

Wearable Technology based secure access control system with motion based password

The main aim of this project is to develop a most secure access control system to open or close the door by using MEMS based accelerometer. MEMS is a Micro Electro Mechanical Sensor which is a highly sensitive sensor and capable of detecting the tilt. This sensor finds the tilt and makes use of the accelerometer to open or close the door depending on tilt. For example if the tilt is to the right side then the door opens or if the tilt is to the left side then the door closes.

This device is portable and this system operation is entirely driven by wireless technology. User can wear it to his wrist like a watch and can operate it by tilting the MEMS Accelerometer sensor. User can assign a password (simultaneous 3 tilts) so that unknown person cannot open the door.

This project makes use of a micro controller, which is programmed, with the help of embedded C instructions. This microcontroller is capable of communicating with transmitter and receiver modules. The MEMS based sensor detects the tilt and provides the information to the microcontroller (on board computer) and the controller judges whether it is a positive or negative slope. Depending on the slope the acceleration the door is controlled which is done dynamically by the controller. A stepper motor linked with the doors makes the door open or close. The Microcontrollers are programmed using Embedded C language.

The main objectives of the project are:

1. Secure access based on motion based password.
2. User controlled door accessing system.
3. Wireless data transmission.

This project provides us with the learning's on the following aspects:

1. MEMS Accelerometer Sensor.
2. Interfacing Motors with Microcontroller.
3. Interfacing MEMS with Microcontroller.
4. Conversion of AC supply to DC supply.
5. Embedded C programming.
6. PCB Design and development.
7. RF technology.

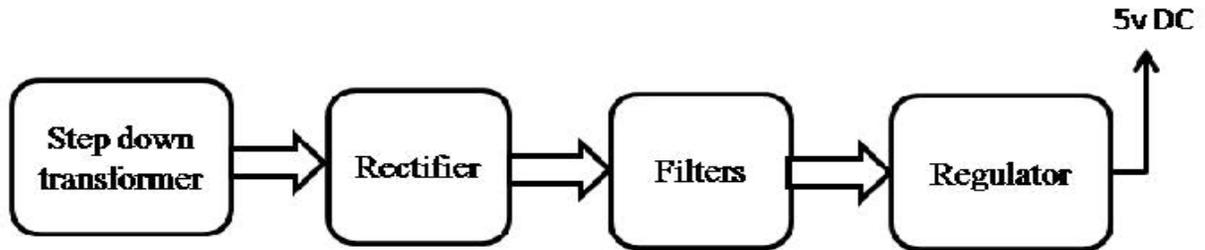
The major building blocks of this project are:

1. Microcontroller Mother Boards with Regulated power supply.
2. MEMS Accelerometer based sensor.
3. Stepper motor.
4. Stepper motor Driver.
5. Crystal oscillator.
6. Reset.
7. RF transmitter and receiver modules.
8. LED indicators.

Software's used:

1. PIC-C compiler for Embedded C programming.
2. PIC kit 2 programmer for dumping code into Micro controller.
3. Express SCH for Circuit design.
4. Proteus for hardware simulation.

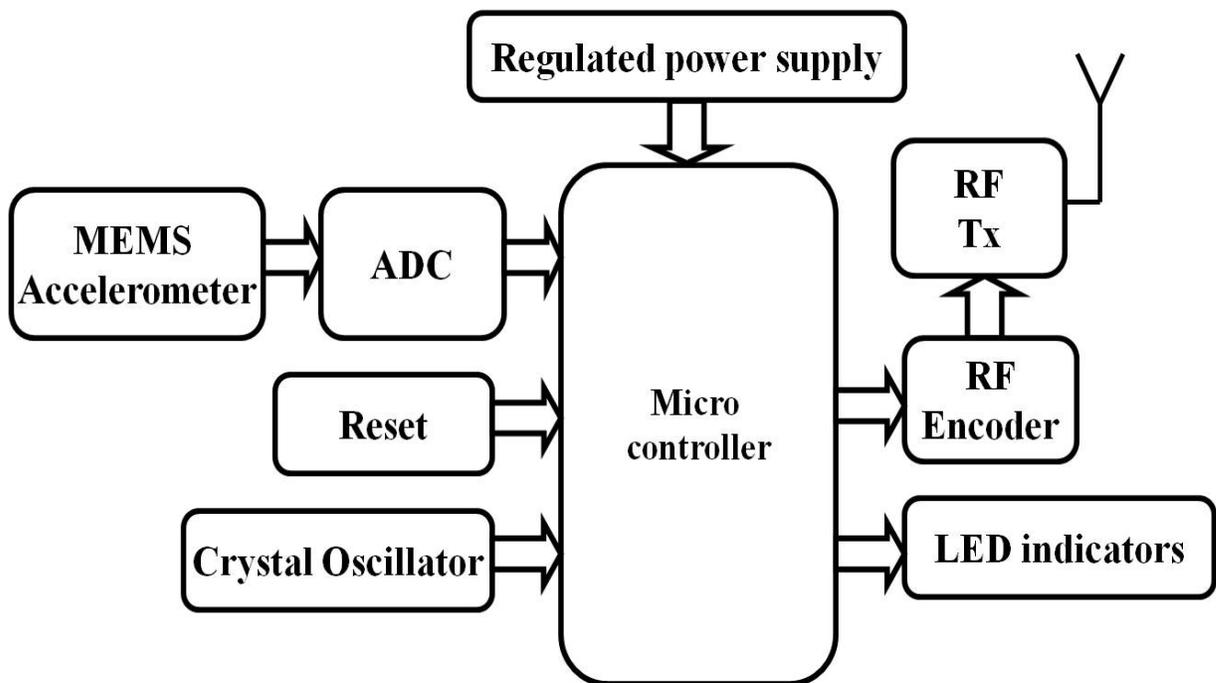
Regulated Power Supply:



Block Diagram:

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1. System with user



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2. System at door

