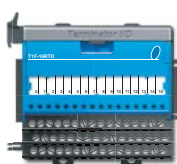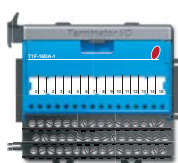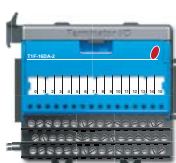# Analog I/O Modules

The Do-more T1H Series PLC supports all analog I/O modules available for the Terminator I/O product line.

T1F-08AD-1 **T1F-08AD-2** **T1F-16AD-1** **T1F-16AD-2**

T1F-16RTD **T1F-16TMST** **T1F-14THM**

Analog Input Modules*			
Part Number	Number of Channels	Description	Price
T1F-08AD-1	8	Analog Current Input	$503.00
T1F-08AD-2	8	Analog Voltage Input	$503.00
T1F-16AD-1	16	Analog Current Input	$708.00
T1F-16AD-2	16	Analog Voltage Input	$710.00
T1F-16RTD	16	RTD	$697.00
T1F-16TMST	16	Thermistor	$629.00
T1F-14THM	14	Thermocouple	$915.00

*Terminal Bases sold separately

T1F-08DA-1 **T1F-08DA-2** **T1F-16DA-1** **T1F-16DA-2**

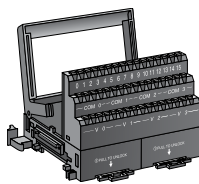| Analog Output Modules*			
Part Number	Number of Channels	Description	Price
T1F-08DA-1	8	Analog Current Output	$645.00
T1F-08DA-2	8	Analog Voltage Output	$694.00
T1F-16DA-1	16	Analog Current Output	$995.00
T1F-16DA-2	16	Analog Voltage Output	$1,069.00

*Terminal Bases sold separately

T1F-8AD4DA-1 **T1F-8AD4DA-2**

Analog Input/Output Modules*			
Part Number	Number of Channels	Description	Price
T1F-8AD4DA-1	8/4	Analog Current Input/ Output	$613.00
T1F-8AD4DA-2	8/4	Analog Voltage Input/ Output	$613.00

*Terminal Bases sold separately

Analog I/O modules above are shown installed in the Terminal Base. Terminal Bases are sold separately and are listed in the table below.
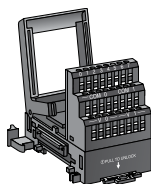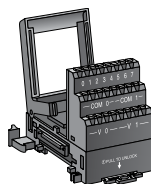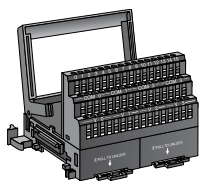
T1K-08B **T1K-08B-1** **T1K-16B** **T1K-16B-1**

Terminal Bases			
Part Number	Number of Terminals	Description	Price
T1K-08B	8	Screw Type	$155.00
T1K-08B-1	8	Spring Clamp	$168.00
T1K-16B	16	Screw Type	$192.00
T1K-16B-1	16	Spring Clamp	$201.00

For more detailed specifications and wiring diagrams, please refer to the Terminator I/O (Field I/O) section in this catalog.

Analog I/O Modules

The following table may be helpful for you to select the right modules for your application.

Analog Input Modules				
Input Type	**Specification**	**Number of Input Points per Module**		
		8	**14**	**16**
Current	-20 to 20 mA, 0–20 mA, 4–20 mA	T1F-08AD-1 T1F-8AD4DA-1		T1F-16AD-1
Voltage	0–5 V, 0–10V, ±5V, ±10V	T1F-08AD-2 T1F-8AD4DA-2		T1F-16AD-2
RTD	Pt100, Pt1000, jPt100, CU-10V, CU-25V, 120V Nickel			T1F-16RTD
Thermistor	10K-AN (Type 3), 10K-CP (Type 2) 5K, 3K, 2252, 1.8K			T1F-16TMST
Thermocouple	Type J, E, K, R, S, T, B, N, C		T1F-14THM	

Analog Output Modules				
Output Type	**Specification**	**Number of Output Points per Module**		
		4	**8**	**16**
Current	0–20 mA, 4–20 mA		T1F-08DA-1	T1F-16DA-1
	4–20 mA	T1F-8AD4DA-1		
Voltage	0–5V, 0–10V, ±5V, ±10V	T1F-8AD4DA-2	T1F-08DA-2	T1F-16DA-2

For more detailed specifications and wiring diagrams, please refer to the Terminator I/O (Field I/O) section in this catalog.

