

Hi guys here is how to make a latching E stop that is triggered by both physical Estop switch and also within linuxcnc.

How it works is both software estop and ext physical estop can signal a estop condition. Ext estop must be cleared before the software estop can be cleared. And the machine will not enable until the "machine on button" is selected. But the Ext Estop can still by pass software and cut the power making this quite safe. **This is important, you are not relying on software to work you E stop. If the computer glitches out you are still safe.**

You will require two DPDT relays, plus you can add in more relays, if you need to for bigger Machines.

This is the dummy cheat sheet to get you started. Hopefully this helps everyone else starting Out and you don't take as long as I did to work it out haha.

There are a few parts to this which I will explain in video but I will write them down here also. **My comments are in red...**

**These symbols mean next step => ( edit ignore the hal file => lol)**

### **Software part:**

=>Run through the stepper configurator or pncconf wizard  
=>select include classic ladder.  
=>click the drop down menu and select sample ladder programs  
=> Estop program.  
=>Then go through the rest of the configurators and set up your machine.  
=>when you get to the IO tabs select input 1 and make it ext estop  
(wire you big red estop button here)  
=>select output 1 and make it estop in (this is the gui Estop)

Thats all for this part. Now you will have to change a few lines of code in the hal file. I will show you how to use Halcmd which i highly recommend. It makes everything so much Easier!!!

**Here are the Hal lines that you need to change. The lines with ## are original signals from step config or pncconf and below it are the changes you need to make.**

**I use a mesa 5i25 and 7i76 so if you have those cards this should be plug and play. If you are using a parport you will need to change the hal pins to select this.**

```
##--- ESTOP-OUT --- (gui estop this is now linked to classic ladder only)
##net estop-out => hm2_5i25.0.7i76.0.0.output-00
# --- machine-is-on --- (there is no E stop out signal now)
net machine-is-on => hm2_5i25.0.7i76.0.0.output-00

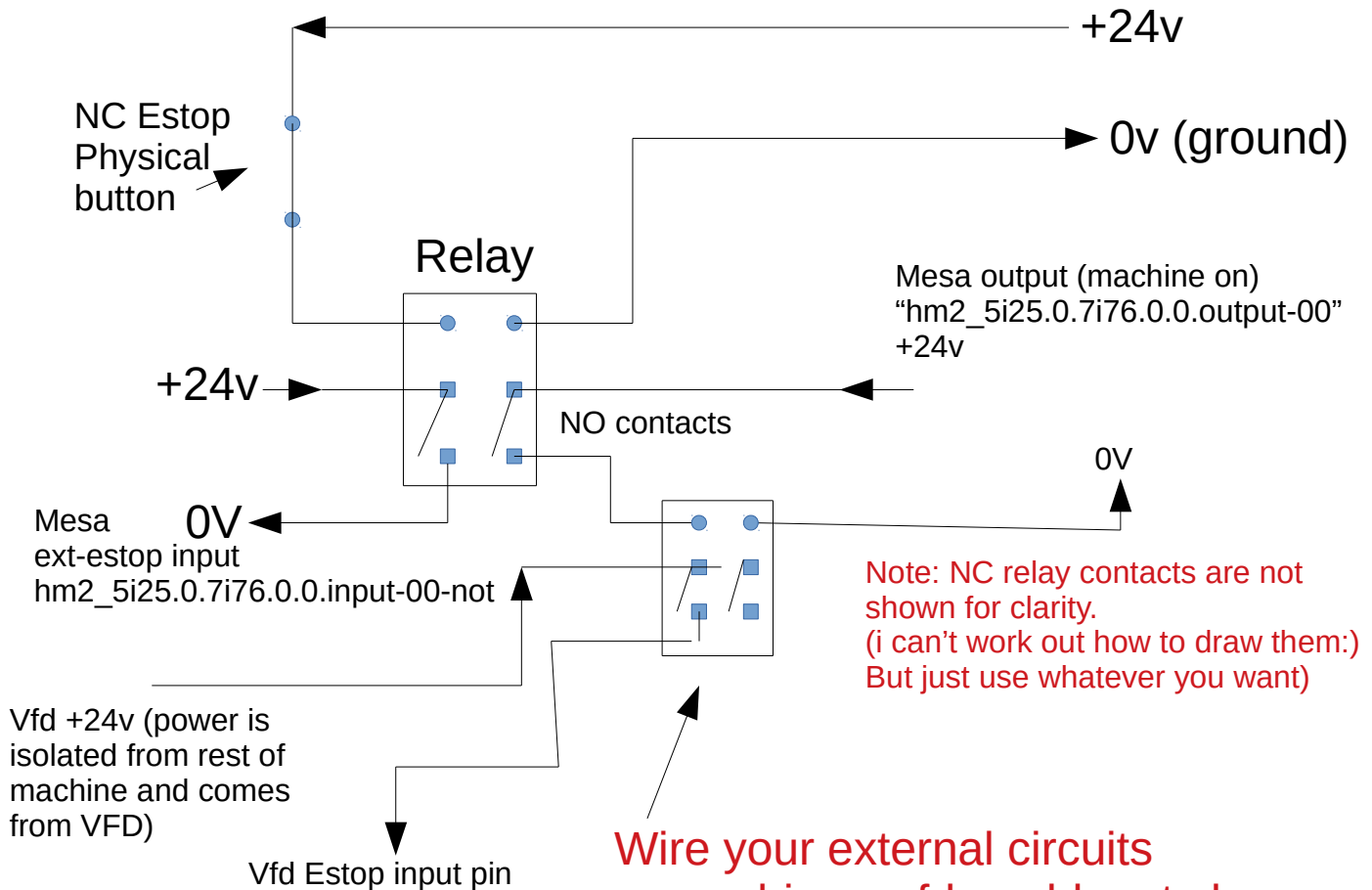
## --- ESTOP-EXT ---
##net estop-ext <= hm2_5i25.0.7i76.0.0.input-00

# --- ESTOP-EXT --- (Note the IO pin is inverted. I did that to work with my relays)
net estop-ext <= hm2_5i25.0.7i76.0.0.input-00-not
```

**That is all the Hal you need to change, its as close to the stock config that is generated as I could make it and works with both step config and pncconf. (I test with step config up at the house)**

Note I only use one dc power supply for everything in main circuit including the mesa card IO inputs and outputs. (Note Mesa card gets logic 5v from pc)  
 So all +24 volt connections are coming from the same positive terminal.  
 All 0V (ground) also comes from the same negative terminal  
 on the powersupplyit just looks easier to read if I don't draw lines connecting the different circuits.

External Estop cuts power to relays and sends Estop signal to linuxcnc



Note: NC relay contacts are not shown for clarity.  
 (i can't work out how to draw them:)  
 But just use whatever you want)

Wire your external circuits servo drives, vfd enable, etc here  
 It is up to you what you wire here depending on your machine.  
 I have given you my sample wiring for a Schiender vfd.

If you need help and I have time try contact me at my website  
[Carbidecutters.co.nz](http://Carbidecutters.co.nz)