T40H-Relay Installation Manual

The T40Relay controller can be easily installed in many plastic or metal enclosures. You need to use 6 CB 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.
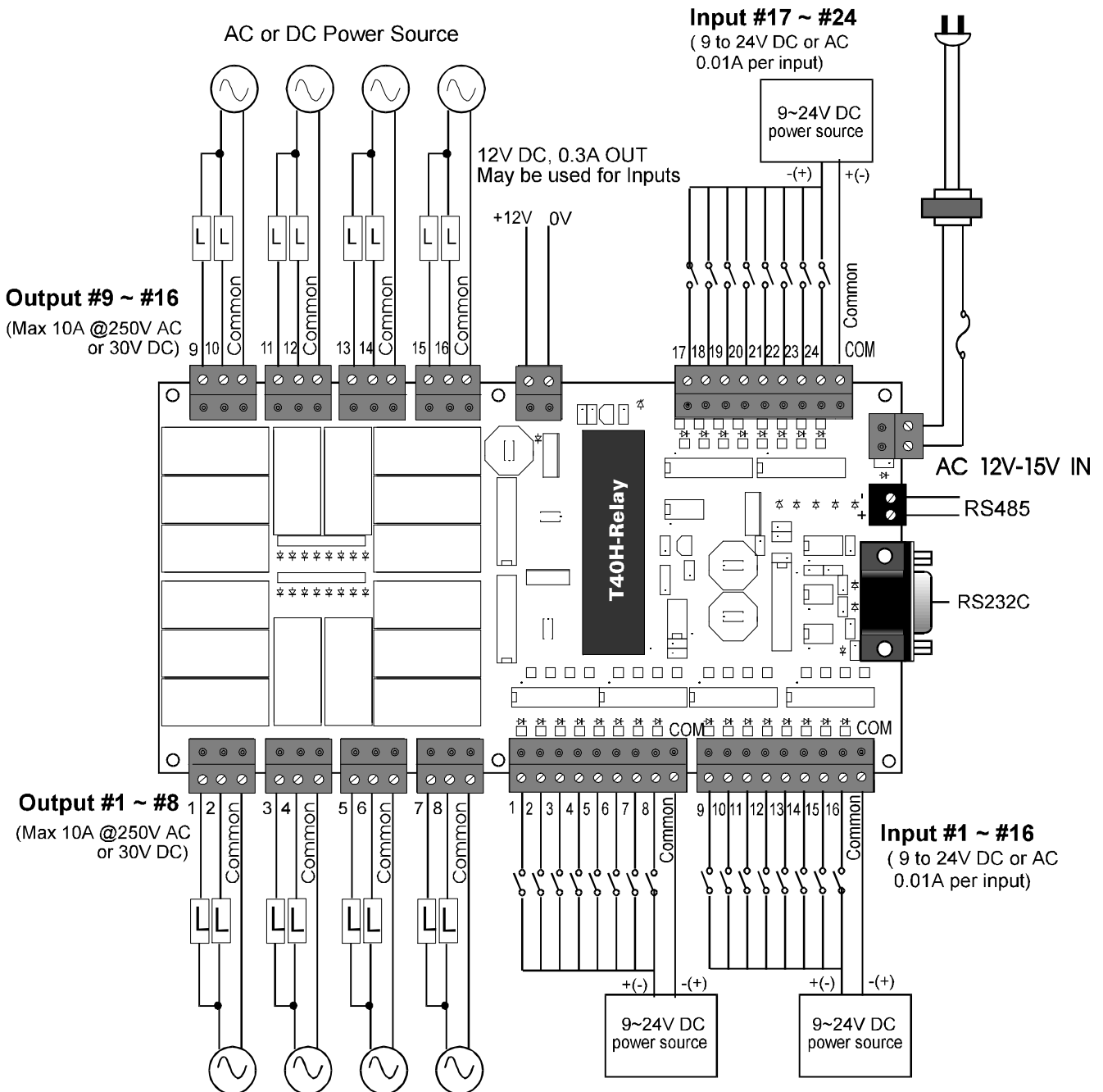

Figure 1 : T40H-Relay Wiring Diagram

1. Power Supply

The T40Relay 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 1.5A output current. Alternatively, a DC 12 to 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 continously.

