SIEMENS

Technical Specification Sheet
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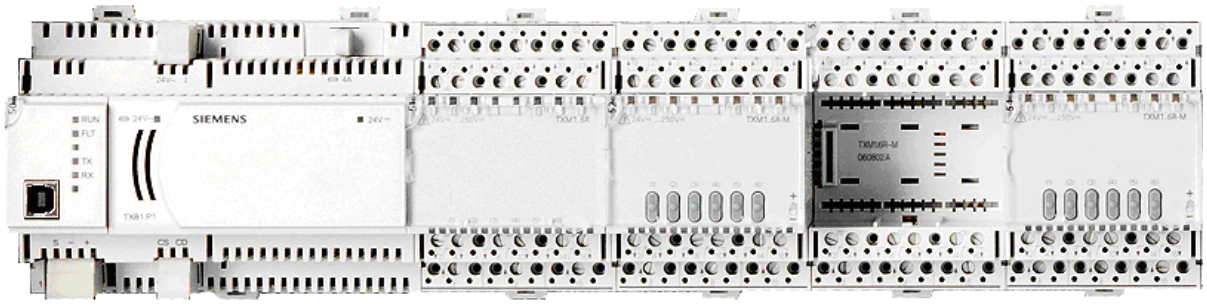
TX-I/O Product Range



Description

TX-I/O™ is a range of I/O modules, with associated power and communication modules, for use within the APOGEE Automation System. The TX-I/O product range includes the following:

- Eight types of I/O modules, which act as signal converters. The I/O modules communicate between the PXC Modular or the PXC-36 and the related devices in the building services plant.
- TX-I/O Power Supply for the TX-I/O modules.
- TX-I/O Bus Connection Module, which bridges communication and power from one DIN rail to another.
- TX-I/O Island Bus Expansion (IBE) module, which bridges communication between the primary field panel and expansion field panels.
- P1 Bus Interface Module (BIM), which connects TX-I/O modules to the P1 FLN. The P1 BIM provides power for TX-I/O modules, but it does not contain applications or perform control; the control database for the TX-I/O points resides in a field panel.

TX-I/O Modules provide I/O points for APOGEE based upon TX-I/O Technology. TX-I/O Technology provides flexibility of point types, tremendous flexibility of signal types and support for manual operation.

There are eight types of TX-I/O modules:

- 8 point DI module (TXM1.8D)
- 16 point DI module (TXM1.16D)
- 6 point DO with Relay module (TXM1.6R)
- 6 point DO with Relay and Manual Override module (TXM1.6R-M)
- 8 point Universal module (TXM1.8U)
- 8 point Universal with local override/identification device (LOID) module (TXM1.8U-ML)
- 8 point Super Universal module (TXM1.8X)
- 8 point Super Universal with LOID module (TXM1.8X-ML)

Features

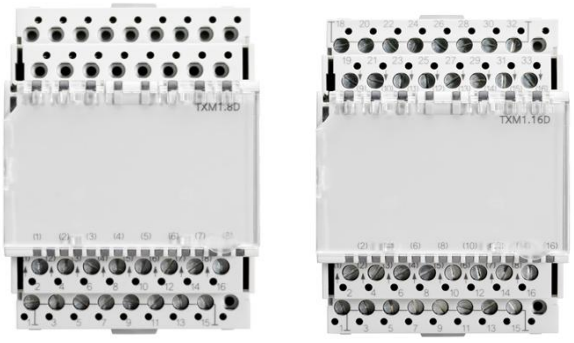
- The *self-forming TX-I/O island bus* transmits power as well as communication signals.
  - The TX-I/O island bus can be extended a maximum of 164 feet (50 meters).
  - Adding an Island Bus Expansion (IBE) module expands communication data up to an additional maximum of 200 feet (61 m) in two directions.
- *Hot-swappable electronic components* allow powered electronics to be disconnected and replaced without removing terminal wiring or disturbing the self-forming bus.

