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ELG 4137 VHDL PROJECT

A Vending Machine Processor Design

As a junior engineer working in a high tech company, you are asked to implement a **RTL** description of a vending machine processor using **VHDL** to control a vending machine. Here is how the vending machine is supposed to work. Figure 1 shows the block diagram of the vending machine.

The machine has a single coin slot that accepts nickels, dimes and quarters, one at a time. A coin sensor provides the processor with a 1-bit input **C** that becomes 1 when a coin is detected, and an 8-bit input **V** indicating the coin's value in cents. Two 8-bit inputs **S0** and **S1** indicate the cost of the two types of soda drink. Note that the value of **S0** and **S1** can be set by the vending machine owner. **Choice** is a 1-bit input to the vending machine indicating the type of soda drink selected (**Choice** = 0 is for soda drink type 0 with the cost S0 and **Choice** = 1 is for soda drink type 1 with cost of S1).

If the amount of money deposited is less than the cost of the soda, the processor generates an 8-bit output **P** to display the amount of money deposited in cents. Once the processor has seen coins whose value equals or exceeds the cost of a soda, the processor should set an 2-bit output **D** for one clock cycle, causing a soda to be

dispensed (00 or 11 for no action, 01 for the release of soft drink type 0, and 10 for the release of soft drink type 1). The vending machine also should generate the 8-bit output **E** indicating the change to be returned in cents.

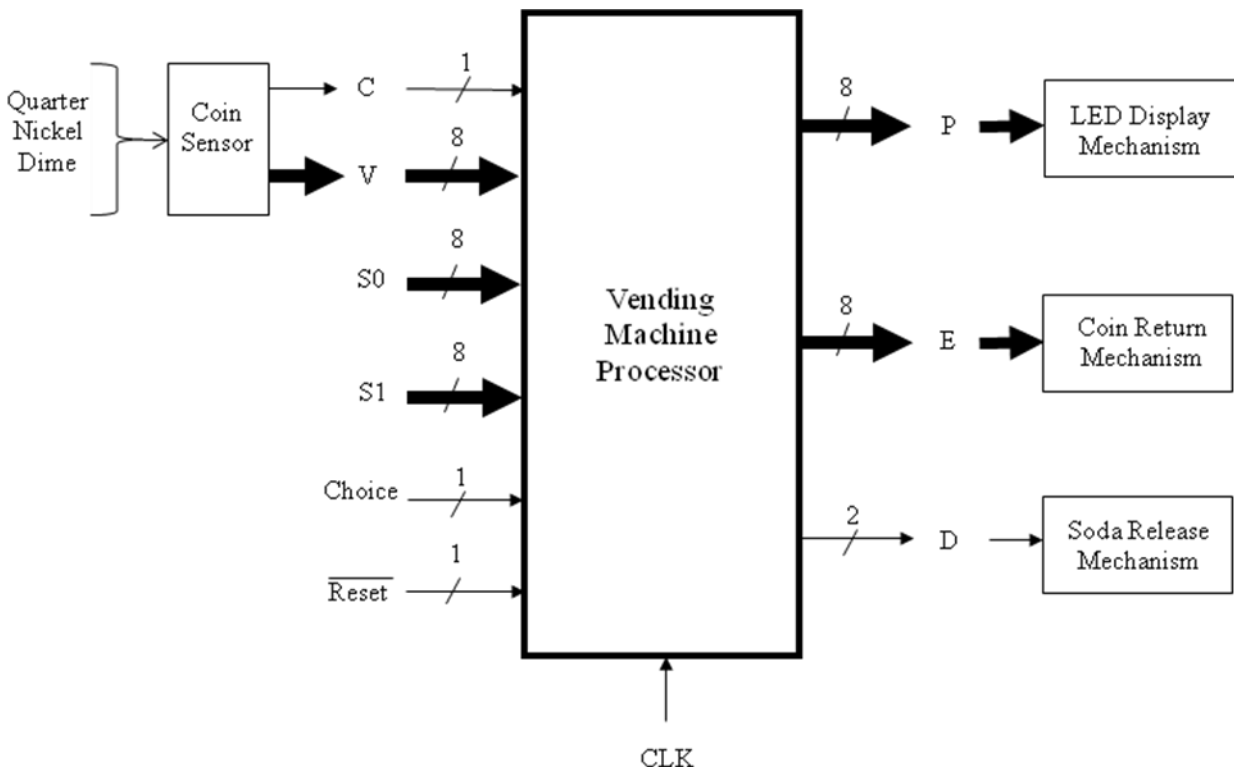


Figure 1. Soda Vending Machine