Do-more T1H Series PLC Overview

Module Compatibility

The following table shows which Terminator I/O product line components are supported by the T1H-DM1 and T1H-DM1E Do-more CPUs.

Module Compatibility Table					
Module	**Part Number**	**Status**	**Module**	**Part Number**	**Status**
Base Units	T1K-08B	✓	**Analog I/O Modules**	T1K-08B	✓
	T1K-08B-1	✓		T1K-08B-1	✓
	T1K-16B	✓		T1K-16B	✓
	T1K-16B-1	✓		T1K-16B-1	✓
Discrete I/O Modules	T1K-08ND3	✓		T1K-08ND3	✓
	T1K-16ND3	✓		T1K-16ND3	✓
	T1K-08NA-1	✓		T1K-08NA-1	✓
	T1K-16NA-1	✓		T1K-16NA-1	✓
	T1K-08TD1	✓		T1K-08TD1	✓
	T1K-16TD1	✓		T1K-16TD1	✓
	T1K-08TD2-1	✓		T1K-08TD2-1	✓
	T1K-16TD2-1	✓		T1K-16TD2-1	✓
	T1H-08TDS	✓		T1H-08TDS	✓
	T1K-08TA	✓	**Specialty Module**	T1K-08TA	✓
	T1K-16TA	✓			
	T1K-08TAS	✓			
	T1K-08TR	✓			
	T1K-16TR	✓			
	T1K-08TRS	✓			

✓ = *Supported*

Do-more T1H Series PLC Overview

Communications

The Do-more T1H Series PLC supports many communication protocols. The following table shows which CPU module communications port supports each protocol.

Protocols	CPU Modules		
	T1H-DM1 / T1H-DM1E		T1H-DM1E
	USB Port	RS-232 Serial Port	Ethernet Port
Do-more Designer Programming	Yes	Yes	Yes
Modbus/RTU Client (Master)		Yes	
Modbus/RTU Server (Slave)		Yes	
Modbus/TCP Client (Master)			Yes
Modbus/TCP Server (Slave)			Yes
DirectLOGIC RX/WX Client (Master)			Yes
DirectLOGIC RX/WX Server (Slave)			Yes
K-Sequence Server (Slave)		Yes	
DirectNET Server (Slave)			
HEI Ethernet I/O Master			Yes
SMTP (EMail) Client w/Authentication			Yes
Simple Network Time Protocol (SNTP) Client			Yes
Do-more/PEERLINK			Yes
Do-more Time Synchronization Protocol (Client, Server, Alternate Client)			Yes
Do-more Logger/UDP			Yes
Serial ad-hoc ASCII/Binary Programatic Control		Yes	
UDP ad-hoc Programmatic Control			Yes
TCP Client Programmatic Control			Yes
TCP Server Programmatic Control			Yes

Blank = Not Supported

Field Device Wiring and Power Options

Terminal base specifications

Terminator I/O terminal bases are available in screw clamp and spring clamp versions for both half-size and full-size modules. Hot stamp silkscreen labeling is used for numbering I/O points, commons, and all power terminals.

Terminal Base Specifications		
Terminal Type	Screw type	Spring clamp
Recommended Torque	1.77–3.54 lb·in (0.2–0.4 N·m)	N/A
Wire Gauge	Solid: 25–12 AWG Stranded: 26–12 AWG	Solid: 25–14 AWG Stranded: 26–14 AWG

Field device wiring options

Power your DC input devices from the integrated 24VDC power supply bus. T1K-08ND3 and T1K-16ND3 DC input modules include jumpers for selecting the internal 24VDC power supply available for 2- and 3-wire field devices. Clearly labeled triple stack terminals make it easy to wire 2- and 3-wire devices ensuring clean wiring with only one wire per termination.

External user supplied 24VDC power, or auxiliary 24VDC terminals from T1K-01AC, can be easily applied directly to one end of the terminal rows and jumpered across each base in the system.
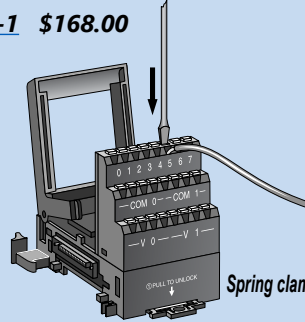
This is a convenient solution for powering analog I/O and discrete DC output devices whose modules do not have direct access to the internal bussed 24VDC. If current consumption increases, simply add additional T1K-01AC power supplies into the system.
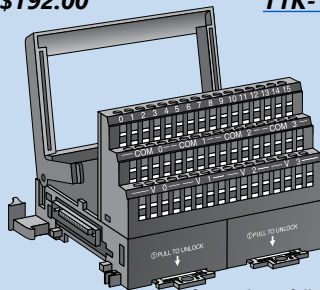
T1K-08B *$155.00*
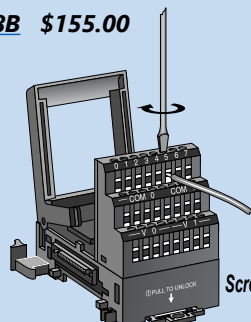
T1K-08B-1 *$168.00*

