

TX-I/O Modules Installation for UL/ULC Applications



NOTE:

Follow the installation instructions and regulatory requirements in this document if you are installing TX-I/O™ products purchased through Siemens North America. This Installation Instruction is available (<https://sid.siemens.com/v/u/A6V10243914>). All installations must conform to national and local codes and regulations (NEC, CEC, etc.).

Product Description

TX-I/O™ is a range of I/O modules, with associated power and communication modules. Each I/O module consists of a Terminal Base with I/O Bus and an Electronic Module which communicate between the field panel controller and the related field devices in the building services plant

Product Numbers

TXM1.8D	Eight Digital Input points may be used as pulse counters up to 10 Hz.
TXM1.16D	16 Digital Input points, 8 of the 16 points may be used as pulse counters up to 10 Hz.
TXM1.6R TXM1.6R-M	Six Digital Output points, Class 1 relay. TXM1.6R-M includes manual override switches.
TXM1.4D3R*	Four Digital Input points may be used as pulse counters up to 10Hz and 3 Digital Output points Class 1 relay.
TXM1.8U TXM1.8U-ML	Eight points, which can be individually configured as Analog Input, Analog Output, or Digital Input. Distributes 24 Vac to power actuators. TXM1.8U-ML includes local override buttons and an LCD signal display.
TXM1.8X TXM1.8X-ML	Eight points, which can be individually configured as Analog Input, Analog Output, or Digital Input. Distributes 24 Vac to power actuators and 24 Vdc to power sensors. TXM1.8X-ML includes local override buttons and an LCD signal display.
TXM1.8T*	Eight Triac output points, 125 mA / 3 VA each or 250 mA / 6 VA for 3-Pos, 1 A maximum per module. TX-I/O Bus Field Device Supply must be 24 Vac only, insert TXS1. EF4 before if needed.

*c-UL listed

Warning/Caution Notations



WARNING

Personal injury or property damage may occur if you do not follow a procedure as specified.



CAUTION

Equipment damage or loss of data may occur if you do not follow a procedure as specified.

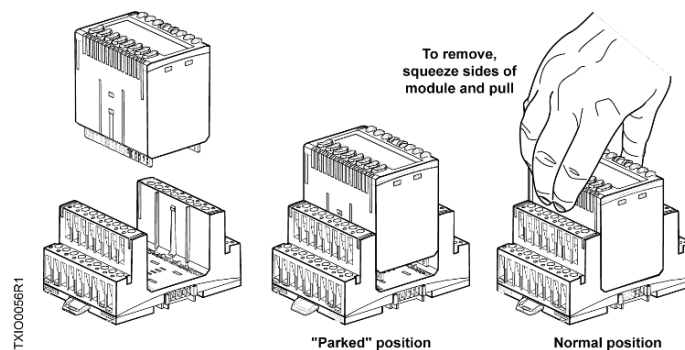


Figure 1. Module Example (Universal I/O).

Required Tools and Materials

- Wire stripper/side cutter
- Small flat-blade screwdriver
- Digital multimeter (DMM)

Expected Installation Time

7 minutes

Prerequisites

	CAUTION
	No power wiring is connected to the field panel controller or other TX-I/O components at this time.

	CAUTION
	The TX-I/O island bus must be mounted on a DIN rail (1.38" x 0.3" x 0.04" (35 mm x 7.5 mm x 1 mm)).

	CAUTION
	For information on point wiring or extending the TX-I/O island bus outside the enclosure, see table <i>Wire Type Requirements</i> .

	NOTE:
	Depending on the module types and point configurations used, one service box transformer may have insufficient power for more than two TX-I/O Power Supplies. More power may be required if using a Modular Series with the maximum number of TX-I/O modules.

Energy Management Installations

- NEMA-Type 1 or better enclosure with DIN rails
- Source of 24 Vac or 24 Vdc Input power for associated power or communication modules
- Any Energy Management TX-I/O Controller
- Any Smoke Control Device listed below

For Smoke Control Installations

- PXA-ENC19 or PXA-ENC34 Enclosure
- PXA-SB115V192VA, PXA-SB230V192VA, PXA-SB115V384VA, or PXA-SB230V384VA Service Box (24 VAC Output for Smoke Control)
- TXS1.12F4 Power Supply, TXS1. EF4 Bus Connection Module or TXA1. IBE Island Bus Expansion Module
- Any PXC7, PXC5, PXC4, PXC100, TC1000, PXC36, TC36 Controller or TXB1. P1 Bus Interface
- Supply 24VDC, 2.0W Max, 0.083 A Max