For system using solid state sensors, a DC 12V, 0.3A (unregulated) power output is also available for use by the sensors. This DC output can alternatively be used as a power input to connect to a backup battery as shown in the following diagram:
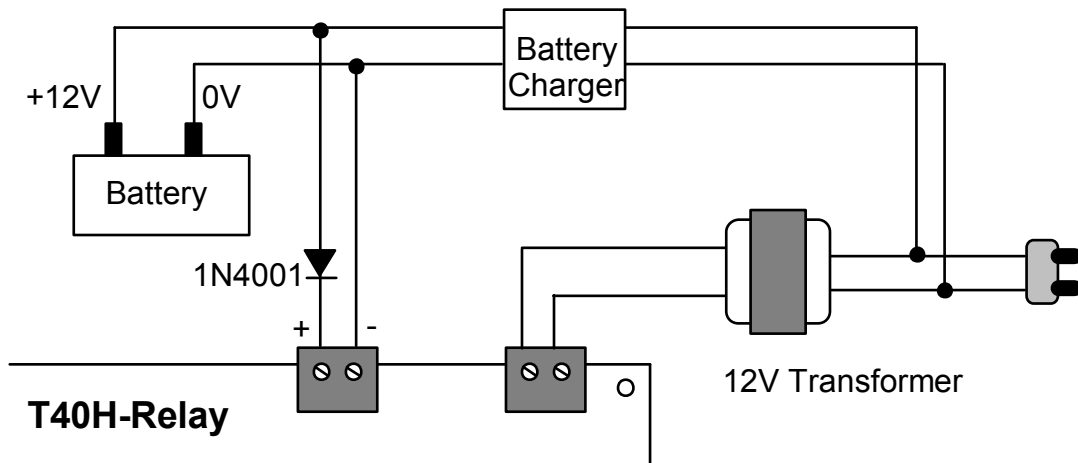

Figure 2 Using a T40H-Relay with battery backup

This opens up an interesting possibility of a power fail-safe application by using a lead-acid battery as backup instead of paying for an expensive Uninterruptable Power Supply.
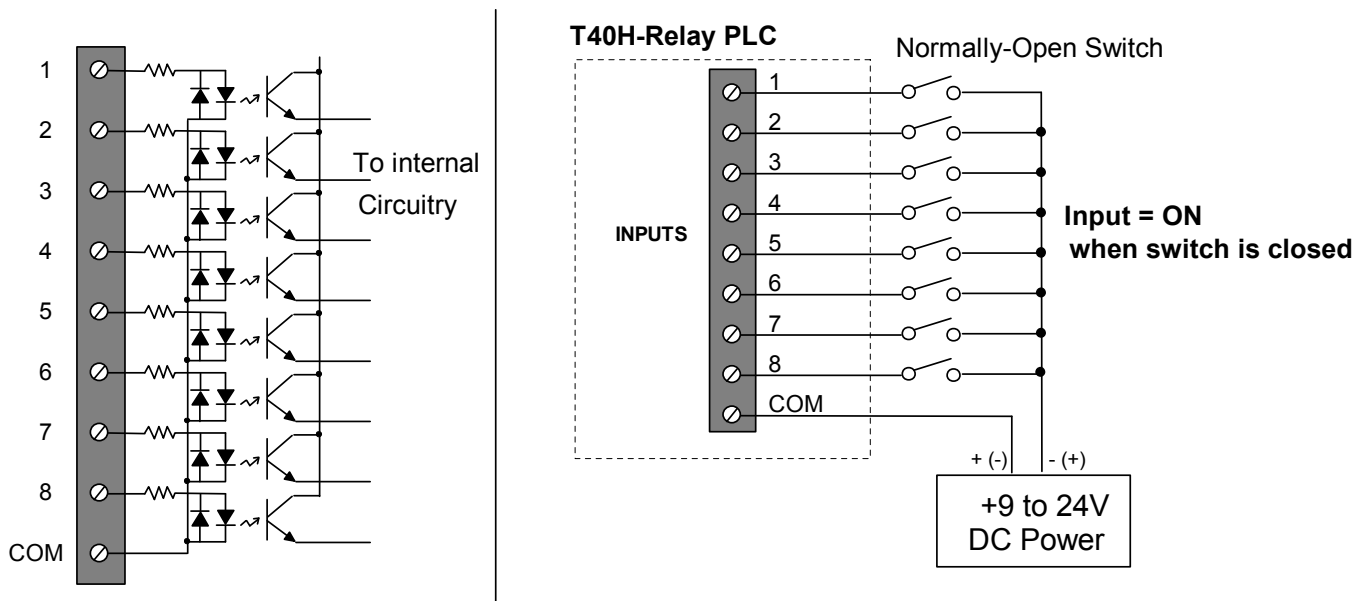
2. Input Units