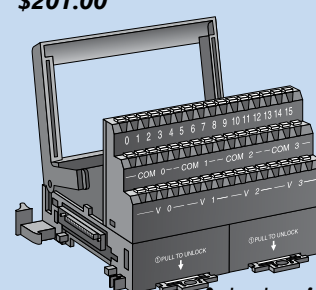*Screw clamp, half-size*

Spring clamp, half-size

T1K-16B *$192.00*

T1K-16B-1 *$201.00*

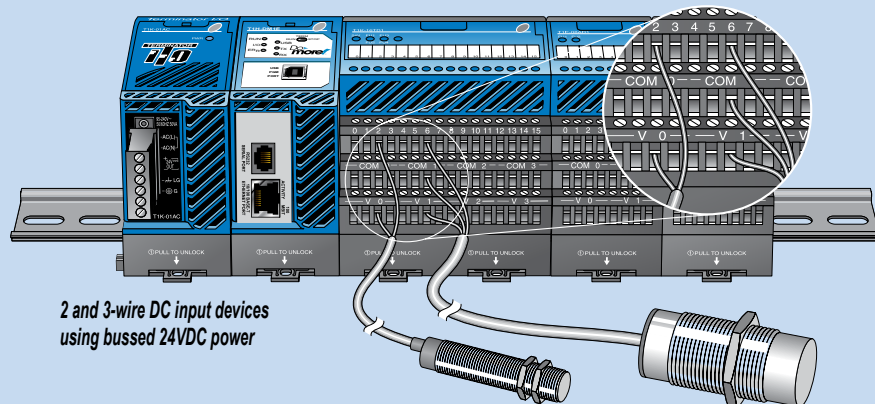*Screw clamp, full-size*

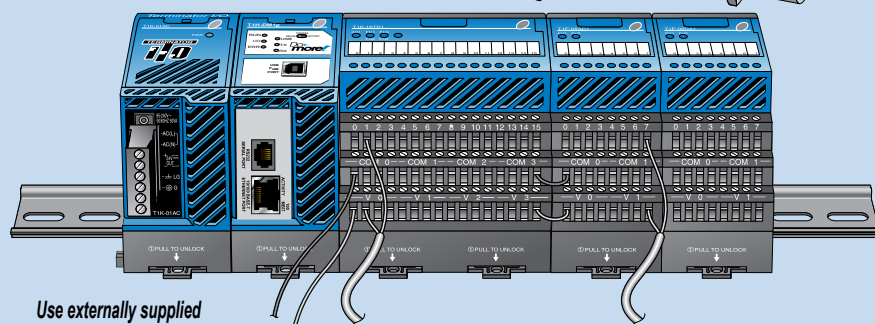*Spring clamp, full-size*

2 and 3-wire DC input devices using bussed 24VDC power

Use externally supplied 24VDC power or 24VDC auxiliary power from T1K-01AC

**WARNING:** *THE T1H SERIES PLC DOES NOT SUPPORT THE HOT-SWAP FEATURE.*

# I/O Module Installation

I/O module installation

I/O modules feature separate terminal bases for easy installation.
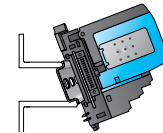
To install I/O modules:

