

6. Counters

There are 20 independent counters in T28H. These counters occupy the first 20 entries in TRiLOGI's Counters table. All counters range from 1 to 9999.

These counters either operate as down-counters from a preset value or as reversible Up/Down counters. Any one or all of the first 8 counters can also double as step counters for the 8 sequencers available on T28H.

7. Host computer connection

Programming of the T28H controller is done entirely on an IBMPC compatible computer and the program is subsequently downloaded to the controller via the host computer serial port. A straight DB9 male/female cable is all you need for interfacing to the host computer RS232C port.

The female DB-9 D-connector of is to be connected to either COM1: or COM2: of the PC. If your computer has a 25-pin serial connector, then you will need a 9-pin (male) to 25-pin (female) adapter to complete the connection.

8. DIP Switch Settings

A 4-position DIP switch is situated just below the T28H CPU on the controller. The switches allow the controller to be configured for different operating modes, as indicated in the following table.

DIP Switch	OFF	ON
SW1-1	All outputs, relays, timers and counter values are non-retentive.	The first 32 relays, timers #1-8 and counters #1-8 retain their logic status and present values when power off.
SW1-2	Select RS232C interface	Select RS485 interface
SW1-3	Baud Rate always = 9600	Use baud rate set by "BW" command (See User's Manual)
SW1-4	Normal Run mode	Suspends execution of ladder logic program. However, host communication remains active (e.g. when used as a slave I/O card only).

T28H-Relay Installation Guide

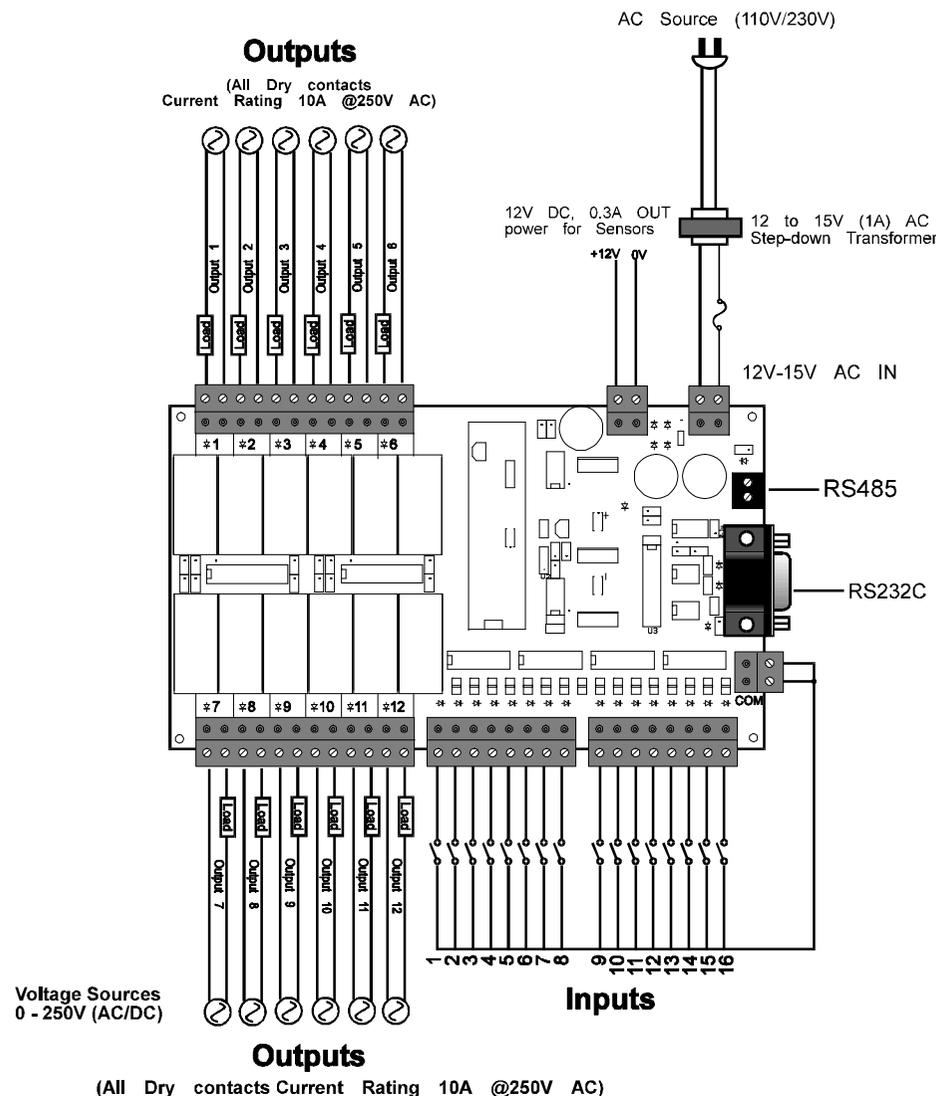


Figure 1-1

The T28H-Relay controller can be easily installed in many plastic or metal enclosures. You need to use 4 PCB standoffs to support the controller and to fasten it to a console box. Screw terminals are provided for quick connection to all input and output wires. In addition, each block of screw terminals can easily be detached from the controller body, enabling easy replacement of the controller board when necessary. The following sections describe various subsystems of the controller.

