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## ANALYSIS OF SMART HOME SYSTEM FOR SMOKE AND FIRE DETECTION USING GSM

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Received on: 25.09.2016

Accepted on: 15.10.2016

### Abstract:

Security has turning into an imperative issue all around. Home security is getting to be vital these days as the is expanding day by day. Safety from spilling of crude gas and fire are the most imperative prerequisites of home security framework for individuals. A customary correspondence based security frameworks gives improved security as at whatever point a sign from sensor happens, an instant message is sent to a desired number to take essential actions. This paper proposes a technique for home security system. Whenever there is a fire mischance in a house this strategy gives security alarm and sends SMS which utilizes GSM-GPS Module (sim548c) and lpc2148 Microcontroller, sensors.

**Keywords:** GSM (Global System for Mobile communications), LPC2148 PROCESSOR, SMS (Short Message Service), Temperature sensor (LM35), Gas sensor(MQ-2).

### I. Introduction

With the fast financial advancement, individuals' expectations for everyday comforts enhanced extraordinarily. A developing number of extensive cutting edge structures are built in urban areas, towns and towns. What's more, heaps of embellished materials utilized as a part of the structures are inflammable, for example, waterproof materials, and warmth safe materials[2]. In the event of flame, every one of these materials will add to the spread of flame combustible joined with cutting edge higher floors, and will come about substantial loses to individuals' lives and property. With the conventional caution framework relying upon the long-separate links, here are a few inconveniences, for instance, it is hard to install, maintain, and change the recognizing position of distinguishing point. With a specific end goal to take care of these issues, remote disseminated temperature by GSM module, smoke identification is talked about in this paper.

The utilization of remote correspondence innovation in the flame checking framework, makes the observing framework

been effectively connected on various events, builds adaptability for the establishment and gives incredible comfort.

The project entails the design and engineering of a wireless smoke detector unit and network. The premise of the wireless network is to alert and to set off all of the smoke detectors in the network if one smoke detector is set off. The hardware modules include the PIC microcontroller, temperature sensor, smoke sensor, low battery sensor, transmitter, and receiver. The software component includes the program and code implemented via the PIC microcontroller. In its completion and entirety, the smoke detector unit properly functions and in the manner it was originally planned and designed.[1]

Smoke can be sensed by using the smoke sensors which accomplish in several ways either ionization, photoelectric or a combination of both depends on the type of detector. The wellspring of force for remote smoke identifiers found in the house is fueled by dispensable batteries. In spite of the fact that the National Fire Protection Association (NFPA)[3] prescribes a smoke alert be introduced in each room, it is more normal to have interconnected smoke cautions all through the house.

In this security framework is SMS based and utilizes GSM innovation to send the SMS to the proprietor. The proposed framework is gone for the security of Home against the Fire. In any of the above cases happens while the proprietors are out of their home then the gadget sends SMS to the crisis number which is given to the framework. The framework is comprised of three parts: sensors, GSM Module, arm7 processor, transfers to control the gadget and bells to give security ready sign as far as sound[8].

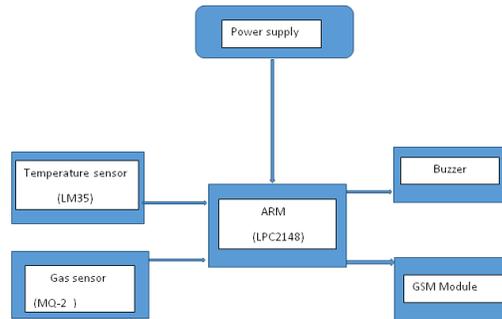
## **II. Proposed System**

A model of shrewd home is readied utilizing minimal effort materials like acrylic, plywood and so forth. Having adequate quality to test the model of created framework. It comprises of different sensors such as temperature sensor, smoke sensors and so forth. This can control by an lpc2148 processor. It gathers data from the sensors settles on a choice and sends SMS to a using so as to relate number a GSM modem[7]. On the off chance that it finds any intrusion in its sensors (for illustration IR sensor) then smaller scale controller will send a SMS to the property holder. Similarly if the temperature is expanded over certain point or gas sensor sensors is ON, a SMS will be sent to the mortgage holder" "Flame at home "giving the sign of flame.

As the framework is SMS based, there is no compelling reason to have additional hardware to transmit SMS. Versatile systems are utilized for transmission[9]. It is exceptionally financially savvy, as step by step the expense of SMS is decreasing. . Confidence in information. Information can't be lost.

Highly solid. More advantageous .Increases security.

Basic Functional Block diagram



**Block diagram of Fire Detection System Using GSM**

### III. Hardware Schematics

Equipment of the framework contains sensors, LPC2148 small scale controller, Buzzer, in framework software engineer and transfers to control the machines. The yields of the considerable number of sensors are associated with LPC2148 which is controlled by force supply and actuators are associated with LPC2148. The temperature sensor LM35 is utilized in each room. Temperature is consistently observed, on the off chance that it is high (greater than 45 degree) if there should be an occurrence of flame, a SMS is sent ("Fire at home") to the property holder.