All TX-I/O modules include the following features:

- DIN rail mounting.
- High density (point count to physical dimensions).
- Hardware addressed with address keys.
- Removable label holder that allows for customized point labels.
- LEDs that provide status indication and diagnostic information for the I/O module, as well as for each point on the module.
- Separable into terminal base and plug-in I/O module electronics for:
  - Improved installation workflow, allowing field wiring to be terminated prior to installation of electronics.
  - Optimum diagnostics—connected peripheral devices can be measured without affecting or being affected by the I/O module.
  - Quick replacement of electronics for service.

Module Introduction

Digital Input Modules (TXM1.8D and TXM1.16D)

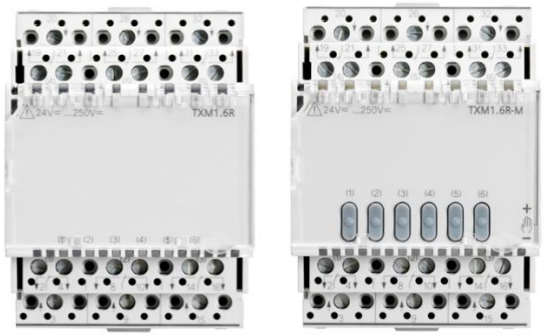


The TXM1.8D and TXM1.16D are dedicated to monitoring, respectively, 8 and 16 digital input points.

- They monitor status signals from normally open (NO) or normally closed (NC), latched voltage free/dry contacts.
- All 8 points on the TXM1.8D module, as well as 8 of the 16 points on the TXM1.16D module, may be used as pulse counters up to 10 Hz.
- Each input point has a green LED for status indication.

NOTE: No potential (dry contact) for all points.

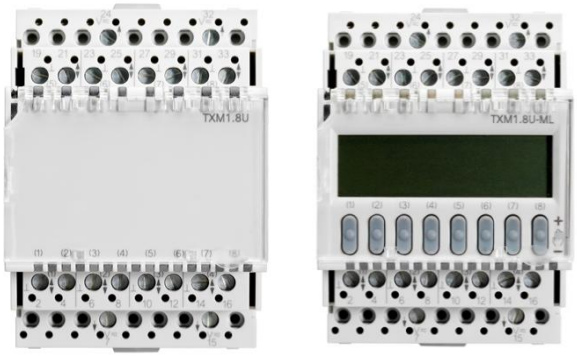
Digital Output Modules (TXM1.6R and TXM1.6R-M)



The TXM1.6R and TXM1.6R-M Digital Output Modules provide six NO or NC (form C), maintained or pulsed, voltage free/dry contacts.

- The contacts are rated for a maximum of 250 Vac at 4A.
- Each I/O point has a green LED for status indication.
- The TXM1.6R-M module is also equipped with manual override switches. An orange LED per override switch indicates override status individually per point.

Universal Modules (TXM1.8U and TXM1.8U-ML)



The TXM1.8U and TXM1.8U-ML Universal I/O modules provide 8 points, which can be individually software configured as digital input, analog input, or analog output to best meet the specific application needs.

All Universal I/O modules provide:

- Class 2 AC distribution voltage for peripheral devices, such as valves and actuators.

- Green LED status per I/O point that varies in intensity according to the voltage and current (directly proportional).

Digital input support includes:

- Voltage free/dry contacts
- Pulse counters up to 25 Hz

Analog input sensor support includes:

- 1K Nickel – Landis & Gyr curve
- 1K Platinum – 375 and 385 coefficient
- 10K and 100K Thermistor – Type II Curve

Active input and output support includes:

- Analog input voltage 0-10 Vdc
- Analog output voltage 0-10 Vdc

TXM1.8U-ML modules are also equipped with a local override/identification device (LOID), which includes an LCD signal display. The LCD displays the following information for each I/O point:

- Configured signal type
- Symbolic display of process value
- Notification of faulty operation, short circuit, or sensor open circuit

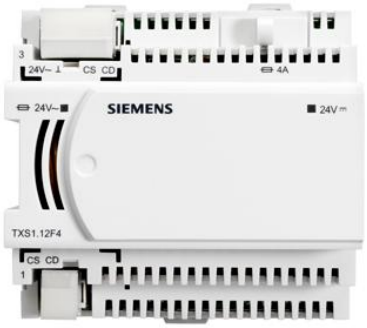
Orange LEDs indicate override status individually per point.