Figure 3 Opto-isolated input interface & limit switch interfacing

There are a total of 24 physical inputs (divided into 3 blocks of 8 inputs) in T40H-RELAY. These inputs are numbered from 1 to 24. These numbers correspond directly to the first 24 entries in TRiLOGI's^{TM} Input Table. All the inputs of the T40H-RELAY employ AC opto-isolators and they can be connected to either PNP or NPN type sensors. Every 8 inputs are connected to a separate COMMON point, as shown in the following diagram:

Input Voltage for Logic 1:   +9V to +30V, > 5mA
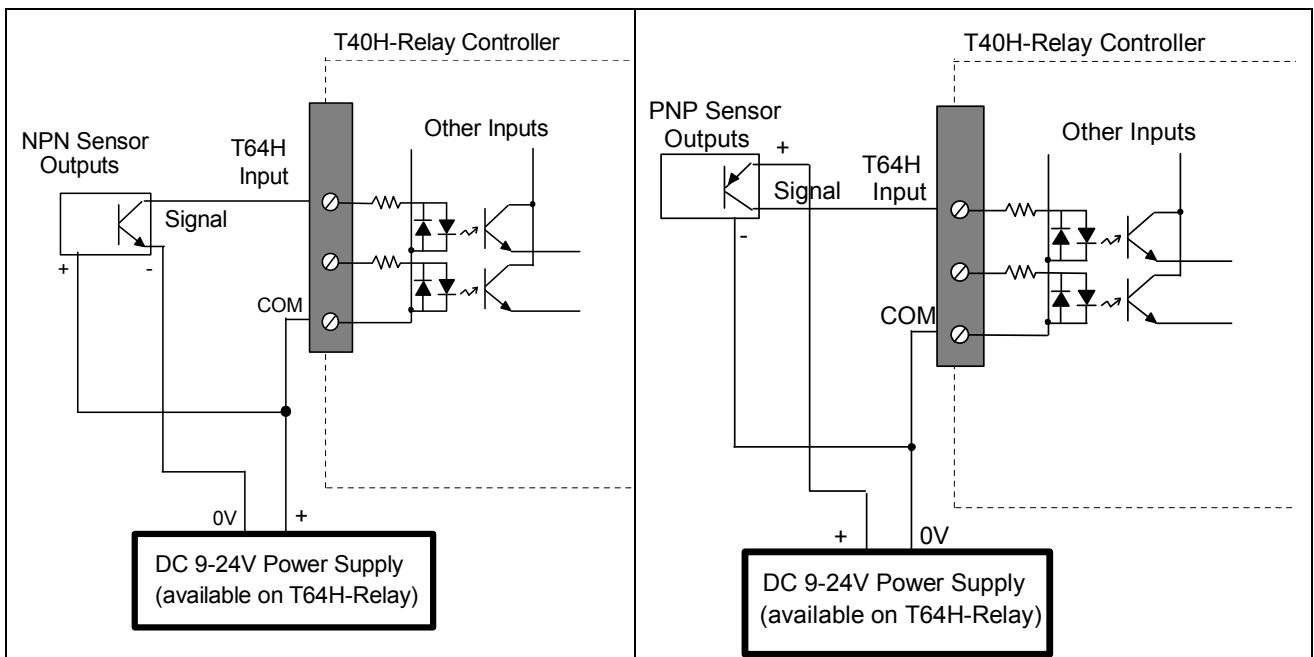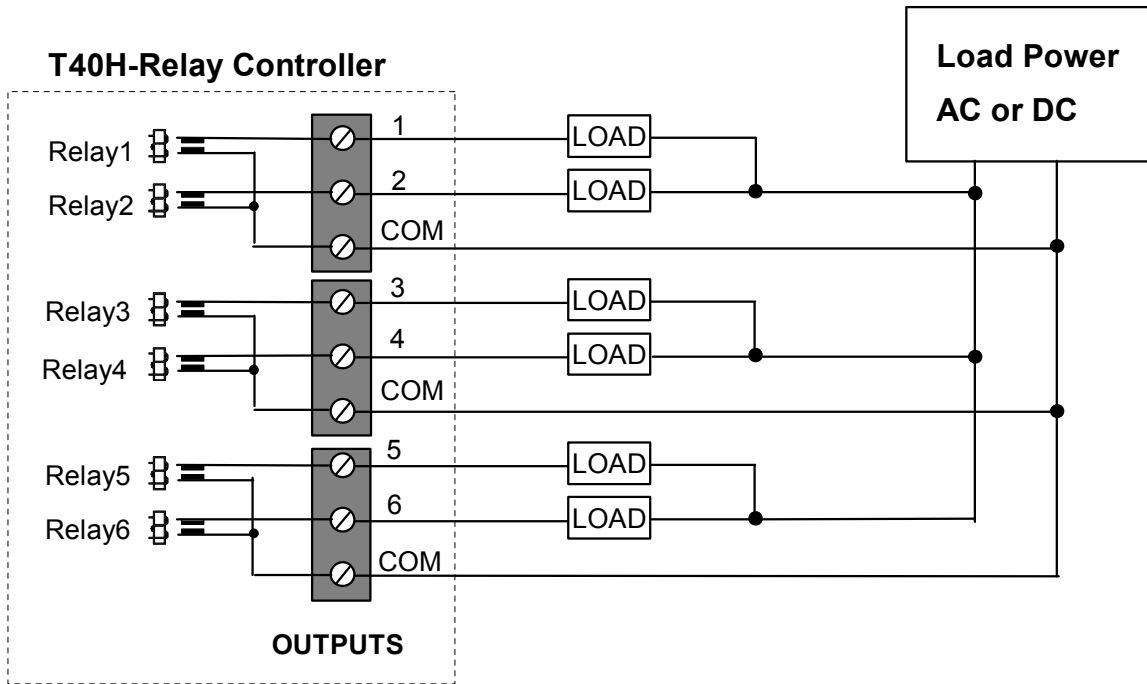Input Voltage for Logic 0:   Open Circuit or leakage current < 1mA.