1. System Resources

Internal Resources	Standard Type	T28H-plus-Relay
Inputs	16	16
Outputs	12	12
Internal Relays	128	256
Timers	20	40
Counters	20	40
Sequencer	8	8
Maximum Program Steps	400	800

2. Power Supply

The T28H-Relay controller has built in rectifiers and voltage regulator to supply power to the entire board. Hence it requires only a 12V to 15V (rms) AC power source to be connected to the upper-right screw terminal block as shown in Figure 1-1. Use a transformer that can supply at least 1.0A output current. Alternatively, a DC 15V power source can also be connected to the same terminals to power up the system. Make sure that the DC source is capable of sourcing at least 1A of current continuously.

For system using solid state sensors, a DC 12V, 0.3A (unregulated) power output is also available for use by the sensors.

3. Input Units

There are a total of 16 physical inputs in T28H. These inputs are numbered from 1 to 16. These numbers correspond directly to the first 16 entries in TRiLOGI's™ Input Table. An input is turned ON if it is electrical connected to the COM (common) terminal of the controller. Alternatively, a sensor with open-collector output (NPN type) can also be used to trigger an input. Note that the T28H-Relay provides a 12V DC power output terminal which can be used by the sensors. External DC source can also be used to power the sensor, in this case the 0V of the external power source should be connected in common to the "0V" terminal of the T28H sensor power point.

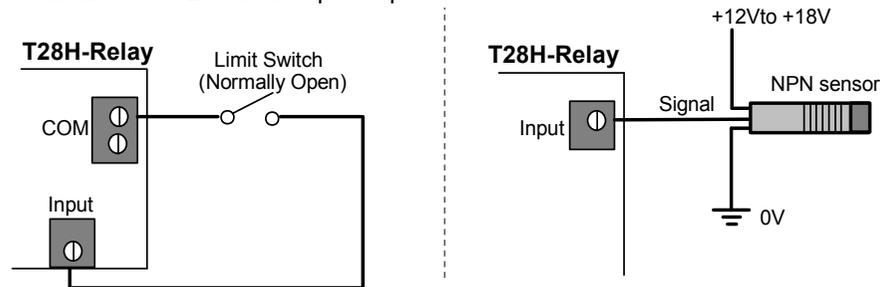


Figure 1-2

4. Output Units

The T28H-Relay controller provides 12 high-current fully-isolated relay output points. Each relay is capable of conducting up to 10A of current @250V AC or 30V DC and is UL and CSA type-approved. Note that every output is a pair of dry contact that is isolated from all other outputs, making it possible for T28H to control vastly different power sources.

Note: When driving heavy DC inductive load it is necessary to connect a varistor or transient absorber across the load to suppress inductive kick, as shown in the following diagram. This protects the relay contact from being damaged by electrical arc that normally occurs when the contact opens.

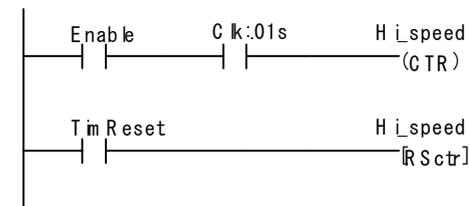
5. Internal Relays

The T28H supports up to 128 internal relays. Internal relays are useful for storing temporary logic states or serving as flags to a host computer which may examine them via the serial port. These relays correspond to the first 128 entries in TRiLOGI's Relays table.

6. Timers

The 20 software countdown timers in T28H occupy the first 20 entries in TRiLOGI's Timers table. The range of the timer preset value is from 0.1 to 999.9 seconds.

Additional timers may be created by feeding a built-in clock source to unused counters. The T28H supports 6 clock sources of various periods: 0.01s, 0.02s, 0.1s, 0.2s, 1 sec and 1 minute. The 0.01s clock source can be used to create high speed timers of 0.01s resolution, as shown in the example below:



The counter "Hi_speed" becomes a timer which counts down every 0.01s until it reaches zero. Note that the above timer is also a retentive type, i.e. when the input condition "Enable" is false, the timer stops but is not reset. If you prefer the timer to be reset when the condition is false, then reset the counter "Hi_speed" using the false "Enable condition".