Title of Project: Home Security Automation System

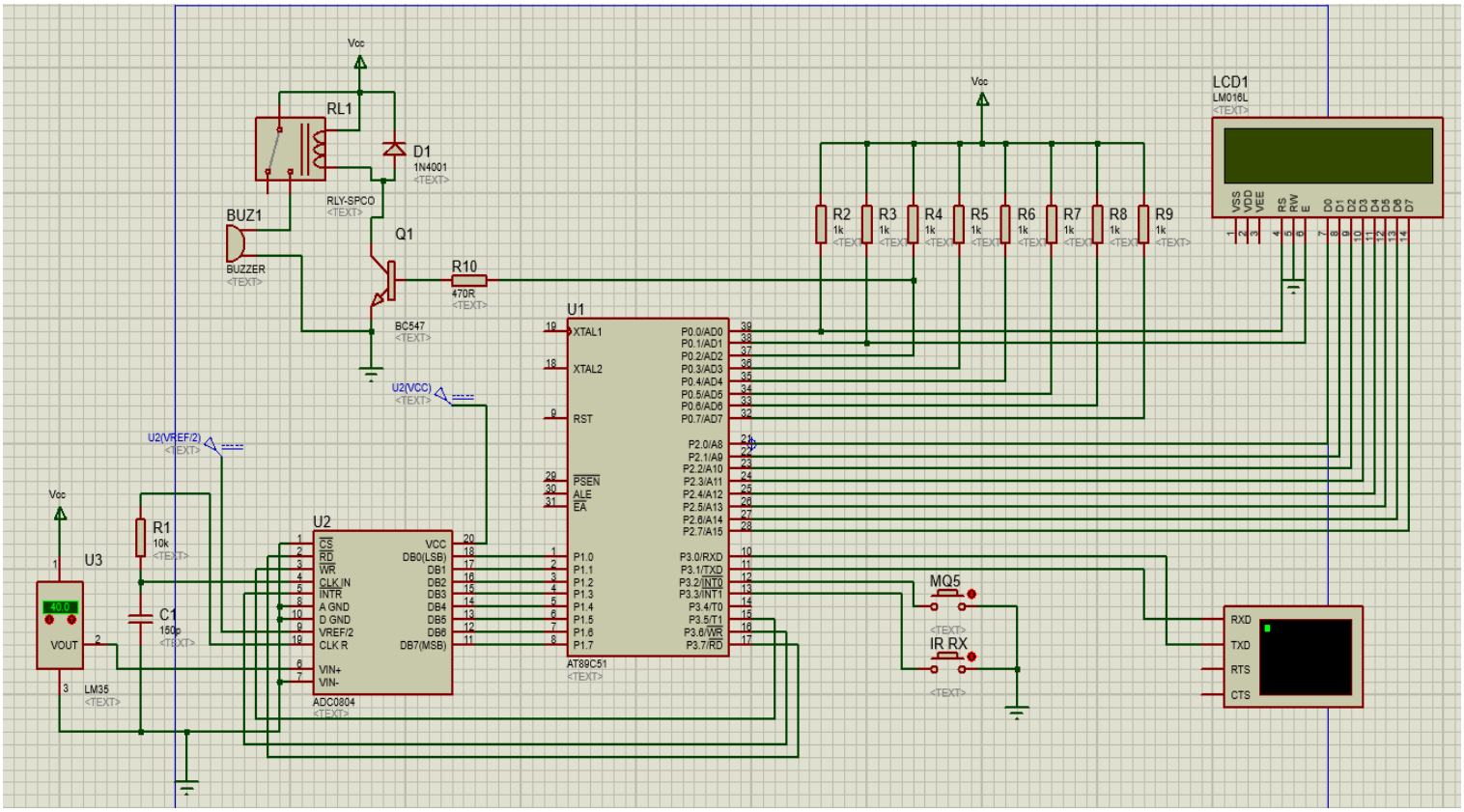
1. Introduction

a. A home automation system is a network of interconnected devices and sensors that work together to automate and control various tasks and functions within a home. In a home automation system created in Proteus using a microprocessor, the microprocessor acts as the central processing unit (CPU) and is responsible for controlling the various components of the system.
b. The system includes various sensors such as temperature and humidity sensors, motion sensors, light sensors, etc. The system is designed to automate various tasks within the home such as adjusting the temperature and humidity levels, and detecting motion and responding accordingly.
c. Overall, a home automation system created in Proteus using a microprocessor offers convenience, energy efficiency, and enhanced security to homeowners, making it a popular choice for modern homes.