Super Universal Modules (TXM1.8X and TXM1.8X-ML)

The TXM1.8X and TXM1.8X-ML Super Universal modules share all of the Universal module features, and also provide:

- Analog input current 4-20 mA
- Analog output current 4-20 mA
  (four current outputs maximum per module on Points 5 through 8)
- 24 Vdc distribution from power supply for sensors at a maximum of 200 mA per module

TX-I/O Power Supply (TXS1.12F4)



The TX-I/O Power Supply generates 24 Vdc at 1.2A to power TX-I/O modules and peripheral devices.

- Up to 4 TX-I/O Power Supplies can be operated in parallel, with a maximum of two per DIN rail.
- It can be located within a row of TX-I/O modules or at the beginning of a new DIN rail.

The TX-I/O Power Supply performs the following functions:

- Transfers 24 Vac at 4A to power TX-I/O modules and peripheral devices.
- Routes CS (+24 Vdc Communication Supply) and CD (Communication Data signal) between DIN rails.
- Provides an input point for 24 Vac to power additional peripheral devices.
- Isolates the 24 Vac peripheral device supply in case of overload or short-circuit with Class 2 distribution. The replaceable AC fuse can be accessed from an installed module.
- Indicates the AC fuse status (via LED) for easy diagnostics.

TX-I/O Bus Connection Module (TXS1.EF4)

The Bus Connection Module transfers DC power for TX-I/O modules and peripheral devices and transfers AC power for peripheral devices.

- It can be located within a row of TX-I/O modules or at the beginning of a new DIN rail.

The TX-I/O Bus Connection Module performs the following functions:

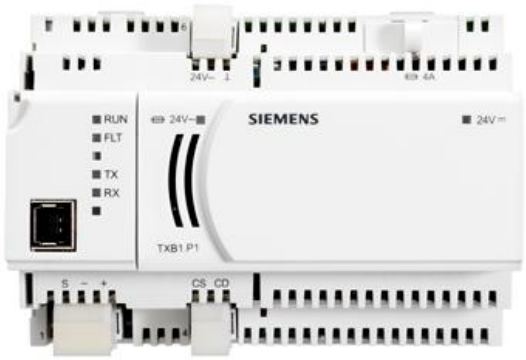
- Routes CS (+24 Vdc Communication Supply) and CD (Communication Data Signal) between DIN rails.
- Provides an input point for 24 Vac to power additional peripheral devices.
- Isolates the 24 Vac peripheral device supply in case of overload or short-circuit with Class 2 distribution. The replaceable AC fuse can be accessed from an installed module.
- Indicates the AC fuse status (via LED) for easy diagnostics.

TX-I/O Island Bus Expansion Module (TXA1.IBE)

The TX-I/O Island Bus Expansion (IBE) module increases the distance between the primary field panel and expansion field panels without affecting the TX-I/O island bus maximum distance.

- An LED provides an indication of island bus communication.
- The IBE converts the TX-I/O island bus signal on the self-forming rail to an RS-485 signal level on the connector.
  - Each IBE module supports a maximum of two RS-485 segments.
  - Each segment may extend up to 200 ft (61 m) from the primary enclosure.
  - The island bus length extended from the primary field panel is added to island bus length extended from any expansion panel. RS-485 segment length between the IBEs does not add to the island bus length.
- The IBE does not transfer power over the RS-485 segment.
- Switches set the IBE as the TX-I/O island bus master (BM) or an RS-485 end-of-line terminator.
- A programming tool is not required.
- A maximum of 5 IBEs may be installed on the island bus: one IBE in the primary enclosure plus one in each expansion enclosure (maximum of 4).
- Only one Island Bus Expansion (IBE) module per enclosure is permitted.
- Expansion enclosures must be supplied using a separate TX-I/O Power Supply. Loss of this power does not affect the primary enclosure.

