

SPECIFICATIONS - SPECIALTY MODULES



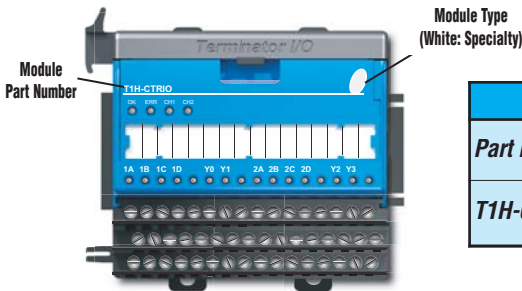
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Specialty Modules Overview

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

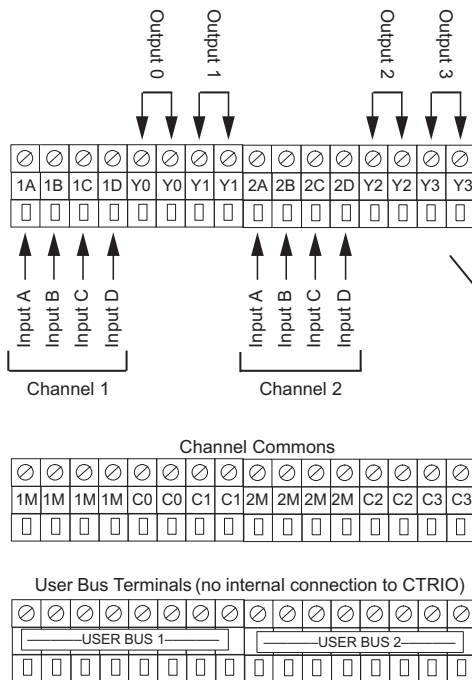
T1H-CTRIO Overview

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 lefthand column will 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	400 mA @ 5 VDC
Isolation	2500 V I/O to Logic, 1000 V among Input Channels and All Outputs

Input Specifications

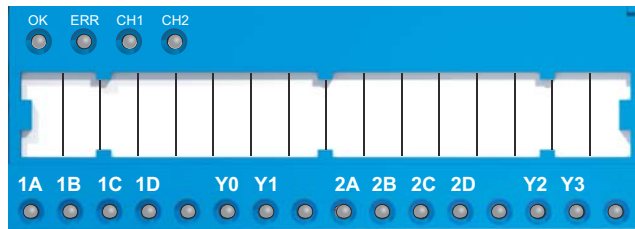
Input	8 pts. sink / source
Maximum Input Frequency	100 kHz
Minimum Pulse Width	5 μ sec
Input Voltage Range	9 - 30 VDC
Maximum Voltage	30 VDC
Input Voltage Protection	Zener clamped at 33 VDC
Rated Input Current	8 mA typical, 12 mA maximum
Minimum ON Voltage	9.0 VDC
Maximum OFF Voltage	2.0 VDC
Minimum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

