCP1/TCP2: 8 bytes in/ 8 bytes out (not used)
Connection Method	2-wire or 3-wire (3-wire default)
Power Supply	Via I/O Bus
Conversion Time	Approx. 250ms
Measuring Current	5mA typical
Linearity Error	< ± 1°C
Current Consumption (from I/O Bus)	60mA
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
Status Indicators	4, see LED Status chart

LED Status		
LED	***LED ON***	***LED OFF***
Green LED: RUN	Normal Operation	Watchdog-timer overflow if no data transmitted within WD set time.
Red LED: ERROR	Sensor fault, e.g. broken wire	No Error

PX-324-1 $00?ev:

Four-channel RTD Input Terminal
The PX-324-1 (type 3) RTD Input Terminal provides four PT100 RTD inputs with full linearization and LED status.



General Specifications	
Operating Temp	0 to 55 °C
Storage Temp	-25 to 85 °C
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	70g (2.4 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes
Adjacent Mounting on Bus Terminals without Power Contact	Yes
Passes Terminal Bus Power	No
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

***To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

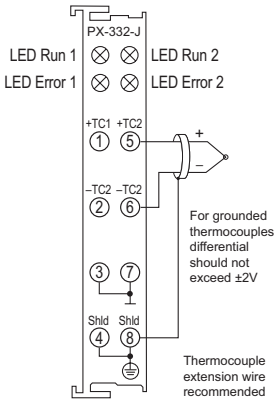
Terminal Specifications	
Number of Channels	4
Range	-200 to 850 °C
Resolution	0.1 °C per digit
Input Type	PT100
Data Bytes Consumed	PX-MOD: 8 bytes input PX-TCP1/TCP2: 16 bytes in/ 16 bytes out (not used)
Connection Method	2-wire
Power Supply	Via I/O Bus
Conversion Time	Approx. 250ms
Measuring Current	5mA typical
Linearity Error	< ± 1°C
Current Consumption (from I/O Bus)	60mA
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
Status Indicators	4, Red: sensor fault

Thermocouple Input Terminals

PX-332-J $00?ex:

Two-channel Type J Thermocouple Input Terminal

The PX-332-J (type 3) Thermocouple Input Terminal provides two Type J thermocouple inputs with full linearization, cold-junction compensation, and LED status.



General Specifications	
Operating Temp	0 to 55 °C
Storage Temp	-25 to 85 °C
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	70g (2.4 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes
Adjacent Mounting on Bus Terminals without Power Contact	Yes
Passes Terminal Bus Power	No
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

***To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

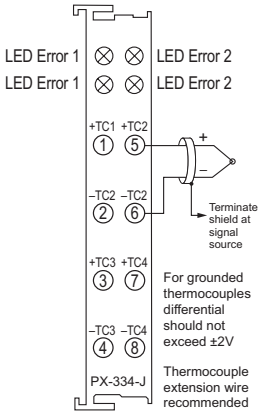
Terminal Specifications	
Number of Channels	2
Range	-100 to 1200 °C
Resolution	0.1 °C per digit
Input Type	Type J thermocouple
Data Bytes Consumed	PX-MOD: 4 bytes input
	PX-TCP1/TCP2: 8 bytes in/ 8 bytes out (not used)
Connection Method	2-wire (Thermocouple extension wire recommended)
Power Supply	Via I/O Bus
Conversion Time	Approx. 250ms
Measuring Current	5mA typical
Linearity Error	± 0.5% (relative to full scale value)
Current Consumption (from I/O Bus)	65mA
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
Status Indicators	4, see LED Status chart

LED Status		
LED	***LED ON***	***LED OFF***
Green LED: RUN	Normal Operation	Watchdog-timer overflow if no data transmitted within WD set time.
Red LED: ERROR	Sensor fault, e.g. broken wire	No Error

PX-334-J $00?ez:

Four-channel Type J Thermocouple Input Terminal

The PX-334-J (type 3) Thermocouple Input Terminal provides four Type J thermocouple inputs with full linearization, cold-junction compensation, and LED status.



