

Homework #6

LabVIEW

Dr. Pogo

Assignment is due on Thursday, March 8, 2012

Assigned February 23, 2012

Assignment #6: Digital Data Acquisition

- Controls:** A “buzzer mute” switch, a stop button, and a configure button
A mode switch, plus two dials and one switch to mimic the external inputs
- Indicators:** Two active voltage indicators
4 panel lights (red, green, yellow, purple)
‘Daq found’ and ‘Daq not found’ indicators
- Operation:** Requires a DAQ, the prototype board, and two analog voltage sources.

This is a difficult assignment. It will REALLY pay off to consider structural issues before you begin coding: determine what loops and structures will be located where and activated when. Where do you need shift registers?

The Mode switch selects between using the external hardware or their onscreen versions. The two ‘Daq found’ indicators should initialize off, and the program should initialize in “internal” mode. When in ‘internal’ mode, the program should run even if the DAQ is missing. If the user **switches to** “external” mode, the program should attempt to discover the Daq, and start it for both digital I/O and Analog input (if it is found). The program should revert back to “internal mode” if the DAQ is not found. When the stop button is pressed, all the LED’s, lights, and buzzers should be turned off on both the hardware and the screen before the program stops (except the ‘DAQ Found’ or ‘DAQ Missing’ lights). The “Case” for a **change** from internal to external mode is at least as important as the “Case” for just being **in** internal or external mode. Failure to recognize this is a common error.

The program will monitor two voltage signals that may each range between 0 and +8 volts. If both signals are under 5 volts, the green LED should be on (on both the panel and the prototype). If either voltage is over 5 volts, the red lights should be on. While the channel B voltage is larger than the channel A voltage, the yellow lights should be on (when the prototype switch is *up*. When the prototype switch is *down*, the yellow lights should come on when the channel A voltage is larger than the channel B voltage). If the yellow light ever changes from off to on, it must stay on for a minimum of 2 full seconds, even if the voltages return to their prior condition during that time. After 2 seconds, the yellow light should go off only if the voltages have returned to their prior condition.

If the sum of the two voltages is between 12 and 14 volts, the purple LED should light, and the buzzer should sound. However, if the buzzer mute switch is active, then the buzzer should not sound (but the purple light should remain on). Similarly, if the sum of the two voltages is between 14 and 16 volts, both the purple LED and the buzzer should continuously “blink” (1 second on, and 1 second off). The buzzer is still subject to the mute switch in this case. While in external mode, if the prototype switch is changed, the onscreen switch should change as well.

The configure button should call a pop-up dialog to allow the user to specify which pins of the daq the prototype is connected to. It may only be used while in “internal” mode (use a warning dialog if the user attempts to reconfigure the wires while in external mode). You may use my subVI, but I will not explain what it does or how it works. Your program will NOT be tested at all using the default configuration values, so you better make sure your digital inputs and outputs actually work for some other random configurations.