1. Slide the module into its terminal base (until it clicks into position)
2. Hook upper DIN rail tabs over the top of DIN rail, and press the assembly firmly onto the DIN rail.
3. Slide the module along the DIN rail until it engages with the adjacent module.
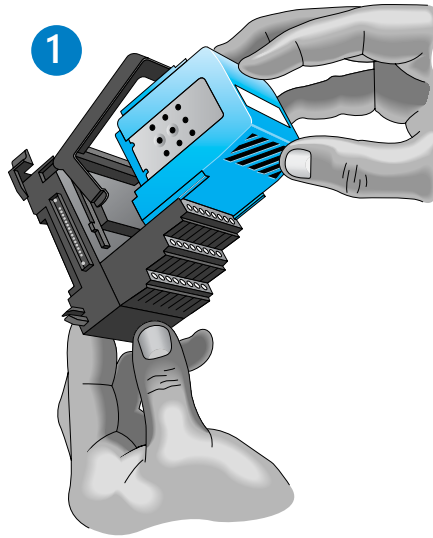
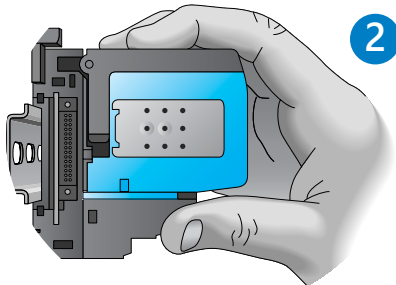*DN-ASB1 angled mounting bracket*
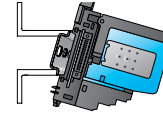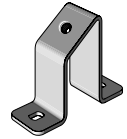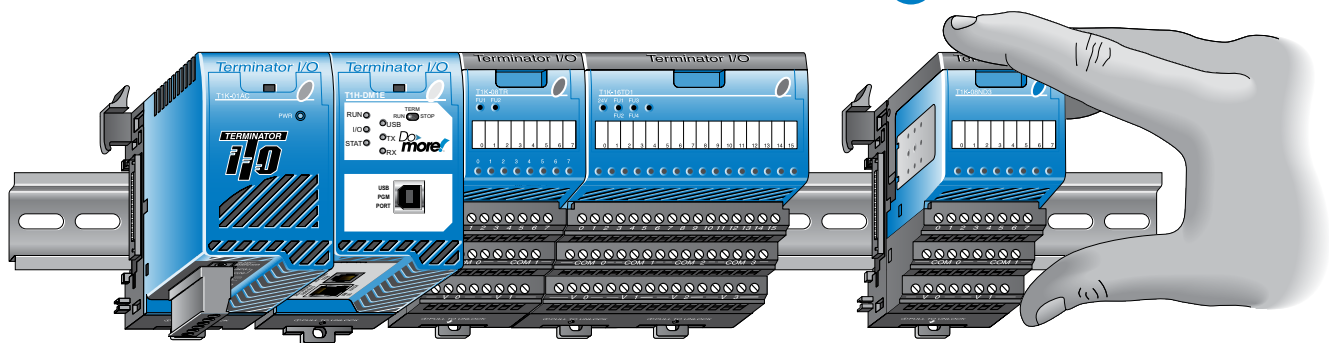
Great for mounting in upper locations

Great for mounting in lower locations

Optional angled support bracket raises and tilts the mounting rail for easier access and wiring. Use with 35mm DIN rail. See the Connection Systems in this catalog for details.
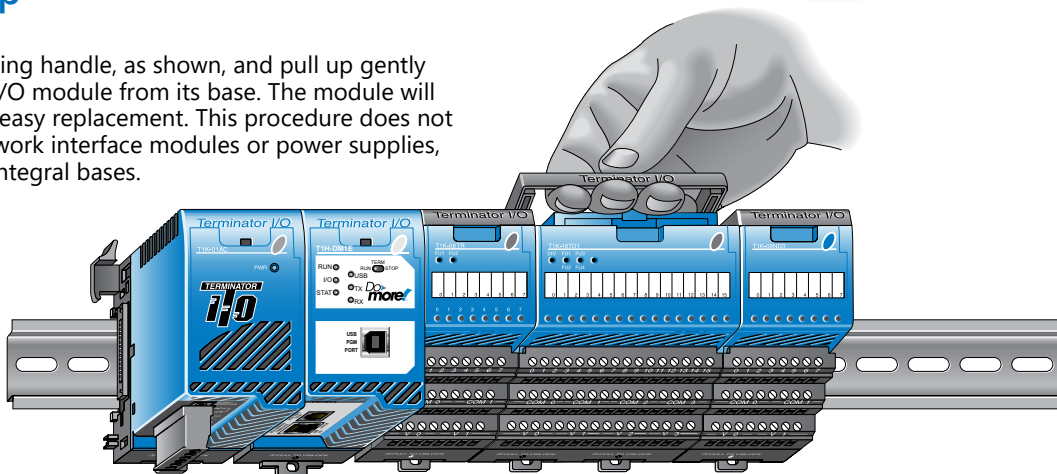
Removing I/O modules is a snap

Grip the locking handle, as shown, and pull up gently to eject the I/O module from its base. The module will slide out for easy replacement. This procedure does not apply to network interface modules or power supplies, which have integral bases.