General Specifications	
Operating Temp	0 to 55 °C
Storage Temp	-25 to 85 °C
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	70g (2.4 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes
Adjacent Mounting on Bus Terminals without Power Contact	Yes
Passes Terminal Bus Power	No
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

***To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

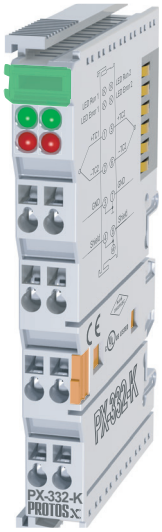
Terminal Specifications	
Number of Channels	4
Range	-100 to 1200 °C
Resolution	0.1 °C per digit
Input Type	Type J thermocouple
Data Bytes Consumed	PX-MOD: 8 bytes input
	PX-TCP1/TCP2: 16 bytes in/ 16 bytes out (not used)
Connection Method	2-wire (Thermocouple extension wire recommended)
Power Supply	Via I/O Bus
Conversion Time	Approx. 250ms
Measuring Current	5mA typical
Linearity Error	± 0.5% (relative to full scale value)
Current Consumption (from I/O Bus)	75mA
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
Status Indicators	4, Red: sensor fault/broken wire

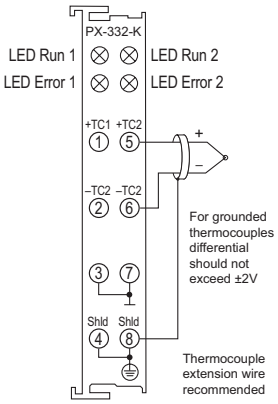
Thermocouple Input Terminals

PX-332-K $00?ey:

Two-channel Type K Thermocouple Input Terminal

The PX-332-K (type 3) Thermocouple Input Terminal provides two Type K thermocouple inputs with full linearization, cold-junction compensation, and LED status.





General Specifications	
Operating Temp	0 to 55 °C
Storage Temp	-25 to 85 °C
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	70g (2.4 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes
Adjacent Mounting on Bus Terminals without Power Contact	Yes
Passes Terminal Bus Power	No
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

***To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

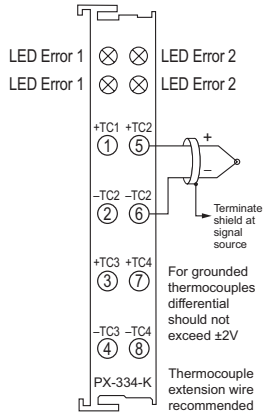
Terminal Specifications	
Number of Channels	2
Range	-100 to 1370 °C
Resolution	0.1 °C per digit
Input Type	Type K thermocouple
Data Bytes Consumed	PX-MOD: 4 bytes input
	PX-TCP1/TCP2: 8 bytes in/ 8 bytes out (not used)
Connection Method	2-wire (Thermocouple extension wire recommended)
Power Supply	Via I/O Bus
Conversion Time	Approx. 250ms
Measuring Current	5mA typical
Linearity Error	± 0.5% (relative to full scale value)
Current Consumption (from I/O Bus)	65mA
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
Status Indicators	4, see LED Status chart

LED Status		
LED	***LED ON***	***LED OFF***
Green LED: RUN	Normal Operation	Watchdog-timer overflow if no data transmitted within WD set time.
Red LED: ERROR	Sensor fault, e.g. broken wire	No Error

PX-334-K $;00?e]:

Four-channel Type K Thermocouple Input Terminal

The PX-334-K (type 3) Thermocouple Input Terminal provides four Type K thermocouple inputs with full linearization, cold-junction compensation, and LED status.



General Specifications	
Operating Temp	0 to 55 °C
Storage Temp	-25 to 85 °C
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	70g (2.4 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes
Adjacent Mounting on Bus Terminals without Power Contact	Yes
Passes Terminal Bus Power	No
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

