

SPECIFICATIONS - SPECIALTY I/O MODULES



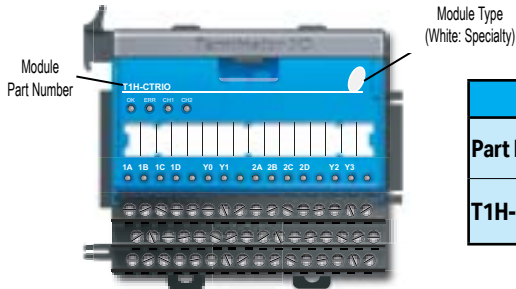
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Specialty Modules Overview

Each specialty module is identified with a white bar across the front panel as seen below. The module's front panel is also equipped with LED status indicators. These indicators show the module health and I/O status. Currently the T1H-CTRIO is the only Specialty Module available to use with the Do-more T1H CPU's.

Specialty Modules



Specialty Modules		
Part Number	Description	See Page
T1H-CTRIO	High Speed Counter Interface Module	7-3



WARNING: The T1H Series PLC does not support any Hot-Swap features.

T1H-CTRIO

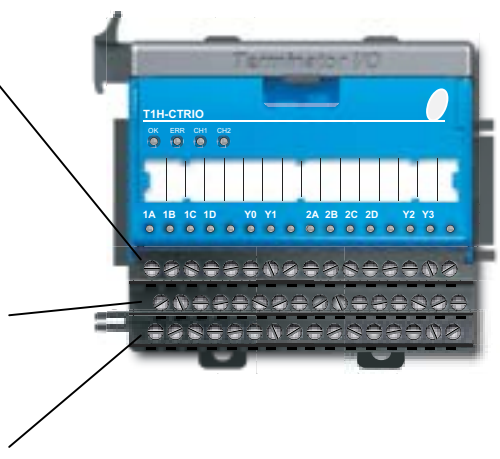
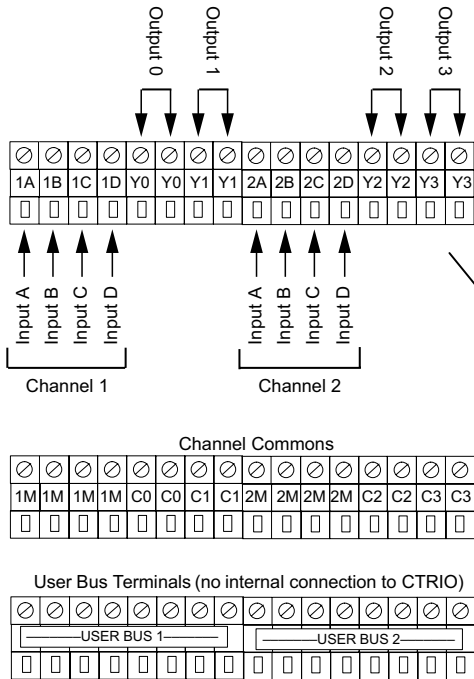
T1H-CTRIO Overview

The T1H-CTRIO Counter I/O (CTRIO) module is designed to accept high-speed pulse input signals for counting or timing applications. This module provides high-speed pulse output signals for servo/stepper motor control, monitoring and alarming as well as other discrete control functions.

The T1H-CTRIO module offers greater flexibility for applications which call for precise counting or timing based on input events or for high-speed control output applications. The CTRIO module can also be used for applications that call for a combination of both high-speed input and high-speed output control functions.