P1 Bus Interface Module (TXB1.P1 and TXB1.P1-4)



The P1 Bus Interface Module (P1 BIM) provides P1 FLN communication and power for TX-I/O modules. It does not contain application or control for the TX-I/O modules.

The P1 BIM provides the following features:

- Communication on the P1 FLN or MEC Expansion Bus.
- 24 Vac input.
- Generation of 24 Vdc at 600 mA to power TX-I/O modules and peripheral devices.
- Plug-in screw terminals.
- Isolates the peripheral device supply in case of overload or short-circuit with Class 2 distribution. The replaceable AC fuse can be accessed from an installed module.
- Separate LEDs for module operation, FLN communication activity, 24 Vdc present on the TX-I/O island bus, and monitoring of the 24 Vac fuse.

TXB1.P1

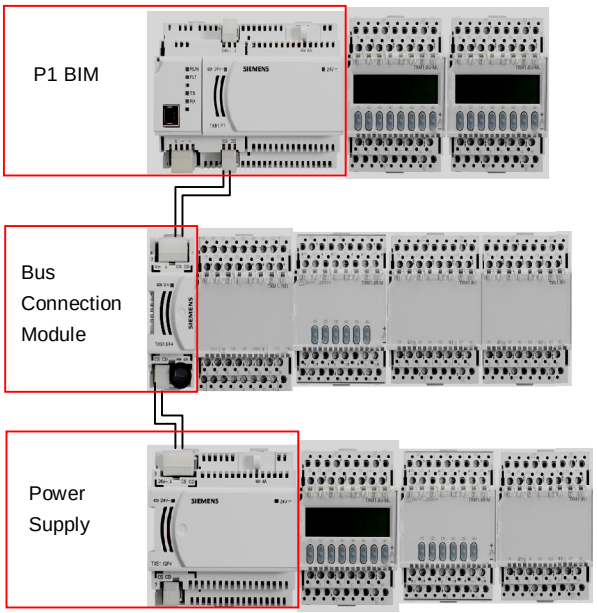
- Support for 80 TX-I/O points.
- Support for up to 10 I/O modules.
- Transfer of 24 Vac at a maximum of 4A to power peripheral devices.
- Up to three TX-I/O Power Supplies can be operated in parallel, max of 2 per DIN.

