

Chapter 8 – Using a Toggle or Pushbutton Switch

April, 2020

David Ackmann – Gateway Division NMRA

A toggle or pushbutton switch is generally used in an Arduino “loop” function to test whether a task should be started or stopped, or possibly for configuration. In my Lumberjack project, I use a momentary pushbutton (this means that the switch is closed only when it is depressed) to start the chopping animation, and in my Carousel project I use a toggle switch (which means when the switch is thrown, it stays in the “on” position until I throw it back to the “off” position) to start or stop the carousel.

The simplest switches are “single pole-single throw”, which means that underneath there are only two connection points, and these are the ones I will discuss here. The points are either connected into a complete circuit, or they are not. If you are unfamiliar with the way switches work, you can place an ohm meter across the leads, and when the toggle is in one position, or the push button depressed, the meter will read zero ohms in one position, and an infinite number of ohms in the other.

Take your switch and connect wires to the two terminals, either soldering or using wires connected to spade connectors tightened down with screws. Now connect one wire to a ground position and the other to a digital pin (I will assume you are using pin D2). There is no conventional color to use for wires in switches. You are now ready to test the switch

There is a simple sketch under the Chapter 8 heading of the website at <http://daackm.github.io> called “Switches”. Using the IDE, copy and paste the sketch into an emptied sketch, and run the sketch.

The LED in the middle of the Arduino, the one connected to pin 13, will turn on and off as the switch is turned on and off.

It may seem that connecting a switch to a 5V source via one wire and a ground point on the other end would lead to a short circuit, but that is where INPUT_PULLUP comes into play. Using INPUT_PULLUP invokes a resistor internal to the Arduino which prevents a short circuit; it sets the value of the testing pin to HIGH when the switch is open, and LOW when it is closed.