

EE 231 Prelab 6

Debouncing Switches

A switch is a mechanical device and as such is much slower than an electronic circuit. When a switch is opened or closed the mechanical contacts do not break or make a connection instantaneously, but can “bounce” between open and closed, thus making several transitions. If you were to use a mechanical switch to increment a counter (to count, say, people going through a turnstile), a single closure of the switch could increment the counter many times. In this lab we will use the logic analyzer to look at switch bounce, and use an SR latch to debounce a mechanical switch.

1. Prelab

1.1. The waveform shown in Figure 1 shows the values on S and R when the switch of Figure 2 is moved from the UP position to the Down position, then moved back to the UP position.

Complete the timing diagram to show what will be the Data (output of top NAND gate) and Data2 (output of bottom NAND gate) outputs.

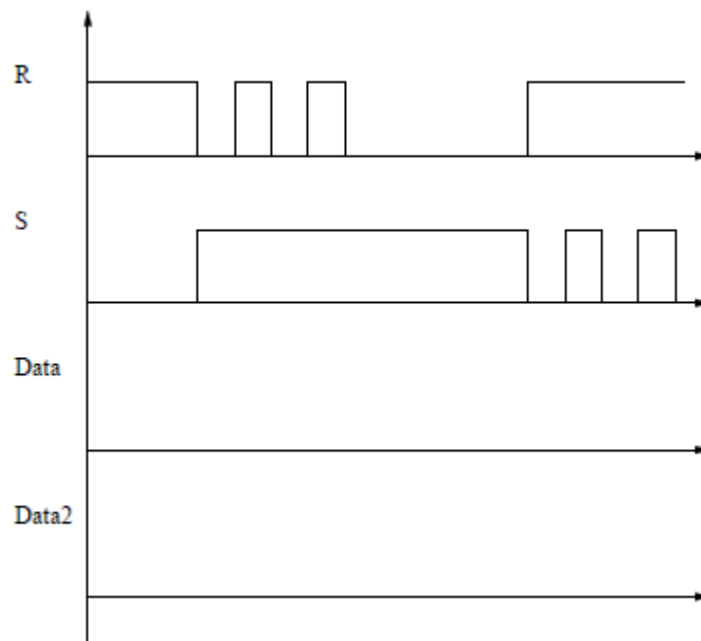


Figure 1: RS Values for Above Example

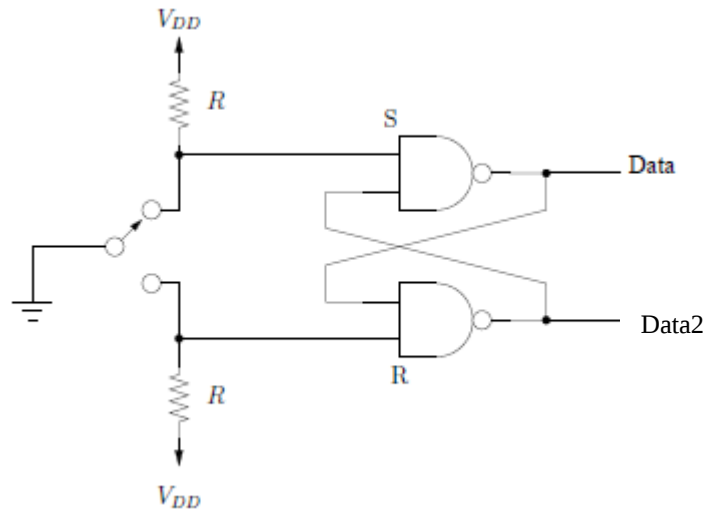


Figure 2: A Simple Switch