2. Architecture with Diagram

a. A program written in C for a microcontroller-based system that implements a home security system. The system includes sensors for fire, LPG gas leakage, and intruder detection, and also communicates with a GSM module to send out alert messages when any of these events occur.
b. The program initializes the microcontroller and various peripherals such as an LCD screen, an ADC0804 analog-to-digital converter, and a UART interface for communicating with the GSM module. It also defines various functions for controlling these peripherals, such as displaying text on the LCD, reading data from the ADC0804, and sending strings of data over UART.
c. The main function contains an infinite loop that continuously reads data from the ADC0804 and checks if any of the sensors have been triggered. If a sensor is triggered, the system displays an appropriate alert message on the LCD and sends out a message over the GSM module.

d. The program also defines two interrupt service routines (ISR) for handling external interrupts on pins P3.2 and P3.3, which are triggered by sensors for LPG gas leakage and intruder detection respectively. When either of these sensors is triggered, the ISR sets a flag to indicate that the corresponding alert message has been sent over the GSM module, to prevent repeated messages from being sent for the same event.



3. Tools (S/W- For Eg: Keil,MCU-51,Proteus)

a. Proteus Design Suite: It is a software package for electronic circuit simulation and PCB design. It allows the user to simulate microcontroller-based projects in software before implementing them in hardware.

b. Keil µVision IDE: It is an integrated development environment (IDE) used to develop applications for microcontrollers. Keil µVision IDE provides a development environment for programming 8051-based microcontrollers.

4. Components Used

a. Microcontroller: The art of the home automation system, the microprocessor 8051, is responsible for controlling and coordinating all the connected devices and sensors.

b. Sensors: Sensors are used to detect changes in the environment and trigger actions in response. Examples of sensors that may be used in a home automation system include temperature sensors, motion sensors and gas sensors.

c. LCD Display: LM016L is a popular 16x2 character LCD (Liquid Crystal Display) 5x7 pixel Matrix and can also display special characters.

d. Virtual Terminal: A virtual terminal is a software-based interface that allows users to communicate with a computer or microcontroller using a text-based interface.

e. Buzzer: A buzzer in Proteus is an audio output device that produces sound by generating a varying frequency signal on its input pin. It is typically used as an indicator or alarm in electronic circuits.

5. Applications

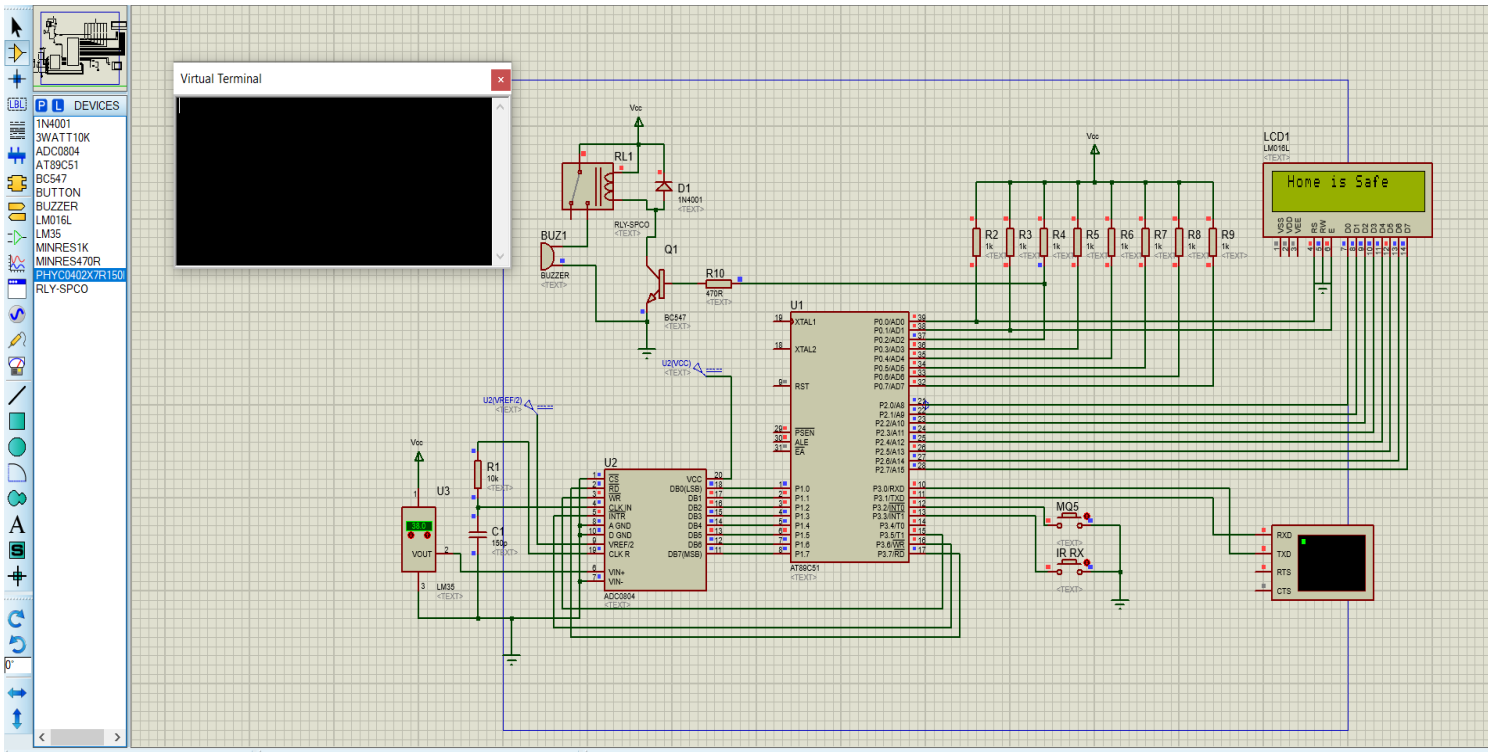
a. Emergency response: In the event of an emergency, a home security system application can be used to quickly contact emergency services and provide them with important information, such as the user's location and the type of emergency.