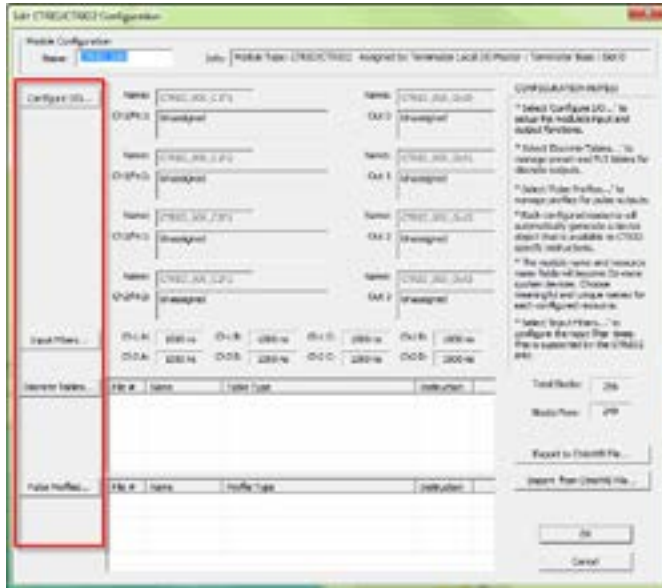
The T1H-CTRIO module has its own internal microprocessor and operates asynchronously with respect to the CPU. Therefore, the response time of the on-board outputs is based on the module's scan time, not the CPU's scan time (unless the CPU is controlling the outputs directly).

T1H-CTRIO Terminal Block Layout

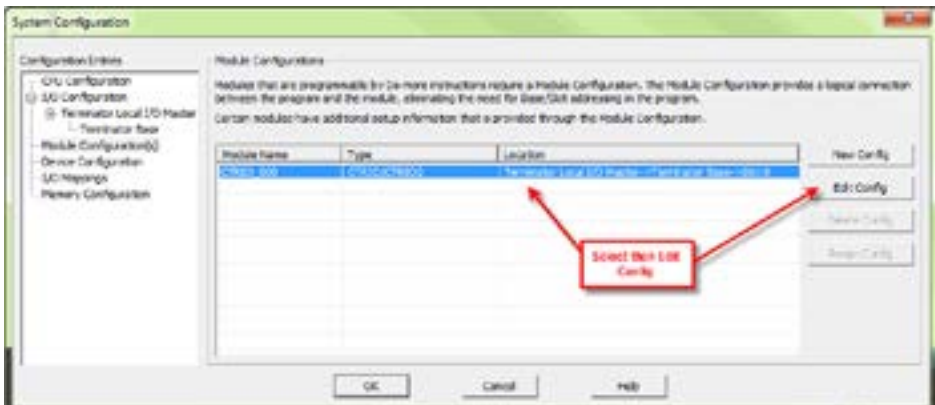


T1H-CTRIO Configuration

The module configuration of the T1H-CTRIO is done from within the Edit CTRIO/CTRIO2 Configuration window seen below. The Configure I/O..., Input Filters..., Discrete Tables... and Pulse Profiles... buttons in the left hand column allow you to configure the input and output functions of the selected module. Refer to the Do-more Designer Help File for more information on configuration options.



The above window can be accessed once the T1H-CTRIO module is added to the I/O configuration either manually or automatically. See the Verify Hardware Configuration section of the Getting Started chapter for more information on setting up the I/O configuration. With the module added, select the Module Configuration(s) entry from the System Configuration page. Then choose the desired module and select Edit Config.

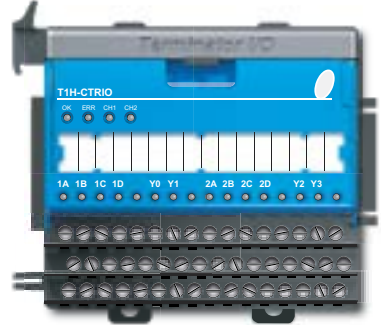


T1H-CTRIO Specifications

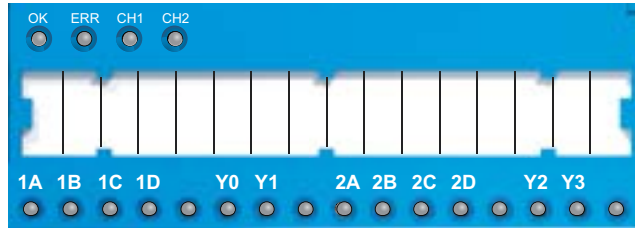
General Specifications	
Discrete I/O Points Used	None (I/O map directly in T1H-DM1/E data structure)
Base Power Required	400mA @ 5VDC
Isolation	2500V I/O to Logic, 1000V among Input Channels and All Outputs