Supply 24VDC, 2.0W Max, 0.083 A Max For all Installations

- Enclosure is installed with DIN rail mounted
- Appropriate Low Voltage Source is installed
- Appropriate Input Power for Source is installed
- System Neutral is grounded with a single point earth ground at the Low Voltage Source
- Low Voltage Power is OFF
- Power and communication wiring is terminated to removable plugs on associated devices
- Electronic modules are either removed from or parked in the terminal bases with key rotated out
- All necessary field device wiring is pulled and terminated on base per the layout drawing
- Class 1 Relay Current Interrupt is installed at field device in series with external supply line
- For indoor dry installations only
- Field wiring range 12-20AWG
- All circuits are non-supervised.

General Installation Requirements

	CAUTION
	All devices not isolated by an Island Bus Expansion module (TXA1. IBE) must be connected to the same grounding point.

	CAUTION
	TX-I/O components require a system neutral with single point earth ground at the secondary neutral transformer. Do not connect these components to a floating system neutral.

Power Requirements

TX-I/O Bus power and communication enters Terminal Base female connector to male connector.

- Pin 1, Communication Data CD
- Pin 2, Module Supply CS, 24 VDC
- Pin 3, Not connected
- Pin 4, System Neutral $\perp$, 24 VAC/24 VDC
- Pin 5, Field Device Supply 24 VAC/24 VDC

NOTE: Field device supply 24Vdc is for Energy Management only.

I/O Module Insertion Required for Proper Grounding

All measuring/neutral terminals are connected in the plug-in I/O module, not in the terminal base. When the plug-in I/O module is removed, these terminals are not connected.

	WARNING
	Install external supply line fusing in series with relay contacts at controlled device. Fuse type and value should be the lowest required by control relay datasheet or controlled device datasheet. Maximum type and value for Slow-blow fuse is 6 A or Circuit breaker 10 A Characteristic B, C, D according to EN 60898. Failure to install fuse may result in damage to relay or device.

Installation

	WARNING
	Turn OFF AC power at the ON/OFF switch in the Service Box or transformer enclosure.
	CAUTION
	UL/c-UL Listings require that NEC Class I and Class II wiring be kept separate from each other. Use separate conduit and cable tie bars to separate Class I Digital Output (DO) wires from all other Class II wiring by a minimum of 1/4in. (6.4mm).
	CAUTION
	The TX-I/O™ island bus must extend from the male bus connector of the TX-I/O Power Supply, Bus Connection Module or Bus Interface Device. - Male bus connector supplies I/O modules with fuse protected 24 Vac/dc distribution, 24 Vdc power and TX-I/O communication. Analog I/O modules detect loss of 24Vac/dc. - Female bus connector where provided shares 24 Vdc power and TX-I/O communication but does not connect 24Vac/dc field device power.

	CAUTION
	Only insert or remove the field panel controller, TX-I/O Power Supply, Bus Connection Module or Bus Interface Device when the power is OFF.



This device includes electrical and electronic components and must not be disposed of as domestic waste. Product recovery and disposal must comply with all national and local regulations.

Basic Steps for Connecting Devices to the DIN Rail

The island bus establishes its own connection when TX-I/O™ devices are plugged into one another on a DIN rail.

1. Slide out the mounting tabs.
2. Align the channel on the back of the device with the DIN rail.
3. Using a flat blade screwdriver, push in each mounting tab until it clips onto the DIN rail.
4. Align female bus connector of an I/O module with a male bus connector and slide the I/O module down over the TX-I/O island bus connector.
5. Push in each mounting tab until it clips onto the DIN rail.

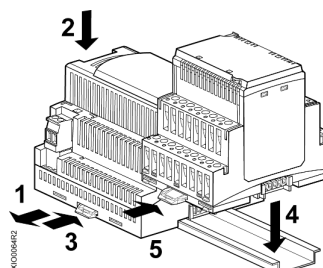


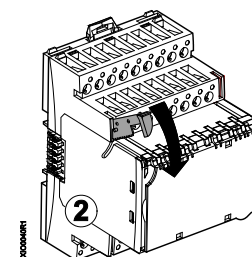
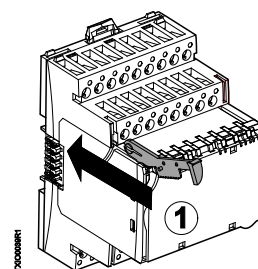
Figure 2: Connecting Devices to the TX-I/O Island Bus.

