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Manual

Introduction

Lifestyle in the modern society along with human behavior and thinking is changing dramatically with the advancement of technology, and the concept of a simple home is changing into a smart home. The advancement of technology has increased the safety and security of people along with their belongings. Safety and Security describes protection of life and property. The wireless communication is increasing day by day. Mobile phones today are not just used to make calls. The use of mobile phones is changing with the development of technology and they can be used for different purposes as well. This has motivated us to use mobile phones to remotely control household security system and to receive a feedback SMS about the security and safety of the house. In this proposal paper we describe a remote security system which can receive feedback from different household security modules and sensors by sending a SMS to user mobile phone and monitor the safety and security of the house just by SMS. The application consisted of two units, the microcontroller and the mobile unit. The mobile unit acted as a recipient to get responses from the microcontroller.

In addition to this, the microcontroller unit was responsible for reading input from the sensors. The Arduino platform was used as the system platform with Arduino Uno Board as the microcontroller board. The SIM900 GPRS/GSM module was used to communicate be-tween the microcontroller unit and the mobile unit. With the help of the GSM network, a mobile can be used to implement a smart home by measuring different type of devices and sensors and getting alerts as SMS. In addition, multiple sensors are used as a temp detector, motion detector and intrusion detector which trigger the alarm upon reaching the critical limit. The microcontroller would then control the home appliances based on the information given to it and send a feedback during a security breach and it also send a feedback during gas leakage or if fire takes place. The proposed solution is easy to use, simple, secure, and robust. The project could be extended further by using wireless communication or Internet communication along with the GSM network to reduce the limitation in the absence of GSM network.

Project Title:

In this project proposal, we will make a system that will receive information about home safety and security system using GSM technology. We will also show that we can receive SMS feedback from sensors installed at home. Even in the absence of an android phone or any other phone by receiving a normal SMS. The advantage of using GSM technology is that we can receive SMS feedback from remote places anywhere in the world. This system will allow the owner to receive a feedback status of the home. For example: If one of the sensor sense a change in temperature in the living room. It will send SMS to the owner of the house and alert him about the condition. We are using an antitheft reporting system which will report the owner by ringing an alarm and by sending an SMS. Also for the safety system in case of fire or gas leakage it will report the owner by sending a SMS and also by ringing an alarm to alert the surroundings. An LCD will be giving real time sensor data. Thus by using GSM technology, it provides the wireless feedback to the owner of the house.

Project Overview Statement Template

An overview template giving objectives of the system.

Project Overview

Project Title: Home Security and Safety System

Project Members:

Name	Roll NO.
Ruman Munir	BCSF16M016
Abdul Kareem Qammar	BCSF16M049

Project Goal: Our goal is to make a remote security system that will send SMS (Short Message Service) to the house owner and report the condition of the house and other sensors. The system will also be able to send feedback to the owner to apply any counter measures. The Security sensors will be installed all around the house and send the data to the owner if there is any security breach.

Objectives:

Sr.#	
1	To send feedback to the owner of the house.
2	To measure sensitivity of the sensors.
3	To Send data to owner using SMS.
4	Real-time communication between owner.
5	LCD Display for giving status of the system.
6	In case of emergency ringing the alarm.
7	Ring the alarm in case of fire or gas leakage.

Project Success criteria:
If our project achieves all our goals and objectives it comes to a point of success. We must deliver the project within time Collectively as a team, success is easy to achieve with proper guidance.

Assumptions, Risks and Obstacles:

Organization Address (if any):

Type of project: ❑ Research ✔ Development

Target End users: General Public

Development Technology: ❑ Object Oriented ✔ Structured

Platform: ❑ Web based ❑ Distributed
❑ Desktop based ❑ Setup Configurations
✔ Other___Arduino_____