***To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

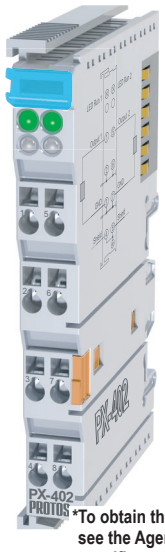
Terminal Specifications	
Number of Channels	4
Range	-100 to 1370 °C
Resolution	0.1 °C per digit
Input Type	Type K thermocouple
Data Bytes Consumed	PX-MOD: 8 bytes input
	PX-TCP1/TCP2: 16 bytes in/ 16 bytes out (not used)
Connection Method	2-wire (Thermocouple extension wire recommended)
Power Supply	Via I/O Bus
Conversion Time	Approx. 250ms
Measuring Current	5mA typical
Linearity Error	± 0.5% (relative to full scale value)
Current Consumption (from I/O Bus)	75mA
Electrical Isolation	500Vms (I/O bus/field potential)
Heat Dissipation	1W max
Status Indicators	4, Red: sensor fault/broken wire

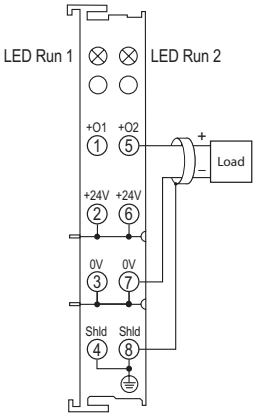
Analog Current Output Terminals

PX-402 $;00?e[:

Two-channel, 4-20 mA Analog Output Terminal

The PX-402 (type 1) Analog Output Terminal provides two electrically isolated, 4-20 mA outputs with 12-bit resolution and Run LED status.





*To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	80g (2.8 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes, DC only
Adjacent Mounting on Bus Terminals without Power Contact	No
Passes Terminal Bus Power	Yes
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

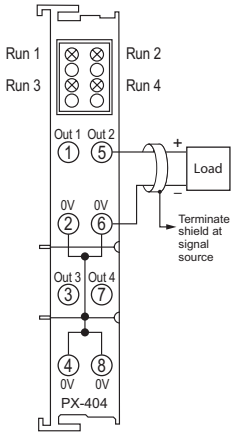
Terminal Specifications	
Number of Channels	2
Output Ranges	4 to 20 mA
Resolution	12 bit
Output Type	Single-ended
Data Format	Decimal: 0-32767
Data Bytes Consumed	PX-MOD: 4 bytes output
	PX-TCP1/TCP2: 8 bytes out/ 8 bytes in (not used)
Output Power Source	24VDC via terminal power bus
Current Consumption (from Load Voltage)	50mA + load
Source Load	< 500Ω (short-circuit protected)
Conversion Time	Approx. 1.5 ms
Accuracy	± 0.5 LSB linearity error, ± 0.5 LSB offset error ± 0.1% of the full scale value
I/O Bus current Consumption (5V)	60mA
Electrical Isolation	500Vms (I/O Bus/signal voltage)
Heat Dissipation	1W max
Status Indicators	2, see LED Status chart

LED Status		
LED	***LED ON***	***LED OFF***
Green LED: RUN	Normal Operation	Watchdog-timer overflow if no data transmitted within WD set time.

PX-404 $00?e_:

Four-channel, 4-20 mA Analog Output Terminal

The PX-404 (type 1) Analog Output Terminal provides four electrically isolated, 4-20 mA outputs with 12-bit resolution and Run LED status.



General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	80g (2.8 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes, DC only
Adjacent Mounting on Bus Terminals without Power Contact	No
Passes Terminal Bus Power	Yes
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

*To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

Terminal Specifications	
Number of Channels	4
Output Ranges	4 to 20 mA
Resolution	12 bit
Output Type	Single-ended
Data Format	Decimal: 0-32767
Data Bytes Consumed	PX-MOD: 8 bytes output
	PX-TCP1/TCP2: 16 bytes out/ 16 bytes in (not used)
Output Power Source	24VDC via terminal power bus
Current Consumption (from Load Voltage)	60mA + load
Source Load	< 350Ω (short-circuit protected)
Conversion Time	Approx. 4ms
Accuracy	± 0.5 LSB linearity error, ± 0.5 LSB offset error ± 0.1% of the full scale value
I/O Bus current Consumption (5V)	20mA
Electrical Isolation	500Vms (I/O Bus/signal voltage)
Heat Dissipation	1W max
Status Indicators	4, see LED Status chart

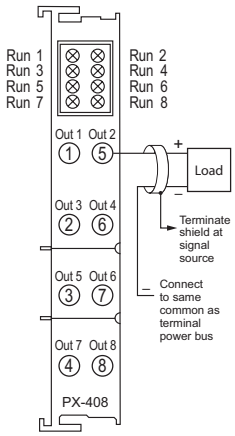
LED Status		
LED	***LED ON***	***LED OFF***
Green LED: RUN	Normal Operation	Watchdog-timer overflow if no data transmitted within WD set time.