Output Specifications

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



T1H-CTRIO LED Indicators

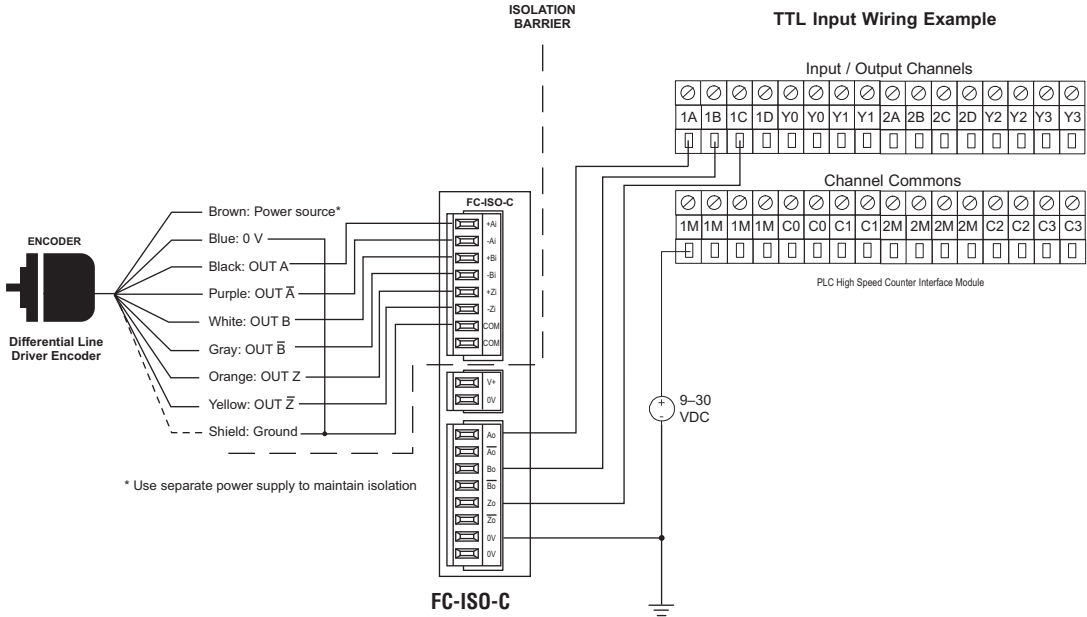


LED Descriptions	
OK	Module OK
ERR	User Program Error
CH1	Channel 1 Status
CH2	Channel 2 Status
1A - 1D	Channel 1 A-D Status
2A - 2D	Channel 2 A-D Status
Y0 - Y3	Output Status

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

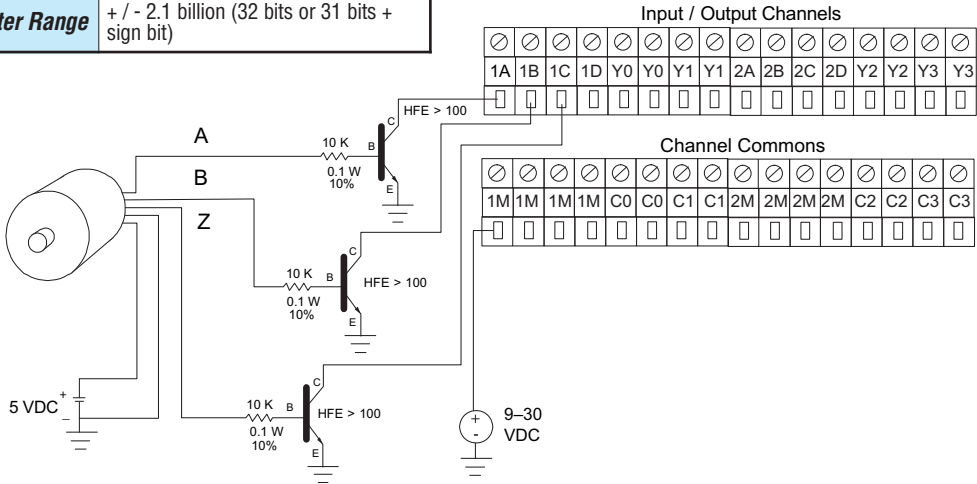
More LED Diagnostics Definitions	
CH1	Blinks when Channel 1 Function 1 is counting or timing.
CH2	Blinks when Channel 2 Function 1 is counting or timing.
Y0 - Y3	Follows actual output state; ON = output is passing current.

