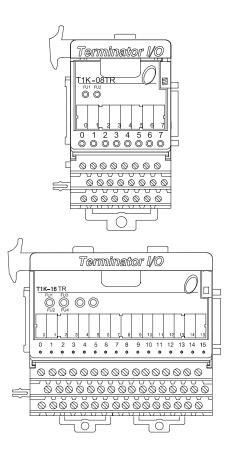
Relay Output Modules

8-point and 16-point, relay output modules

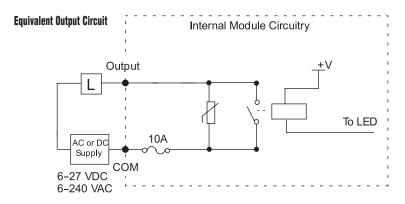
The 8-point relay output module uses a T1K-08B or T1K-08B-1 base, which is purchased separately.

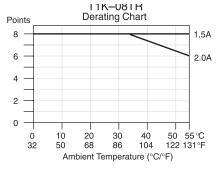
The 16-point Relay output module uses a T1K-16B or T1K-16B-1 base, which is purchased separately.

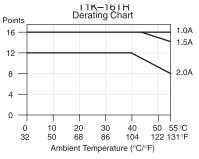


Specifications	T1K-08TR	T1K-16TR	
Outputs per Module	8 normally open	16 normally open	
Isolated Commons	2 (4 pts. / common) isolated	4 (4 pts. / common) isolated	
Operating Voltage Range	6–240 VAC (47–63) Hz, 6–27 VDC		
Output Voltage Range	5–264 VAC (47–63 Hz), 5–30 VDC min./max.		
Max. Load Current	2A / pt., 8A / common	2A / pt., 6A / common (subject to derating)	
Max. Leakage Current	0.1 mA @ 264VAC		
Max. Inrush Current	6A for 10ms / pt.; 20A for 10ms / com.		
Min. Load	5mA @ 5VDC		
OFF to ON Response	< 15ms		
ON to OFF Response	<10ms		
Base Power Required	350mA @ 5VDC 700mA @ 5VDC		
Status Indicators	Logic side		
Error Status Indications(LEDs)	FU1 ON = fuse 1 blown FU2 ON = fuse 2 blown	FU1/FU2 ON = fuse 1 or 2 blown FU3/FU4 ON = fuse 3 or 4 blown	
Fuses (User Replaceable) T1K-FUSE-2	2, (10A, 250V / common) 5 x 20 mm type	4, (10A, 250V / common) 5 x 20 mm type	
Weight	110g	200g	

Typical Relay Life (Operations)				
Voltage and Load Time	Load	Load Current		
Voltage and Load Type	1A	2A		
24 VDC Resistive	500 K	250 K		
24 VDC Solenoid	100 K	50 K		
110 VAC Resistive	500 K	250 K		
110 VAC Solenoid	200 K	100 K		
220 VAC Resistive	350 K	200 K		
220 VAC Solenoid	100 K	50 K		







Dimensions and Installation

It is important to understand the installation requirements for your Terminator I/O system. This will ensure that the Terminator I/O products work within their environmental and electrical limits.

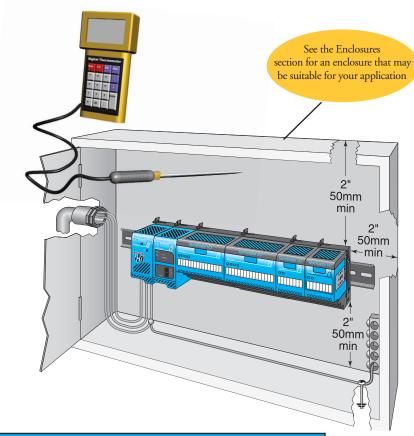
Plan for safety

This catalog should never be used as a replacement for the technical data sheet that comes with the products or the T1K-INST-M Installation and I/O Manual (available online at .) The technical

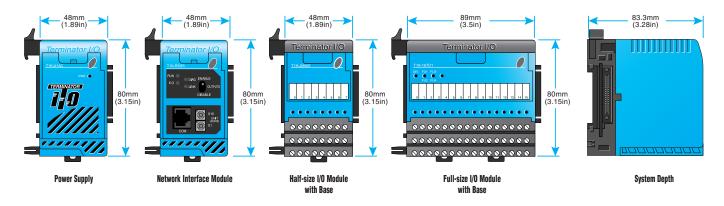
data sheet contains information that must be followed. The system installation should comply with all appropriate electrical codes and standards.

Unit dimensions and mounting orientation

Use the following diagrams to decide if the Terminator I/O system can be installed in your application. Terminator I/O units should be mounted horizontally. To ensure proper airflow for cooling purposes, units should not be mounted upside-down. It is important to check the Terminator I/O 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.



