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 cutters².



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.

Hardware



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

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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

Bi	81 🕲 CNC Control Configuration Wizard - 🗆 🗙												
	1.)Primary System Configuration 2.)Axis Configuration 3.)Spindle Setup 4.)Advanced												
	Select Axis Drive Type												
РС		Custom Gecko	G540 "Legacy"	○ Estun Pronet									
2		○ Gecko G540 "E	Drive Only"	○ Yaskawa Sigma 5/7									
2		○ Gecko G201, G	214, and others	 Delta TECO Other 									
zar		○ Clearpath SDS	K: 800										
9		○ Clearpath SDH	P: 6400										
		O DMM DYN2/DY	N4	○ Bench Test									
Mi		Restore Drive Def	aults	Schematics and other info									
	Custom Cooke CE40 "Leggery" Input and Output Man												
	Modify this I/O assignment only if different input and Output assignments												
ku	are required, otherwise follow these standard I/O assignments which match the standard Acorn hookup schematics.												
	L	PLC Name	Input Type										
	Input 1	Unused 🗸	NO v	Output 1	G540SpinRevOff	v							
×	Input 2	Unused	NO v	Output 2	Lube	~							
	Input 3	Unused	NO v	Output 3	ChargePump	v							
	Input 4	Unused	NO v	Output 4	G540SpinFwdOff	v							
OD	Input 5	EStopOk	NO v	Output 5	NoFaultOut	v							
	Input 6	ProbeTripped	NO v	Output 6	DriveResetOut	v							
	Input 7	Unused 🗸	NC v	Output 7	Flood	v							
	Input 8	Unused	NO	Output 8	ClampOn	~							
	NC = Normally Closed, NO = Normally Open, TTL Output Open Collector: see hookup schematics for proper												
		Reset CNC Configuration			Write Settings	to UNC contro	ol configur	ration					

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.

Write Settings to CNC control configuration

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.

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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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