# About the Project

A Smart home system focuses on controlling home electronic devices whether you are inside or outside your home. Smart Home gives an individual the ability to remotely or automatically control things around the home. A Smart home is a device or instrument designed to perform a specific function, especially an electrical device, such as a refrigerator, for household use. The task can be performed by on bases of sensor data. which will take itself decision and action to perform.

Example.

In a project we have used a GAS Sensor. the sensor is calibrated using the main ckt and the raw data is collected .n the set point is set to indicate the gas detections.

Now when in a House or in a workshop if any harmful gases are leak and if the gase intensity goes on increasing then.

The microcontroller indicates the present of gas like “GAS DETECTED” on LCD screen. And a heavy duty Exhuast fan will be switched on. And a buzzer will beep continuously.

The recent developments in technology which permit the use of radio frequency technology such as Bluetooth have enabled different devices to have capabilities of communicating with each other. Bluetooth is a new technology, which has at its center the goal of eliminating wired connections between computers. Instead of connecting with wires, every appliance has small transmitters/receivers. The radio frequency used (2.4 GHz) is so high that the range of transmission will be small (about 1M). This is important because the range is so small, that it can be used in apartments without much interference to your neighbors or from them. These are a few reasons that make Bluetooth technology ideal for home automation. With this in mind, I propose to design an internet based home automation system for remote control of home appliances.

**Optional Modification:**

Many people are always on the move from place to place due to business demands. Some people can spend a couple of days away from their home leaving all their household appliances without any kind of monitoring and control. Some devices are left plugged into power sockets whereas others are supposed to be plugged into and out of power sockets at different intervals depending on the time of the day. All this requires an individual to manually attend to each of the devices independently from time to time. All such monitoring and control can be done without necessarily being around or inside the home. Some devices if not controlled properly consume a lot of energy which leads to extra expenditure on electricity. Therefore I propose to design an SMS based home automation system which will enable one to remotely manage his/her appliances from anywhere, anytime.

**Block Diagram**.

DC/Servo Motor

(Optional)

Power supply

Temperature Sensor

PIR sensor

Light sensor

GAS sensor

GSM Module

(optional)

Bluetooth Module

Relay1

Relay 2

Relay 3

Relay 4

Microcontroller

LCD 16x2

TO Relay

Android Phone

* Temperature Sensor is connected to the Analog port of the microcontroller. The output of the sensor is in is linear form the formula in the code converts the analog reading into the degrees celcies.
* PIR sensor is Passive Infrared Sensor .it comes in a fully assembled package and Is connect to the port pin of the microcontroller. It used for motion detection
* Light Sensor is made to work using a LDR. whose output is given to the analog port. The analog voltage is the process in the comptroller to determine the day light intensity.
* GAS sensor can be place in kitchens or in workshops to detect the gas leakage. the sensor is connected to the analog port .the detection of gas is determined by the set point of the raw data according to the datasheet and the calibration done.
* Power supply section the 5v supply is given to the microcontroller circuit. And the 9v supply is given to the relays.
* The portD is connected to the Ldc display the lcd is usd to display the real time data. of the sensors.
* To control the relay operation and to monitor the status of the sensor the Bluetooth module used and connected to the serial communication port of the microcontroller.
* The android phone has a application to communicate with other Bluetooth device this type of software have been used to control the operation and monitor.
* Optional parts like dc/servo motors can be used to make some automated operation like opening/closing the window,door,locking the door, valves of waters..etc
* Optional module GSM modem can be used to operate the system far remote place.

**Advantages**

1. Sensors used have high sensitivity and are easy to handle.

2. Low cost system, providing maximum automation.

3. User is indicated for changes in actuator state thereby giving an option for manual override.

4. Low maintenance and low power consumption.

5. The system is more compact compared to the existing ones, hence is easily portable.

6. Can be easily modified for improving the setup and adding new features.

7. Time saving.

8. Provides a user-friendly interface hence will have a greater acceptance by the

technologically unskilled workers.

9. Feedback for every command is given by system.

10. malfunctioning of single sensor will not affect the whole system.

**DISADVANTAGES**

1. No self-test system to detect malfunction of sensors.

2. Requires uninterrupted power supply.

3. Limited Range.

4. System doesn’t have Decision making capacity.

**Application**

***1. ANTI-THEFT REPORTING***

* When someone break in , Home-Guard uses GSM network to report automatically to 1 preset numbers: short message for control center, short message for 31pre-stored mobile phone.

***2. EMERGENCY REPORTING***

Under emergency situation, the house member can press SOS key on the RF remote or on wireless Door/ Window sensor. Home-Guard also uses GSM network to report to 5 pre-stored numbers: short message for control center, short message for 3 pre-stored mobile phone, and 1 voice call for monitoring or talking.

***3. EXTRA FUNCTIONS***

* Fire/Gas Instant reporting: Wireless Heat Sensor, Wireless Smoke Sensor, Wireless Gas Sensor, Wireless CO Sensor
* Wireless PIR Sensor
* Wireless temperaturs
* Optional Wired Auto.door/window opening.

***4. ARM/DISARM BY SMS***

Users can also check the alarm status anytime by simply sending an inquiry SMS message to the main unit.