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IOT based Home Security System using Arduino

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Abstract: Security has been turning into a significant issue all over the place. Every individual wants his home, industry, bank secured. Home security is becoming necessary. Now days as the possibilities of theft are increasing day by day. Hardware of this system has been designed using microcontroller, IR (Passive Infra Red) motion sensor as the primary sensor for motion detection, a Wifi module ESP8266 to connect and communicate using the internet, keypad and buzzer for alarm. This Security System can monitor home space that is surrounded by IR sensor by sending SMS, and make people panic by turning on the buzzer when passing nearby area that detected by IR sensor. The Home Security System has been tested and can successfully detect human movement.

Keywords: Sensors, Arduino uno, microcontroller, keypad, Wifi module, internet of things

I. INTRODUCTION

While the cost of living is rising up, there is a growing focus to involve technology to lower those prices. Keeping this in mind the Home security project allows the user to build and maintain a house that is secured enough using the sensors and buzzer.IOT is ainterrelated to mechanical devices.

A smart home will take benefits of its environment and allow coherent control whether the user is present or far away. With a home having this advantage, you can know that your home is secured enough even in your absence. By implementing this system, it is possible to explore a various of engineering challenges, which includes software programming, PCB design, Wi-Fi, TCP/IP protocols, Web Server logic design, and other aspects. This system provides great insights to the challenges of software and hardware design.

II. METHODOLOGY

IOT and Arduino Based Home Security System utilizes four sensors, to be specific, Temperature, Smoke, LPG and IR sensors. Information from these sensors is then sent to the Arduino, which has an inbuilt sign converter.

Arduino then sends information over to the Wi-Fi module-EPS8266. EPS8266 is a chip utilized for associating small scale controller to Wi-Fi system and make TCP/IP associations and send information.

Data, which is detected by these sensors, is then sent to the IOT. To expand on the robbery recognition, we have associated a secret key module by which a client can enter the secret key.

The entryway would open just if the secret word entered is right. The IR sensor should be introduced on the entryway, which is, as a matter of course initiated.

If an individual enters the right secret key, the IR sensor is de-actuated for 10 seconds and the ringer won't turn ON. On the off chance that someone attempts to go into the house without entering the secret word, for example by harming the lock or thereabouts, when the individual passes the IR sensor, the bell would be turned ON.

The signal would be turned ON regardless of whether an off-base secret phrase is entered for continuously multiple times. To exhibit the entryway, we have utilized a DC engine. The ringer will turn ON in any event, when it identifies incense sticks just as a light fire.

Temperature and Smoke sensors are utilized for fire discovery. When the fire is recognized, the sign will be sent to the small scale controller will at that point send fitting information to the LCD and the Wi-Fi module. Data is thusly sent to the site utilizing the IOT module. So also, the LPG sensor is utilized for LPG gas spillage identification. The pre-requisiting for this task is that the Wi-Fi module ought to be associated with a Wi-Fi zone or a hotspot.
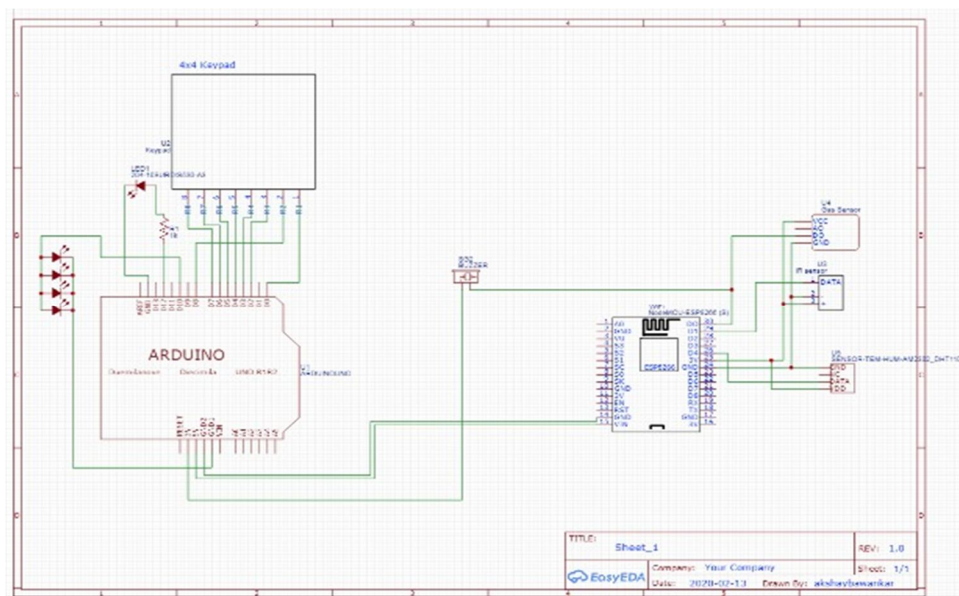
III. CIRCUIT DIAGRAM