Input Specifications	
Input	8 pts. sink / source
Maximum Input Frequency	100kHz
Minimum Pulse Width	5µsec
Input Voltage Range	9–30 VDC
Maximum Voltage	30VDC
Input Voltage Protection	Zener clamped at 33VDC
Rated Input Current	8mA typical, 12mA maximum
Minimum ON Voltage	9.0 VDC
Maximum OFF Voltage	2.0 VDC
Minimum ON Current	5.0 mA @ 9.0 VDC
Maximum OFF Current	2.0 mA
OFF to ON Response	Less than 3.0 µsec
ON to OFF Response	Less than 3.0 µsec

Output Specifications	
Outputs	4 pts., (sink/source), independently isolated
Pulse Outputs	2 channels, 20Hz to 25kHz Pulse/Direction or CW/CCW
Minimum Pulse Width	5µsec
Output Voltage Range	5–36 VDC
Maximum Output Voltage	36VDC
Maximum Load Current	1.0 A
Maximum Leakage Current	100µA
Inrush Current	5.0 A for 20ms
ON State V Drop	0.3 VDC or less
Overcurrent Protection	15A maximum
OFF to ON Response	Less than 3.0 µsec
ON to OFF Response	Less than 3.0 µsec



T1H-CTRIO LED Indicators

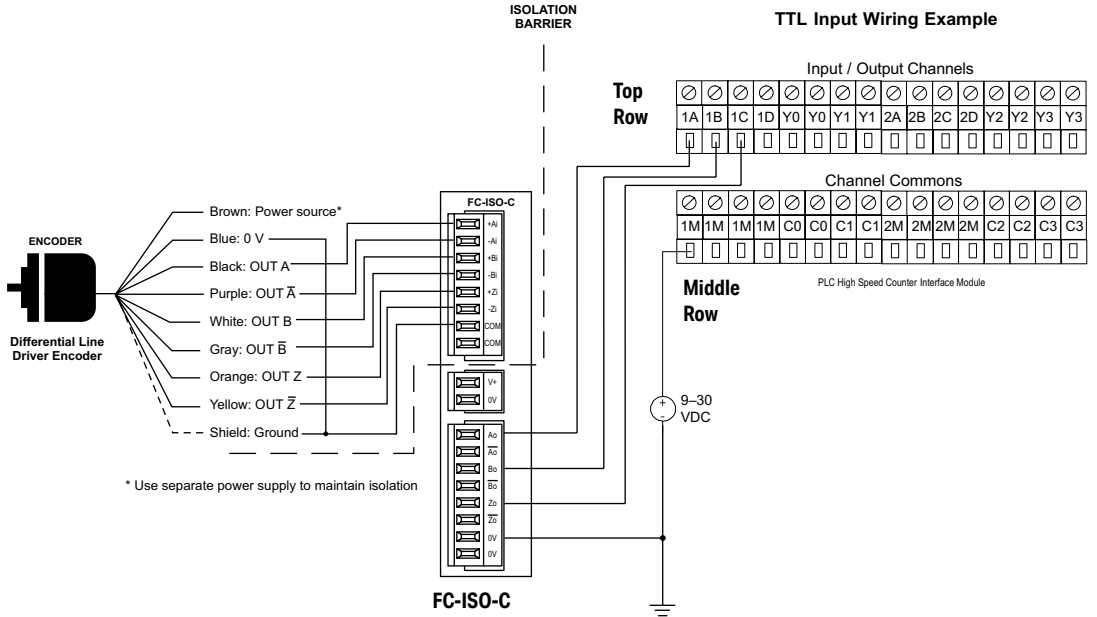


LED Descriptions	
OK	Module OK
ERR	User Program Error
CH1	Channel 1 Status
CH2	Channel 2 Status
1A-1D	Channel 1 A-D Status
2A-2D	Channel 2 A-D Status
Y0-Y3	Output Status

