

Homework 6 Z6

Outline Chapter Z5

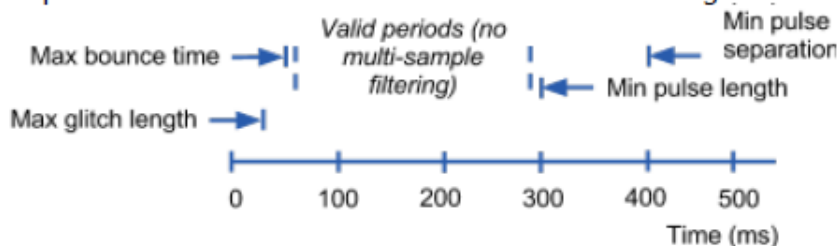
Create a state machine which will eliminate glitches (noise) and bounce on an input switch.

Consider that the noisy period can last for up to 120 msec.

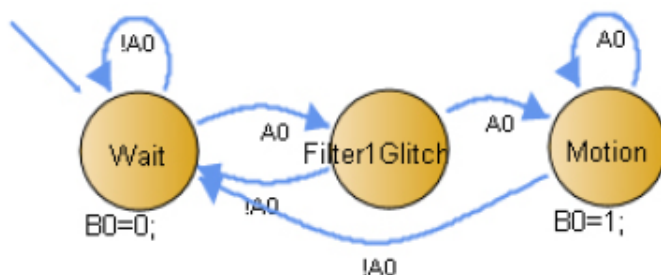
Create a timed input conditioning synchSM which can debounce for 150 msec with a clock rate of 50 msec.

Review the following:

Example: Consider a synchSM whose only purpose is to condition the signal on input A0 coming from a motion sensor (A0=1 should mean motion is sensed), into a clean signal on output B0 such that B0=1 indicates motion. Timing features are summarized in the figure:



From the figure, we see that, without consecutive sample filtering, the period must be greater than 50 ms and less than 300 ms. If we introduce filtering that requires two consecutive 1 samples, the period must be less than $300 / 2 = 150$ ms (and still greater than 50 ms). We may choose 100 ms as the period. The input conditioning synchSM is shown below:



The example above with 150 msec would introduce a latency of response for a worst case condition of double the 150 msec filter time for a total latency of 300 msec.

Run the SM clock rate at 50 msec for your designed system and debounce for a total period of 150 msec. In this system, what would be the worst case latency?

NOTE: If the RIMS is not capable of running at 50 msec real-time, simulate the condition by slowing down the simulation rate (slider top-right of simulation)