Figure 4 Input Interfacing to PNP and NPN type sensors

3. Output Units

The T40H-Relay controller provides 16 normally-open, voltage-free relay outputs. Every 2 outputs share a common terminal (COM). Each output has a red LED indicator which lights up when the output is turned ON. Note that T40H-Relay uses high current relay which is capable of handling up to 10A of continuous current @250V AC or 30V DC.

Electrical specifications:

Output type		:	Relay contacts, Normally open.
Current Rating	@30V DC	:	10A (Electrical life = 2×10^5 cycles)
	@250V AC	:	10A (Electrical life = 2×10^5 cycles)
Maximum total current per block of 2 outputs		:	10A

T40H-Relay Controller

Relay1
Relay2

Relay3
Relay4

Relay5
Relay6

1
2
COM

3
4
COM

5
6
COM

LOAD
LOAD

LOAD
LOAD

LOAD
LOAD

Load Power
AC or DC

OUTPUTS

Note: When switching inductive load, always ensure that snubber circuit or bypass diode is connected to absorb inductive kick which occurs when the relay contact opens. If left unchecked, the inductive kick causes electric arc to form across the contact which will wear out the contact material and severely shorten the contact life of the relay.

T40H-Relay

Only suitable for DC Load
Diode voltage =4 x peak voltage
Current =2 x peak current
Power=Decided by Duty Cycle

