

Below, please find some information relevant to the use of pushbuttons and LEDs on the Freescale board that we are using in the DSP class. This information should be useful to those wanting to access pushbuttons and/or LEDs in the various class and/or project assignments.

The processor has a System Integration Module (SIM) that contains a System Clock Gating Control Register 5 (SCGC5) that controls whether the clock is routed to the ports (needed to make the ports active). There is a couple pushbuttons that can be used: switch 2 (SW2) and switch 3 (SW3), which are connected to PORTC and PORTB, respectively. To get these to operate, you need to enable the clock to PORTB and PORTC through SCGC5, and then you need (for each desired pin, in this case, those connected to SW2 and SW3) to set the corresponding port Pin Control Register to configure the MUX field so that the pin is configured GPIO (the K22 Reference manual I posted is helpful here). The default configuration (I think) for GPIO is as an input (the desired direction for a pushbutton), so I don't think you need to worry about the port data direction register. Keep in mind, you may need to implement a software debounce to realize reliable pushbutton operation – see the instructor if you have never heard of switch debouncing.

You follow much the same process to access the 3 LEDs (RGB) on the board (PORTD pin 5 for blue, PORTA pins 1 and 2 for red and green). Since ports A and D are used, you need to route the clock to both (through SCGC5) and set the corresponding MUX values in the PCR's to configure each pin as GPIO. Lastly, since the LED needs the pins to act as outputs, you need to configure the corresponding Port Data Direction Register to configure output (rather than input) behavior.