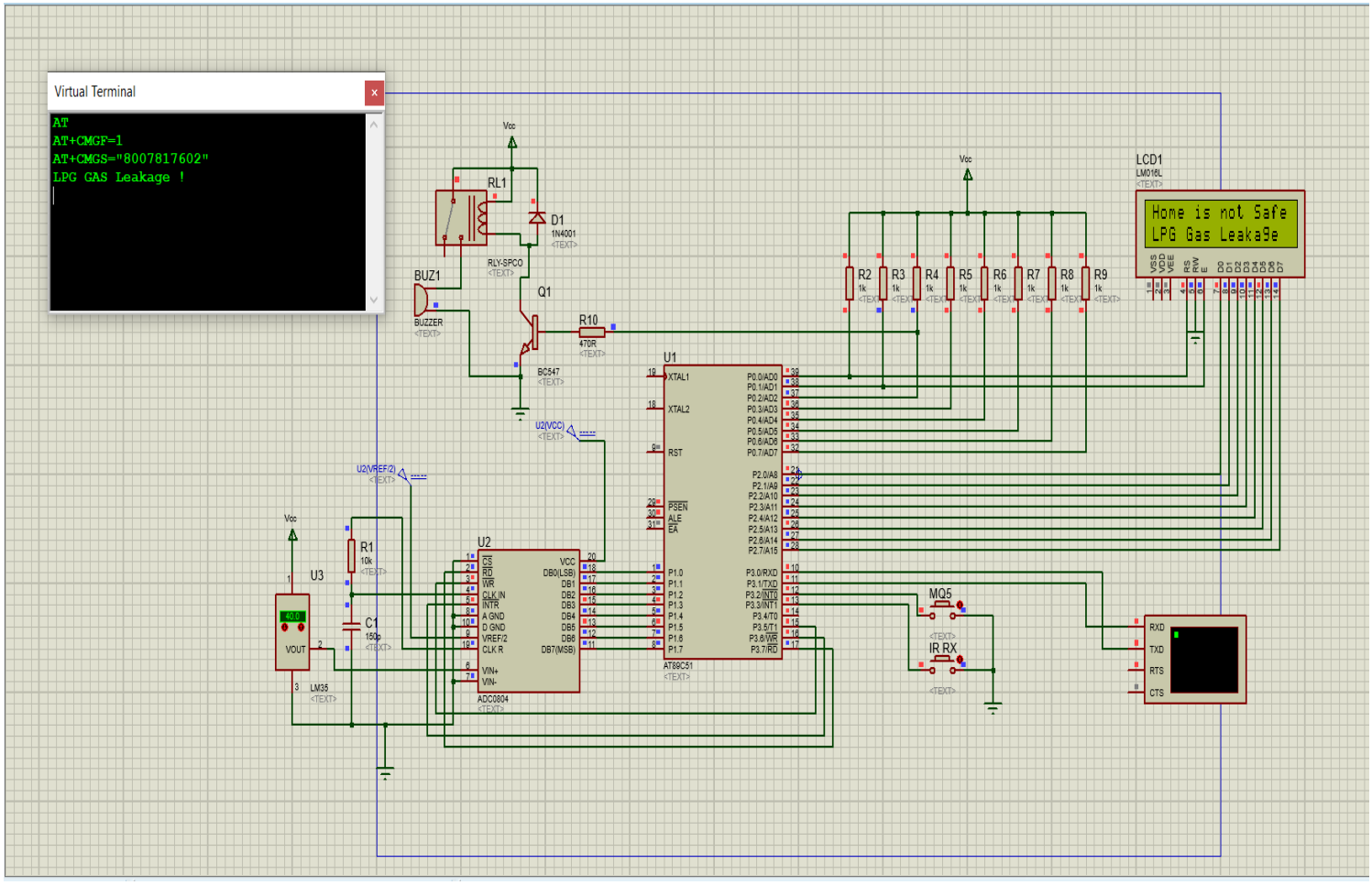
b. HVAC Control: The microprocessor-based home automation system can control the temperature, humidity, and ventilation of the house. It can be programmed to maintain the desired temperature and humidity levels inside the house.