T1H-CTRIO Input Wiring Diagrams



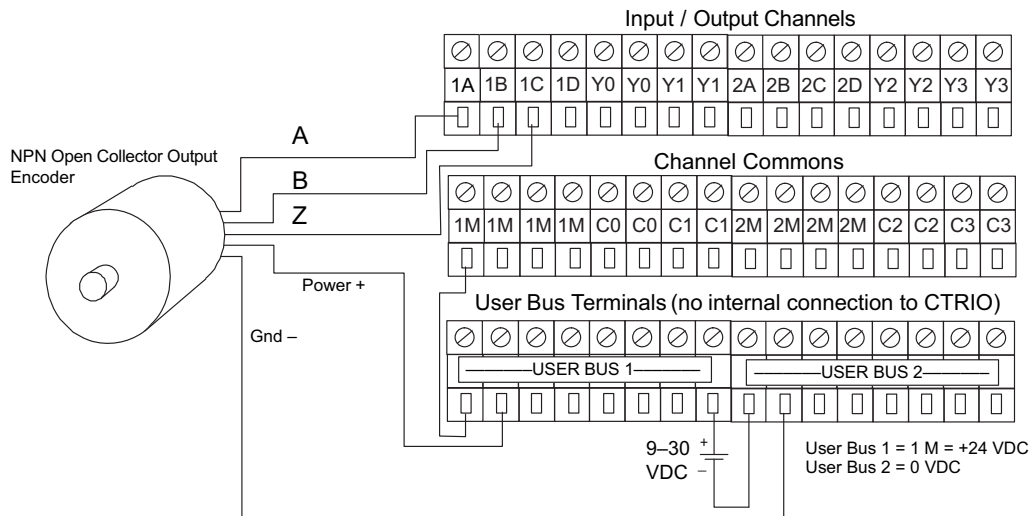
CTRIO Input Resources	
Counter/Timer	4, (2 per 4 input channel group)
Resource Options	1X, 2X, or 4X Quadrature, Up or Down Counter, Edge Timer, Dual Edge Timer, Pulse Catch, Reset, Inhibit, Capture
Timer Range/Resolution	4.2 billion (32 bits); 1 μ s
Counter Range	+ / - 2.1 billion (32 bits or 31 bits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