LED Diagnostic Definitions		
OK	ERR	Description
ON	OFF	All is well - Run Mode
ON	ON	Hardware Failure
Blinking	Blinking	Boot Mode - Use for Field OS Upgrades
Blinking	OFF	Program Mode
OFF	Blinking	Module Self - diagnostic Failure
OFF	ON	Module Error due to Watchdog Timeout
OFF	OFF	No Power to Module

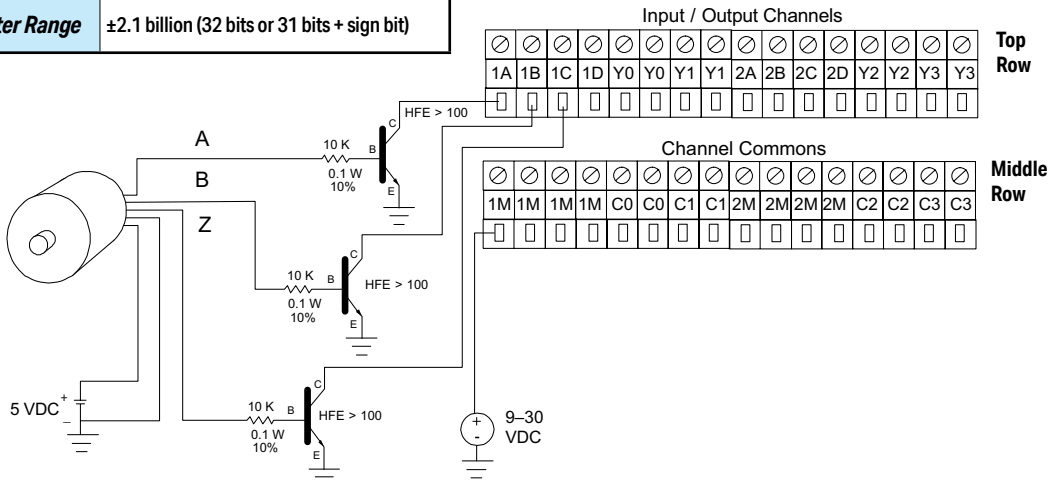
More LED Diagnostics Definitions	
CH1	Blinks when Channel 1 Function 1 is counting or timing.
CH2	Blinks when Channel 2 Function 1 is counting or timing.
Y0-Y3	Follows actual output state; ON = output is passing current.

T1H-CTRIO Input Wiring Diagrams



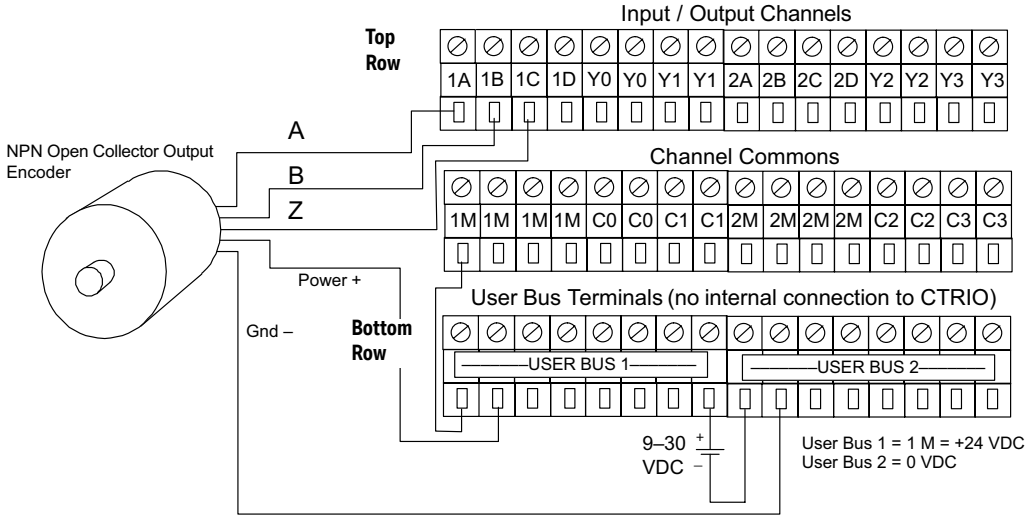
CTRIO Input Resources	
Counter/Timer	4, (2 per 4 input channel group)
Resource Options	1X, 2X, or 4X Quadrature, Up or Down Counter, Edge Timer, Dual Edge Timer, Pulse Catch, Reset, Inhibit, Capture
Timer Range/Resolution	4.2 billion (32 bits); 1 μ s
Counter Range	\pm 2.1 billion (32 bits or 31 bits + sign bit)

