Kill Switch in Main Controller

Welcome back to Cypress Academy, PSoC 6 101. In the last video I showed you how to use the PSoC digital logic block to build a hardware kill switch.

Now let’s add that same kill switch functionality to our BLE controlled robotic arm project. In order to do this, I'm going to take advantage of the fact that PSoC Creator will let you have two projects open in the same workspace at the same time. I'm sure that as soon as I said this my friend Greg had the hair standing up on the back of his neck. He hates - hates - having multiple projects open at the same time because it is really, really easy to edit in the wrong place or program the wrong thing.

So, let me show you how to do this and to try to help keep you out of trouble. If you look in the workspace explorer, you'll see that I have a bunch of projects in this workspace. And you may notice that one of these projects is in BOLD… that means that it's the currently active project. When you click build or program this is the project that will be built and programmed.

Many times, I've seen people - including myself - edit in a project and click program only to find out that they were editing the wrong project.

Here let me show you.

First, right click on the Main Controller project and pick “Set As Active Project”. Notice that after a second or two that project becomes bolded. That means that this is the project that will be programmed – it's the active project.

Now open the BasicKillSwitch schematic. Then open the schematic for your Main Controller. Notice the tab for the basic kill switch is somewhat grey. This means that it is NOT - I repeat NOT - the active project. Any tab that is greyed is NOT the active project. So, any tab that is white IS part of the active project. So grey tabs are not active, white tabs are active.

Notice that if I change the BasicKillSwitch project to be active the two tabs switch - one goes white and the other one goes grey – they flip.

The best way not to be confused is to close all of the tabs except for the ones you're using. You can close a tab by right clicking and choosing "Close"… or you can close all of the other tabs by selecting "Close All But This" to close all the other tabs.

Now, open the BasicKillSwitch schematic and the Main Controller schematic. Then right click on the Main Controller project and select "Set As Active". Now click on the tab for the Kill Switch schematic and then select all of your kill switch hardware and type Ctrl-C to copy it to the clip board.

Then click on the Main Controller schematic and type Ctrl-V to paste and then click it where you want it to go in your schematic.

Now close the Basic Kill switch project so that you don't accidentally edit it.

It turns out that one of the features that the TCPWM has is that you can start and stop it with a logic pin. Moreover, both the start and stop inputs can be configured as either rising edges or as falling edges.

To enable the hardware kill and start functionality in the PWMs, we need to double click and configure them. So first, I’ll click on the advanced tab, and set the kill input to falling edge and the start input to rising edge. Now, back in the schematic, I can now connect the output of the flip-flop to the kill and start inputs of both PWMs. You notice after we changed the configuration when we went back into the schematic the start and stop pins were created and you could see them for the first time.

Once the schematic is done we need one small change in the main\_cm4.c file - specifically to start the LEDBlink PWM… like so.

Another thing that people tend to forget is to set the pins, so I'll go back to the Design Wide Resources and set the pins… then hit the program button.

Alright, now let's try it out… notice that when I reset the controller… that the LED is blinking red…. When I open up the terminal notice that the keys don’t change the position of the robot. OK that's good – that means our kill switch is doing the right thing. Then when I click on the hardware switch the blinking red LED turns off and look there, the green LED is turned on, and guess what - I can control robot arm again… nice.

Now we have our Kill Switch, aka the Nicholas Safety Switch in place.

In the next video I will walk through how to use the capacitive sensing interface on the PSoC 6 BLE Pioneer Kit to control the robotic arm with our CapSense technology.

You can post your comments and questions and suggestions and criticisms or anything else you want in our PSoC 6 community or as always you are welcome to email me at alan\_hawse@cypress.com or tweet me @askioexpert. Thank you very much.