TTL Quadrature Encoder Wiring Example

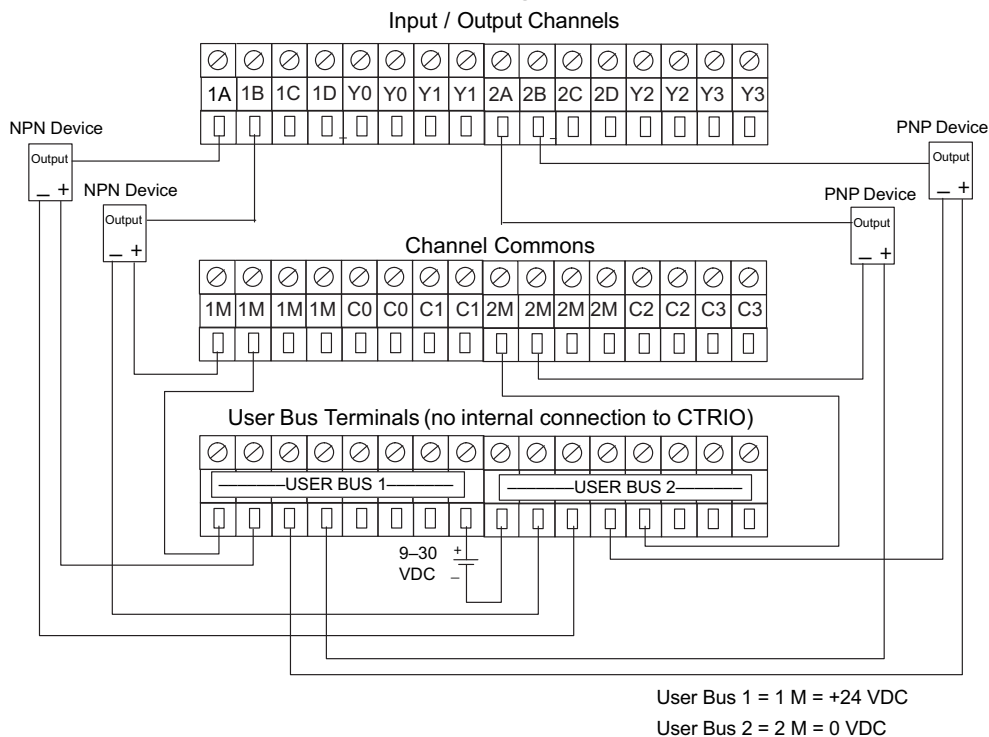


T1H-CTRIO Input Wiring Diagrams

Quadrature Encoder Wiring Example

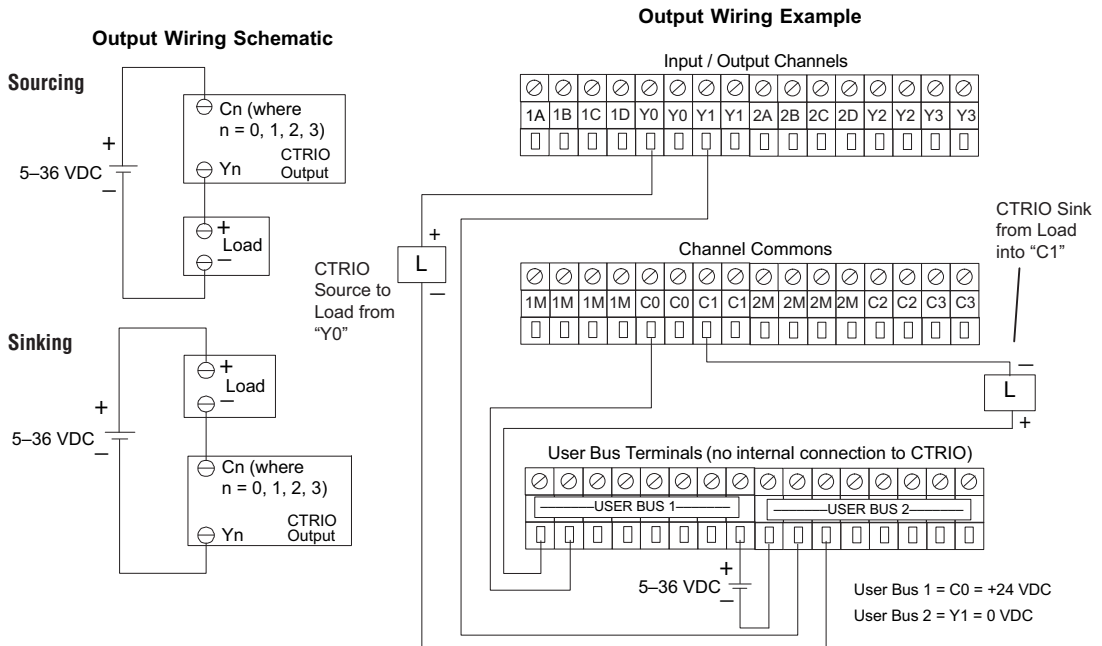


Input Wiring Example



T1H-CTRIO Output Wiring Diagrams

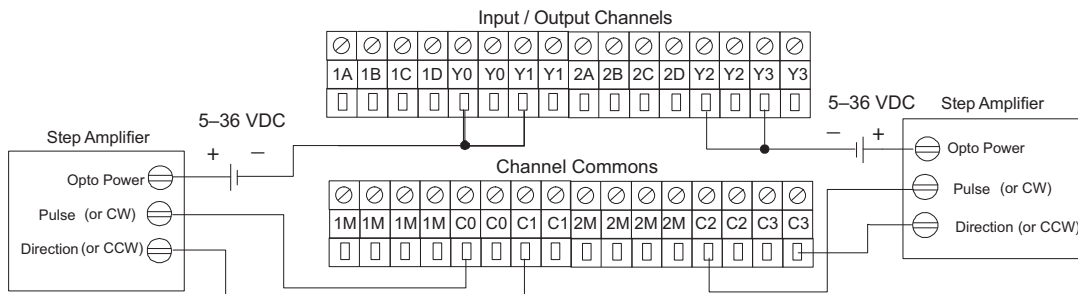
The module has 4 optically isolated output points (pts. Y0 - Y3 with isolated commons C0 - C3, respectively). The outputs must be wired so positive current flows into Cn terminal and then out of the Yn terminal.



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, DynamicVelocity, 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). RawMode: Direct access to output from user program.
Target Position Range	+ / - 2.1 billion (32 bits or 31 bits + sign bit)