TTL Quadrature Encoder Wiring Example

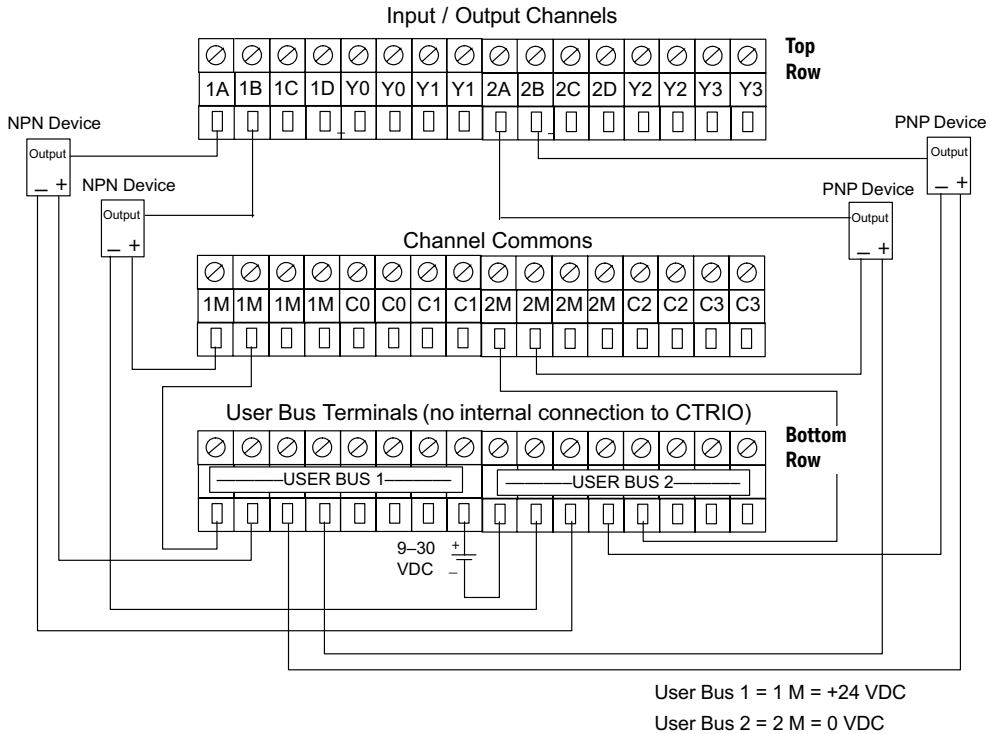


T1H-CTRIO Input Wiring Diagrams

Quadrature Encoder Wiring Example

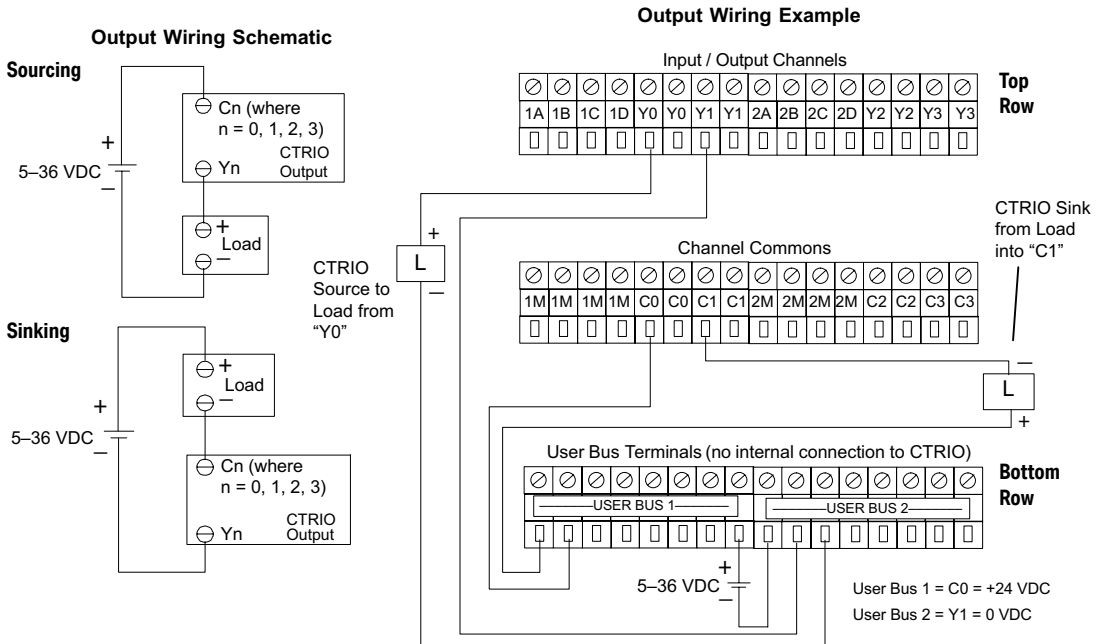


Input Wiring Example



T1H-CTRIO Output Wiring Diagrams

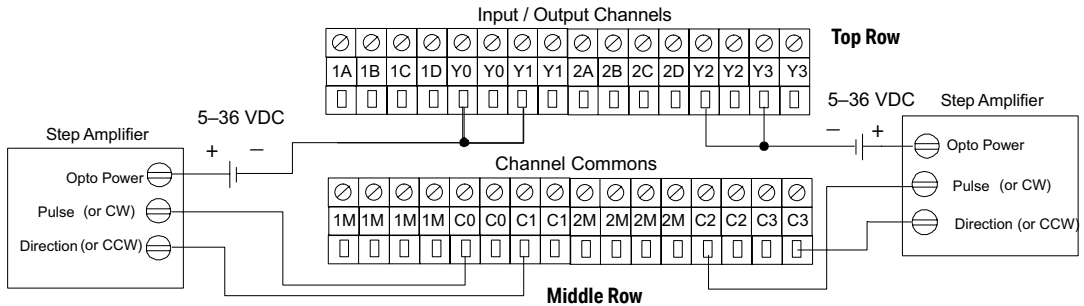
The module has 4 optically isolated output points (pts. Y0–Y3 with isolated commons C0–C3, respectively). The outputs must be wired so positive current flows into Cn terminal and then out of the Yn terminal.



T1H-CTRIO Output Wiring Diagrams

The stepper wiring example assumes the Step Amplifier interface to be opto-coupler LEDs (common anodes at the “OPTO Power” terminal) with internal current limiting resistors. This is a standard method, but you must consult your stepper amplifier documentation to ensure that this method is applicable.

Stepper / Servo Drive Wiring Example



CTRIO Output Resources	
Pulse outputs / Discrete outputs	Pulse outputs: 2 Channels (2 outputs per channel) Discrete outputs: 4 pts.
Resource Options	Pulse outputs: pulse / direction or CW / CCW. Profiles: Trapezoid, S-Curve, Symmetrical S-Curve, Dynamic Positioning, Dynamic Velocity, Home Search, Velocity Mode, Run to Limit Mode, and Run to Position Mode. Discrete Outputs: 4 configurable for set, reset, pulse on, pulse off, toggle, and reset count function (assigned to respond to Timer / Counter functions). Raw Mode: Direct access to output from user program.
Target Position Range	±2.1 billion (32 bits or 31 bits + sign bit)