Analog Current Output Terminals

PX-408 $00?e#:

Eight-channel, 4-20 mA Analog Output Terminal

The PX-408 (type 1) Analog Output Terminal provides eight electrically isolated, 4-20 mA outputs with 12-bit resolution and Run LED status.



General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	80g (2.8 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes, DC only
Adjacent Mounting on Bus Terminals without Power Contact	No
Passes Terminal Bus Power	Yes
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

***To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

Terminal Specifications	
Number of Channels	8
Output Ranges	4 to 20 mA
Resolution	12 bit
Output Type	Single-ended
Data Format	Decimal: 0-32767
Data Bytes Consumed	PX-MOD: 16 bytes output
	PX-TCP1/TCP2: 32 bytes out/ 32 bytes in (not used)
Output Power Source	24VDC via terminal power bus
Current Consumption (from Load Voltage)	50mA + load
Source Load	< 150Ω (short-circuit protected)
Conversion Time	Approx. 8ms
Accuracy	± 0.5 LSB linearity error, ± 0.5 LSB offset error ± 0.1% of the full scale value
I/O Bus current Consumption (5V)	25mA
Electrical Isolation	500Vms (I/O Bus/signal voltage)
Heat Dissipation	1W max
Status Indicators	8, see LED Status chart

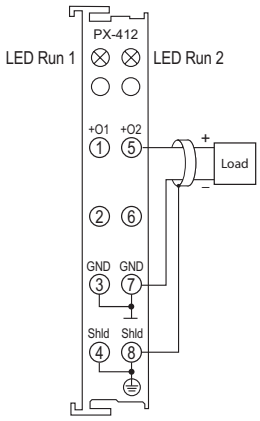
LED Status		
LED	***LED ON***	***LED OFF***
Green LED: RUN	Normal Operation	Watchdog error if no data transmitted within WD set time.

Analog Voltage Output Terminals

PX-412 $;00?e!:

Two-channel, 0 to 10 VDC Analog Output Terminal

The PX-412 (type 3) Analog Output Terminal provides two electrically isolated, 0 to 10 VDC outputs with 12-bit resolution, common ground potential, and Run LED status.



General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	85g (3.0 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes
Adjacent Mounting on Bus Terminals without Power Contact	Yes
Passes Terminal Bus Power	No
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

***To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

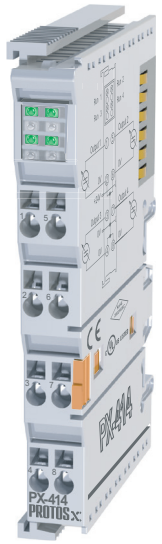
Terminal Specifications	
Number of Channels	2
Output Ranges	0 to 10 VDC
Resolution	12 bit
Output Type	Single-ended
Data Format	Decimal: 0-32767
Data Bytes Consumed	PX-MOD: 4 bytes output PX-TCP1/TCP2: 8 bytes out/ 8 bytes in (not used)
Output Power Source	24VDC via terminal power bus
Current Consumption (from Load Voltage)	50mA + load
Source Load	> 5kV (short-circuit protected)
Conversion Time	Approx. 1.5 ms
Accuracy	± 0.5 LSB linearity error, ± 0.5 LSB offset error ± 0.1% of the full scale value
I/O Bus current Consumption (5V)	75mA
Electrical Isolation	500Vms (I/O Bus/signal voltage)
Heat Dissipation	1W max
Status Indicators	2, see LED Status chart

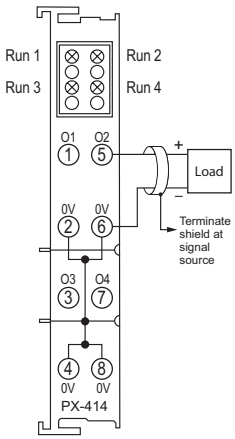
LED Status		
LED	***LED ON***	***LED OFF***
Green LED: RUN	Normal Operation	Watchdog error if no data transmitted within WD set time.