Fig1. Circuit Diagram

A. Materials And Methods

Various hardware materials are required to have an home security system. Some of the required components to have and idea about the proposed system are:

Components required

1) ESP-8266 Wi-Fi Module
2) Smoke sensor
3) Temperature sensor
4) IR sensor
5) Gas sensor
6) Buzzer
7) Keypad
8) Board
9) 12 V power supply

B. ARDUINO-UNO

Arduino-uno is a microcontroller board. It has totall 14 advanced info/yield sticks out of which 6 can be utilized a PWM yields, 6 simple sources of info, a 16 MHz precious stone oscillator, a USB association , and a reset button. It contains all the luxuries which are expected to help the microcontroller; basically associate it to a PC with a USB link or force it with an AD to DC connector or battery to begin. The microcontroller is an open source, PC hardware and programming association, and customer bunch that plans and produce microcontroller packs.
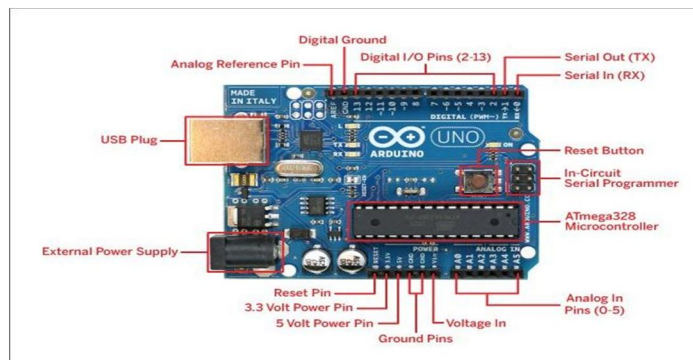
C. ESP8266 WiFi Module

The ESP8266 Wi-Fi Module is an autonomous SOC with joined TCP/IP show stack that can give any microcontroller access to your Wi-Fi compose. The ESP8266 is capable of either encouraging an application or offloading all Wi-Fi sorting out limits from different application processor. Each ESP8266 module comes pre-altered with an AT request set firmware, which implies, you can essentially get this up to your Arduino contraption and get about as a great deal of Wi-Fi-limit as a Wi-Fi Shield offers (and that is basically out of the case)! The ESP8266 module is an unbelievably monetarily insightful board with a tremendous, and ever creating, organize. This module has an inconceivable enough prepared planning and limit capacity that confirm it to be composed with the sensors and other application unequivocal contraptions through its GPIOs with unimportant improvement ahead of time and immaterial stacking during runtime. Its elevated level of on-chip fuse considers irrelevant outside equipment, including the front-end module, is planned to have unimportant PCB zone. The ESP8266 underpins APSD for VoIP applications and Bluetooth synchronization interfaces, it contains a self-balanced RF permitting it to work under every single working condition, and requires no outer RF parts.
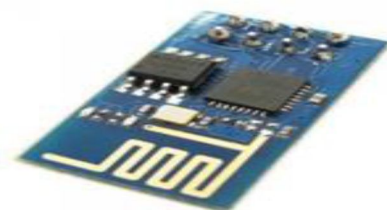

D. PIR Sensor

A PIR is utilized to detect development of individuals, creatures, or different items. They are regularly utilized in robber cautions and naturally actuated lighting frameworks. They are normally called essentially "PIR", or some of the time "PID", for "uninvolved infrared indicator". The sensor changes over the changes in the approaching infrared radiation into an adjustment in the yield voltage, and this triggers the discovery. PIRs come in numerous arrangements for a wide assortment of uses.

E. MQ-6 Sensor

This is an easy to-utilize condensed oil gas (LPG) sensor, appropriate for detecting LPG (made out of generally propane and butane) focuses noticeable all around. The MQ-6 can distinguish gas fixations somewhere in the range of 200 to 10000 ppm. This sensor has a high affectability and brisk reaction time. The sensor's yield is a simple opposition. The drive circuit is basic; you should simply control the radiator loop with 5V, include a heap opposition, and associate the yield to an ADC.

1) High Sensitivity to LPG, iso-butane, propane
2) Small affectability to liquor, smoker
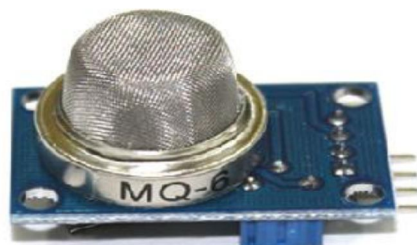
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