TXB1.P1-4

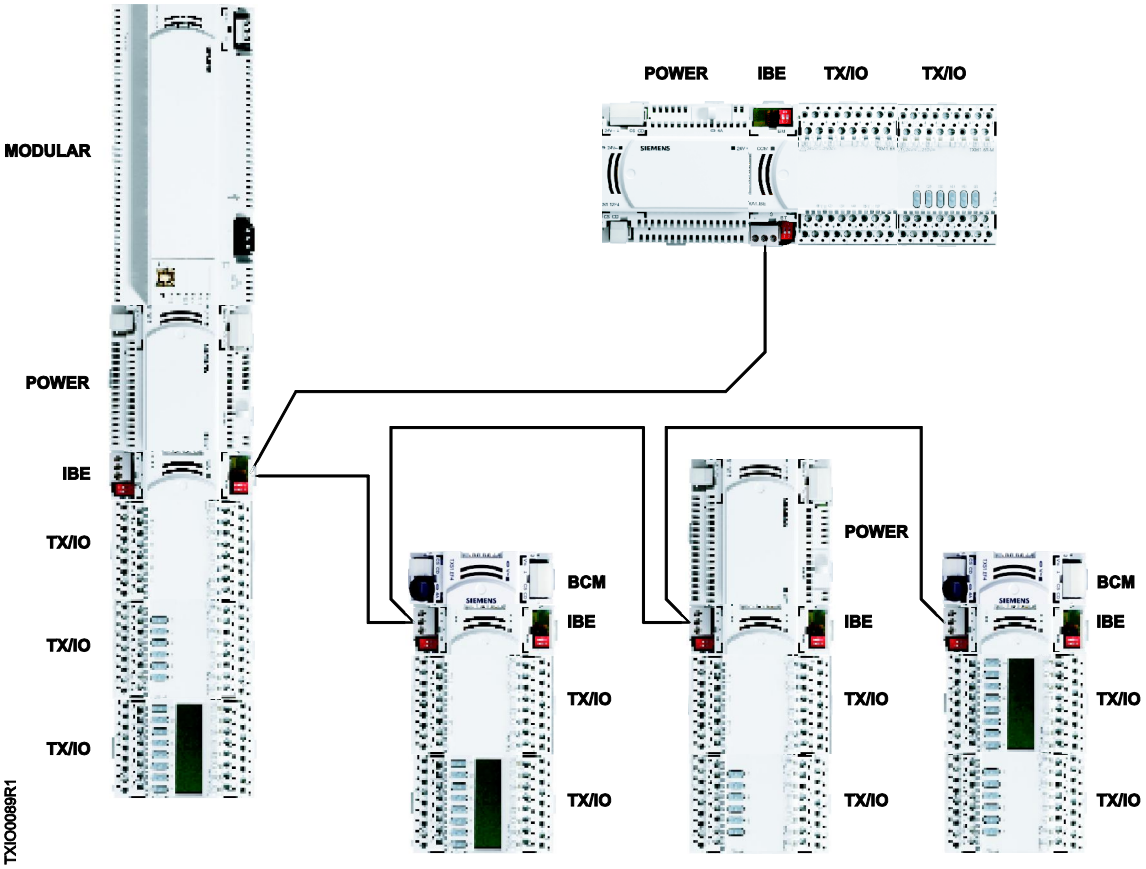
- Support for 64 TX-I/O points.
- Support for up to 4 I/O modules.

TX-I/O island bus Extension

The following picture shows the TX-I/O island bus extended using a Bus Connection Module and TX-I/O Power Supply. This configuration allows the TX-I/O island bus to extend a maximum of 164 feet (50 meters), and may extend outside an enclosure.



The following picture shows the TX-I/O island bus expanded using five Island Bus Expansion modules.