PX-414 $00?e?:

Four-channel, 0 to 10 VDC Analog Output Terminal

The PX-414 (type 1) Analog Output Terminal provides four electrically isolated, 0 to 10 VDC outputs with 12-bit resolution, common ground potential, and Run LED status.w





General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	85g (3.0 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes, DC only
Adjacent Mounting on Bus Terminals without Power Contact	Yes
Passes Terminal Bus Power	No
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

***To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

Terminal Specifications	
Number of Channels	4
Output Ranges	0 to 10 VDC
Resolution	12 bit
Output Type	Single-ended
Data Format	Decimal: 0-32767
Data Bytes Consumed	PX-MOD: 8 bytes output PX-TCP1/TCP2: 16 bytes out/ 16 bytes in (not used)
Output Power Source	24VDC via terminal power bus
Current Consumption (from Load Voltage)	50mA + load
Source Load	> 5kV (short-circuit protected)
Conversion Time	Approx. 1.5 ms
Accuracy	± 0.5 LSB linearity error, ± 0.5 LSB offset error ± 0.1% of the full scale value
I/O Bus current Consumption (5V)	75mA
Electrical Isolation	500Vms (I/O Bus/signal voltage)
Heat Dissipation	1W max
Status Indicators	2, see LED Status chart

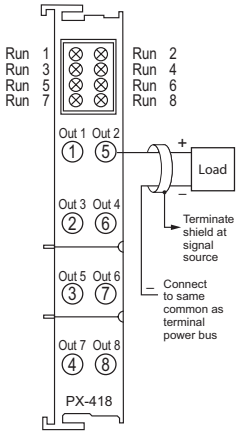
LED Status		
LED	***LED ON***	***LED OFF***
Green LED: RUN	Normal Operation	Watchdog error if no data transmitted within WD set time.

Analog Voltage Output Terminals

PX-418 $;00?e,:

Eight-channel, -10 to +10 VDC Analog Output Terminal

The PX-418 (type 1) Analog Output Terminal provides eight electrically isolated, -10 to +10 VDC outputs with 12-bit resolution, common ground potential, and Run LED status.



General Specifications	
Operating Temp	32 to 131 °F (0 to 55 °C)
Storage Temp	-13 to 185 °F (-25 to 85 °C)
Relative Humidity	5% to 95%, non-condensing
Environment Air	No corrosive gases permitted
Mounting/ Orientation Restrictions	35mm DIN rail/None
Vibration	Conforms to EN 60068-2-6
Shock	Conforms to EN 60068-2-27/ EN 60068-2-29
Noise Immunity	Conforms to EN 61000-6-2/ EN61000-6-4
Protection Class	IP20
Weight	85g (3.0 oz)
Dimensions (WxHxD)	12 x 100 x 68.8 mm (0.47 x 3.94 x 2.71 in)
Adjacent Mounting on Bus Terminals with Power Contact	Yes, DC only
Adjacent Mounting on Bus Terminals without Power Contact	No
Passes Terminal Bus Power	Yes
Passes PE Bus	No
Agency Approvals*	UL/cUL File No. E157382, CE

***To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.**

Terminal Specifications	
Number of Channels	8
Output Ranges	-10 to +10 VDC
Resolution	12 bit
Output Type	Single-ended
Data Format	Decimal: 0-32767
Data Bytes Consumed	PX-MOD: 16 bytes output
	PX-TCP1/TCP2: 32 bytes out/ 32 bytes in (not used)
Output Power Source	24VDC via terminal power bus
Current Consumption (from Load Voltage)	20mA
Source Load	> 5kV (short-circuit protected)
Conversion Time	Approx. 8ms
Accuracy	± 0.5 LSB linearity error, ± 0.5 LSB offset error ± 0.1% of the full scale value
I/O Bus current Consumption (5V)	20mA
Electrical Isolation	500Vms (I/O Bus/signal voltage)
Heat Dissipation	1W max
Status Indicators	8, see LED Status chart

LED Status		
LED	***LED ON***	***LED OFF***
Green LED: RUN	Normal Operation	Watchdog error if no data transmitted within WD set time.