CASE STUDY 1 [Low Level Application]

Vending Machine: -

Diagram

Description automatically generated

Components of block diagram: -

- Microcontroller.

- Coin detection box.

- DAC.

- Relay drive.

- Relay.

- Switch.

- Motor

- Power supply unit consists of Rectifier and Voltage regulator.

Explanation: -

1. Power supply unit: -

* From the main supply AC voltage is continuously supplied to the vending machine i.e., 230v AC.
* There is a rectifier in this unit, which converts AC voltage into DC voltage, and this voltage is supplied to a voltage regulator.
* Voltage regulator converts the supplied voltage to a constant voltage of 5v.
* The 5v supply is supplied to the microcontroller to operate.

1. Coin Detection Box: -

* In case of valid coin detection, a signal is sent to the internal circuitry which also consists of a Microcontroller.
* The microcontroller now operates the motors to dispense a cola bottle in case of valid coin.
* If the coin is not valid then it gets rejected.

1. DAC: -

* As the microcontroller gives the digital data as output, the output signal must give to the Relay drive, but Relay drive cannot understand the digital data so this digital data is converted into Analog signal by using the DAC (Digital to Analog Converter) and then given as input to the relay drive to operate.

1. Relay Driver: -

* A Relay driver is a circuit which can drive, or operate, a relay so that it can function appropriately in a circuit.
* The relay driver can then operate a relay for switching operation in the circuit which can open or close, according to the needs of the circuit and it drives the motor.

1. Motor: -

* Relay is used to drive the motor.
* When the product required is selected and coin is inserted and if accepted by the coin detection box a pulse is given to the Microcontroller and the motor is driven.
* Motor in-turn drives the spring attached to it. The spring rotates the product, which then slides out of the box is given as output.