System Requirements

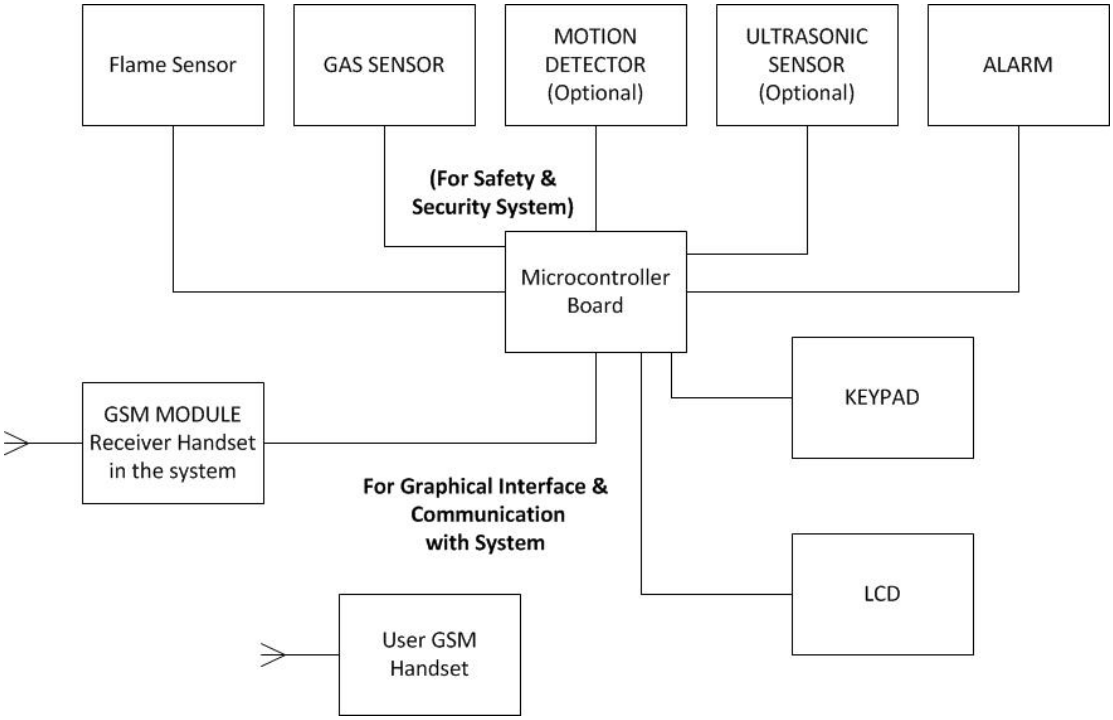
Below is the list of all major system requirements.

System Requirements:

Sr.	Requirements
1	The system should be able to register home owner mobile number.
2	The system should verify the home owner mobile number by sending a verification code on his mobile number.
3	The system should only save mobile number which is verified by the random verification code
4	The system should also able to ring alarm in case of emergency. It will alert the surroundings.
5	The system should not store a same mobile number twice.
6	The system should not accept a number with a wrong format.
7	The system should not accept any wrong inputs.
8	When the system is started for the first time it will only show registration screen. If the system is already registered with the home owner mobile number, it will just show the main screen
9	The home owner should be able to change his mobile number later.
10	The system should be pin code protected.
11	The pin code must be registered along with the mobile phone number. Each time the home owner wants to change something. He will be asked to enter pin code. If the user forgets the pin code, he can choose the option to enter mobile number.
12	The system will also display warnings and correction messages to the user
13	The system should scan each sensor. If it detects any change it will inform the home owner about it by sending a predefined text message.
14	The system should an interactive screen for graphical interface. The home owner can use graphical interface to view all the necessary information about the system.
15	The system should receive inputs with the help of keypad.
16	The home owner can also change the pin code later in the menu.
17	The system will be able to send messages to the home owner mobile number
18	The system should display information about the sensors in use. It should also display live sensor feed on the display.
19	The system should have an option to add neighbors.
20	The system should be able to delete an add neighbors later in the menu.

Application Architecture:

An overview of the application architecture.Describing the communication between each components of the system.



Tools and technologies used with reasoning:

Here is the list of all the hardware components along with the reasons. Software Tools and reasons also given below in the table.

Hardware Components

Tools	**Reasoning**
Arduino Uno/Mega	An open-source microcontroller board for controlling all functions
GSM Module	For sending and receiving SMS to the user.
LCD	For displaying information and status of sensors
MQ2 (Optional)	They are used in gas leakage.
Flame Sensor	This sensor will measure the Flame.
PIR (Optional)	Sensors that will detect infrared heat waves.
Piezo (Optional)	For detecting knocks on the front door.
Alarm	The sound will alert the surroundings for counter measure.
More Sensors	On consumer demand….

Software's Components

Tools	Reasoning
Arduino IDE	For writing, compiling and uploading C/C++ programs to Arduino board.
MS Visio	For making class diagrams, sequence diagrams, activity diagrams and Gantt chart. Etc.
MS Word	For documentation and project proposal.

Hardware Cost Analysis

The cost of equipment used in this project are given in the following

Hardware Cost Analysis

Sr.	Components	Quantity	Price(PKR)
1	Arduino Uno/Mega	2	1500
2	Sim 900 GSM Shield	1	1900
3	DC Adapter	1	250
4	Jumper Cables	120	500
5	Buzzer	1	100
6	LCD Screen	1	400
7	MQ-2 Sensor	3	600
8	Flame detector	1	150
9	Temperature Sensor	1	230
10	Breadboard	2	370
		Total	**= 6000**

REFERENCES

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[3] Arduino Workshop by John-Boxall
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[5] RFID handbook 3rd Edition by Klaus Finkenzeller
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