Terminator I/O 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	500 VDC, 10 M Ω			
Noise Immunity	NEMA ICS3-304 Impulse noise 1µs, 1000V FCC class A RFI (144MHz, 430MHz 10W, 10cm)			
Agency Approvals	UL, CE, FCC class A, NEC Class 1 Division 2			



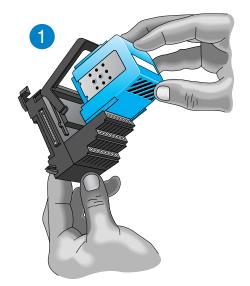
I/O Module Installation

I/O module installation

Terminator I/O modules feature separate terminal bases for easy installation.

To install I/O modules:

- Slide the module into its terminal base (until it clicks into position)
- 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-ASB-1 angled mounting bracket



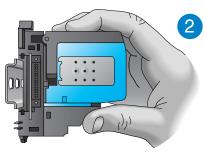


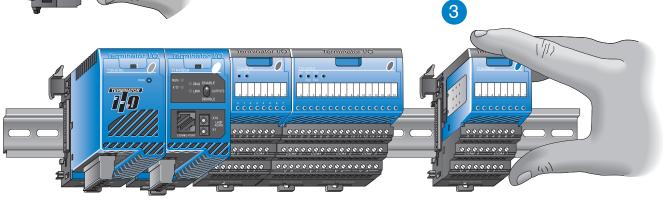
Great for mounting in upper locations



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 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.

Hot-swappable I/O modules You can remove I/O under power, b

You can remove I/O modules under power, but exercise caution while doing so. Do not touch the terminals with your hands or any conductive material. Always remove power when possible.

Power Supplies and Power Requirements

Power supplies

The Terminator I/O product line offers two power supply options: AC or DC. The power supplies are always positioned to the left of the modules to which they supply power. Consult the system configuration examples and the power budgeting example for more information on positioning power supplies.





Power supply specifications

Pow Spec	ver Supply cifications	T1K-01AG	T1K-01DC	
Input Vo	oltage Range	110/220 VAC	12/24 VDC	
Input Fr	equency	50/60 Hz	N/A	
Maximum Power		50VA	30W	
Max. Inrush Current		20A	10A	
Insulation	on Resistance	> 10MΩ @ 500 VDC		
Voltage Withstand		1 min. @ 1500VAC between primary, secondary and field ground		
	Voltage	5.25 VDC	5.25 VDC	
5VDC PWR	Current Rating	2000 mA max (see current option note below)	2000mA max	
	Ripple	5% max.	5% max.	
	Voltage	24VDC	N/A	
24VDC PWR	Current Rating	300mA max. (see current option note below)	N/A	
	Ripple	10% max.	N/A	
Fuse	1 (primary), not rep	laceable		
Replacement Terminal Block (Phoenix Contact)		MVSTBW 2.5/4-ST-5.08 BK	MVSTBW 2.5/6-ST-5.08 BK	

Note: 500mA @ 24VDC can be achieved by lowering the 5VDC from 2000mA to 1500mA.

Power requirements

Module	5VDC	24VDC	Module	5VDC	24VDC	Module	5VDC	24VDC
Interface Modules		DC Output Modules		Analog Input Modules				
T1H-EBC100	300	0	T1H-08TDS	200	0	T1F-08AD-1	75	50*
T1K-DEVNETS	250	45	T1K-08TD1	100	200*	T1F-08AD-2	75	50*
T1K-MODBUS	300	0	T1K-16TD1	200	400*	T1F-16AD-1	75	50*
DC Input Modules		T1K-08TD2-1	200	0	T1F-16AD-2	75	50*	
T1K-08ND3	35	0	T1K-16TD2-1	200	0	T1F-16RTD	150	0
T1K-16ND3	70	0	AC Output M	odules	·	T1F-16TMST	150	0
AC Input Modules		T1K-08TA	250	0	T1F-14THM	60	70*	
T1K-08NA-1	35	0	T1K-16TA	450	0	Analog Outpu	t Module	s
T1K-16NA-1	70	0	T1K-08TAS	300	0	T1F-08DA-1	75	150*
			Relay Output Modules		T1F-08DA-2	75	150*	
			T1K-08TR	350	0	T1F-16DA-1	75	150*
			T1K-16TR	700	0	T1F-16DA-2	75	150*
			T1K-08TRS	400	0	Combination	Analog M	lodules
			Specialty Modules		T1F-8AD4DA-1	75	60*	
			T1H-CTRIO	400	0	T1F-8AD4DA-2	75	70*
			* Use either internal or external source for 24VDC		* Use either interna for 24VDC	ıl or external :	source	

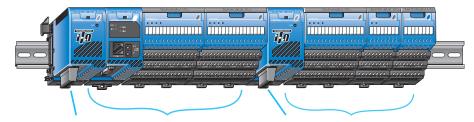
Calculating the power budget

To calculate the power budget, read the available power (current rating) from the Power Supply Specifications table and subtract the power consumed by each module to the right of the power supply. Do not include modules to the right of an additional power supply.

