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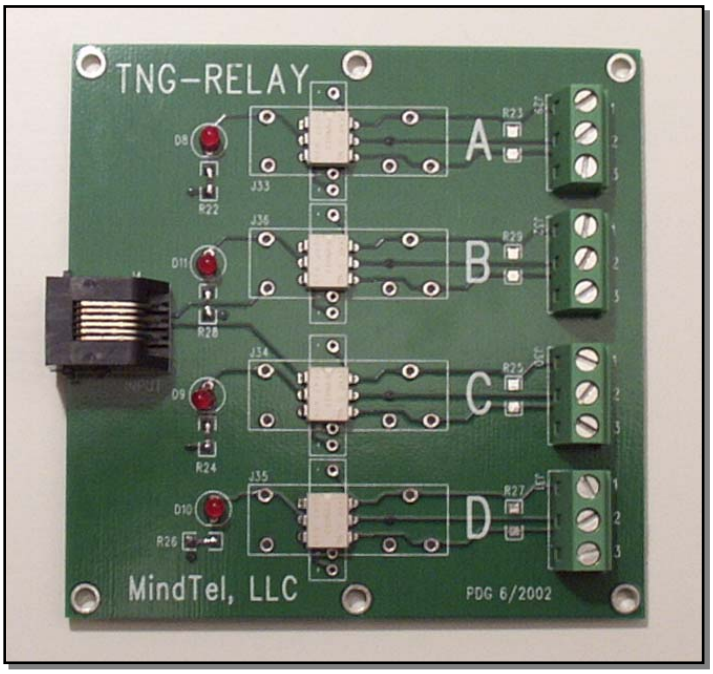
TNG-relay Board

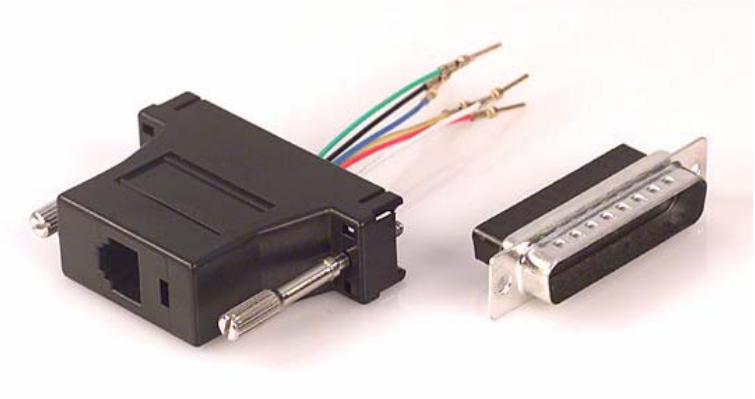


The TNG-relay board allows a TNG-4 digital output port to control four relays. This board is typically sold as a bare board, populated with 4 PVG612 photoMOS HEXFET relays (at right), or populated with 4 Sharp S101S05V AC relays.

This board was originally designed to plug into to any of the four digital I/O ports of TNG-4 with a modular cable. The corresponding port bits (B or D, upper or lower nibble) must be configured as an output (0). The digital I/O ports initialize as inputs. When the port bits are configured as inputs, the indicator LEDs on the TNG-relay card can appear to be on, albeit dimly. They are—just not enough to also turn on the relay. The state of the relay corresponds to the state of the corresponding digital output bit. “1” = ON; “0” = off.

However, this board can be interfaced to any device that provides TTL-compatible positive logic. Usage is not restricted to TNG-4. The driving circuitry must be able to source 3-50 milliamps (mA) at 5 volts, depending on the installed relay. A typical requirement is 5 mA. A ground connection must also be made.

The PC’s parallel port could be used to connect to this board. The adapter/connector shown below and available from Digi-Key (#046-0008-ND) makes such a connection relatively easy.



Digi-Key #046-0008-ND

Custom configurations are available:

The relays can be PVN012 PhotoMOS relays as shown above, P&B/Tyco T75S5D15-05 (DigiKey #PB442) mechanical relays, Radio Shack 275-310 AC SSR (Sharp), H11L1 logic optoisolators, or many of Aromat's AQV-type photoMOS relays. Each channel can be configured separately.

Indicator LEDs are not required. The value of the current limiting resistors, R22, R24, R26, and R28, depends on the current requirements of the relay device and LED.

Screw terminal connections are optional, as is the 6-6 modular jack. Each relay channel has three output connections labeled "1", "2", and "3". The function of the three connections depends on the relay implemented and the configuration of the load.

