Adding A Tool Touch Off to my Centroid Acorn, Version 1.0

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It is very handy to be able to define height differences between cutters. Once done, G code commands and Centroids CNC12 software can automatically compensate for this height. The tedious bit is measuring those differences. Owning a Tool Touch Off (TT) device makes this a semi automatic task.

Here you see my TT sitting on a V block. All that matters here is that the TT is stable. Any rocking causes error. Above the TT is my reference tool. It is just a steel cylinder that is longer than any of my cutters[2].

I tell CNC12 to set my reference. Push a few buttons and the height is recorded. Then I change to my first tool and assign it to Tool 1. Push a few buttons and CNC12 will record how much shorter this cutter is than my reference. If I have a second tool, it would be assigned to Tool 2.

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[2] Any cutter longer than my reference will generate an error message when its height is determined.

I'm using the version of CNC12 that comes with Acorn so it limits me to using automatic Tool Touch Off on only the Reference, Tool 1 and 2. My work around is to use Tool 1 as my scratch pad. As I cycle through my tools, I use copy and paste to put the measured height into the correct tool position. I can have 10 tools. Above that I will need to buy the Pro version that lets me have 200 tools.

My Tool Touch Off is a precision normally closed switch. When that top disk is depressed slightly, the switch opens. A small amount of current still flows which lights the built in red LED. This is not enough to throw the Acorn's input circuit off.

First I will explain the hardware connections and then address the software data that must be populated.
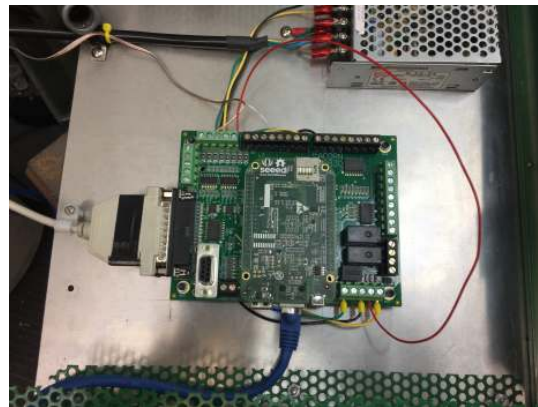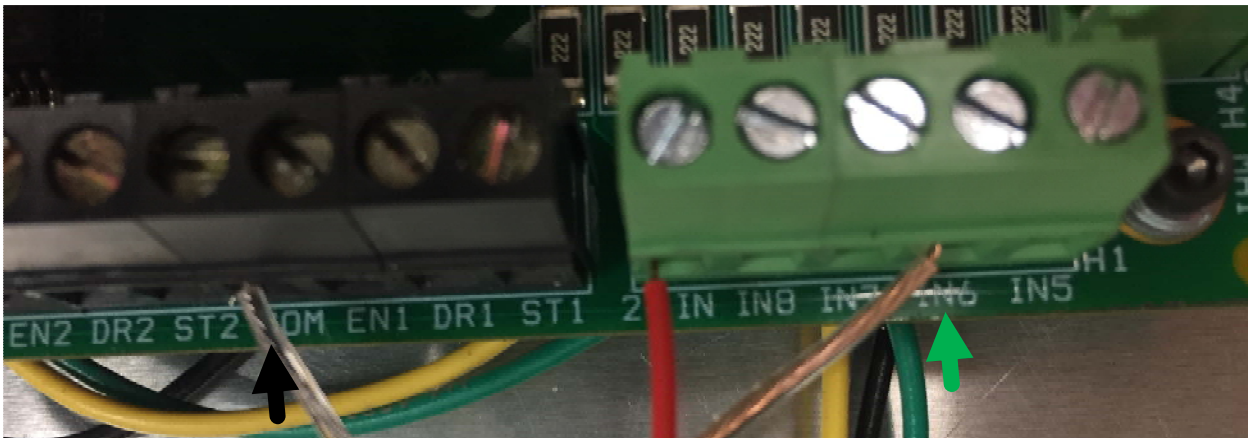
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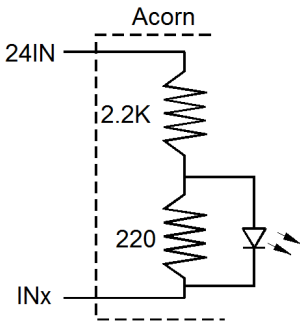
The Acorn board has 8 opto isolated inputs that look like this. The intent is to connect 24VDC between 24IN and Inx in order to turn on the LED in the opto isolator.
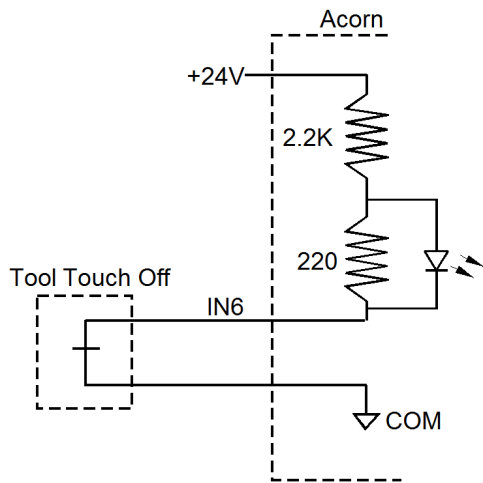
I chose to use IN6 for my TT but you will later see that other inputs can be used.

