

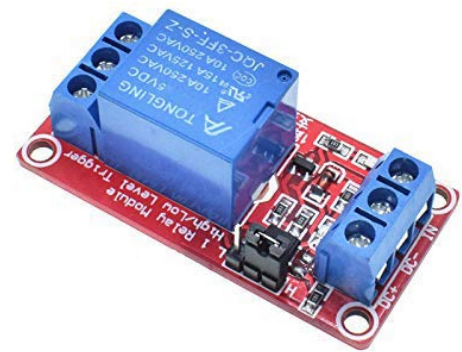
Chapter 13 – Adding a Relay

July, 2020

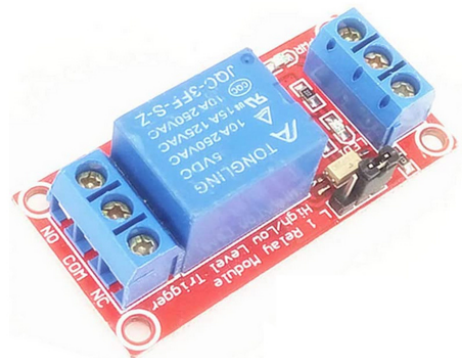
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Sometimes an Arduino needs to control a device which requires a higher voltage than 5VDC, or one which requires more than 40 milliamps of current on one pin. This is where a relay can be useful.

A relay such as Youngneer 5V relay from AMAZON (ASIN: B07M88JRFY, 8 for \$12) can perform such tasks. The upper photo shows the end which is connected to an Arduino; the DC+ terminal is to be connected to the 5V pin of the Arduino, and the DC- terminal connected to the ground of the Arduino (if more than one component requires 5V, then a barrier strip can be a convenient way to connect multiple devices). The IN terminal of the relay is connected to an Arduino pin designated for OUTPUT in a “pinMode(pinNumber,OUTPUT)” statement in an Arduino sketch; just replace “pinNumber” with the number of the pin you wish to use to control the relay.



The lower photo shows how the relay is connected to some other higher voltage or current device. For example, in my Carousel project I needed to control the Carousel motor, which required 8VDC to spin at the speed I wanted; 12V from the power supply caused the motor to spin too fast, and 5V from the Arduino was too slow. I used a “Buck Converter” downstream of the power supply to create the 8 VDC I needed. I then connected the NO pin of the relay (NO means “Normally Open”) to the positive side of the Buck Converter, and the COM pin to the ground at the Buck Converter.



When I wanted to supply power to the Carousel, all I needed to do was to do a “digitalWrite(pinNumber,HIGH)” in the loop function of the sketch, and a digitalWrite(pinNumber,LOW) to turn it off. The relay was rated at well over the 8 volts I needed, and turned the motor on and off as I desired.

The NC terminal of the relay is used if you wish the relay to be operational when the control pin is NOT set to HIGH, essentially opposite of the way described earlier.

Arduinos are generally safe devices because they run at low voltages and currents. If you feel that you must drive devices over 12VDC using a relay, please seek someone qualified to assess the danger. I can think of no reason you would ever need to do so in model railroading, so if you think you have a reason, please do not rely on your own intuition, even if you are qualified, but ask someone else for advice.