Note: The P&B/Tyco T75S5D15-05 relay requires more current than can be supplied by TNG-4 directly.

Device	Pin 1	Pin 2	Pin 3	Control Current	Load Characteristics
PVG612 "A"	AC or DC +power	No connection	AC or DC load high; connect low side of load to DC power ground	5 mA (R=221 Ohms w/ LED)	±60V (peak) AC OR DC @ 1.0A max. Turn on = 2ms Turn off = 0.5ms
PVG612 "B"	+DC power	DC load high; connect low side of load to DC power ground	No connection	5 mA (R=221 Ohms w/ LED)	±60V DC @ 1.5A max.
PVG612 "C"	+DC power	DC load high; connect low side of load to DC power ground	+DC power	5 mA (R=221 Ohms w/ LED)	±60V DC @ 2.0A max.

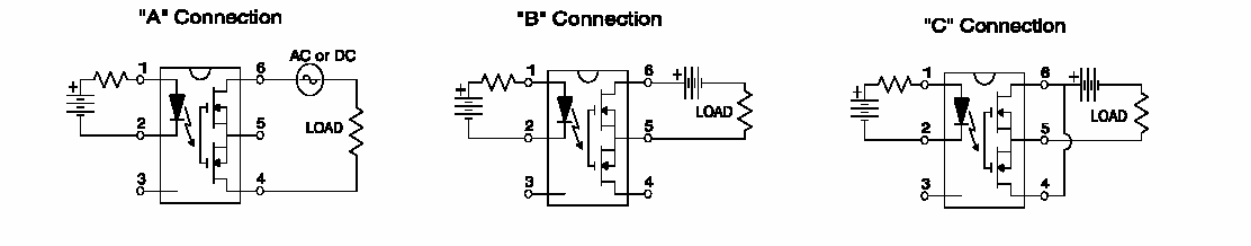
PVN012 “A”	AC or DC +power	No connection	AC or DC load high; connect low side of load to DC power ground	~2.8 mA (R=665 w/ LED) Use 5mA for max. current.	±20V (peak) AC OR DC @ 2.0A max. Turn on = 5ms Turn off = 0.5ms
PVN012 “B”	+DC power	DC load high; connect low side of load to DC power ground	No connection	~2.8 mA	3A DC max.
PVN012 “C”	+DC power	DC load high; connect low side of load to DC power ground	+DC power	~2.8 mA	4.5A DC max.
P&B/Tyco T75	Switch Common	Normally closed	Normally open	~43 mA	5A @ 125VAC or 8A @ 24VDC in 10ms
H11L1	Vcc	GND	Logic Output (install 47k resistor)	~2 mA	Output sinks up to 16mA
Radio Shack SHARP S101S05V	AC Load	No connection	AC Load	20 mA; R=100	3A @125 VAC turn on time 1ms; turn off time 10ms.
Sharp S101S02	AC load	No connection	AC Load	20 mA	1.5A @125 VAC turn on time 1ms; turn off time 10ms.
Aromat/ NAIS AQV210E	AC or DC +power	No connection	AC or DC load high; connect low side of load to DC power ground	3 mA	130mA @ 350V max. AC or DC 2ms switching time
Aromat/ NAIS AQV212	AC or DC +power	No connection	AC or DC load high; connect low side of load to DC power ground	3 mA	400mA @ 60V max. AC or DC 2ms switching time
Aromat/ NAIS AQV214	AC or DC +power	No connection	AC or DC load high; connect low side of load to DC power ground	3 mA	120mA @ 400V max. AC or DC 0.5ms switching time
Aromat/ NAIS AQV241	AC or DC +power	No connection	AC or DC load high; connect low side of load to DC power ground	3 mA	500mA @ 40V max. AC or DC 2ms switching time

Other SSRs, mech. Relays, and optoisolators may be adapted to this board.

