

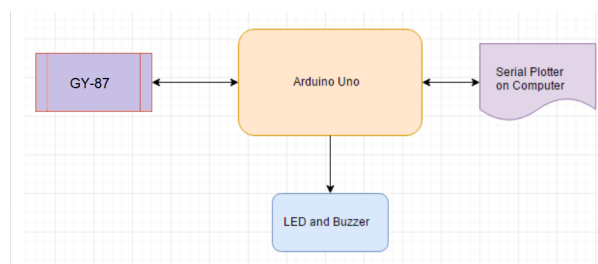
Earthquake Alarm

Introduction

I decided to do this project because natural disasters cause great damage to the world. The earthquake sensor detects the vibration during an earthquake and serves to beep directly and turn on the LED. To talk about the working logic, the aim of this project is to integrate the GY-87 with accelerometer, gyroscope, magnetometer, barometer and temperature sensor as a multifunctional and sensitive integration, so that the LED flashes and an audible warning is given in case of a very small earthquake vibration. On the wall, it is aimed to inform people and to minimize the damage caused by the earthquake.

General Description

With arduino uno, instantaneous data is processed by GY-87 (Accelerometer, Gyroscope, Magnetometer, Barometer/Altitude Sensor and Temperature Sensor), enabling led to light and buzzer to beep during earthquake.

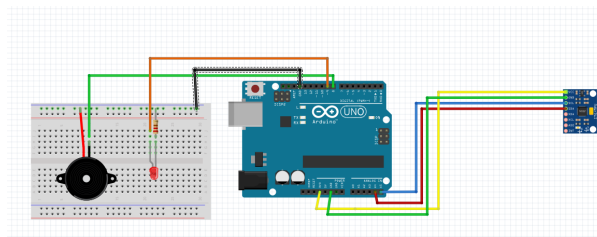


Hardware Design

- Arduino Uno
- GY-87
- Buzzer
- Jumper Wires
- Green Led

- Breadboard
- Resistor

The GY-87 sensor module is a versatile component that combines multiple sensors in a single package. Its common features include a 3-axis accelerometer, a 3-axis gyroscope, a 3-axis magnetometer, and optionally, a barometer/altitude sensor and a temperature sensor. These sensors allow the module to measure linear acceleration, angular rate of rotation, magnetic field strength and direction, atmospheric pressure (altitude), and ambient temperature. The specific sensors included may vary depending on the module variant or manufacturer. It's important to consult the documentation provided by the manufacturer or supplier for accurate information about the features of a particular GY-87 module.



Software Design

This code is a basic earthquake alarm system using an MPU6050 sensor with an Arduino Uno. The MPU6050 sensor measures acceleration in three axes (X, Y, Z) and calculates the total acceleration. The code continuously reads the acceleration values from the sensor and compares the total acceleration to a predefined threshold.

If the total acceleration exceeds the threshold, indicating a significant movement or vibration, the alarm is triggered. The alarm is represented by an LED that blinks and a buzzer that emits a sound. The LED turns on and off rapidly, while the buzzer emits a continuous tone for a brief period.

The purpose of this code is to demonstrate how to use the MPU6050 sensor to detect vibrations or movements that could be indicative of an earthquake. When an earthquake-like motion is detected, the alarm is activated to alert the user.

Obtained Results

The MPU6050 sensor combined with an Arduino Uno can be used to detect vibrations or movements.

By measuring the acceleration in three axes (X, Y, Z) and calculating the total acceleration, the sensor

can provide an indication of significant motion.

The threshold value for total acceleration can be adjusted to customize the sensitivity of the earthquake alarm.

When the total acceleration exceeds the threshold, the alarm system is triggered, indicating the possibility of an earthquake.

The LED and buzzer serve as visual and auditory indicators to alert the user when an earthquake-like motion is detected.

This project demonstrates the potential of using sensor technology for earthquake detection and early warning systems.

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