Completing the TX-I/O Module Installation

1. Fully seat each TX-I/O module in its Terminal Base.
2. Remove the address keys from the strip and then insert as shown.

NOTE: Key was likely inserted in base during prerequisite termination of field device wiring and rotated out as shown in Figure 4 when Electronic Module was Parked or Removed. Check to see if Key is fully seated in base.

NOTE: The TX-I/O address keys must be correctly seated and closed in order to function. Make sure the top of the address key is aligned/flush with the top of the module.



3. Insert the TX-I/O Module labels.
 - Tear out and fold the labels.
 - Match each label to the address key and slide the label into the detachable label holder.

The installation is now complete.

Wire Type Requirements

TX-I/O Wire Type Requirements.				
Circuit Type	Class	Wire Type	Maximum Distance ¹	Conduit Sharing ²
AC Line Power (120V or greater) to transformer	1	No. 12 to No. 14 AWG THHN	See NEC and PX Series Service Boxes	Check local codes
Universal Input/Output	2	No.18 to No.22 AWG, TP ³) or TSP ⁴ CM (FT4) or CMP (FT6) ³)	750 ft (230 m) ¹⁾	Check local codes
Low Voltage Input/Output on SCS (Basic Link)	2	24 AWG UTP ⁵), solid 4 pair unshielded	295 ft (90 m) ¹⁾	Check local codes
Low Voltage Input/Output on SCS (Patch Cables)	2	24 AWG UTP ⁵), stranded 4 pair unshielded	33 ft (10 m) ¹⁾	Check local codes
Dedicated Digital Input	2	No.14 to No.22 AWG. TP not required below 1 Hz. at faster pulse speeds, use TP or TSP ⁴); check job specifications and local codes.	750 ft (230 m)	Check local codes

TX-I/O Wire Type Requirements.				
Circuit Type	Class	Wire Type	Maximum Distance ¹	Conduit Sharing ²⁾
Digital Output	1, 2	No.14 to No.22 AWG. TP not required; check job specifications and local codes.	Check local codes	Check local codes
TX-I/O Island Bus Low voltage AC, low voltage DC, and communication inside low voltage enclosure.	2	No. 14 or 16 AWG, 2 Twisted Pair (TP)	10 ft (3 m)	N/A
TX-I/O Island Bus Low voltage AC, low voltage DC, and communication between enclosures or inside high voltage enclosures ⁷⁾ .	2	1 Twisted Shielded Pair (TSP) + 1 Twisted Shielded 3C (Triad) -or- 1 Twisted Shielded 4C, No. 14 AWG or 16 AWG	164 ft (50m) ⁶⁾	Check local codes
TX-I/O Island Bus Expansion Communication and Power	2	24 AWG 1.5-pair (1 TP & 1 Conductor) with overall shield and drain wire. 24 AWG Low Cap Twisted shielded pair (TSP).	2 × 200 ft (61 m)	Check local codes

- ¹⁾ Wire length affects point intercept entry. Adjust intercept accordingly.
- ²⁾ Conduit sharing rules: No Class 2 point wiring can share conduit with any Class 1 wiring except where local codes permit. (Both Class 1 and Class 2 wiring can be run in the field panel providing the Class 2 wire is UL listed 300V 75°C (167°F) or higher, or the Class 2 wire is NEC type CM (FT4) (75°C or higher) or CMP (FT6) (75°C or higher). NEC type CL2 and CL2P is not acceptable unless UL listed and marked 300V 75°C (167°F) or higher.
- ³⁾ Twisted pair, non-jacketed, UL listed 75°C (167°F) and 300V cable can be used in place of CM (FT4) or CMP (FT6) (both must be rated 75°C or higher) cable when contained in conduit per local codes. See the *Field Purchasing Guide* for wire.
- ⁴⁾ Twisted Shielded Pair TSP is not required for general installation, does not affect TXIO Module specifications, and may be substituted where otherwise specified. TSP should be used in areas of high electrical noise (for example when in proximity to VFDs and other large motors). Where used, connect the shield drain wire to the grounding system inside enclosure.
- ⁵⁾ Cable must be part of a Structured Cabling System (SCS).
- ⁶⁾ Maximum distance is total of all cable on the TX-I/O island bus for 14 AWG four conductor cable. See the formulas in this section for associated maximum power and maximum distance for each wire type.
- ⁷⁾ See TX-I/O Island Bus Guidelines [**Error! Bookmark not defined.**] in this section for cable configuration.

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