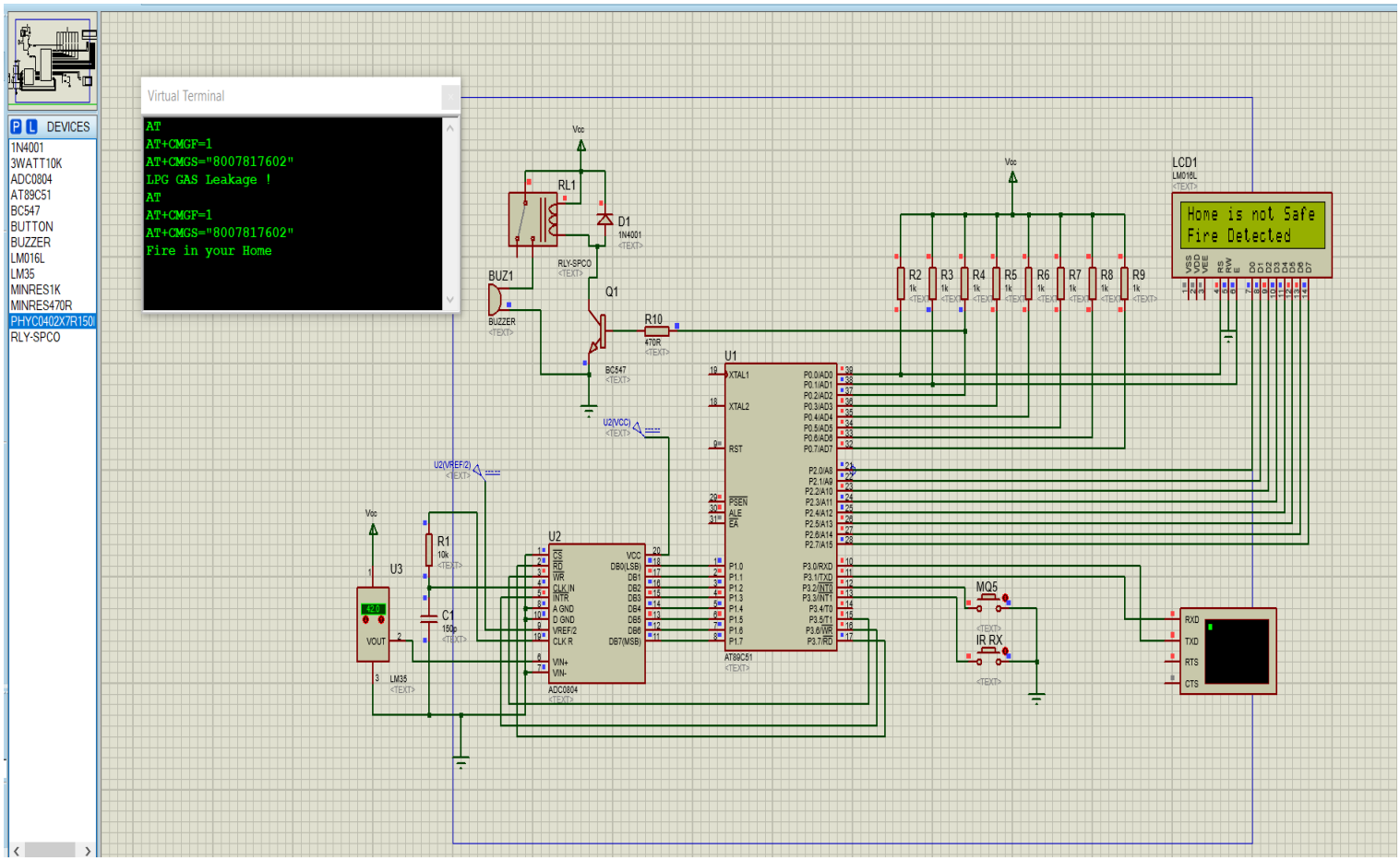
c. Security System: The microprocessor-based home automation system can also be used to control the security system of the house. It can be used to control the entry and exit points of the house and to detect any unauthorized access.