I/O Functions by Module

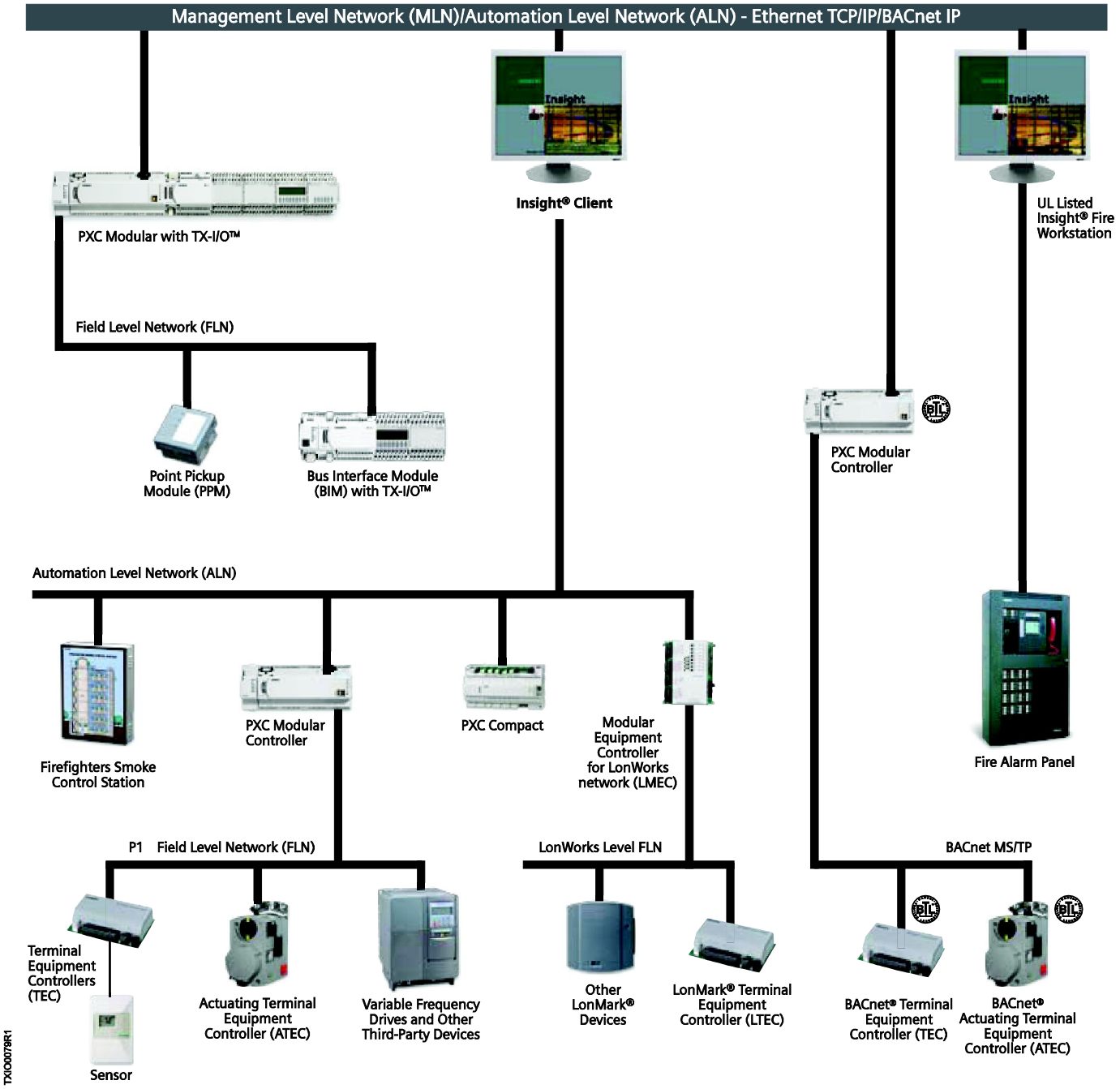
TX-I/O™ function	Description	Module type							
		TXM1.8D	TXM1..16D	TXM1.8U	TXM1.8U-ML	TXM1.8X	TXM1.8X-ML	TXM1.6R	TXM1.6R-M
		Maximum number of functions per module							
Digital inputs									
Binary Input	Status indication, voltage-free/dry contact	8	16	8	8	8	8		
Counter	Count/accumulator, voltage-free/dry pulse contact	8	8	8	8	8	8		
Analog Inputs									
	Temperature LG-Ni1000			8	8	8	8		
	Temperature Pt 1000 375			8	8	8	8		
	Temperature Pt 1000 385			8	8	8	8		
	Temperature (NTC) 10 K			8	8	8	8		
	Temperature (NTC) 100 K			8	8	8	8		
	Voltage, DC 0, 10V *			8	8	8	8		
	Current DC 4, 20 mA *					8	8		
Digital outputs									
BO OnOff	Latched contact, AC/DC 250V, 4A							6	6
BO Pulse	Pulse							6	6
Analog Outputs									
	DC 0..10 V *			8	8	8	8		
	DC 4 ... 20 mA *					4	4		

* Active inputs and active outputs (0-10V and 4-20 mA) must be located on different modules if sensors are externally powered.

TX-I/O Network Architecture Example

The following architecture picture shows TX-I/O modules connected to:

- A P1 BIM located on the Field Level Network.
- A PXC Modular on Ethernet TCP/IP.