WARNING: *THE T1H SERIES PLC DOES NOT SUPPORT THE HOT-SWAP FEATURE.*
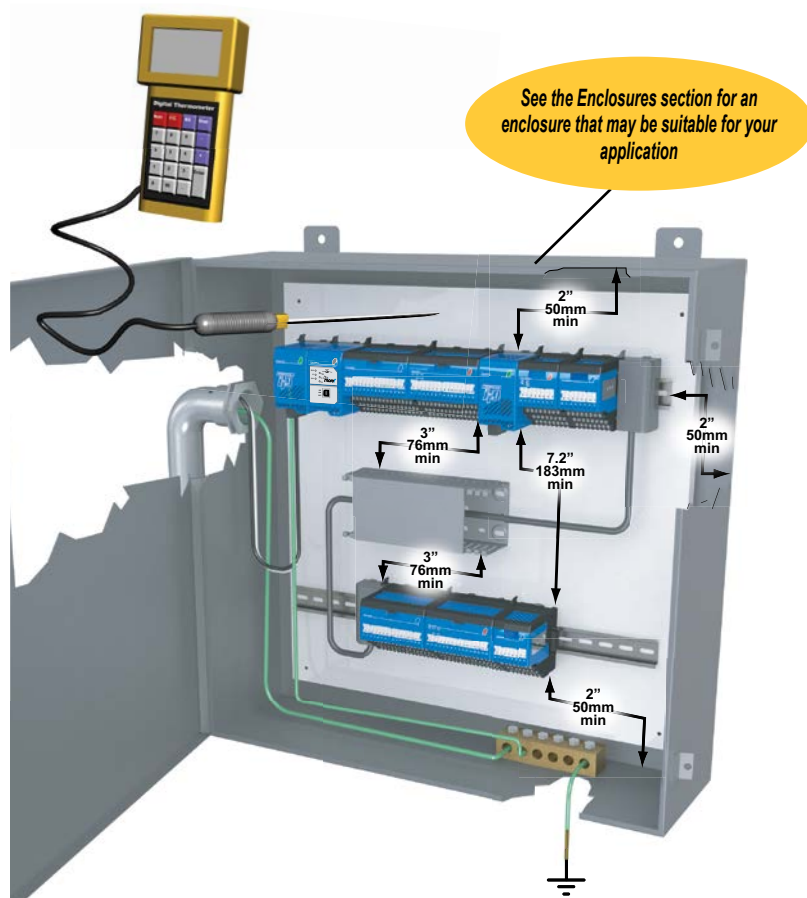
Dimensions and Installation

It is important to understand the installation requirements for your T1H Series PLC system. This will ensure that the PLC system works within their environmental and electrical limits.

Plan for safety

This document should never be used as a replacement for the technical data sheet that comes with the products or the Do-more T1H Series PLC Hardware User Manual (available online at www.automationdirect.com.) The technical data sheet contains information that must be followed. The system installation should comply with all appropriate electrical codes and standards.

Unit dimensions and mounting orientation

Use the following diagrams to make sure the T1H Series PLC system can be installed in your application. The PLC system should be mounted horizontally. To ensure proper airflow for cooling purposes, units should not be mounted upside-down. It is important to check the PLC system dimensions against the conditions required for your application. For example, it is recommended to leave 2" depth for ease of access and cable clearance. However, your distance may be greater or less. Also, check the installation guidelines for the recommended cabinet clearances.

See the Enclosures section for an enclosure that may be suitable for your application

2" 50mm min

2" 50mm min

3" 76mm min

7.2" 183mm min

3" 76mm min

2" 50mm min

Terminator Environmental Specifications

Ambient Operating Temperature	32°F to 131°F (0°C to 55°C)
Storage Temperature	-4°F to 158°F (-20°C to 70°C)
Ambient Humidity	5% to 95% (Non-condensing)
Atmosphere	No corrosive gases. The level of environmental pollution = 2 (UL 840)
Vibration Resistance	MIL STD 810C, Method 514.2
Shock Resistance	MIL STD 810C, Method 516.2
Voltage Withstand (Dielectric)	1500VAC, 1 minute
Insulation Resistance	500VDC, 10Mq
Noise Immunity	NEMA ICS3-304 Impulse noise 1μs, 1000V FCC class A RFI (144MHz, 430MHz 10W, 10cm)
Agency Approvals	UL E185989, CE, FCC class A, NEC Class 1 Division 2

48mm (1.89in) — 80mm (3.15in) — Power Supply

48mm (1.89in) — 80mm (3.15in) — CPU Module

48mm (1.89in) — 80mm (3.15in) — Half-size I/O Module with Base

89mm (3.5in) — 80mm (3.15in) — Full-size I/O Module with Base

83.3mm (3.28in) — System Depth