Output

Load

直流
电源

Modern method use Varistor
Rating =Maximum rms voltage

Varistor

Output

Load

交直流
电源

C=0.1uF~1uF,400V
R=Load resistance

C   R

Output

Load

交直流
电源
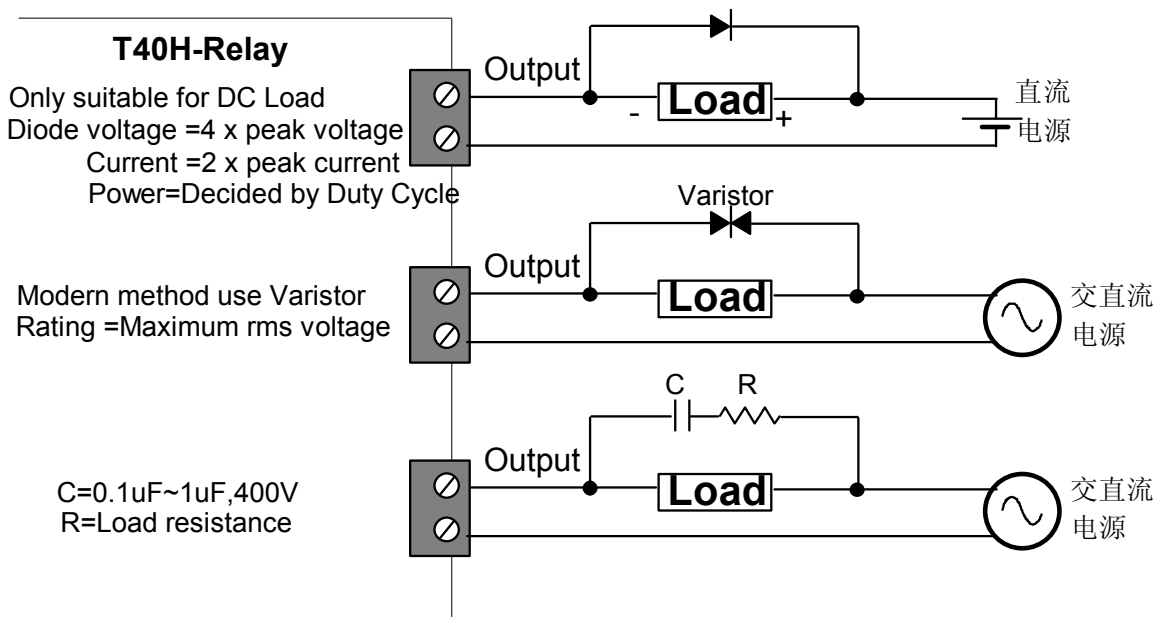
4. Internal Relays -The T40H-RELAY supports up to 128 internal relays (256 for T40Hplus-Relay). Internal relays are useful for storing temporary logic states or serving as flags to a host computer which may examine them via the serial port. If DIP switch SW1 is ON, then the first 32 internal relays retain their logic states when the power is off.

5. Timers - The 20 software countdown timers in T40H-RELAY occupy the first 20 entries in TRiLOGI's Timers table. The range of the timer preset value is from 0.1 to

4

999.9 seconds. If DIP switch SW1 is ON, then the first 8 timers retain their present values and logic states when the power is off. Additional timers may be created by feeding a built-in clock source to unused counters. The T40H-RELAY 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.

6. **Counters -** There are 20 independent counters in T40H-RELAY. 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 in T40H-RELAY. If DIP switch SW1 is ON, then the first 8 counters retain their present values and logic states when the power is off.

7. **Sequencers -** Model T40H-Relay controller supports 8 sequencers of 32 steps each. A sequencer is a highly convenient feature for programming machines or processes which operate in fixed sequences. Any one or all of the first 8 counters can be used as step counters for the sequencers which correspond to sequencers "Seq1" to "Seq8". A Sequencer operates in "steps". Each time the execution condition for the special function ------[AVseq] goes from OFF to ON, the sequencer will forward (increment) one step (starting from 0 to the preset values). See TRiLOGI Programmer's Reference for an example on the use of the Sequencers.

8. **Maximum Program Steps -** A program step is roughly equivalent to a NO or NC contact on the ladder diagram. (Please refer to TRiLOGI's manual for details). T40H-Relay allows program of up to 400 steps to be written.

9. **Host computer connection -** Programming of the T40H-RELAY controller is done entirely on an IBMPC compatible computer using the extremely user-friendly ladder-logic editor cum simulator software: TRiLOGI^{TM} Version 3.2 or higher. (Please refer to TRiLOGI's Programmer's Reference for details) TRiLOGI allows ladder programs to be created on the PC's screen and simulated in real-time. Editing and debugging is greatly simplified with this interactive simulation capability of the software. After creating the program, it is necessary to connect the PC to the T64H-Relay controller for program-transfer and on-line monitoring.

T40H-Relay PLC has one opto-isolated RS232 port for direct connection to PCs and one RS485 port for networking.DIP switch SW1-2 select which the active serial port. use communication format of 8 data bit, 1 stop bit and no parity. The RS485 port may be configured for communication speeds of between 1200 and 38,400.

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 port	Select RS485 port
SW1-3	Baud Rate always = 9600	Use baud rate set by "BW" command (See Section 4)
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).