Specifications:

Dimensions (L × W × D)	
TX-I/O Modules	2.52” × 3.54” × 2.75” (64 mm × 90 mm × 70 mm)
TX-I/O P1 BIM	5” × 3.54” × 2.75” (128 mm × 90 mm × 70 mm)
TX-I/O Power Supply	3.78” × 3.54” × 2.75” (96 mm × 90 mm × 70 mm)
TX-I/O Bus Connection Module	1.26” × 3.54” × 2.75” (32 mm × 90 mm × 70 mm)
TX-I/O Island Bus Expansion (IBE) Module	1.26” × 3.54” × 2.75” (32 mm × 90 mm × 70 mm)
Electrical	
Power Requirements	24 Vac +/-20% input @ 50 or 60 Hz
Power Consumption	
Power Supply	35 VA with 96 VA pass-thru
Bus Connection Module	0 VA with 96 VA pass-thru
TX-I/O P1 BIM	20 VA with 96 VA pass-thru
With the above power consumption, the Power Supply produces 28.8 W (1.2A at 24 Vdc) and the P1 BIM provides 14.4 W (0.6A at 24 Vdc) to be used by the following:	
TXM1.8D	1.1 W
TXM1.16D	1.4 W
TXM1.8U	1.5 W
TXM1.8U-ML	1.8 W
TXM1.8X	2.2 W
TXM1.8X-ML	2.3 W
TXM1.6R	1.7 W
TXM1.6R-M	1.9 W
Island Bus Expansion Module	1.2 W
Terminations	
I/O Terminals	20-12 AWG Solid 20-14 AWG Stranded
Power Supply, BCM, P1 BIM, and IBE	2-, 3-, or 4-position screw terminal pluggable blocks
Operating Environment	32°F to 122°F (0°C to 50°C), 5 to 95% rh, non-condensing
Agency Listings	UL 864 UUKL Smoke Control Equipment ULC/ORD-C100-1992 UUKL7 Smoke Control Equipment UL 916 PAZX CSA 22.2 No. 205 PAZX7
Agency Compliance	FCC Compliance Australian EMC Framework (C-Tick) European EMC Directive (CE) European Low Voltage Directive (LVD) RoHS Compliant

Ordering Information

TX-I/O I/O Modules

Product Number	Description
TXM1.8D	TX-I/O Module, 8 DI points
TXM1.16D	TX-I/O Module, 16 DI points
TXM1.8U	TX-I/O Module, 8 Universal points
TXM1.8U-ML	TX-I/O Module, 8 Universal points with LOID
TXM1.8X	TX-I/O Module, 8 Super Universal points
TXM1.8X-ML	TX-I/O Module, 8 Super Universal points with LOID
TXM1.6R	TX-I/O Module, 6 DO with Relay points
TXM1.6R-M	TX-I/O Module, 6 DO with Relay points with manual override

TX-I/O Power Supply and Bus Modules

Product Number	Description
TXS1.12F4	TX-I/O Power Supply, 1.2 A, 4A Fuse
TXS1.EF4	TX-I/O Bus Connection Module, 4A Fuse
TXA1.IBE	TX-I/O Island Bus Expansion Module with RS-485 connection.
TXB1.P1	TX-I/O Bus Interface Module, P1, 10-module
TXB1.P1-4	TX-I/O Bus Interface Module, P1, 4-module

Accessories

Product Number	Description
TXA1.K12	One set of address keys, numbers 1-12
TXA1.K24	One set of address keys, numbers 1-24
TXA1.K-48	One set of address keys, numbers 25-48
TXA1.K-72	One set of address keys, numbers 49-72
TXA1.LLT-P100	Labels for TX-I/O 100 sheets/pack Letter format
TXA1.LH	Replacement label holders

Regions where this Product is Sold

(US, Asia Pacific, Canada, Latin America, UK)

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