Adding additional power supplies

Each power supply furnishes power only to the network interface and I/O modules to its right. Inserting a second power supply closes the power loop for the power supply to the left, while also powering the modules to its right. Perform a power budget calculation for each power supply in the system.

Power Budget Example					
Module	5VDC	24VDC			
T1K-01AC	+2000mA	+300mA			
T1H-EBC100	-300mA	-0mA			
T1K-16ND3	-70mA	-0mA			
T1K-16TD2	-200mA	-0mA			
T1F-08AD-1	-75mA	-50mA			
Remaining	+1355mA	+250mA			



This power supply powers the network interface module and the next two I/O modules

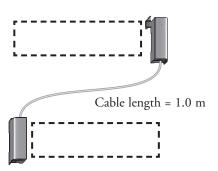
This power supply powers these three I/O modules

Expansion I/O Configurations

Expansion cables

T1K-10CBL T1K-10CBL-1* Right side to left side expansion cable

The T1K-10CBL(-1) connects the right side of an I/O base to the left side of the next I/O base. A maximum of two T1K-10CBL(-1) cables can be used per expansion system.

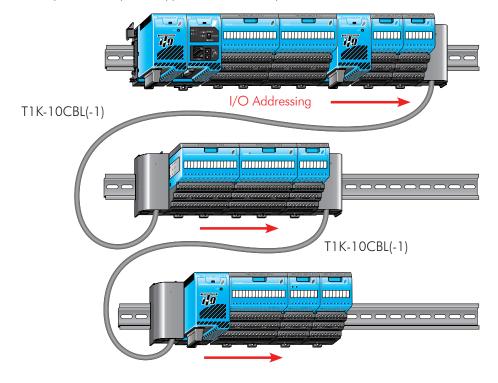


*Note: The (-1) versions of the expansion cables pass 24VDC through on an isolated wire. (All cables pass the 5VDC base power.) Any local expansion DC input module configured for "internal power"

(current sourcing) must either have a power supply preceding it on the same base or, have a (-1) version cable pass 24VDC from a power supply on the preceding base.

Using two T1K-10CBL expansion cables

In the system below, power supplies can be used anywhere.



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 silk screen labeling is used for numbering I/O points, commons, and all power terminals.

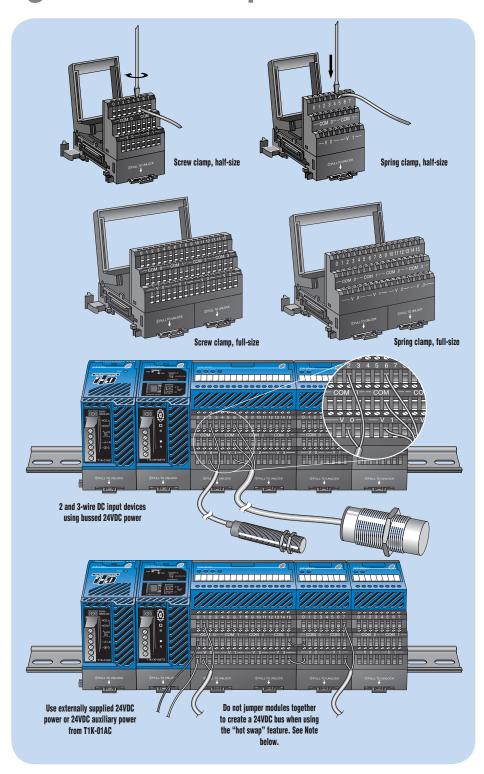
Terminal Base Specifications				
Terminal Type	Screw type	Spring clamp		
Recommended Torque	1.77–3.54 lb·in (0.2–0.4 N·m)	N/A		
Wire Gauge	Solid: 25–12 AWG Stranded: 26–12 AWG	Solid: 25–14 AWG Stranded: 26–14 AWG		

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.



Hot-swap feature

The hot-swap feature allows Terminator I/O modules to be replaced while system power is on. Be careful not to touch the terminals with your hands or other conductive material to avoid the risk of personal injury or equipment damage. Always remove power if it is equally convenient to do so.

Note: Before hot-swapping analog or

DC output modules in a Terminator I/O system, make sure that each of the analog and DC output module's 24VDC and 0 VDC base terminals are wired directly to the external power supply individually. If the external 24VDC and 0 VDC is jumpered from base to base in a daisy chain fashion, and an analog or DC output module is

removed from its base, the risk of disconnecting the external 24VDC and 0 VDC to the subsequent I/O modules exists.