

## **Wireless vibration monitoring system of industrial equipments (Also useful for bridges monitoring)**

The main purpose of the project is to monitor the vibration levels for industrial equipments (machines) using wireless RF technology. In industries when the vibrations of the machines exceed the limits there is a chance of breakdown of the machine. Hence to avoid these problems this device is designed. The device calculates the vibration of machine and if the limit exceeds the device automatically switches of the machine and it alerts the user.

In this project we make use of microcontroller, MEMS ACCELEROMETER vibration sensor, Relay, LED and buzzer, RF transmitter and receiver. Microcontroller is programmed in such that it give the alert sounds at system with concerned authorities, whenever MEMS ACCELEROMETER SENSOR detects the over vibration of the machine and a Relay is used to off the machine.

This project makes use of a microcontroller, which is programmed, with the help of embedded C instructions. The MEMS ACCELEROMETER SENSOR which is a high sensitive sensor detects the vibration and provides the information to the microcontroller (on board computer) and the controller judges whether the limit is exceeded or not and the machine is automatically switched off. This information is transmitted through RF transmitter and this is received at system with concerned authorities and a buzzer alarm is horned indicating high vibration of machine. This device can also be used for generators, bridges and also helps in detecting the earthquakes. The Microcontroller used in the system is programmed using Embedded C language.

**The main objectives of the project are:**

1. MEMS accelerometer based vibration sensor usage.
2. Automatic halting of machines if vibration exceeds.
3. Buzzer alerts at system of concerned authorities.
4. Wireless data transmission.

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

1. Characteristics of MEMS ACCELEROMETER SENSOR
2. RF technology.
3. Interfacing RF transmitter and receiver to Microcontroller.
4. Interfacing MEMS ACCELEROMETER SENSOR with Microcontroller.
5. Embedded C programming.
6. Relay working.
7. PCB Design and development.

**The major building blocks of this project are:**

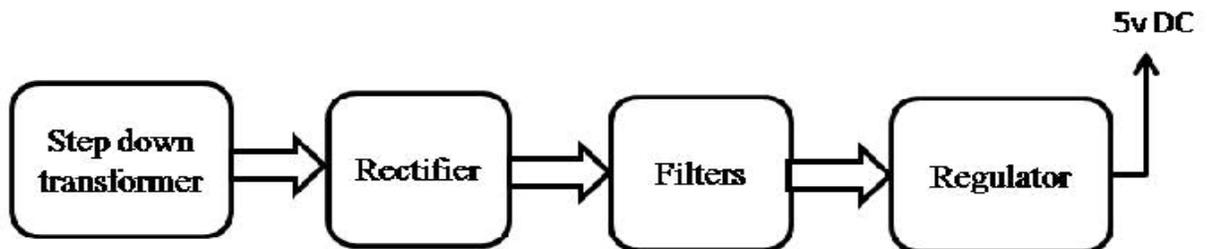
1. Regulated Power Supply.
2. Microcontroller
3. MEMS ACCELEROMETER SENSOR.
4. Encoder and Decoder.

5. crystal oscillator
6. LED indicators.
7. Buzzer with driver.

#### 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.

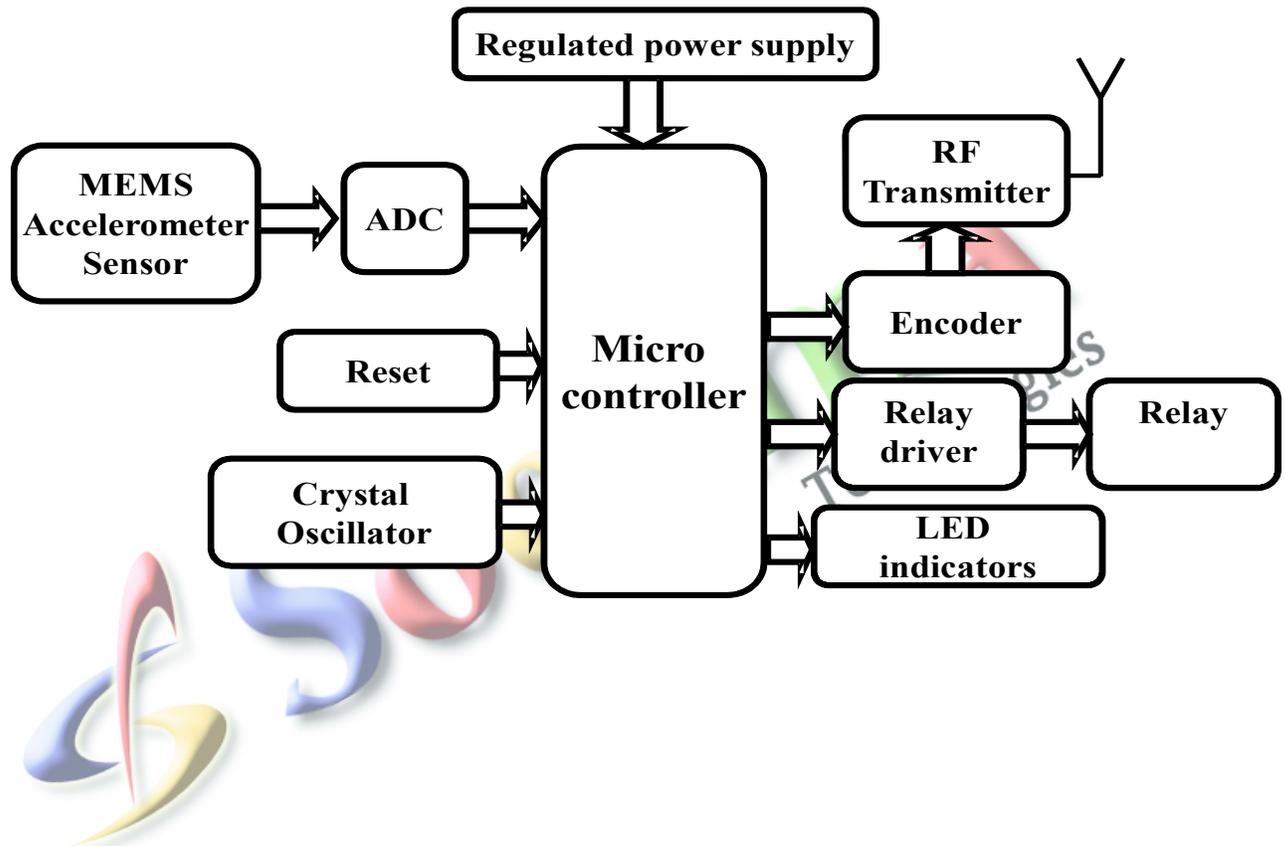
#### Regulated Power Supply:



#### Block diagram:

# Wireless vibration monitoring system of industrial equipments (Also useful for bridges monitoring)

## 1. Transmitter



# Wireless vibration monitoring system of industrial equipments (Also useful for bridges monitoring)

## 2. Receiver

