

Home Security System using Arduino

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Abstract :- Security has been becoming an important issue everywhere. 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

1. 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. 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.

1.1 GENERAL DESCRIPTION

A low cost and efficient secured home system has been presented in this paper. This system has mainly two modules: one is the hardware interface module and other the software communication module. The Arduino uno microcontroller which is also capable of functioning as a microweb server and the interface for all hardware modules. All the communication in this system pass through the microcontroller. The home system offers feature such as environmental monitoring using the temperature, gas and smoke sensor. It also offers switching functionalities to control lighting, fans and other home appliances. Another main feature of this system is the intrusion detection which it offers using the motion sensor and all this can be control from the android app or web application.

1.2 EXISTING SYSTEM

The recent developments in this technology which allows the use of Bluetooth and Wi-Fi have enabled different devices to have capabilities of connecting each other. Using a Wi-Fi shield to act as micro-web server for the Arduino eliminates the need for wired connections between the Arduino board and computer which reduces the cost and enables it to work as a stand alone device. The Wi-Fi module needs the connections to the internet from a wireless router or a wireless hotspot and this would act as the gateway for the Arduino to communicate with the internet. With this in mind, an internet based home security system for remote control is designed.

2. CIRCUIT DIAGRAM

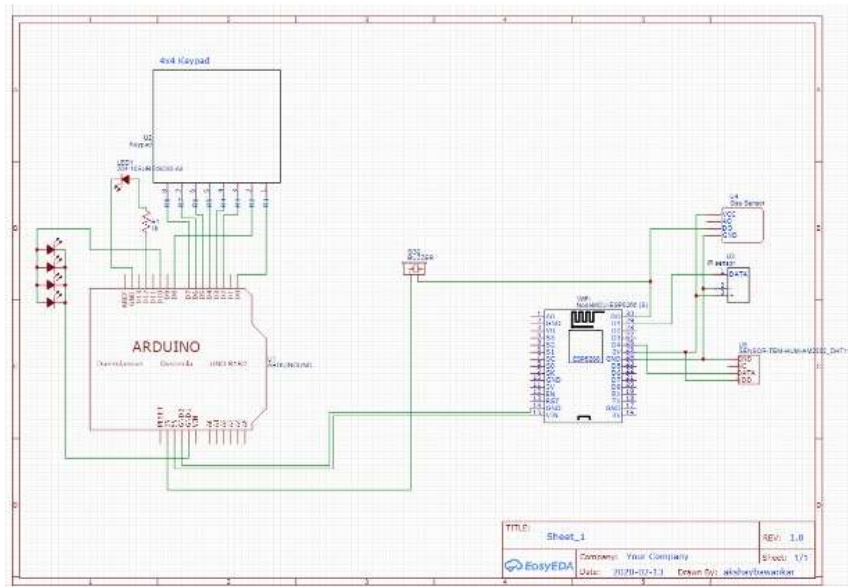


Fig1. Circuit Diagram

MATERIALS AND METHODS

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

Components required

- ESP-8266 Wi-Fi Module
- Smoke sensor
- Temperature sensor
- IR sensor
- Gas sensor
- Buzzer
- Keypad
- Board
- 12 V power supply

ARDUINO-UNO

Arduino-uno is a microcontroller board. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, and a reset button. It contains all the amenities which are needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AD to DC adapter or battery to get started. The microcontroller is an open source, PC equipment and programming organization, and client group that plans and produce microcontroller packs.

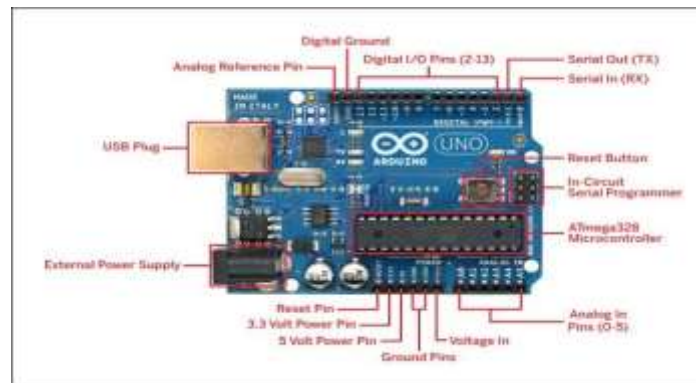


Fig. Arduino Uno board

ESP8266 WiFi Module

The ESP8266 Wi-Fi Module is an independent SOC with incorporated TCP/IP convention stack that can give any microcontroller access to your Wi-Fi organize. The ESP8266 is proficient of either facilitating an application or offloading all Wi-Fi organizing capacities from various application processor. Each ESP8266 module comes pre-customized with an AT order set firmware, which means, you can basically get this up to your Arduino gadget and get about as a lot of Wi-Fi-capacity as a Wi-Fi Shield offers (and that is simply out of the case)! The ESP8266 module is an incredibly financially savvy board with an enormous, and ever developing, network. This module has an incredible enough ready preparing and capacity ability that affirm it to be coordinated with the sensors and other application explicit gadgets through its GPIOs with negligible improvement in advance and insignificant stacking during runtime. Its high level of on-chip incorporation takes into account insignificant outside hardware, including the front-end module, is intended to possess negligible PCB zone. The ESP8266 underpins AP/STA for VoIP applications and Bluetooth concurrence interfaces, it contains a self-aligned RF permitting it to work under every single working condition, and requires no outer RF parts.



Fig. ESP8266 WiFi Module

3. CONCLUSIONS

The sensor put on the entryway advises the mortgage holder when the entryway is opened by sending a Push notice. The client will get this warning independent of whether the telephone is bolted or opened or regardless of whether some other application is opened right now. This was the primary target of the task, which is the client has a sense of security and not stress over any interruption or split ins when he is away from home. This arrangement can likewise be utilized in business workplaces where a few regions are limited for certain staff, such a framework will quickly illuminate the chairman regarding any unapproved faculty attempting to access such a region. In this manner the extensibility and appropriateness of such a framework is just restricted uniquely by the creative mind. Another significant part of the undertaking is the network between the ESP8266 (Wifi module) and the Blynk server. The framework effectively associated with the Blynk the confirmation token and the Blynk libraries. Thus, we had the option to get the notice on our advanced mobile phones when there was any adjustment in the status of the PIR sensor. Likewise the extra capacity to control the alert remotely is exceptionally valuable and can be helpful in some unexpected conditions. It was likewise seen that the Blynk application worked easily and did all correspondence between the equipment and the application precisely. The created framework can likewise be utilized to in modern and business applications, for example, workplaces, distribution centers and different territories where a few zones are held for approved faculty just or different spots where wellbeing and safety measures are of essential concerns, for example, web server room of a major MNC from where corporate information can be taken. The framework can likewise be

effectively moved up to include additional security highlights, for example, cameras, movement recognition sensors, and so forth for expanded wellbeing. The framework can likewise additionally be created by including a RFID scanner so the approved clients need just convey a RFID or NFC tag with them with the rest of their personal effects.

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