Since I just wanted to get it working, my wiring is sloppy. I'll fix it later.

Here is a close up of the wiring on the Acorn. My silver wire from my TT connects to COM (black arrow). My copper colored wire ties to IN6 (green arrow). +24VDC is the red wire and connects to a terminal at the Acorn's input power terminal. The negative terminal of this 24V supply already connects to COM to complete the circuit.
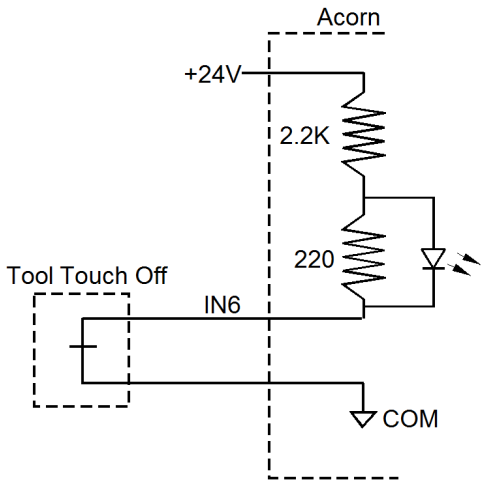
When the TT is in its "normal" state, IN6 is connected to COM. The LED inside the opto isolator is on. When the tool touches down, the switch inside the TT opens and IN6 rises to about +24V. This turns off the LED.

One of the very nice features of the Centroid software is an input diagnostic screen. From the main window, press ALT+I and up comes
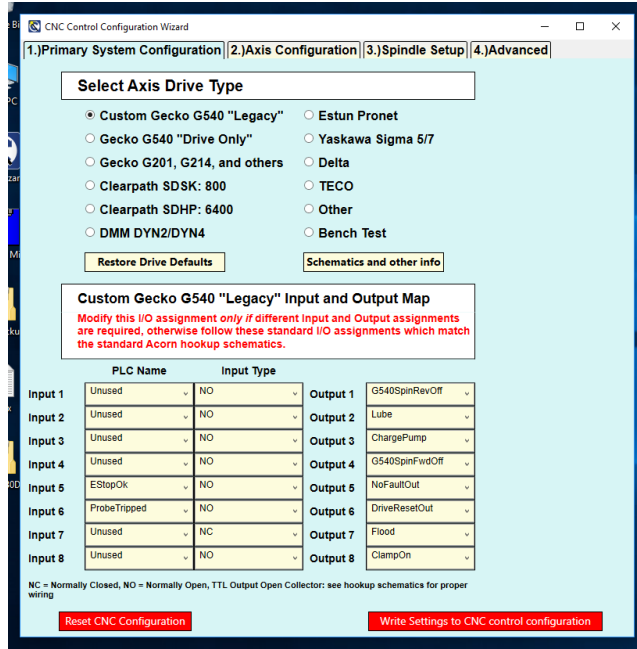

A close up reveals what the software will see at its inputs. Input 6 has a red dot. My TT is in its "normal" state. That red dot under the "6" means that IN6 is pulled low and the LED is on.

When I press on the TT, the LED turns off and the dot turns green. Therefore, all is wired correctly.

Press ALT+I a second time to retire this diagnostic screen.

Software

The Wizard is used to tell the software how the hardware was connected. I'm using the "Custom Gecko G540 Legacy" set up so that is what I have chosen. At the moment I only have my TT and eStop connected as can be seen at the bottom of the window. Input 5 is EStopOK and has an input type of NO. "NO" means Normally Open. When EStop has *not* been triggered (i.e. is OK), the input will be high. This is seen as Normally Open to the software. When EStop is triggered, the input goes low and the software sees it as EStop going active.

Similarly, Input 6 has my TT connected. The drop down menu for Input 6 has been set to ProbeTripped. When my probe has been tripped, a tool is pressing on the top. This causes the internal switch to open. Therefore, tripped is equated with NO, Normally Open. In this case, "Normal" means "Probe Tripped". Obviously I didn't get this right the first time since my idea of normal is when the TT is just sitting there with nothing on top. In any event, this does now make sense to me and does work.
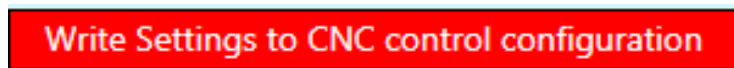
I press this button in order to load the values into the Acorn hardware. It is then necessary to power cycle the Acorn to finish the task.

See the Operator's Manual, Chapter 5 on Tool Setup for how to use the TT.

Acknowledgments
Thanks to "Beevo", Marty Escarcega, and Keith McCulloch for helping me to get this all to work.

I welcome your comments and questions.

If you wish to be contacted each time I publish an article, email me with just "Article Alias" in the subject line.

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