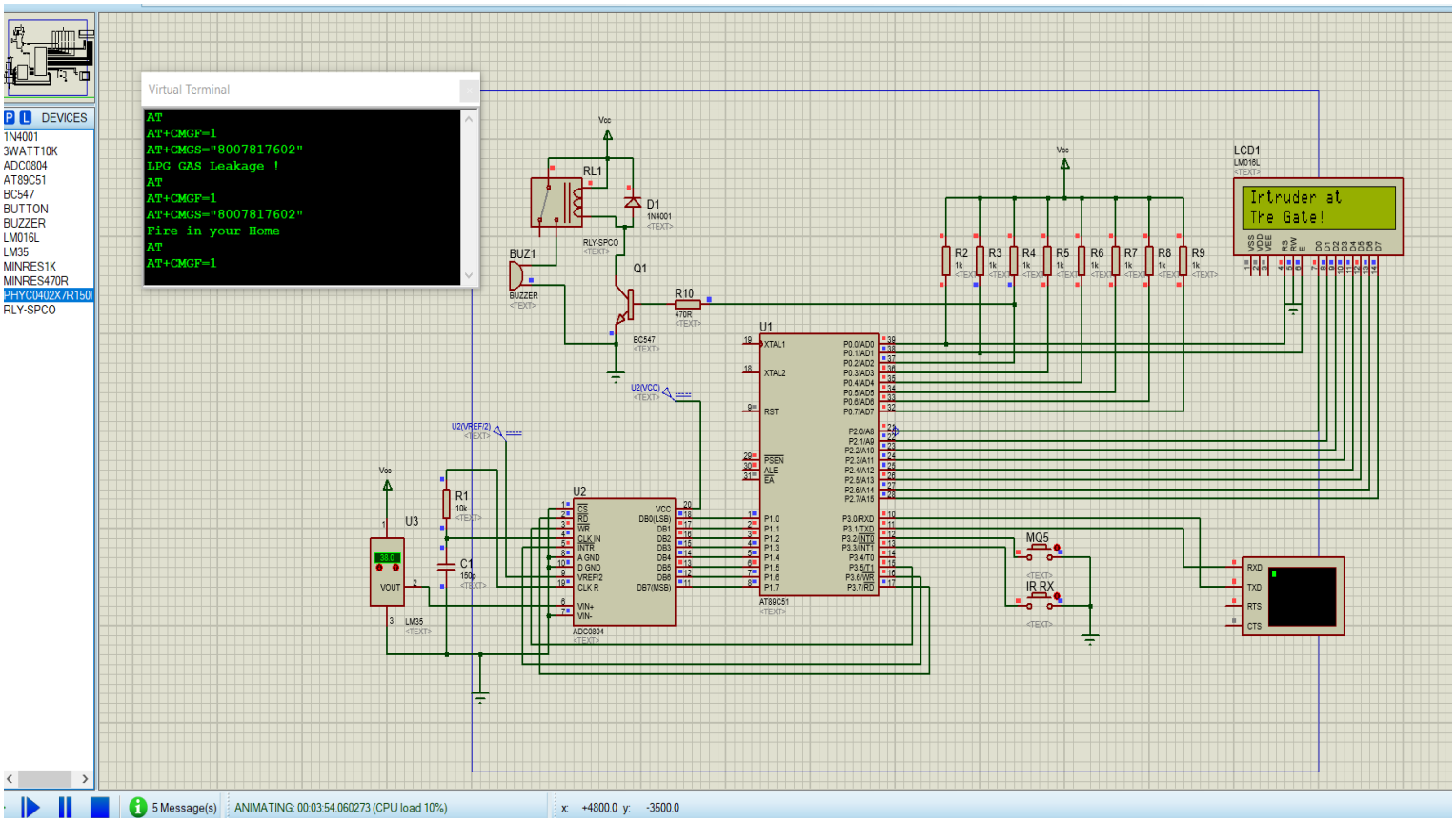
d. Energy Management: The microprocessor-based home automation system can help in managing energy consumption by controlling the use of various devices in the house. It can be used to turn off devices that are not in use and to optimize the use of energy-consuming devices.

