



# VENDING MACHINE

Pratyay (160010009,pratyay.gaikwad.16001@iitgoa.ac.in),  
Saurabh (160020014,saurabh.singh.16002@iitgoa.ac.in),  
Aditya (160020024,aditya.kumar.16002@iitgoa.ac.in),  
Abhisar (160010012,abhisar.kushwaha.16001@iitgoa.ac.in)

---

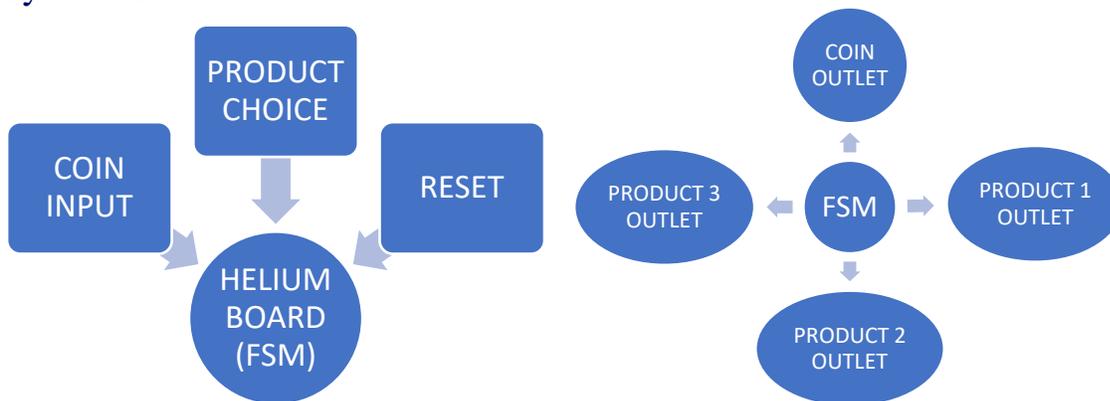
## Introduction

Although a vending machine is a very complex piece of machinery, the electronic controls are rather simple. FSM control of the vending machine is possible because the physical actions of the machine can be broken down to a small number of distinct states. These states are enumerated within the FSM and control is achieved by encoding the appropriate state transition table .

The vending machine to be controlled, accept coins and vends three products. There are two input switches which serve as the function and product selectors. There are also two reset switches.

As outputs, the vending machine controller should indicate to the user whether or not the product selected has been vended as well as the change returned.

## System Overview



**COIN INPUT:** Accepts the coin and signals the helium board accordingly.

**PRODUCT CHOICE:** Takes the option selected by user and converts it into desired input for the FSM.

**RESET:** brings the FSM to idle state.

**HELIUM BOARD:** The heart and brain of the system has our code uploaded on it.

**OUTLETS:** Controlled by FSM are motor driven outlet for product and coin to come out of system.

## Implementation Details

The user will use the global reset switch to initialize the FSM. This switch will set off a simple routine which will test and clear the memory. If this routine fails, it will halt the FSM. Leds will be used to indicate whether or not the start-up routine has completed successfully or not. The user should be able to use this switch at any time during the operation of the machine.

The controller will keep a running total when coins are deposited. To vend a product, the user

will select the product and push the "GO" button. If there is enough money in the machine, it will vend the specified product and return any change. The controller will ignore any vend requests if not enough money had been deposited.

Mechanically the FSM sends signals to the outlets which are motor driven conveyor belts which move s the product out of the vending machine. The FSM signals are used through a L29R3D for running motors.

## Results

The VHDL code for the vending machine seems to work in the proper manner; it gives the desired output as mentioned in the state table. The RTL simulations are giving desired output.

## Conclusion

The physical implementation of this project has been quite difficult since its little tough to control the motion of product on the conveyor belt. We are trying our best to overcome this difficulty.