### IV. Microcontroller Unit

The LPC2141/42/44/46/48 miniaturized scale controller depend on a 16-bit/32-bit ARM7TDMI-S CPU with constant imitating and inserted follow support, that consolidate smaller scale controller with installed flash memory running from 32 KB to 512 KB. A 128-piece wide memory interface and an extraordinary quickening agent design empower 32-bit code execution at the most extreme clock rate. For basic code size applications, the option 16-bit Thumb mode lessens code by more than 30 % with negligible execution penalty. Due to their modest size and low power utilization, LPC2141/42/44/46/48 is perfect for applications where scaling down are a key necessity, for example, access control and point-of-offer. Serial correspondences interfaces going from a USB 2.0 Full-speed device, multiple UARTs, SPI, SSP to I2C-transport and on-chip SRAM of 8 KB up to 40 KB, make these devices exceptionally appropriate for

correspondence doors and convention converters, soft modems, voice acknowledgment and low end imaging, giving both expansive cushion measure and high processing power. Different 32-bit clocks, single or double 10-bit ADC(s), 10-bit DAC, PWM channels and 45 quick GPIO lines with up to nine edge or level touchy outside interrupt pins make these microcontrollers suitable for mechanical control and medicinal frameworks. Practically every ARM direction has a restrictive execution highlight called predication, which is actualized with a 4-bit condition code selector (the predicate). To take into account unlimited execution, one of the four-piece codes causes the direction to be constantly executed. Most other CPU structures just have condition codes on branch directions.

Despite the fact that the predicate takes up four of the 32 bits in a guideline code, and therefore chops down essentially on the encoding bits accessible for removals in memory access directions, it maintains a strategic distance from branch guidelines when creating code for little if articulations. Aside from taking out the branch directions themselves, this jam the get/translate/execute pipeline at the expense of one and only cycle for each skipped guideline.

## V. Sensors

The LM35 is utilized as temperature sensor whose yield voltage is directly corresponding to the Celsius (Centigrade) temperature. Delicate material of MQ-2 gas sensor is SnO<sub>2</sub>, which with lower conductivity in clean air. Whenever the target burnable gas exist, The sensor's conductivity is more higher alongside the gas focus rising. If you don't mind use basic electro circuit, Convert change of conductivity to compare yield sign of gas fixation[3]. The LM35 does not require extra hardware to adjust remotely. The low yield impedance, its direct yield and exact adjustment empowers this incorporated is effectively introduced in a control circuit as shown in figure 2. Because of its low feed stream an impact of self-warming happens little. It is found in various sorts of epitome, the most widely recognized is the TO-92, utilized by low - power transistors.

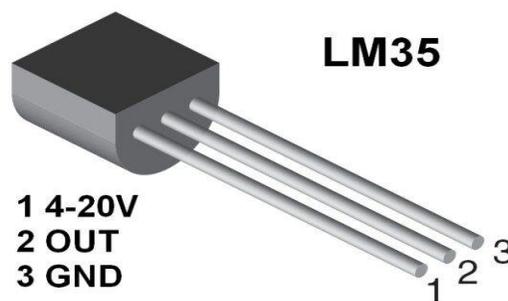


Figure2- LM35 diagram/

Its principle attributes are:

It is adjusted specifically in degrees Celsius. The yield voltage is relative to temperature. It has an ensured exactness of  $0.5^{\circ}\text{C}$  to  $25^{\circ}\text{C}$ . Low yield impedance. Low supply current (60  $\mu\text{A}$ ). Low cost.

### **Gas Sensor**

The MQ arrangement of gas sensors utilize a little radiator inside with an electro-substance sensor. They are touchy for a scope of gasses and are utilized inside at room temperature. The yield is a simple flag and can be perused with a simple contribution of the Arduino.

The MQ-2 Gas Sensor module is helpful for gas spillage distinguishing in home and industry. It can recognize LPG, i-butane, propane, methane, liquor, hydrogen and smoke.

### **VI. GSM**

GSM was composed with a moderate level of administration security. The framework was intended to validate the supporter utilizing a pre-shared key and test reaction. Correspondences between the supporter and the base station can be scrambled[5]. The advancement of UMTS presents a discretionary Universal Subscriber Identity Module (USIM), that uses a more extended validation key to give more prominent security, and in addition commonly confirming the system and the client - though GSM just verifies the client to the system (and not the other way around)[7]. The security demonstrate along these lines offers secrecy and verification, however restricted approval capacities, and no non-revocation. GSM utilizes a few cryptographic calculations for security. Despite the fact that security issues stay for GSM fresher models and calculations might address this[10].

### **VI. Discussion**

The created GSM based security framework gives great reaction to the sensor and sends SMS when it distinguishes the fire or temperature is expanded above fancied level or recognition of interruption at the windows. The time taken by the framework to convey the SMS is subject to the scope region or scope of the predefined versatile system. In the event that the portable is in the scope of the framework at that point the SMS is conveyed in 25-30 seconds.

### **VII. Conclusion**

The framework utilizes two various types of sensors: temperature sensor and smoke locator. The utilizing of two sorts of sensors joined to judge the flame emergency circumstance will expand dependability of framework to a specific degree.

The utilization of remote transmitting innovation makes it conceivable to organize the identification focuses flexibly.

The GSM based home security framework has been outlined and tried with the portable network. The client can go anyplace through the GSM innovation in this way making the framework area independent. This kind of framework is valuable when the proprietor is out of station and the house is bolted.

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