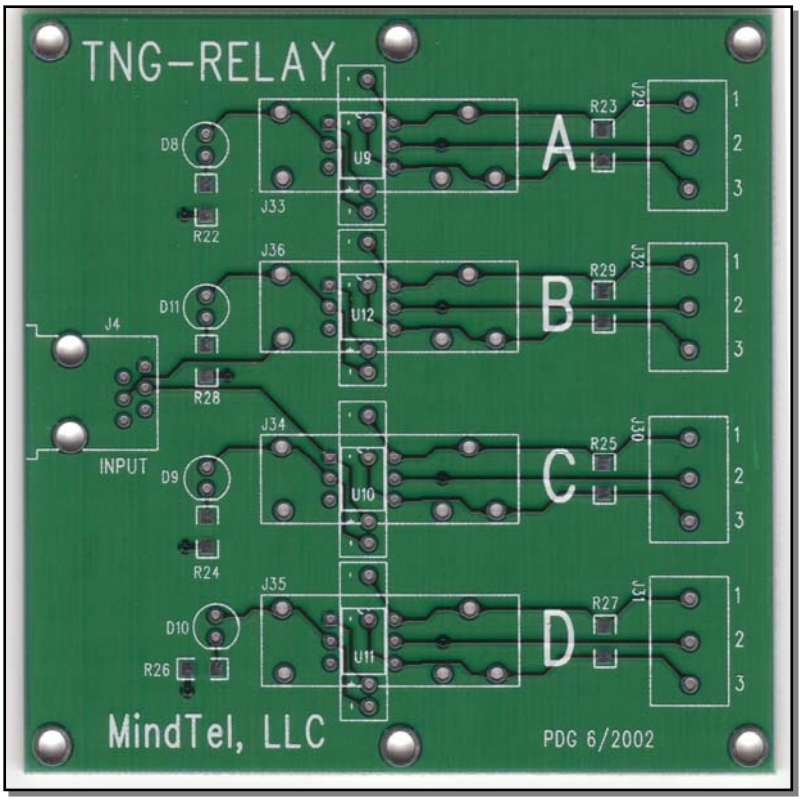
PGN612 / PVN012 pins 6, 5, and 4 correspond to TNG-relay output pins 1, 2, and 3, respectively.

PGN612 / PVN012

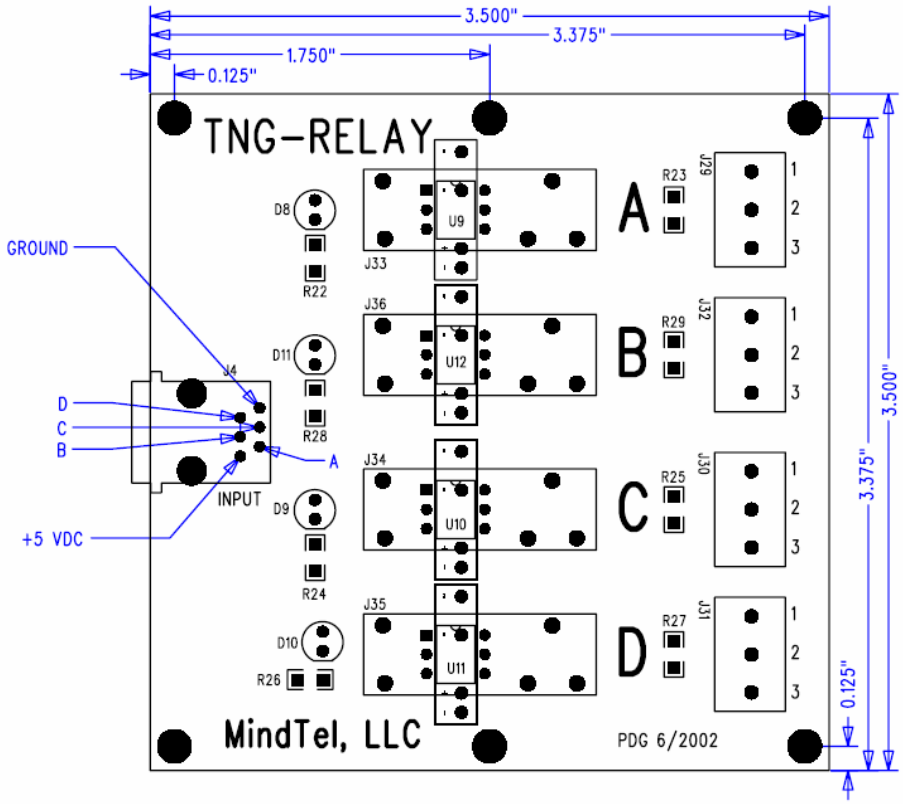
Connection Diagrams



The TNG-relay printed circuit board is 3.5 x 3.5". There are six 0.125" mounting holes, three along the top and three along the bottom edge of the board. All the holes are located 0.125" from the nearest edge. The center holes are situated on the board's midline (1.75"). The mounting holes have an electrical connection to the board's ground plane.



Unpopulated relay board



Dimensions and Connections

Populated with AC relays