6. Results/Output (Screenshots of Output)




Virtual Terminal
AT
AT+CMGF=1
AT+CMGS="8007817602"
LPG GAS Leakage !
Vcc
RL1
D1
1N4001
RLY-SPCO
BUZ1
BUZZER
Q1
BC547
R10
470R
U1
AT89C51
XTAL1
XTAL2
RST
PSEN
ALE
EA
P0.0/AD0
P0.1/AD1
P0.2/AD2
P0.3/AD3
P0.4/AD4
P0.5/AD5
P0.6/AD6
P0.7/AD7
P2.0/A8
P2.1/A9
P2.2/A10
P2.3/A11
P2.4/A12
P2.5/A13
P2.6/A14
P2.7/A15
P3.0/RXD
P3.1/TXD
P3.2/INT0
P3.3/INT1
P3.4/T0
P3.5/T1
P3.6/WR
P3.7/RD
P1.0
P1.1
P1.2
P1.3
P1.4
P1.5
P1.6
P1.7
R2
R3
R4
R5
R6
R7
R8
R9
1k
LCD1
LM016L
Home is not Safe
LPG Gas Leaka9e
U2
ADC0804
U2(VCC)
U2(VREF/2)
R1
10k
C1
150p
U3
LM35
VOUT
MQ5
IR RX
RXD
TXD
RTS
CTS


Virtual Terminal
AT
AT+CMGF=1
AT+CMGS="8007817602"
LPG GAS Leakage !
AT
AT+CMGF=1
AT+CMGS="8007817602"
Fire in your Home
DEVICES
1N4001
3WATT10K
ADC0804
AT89C51
BC547
BUTTON
BUZZER
LM016L
LM35
MINRES1K
MINRES470R
PHYC0402X7R150
RLY-SPCO
Vcc
RL1
D1
1N4001
RLY-SPCO
BUZ1
BUZZER
Q1
BC547
R10
470R
U1
AT89C51
XTAL1
XTAL2
RST
PSEN
ALE
EA
P0.0/AD0
P0.1/AD1
P0.2/AD2
P0.3/AD3
P0.4/AD4
P0.5/AD5
P0.6/AD6
P0.7/AD7
P2.0/A8
P2.1/A9
P2.2/A10
P2.3/A11
P2.4/A12
P2.5/A13
P2.6/A14
P2.7/A15
P1.0
P1.1
P1.2
P1.3
P1.4
P1.5
P1.6
P1.7
P3.0/RXD
P3.1/TXD
P3.2/INT0
P3.3/INT1
P3.4/T0
P3.5/T1
P3.6/WR
P3.7/RD
LCD1
LM016L
Home is not Safe
Fire Detected
R2
R3
R4
R5
R6
R7
R8
R9
1k
U2
ADC0804
VCC
CLK R
CLK IN
INTR
VREF/2
VIN+
VIN-
A GND
D GND
DB0(LSB)
DB7(MSB)
U2(VREF/2)
U2(VCC)
U3
LM35
VOUT
R1
10k
C1
150p
MQ5
IR RX
RXD
TXD
RTS
CTS



7. Conclusion

In conclusion, a home automation system using a microprocessor 8051 can offer several benefits such as improved security, energy efficiency, and convenience. The system can be designed and implemented using various hardware and software components such as sensors, actuators, microcontrollers, and development tools like Keil and Proteus. The working of the system involves sensing the environment through sensors, processing the data using the microprocessor, and controlling the output devices using actuators. With proper implementation and programming, this system can effectively automate various tasks in a home, making it more comfortable and secure for the occupants.