HOME AUTOMATION, MONITORING, CONTROLLING AND SECURITY SYSTEM USING IOT

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Abstract: This project presents the overall design of Home Automation, Monitoring, Controlling and Security System using IOT with low cost and wireless system. This system is designed to assist and provide support in order to fulfil the needs of elderly and people far away from home. Also, the smart home concept in the system improves the standard of living at home. By using a app in android mobile such that it has all the controls of a home design as per the requirement along with security deployment keys, we can get full access of the home automation things. The video feedback is received in the android application which streams the video of IP-Camera. The main control system implements wireless technology to provide remote access from smart phone. It uses the IOT for the controlling and supervising of the home appliances and security of the home. The system intended to control electrical appliances and devices in house with relatively low cost design, user-friendly interface and ease of installation. As this system uses IOT technology, we can operate home appliances from anywhere in this world without any limitation of distances. The installation of this type of system is and efficient for a home without any changes in home design. This system provides not only operating home automation but also manually operating facility for the ease of elder people who is not aware/comfortable with this technology.

1. INTRODUCTION:

A future home is a residence that uses internet-connected devices to enable the remote monitoring, management of appliances and security systems. Home automation or domestics is building automation for a home, called a smart home or smart house. A home automation system will control lighting, climate, entertainment systems, and appliances. It may also include home security such as access control and alarm systems. When connected with the Internet, home devices are an important constituent of the Internet of Things. A home automation system typically connects controlled devices to a central hub or "gateway". The user interface for control of the system uses either wall-mounted terminals, tablet or desktop computers, a mobile phone application, or a Web interface, that may also be accessible off-site through the Internet. In order to provide the long-distance remote operation and all in one system for the home which makes it easier to the user to control, monitor and secure the entire home from anywhere using the IOT.

2. HMCS SYSTEM:

It is a system which provides the full control over the home and it's security. By using this system, you can access the electrical appliances, home things and security system from any where in this world where you have internet access. It is designed in such a way that it costs less for the user to deploy and maintenance is quite simple. It is operated on DC and consumes low power compared to the other system.
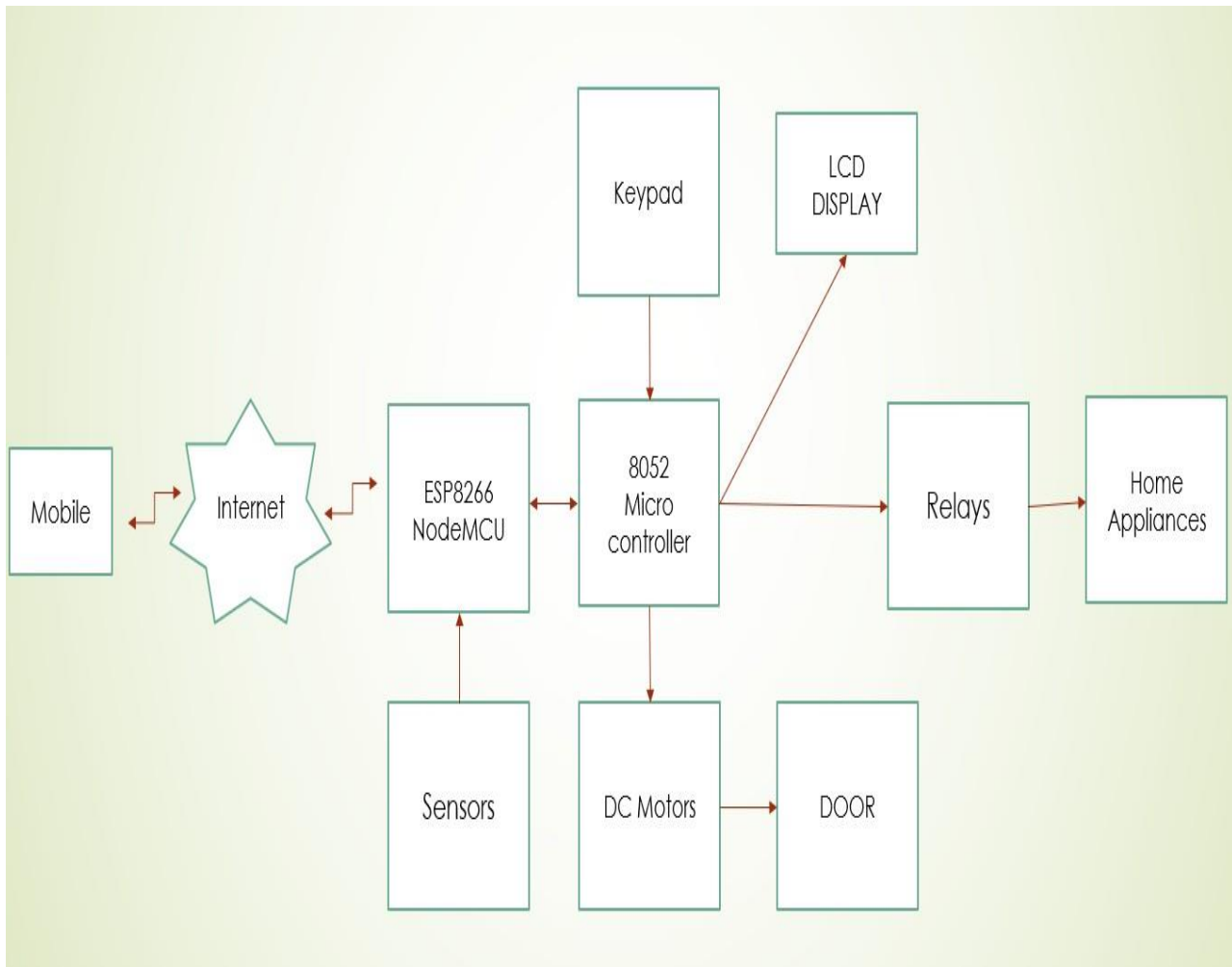
Fig. 1 Block diagram of HMCS system

As you seen in the block diagram, it consists of two microcontrollers and a NODUMCU ESP8266 for its operation. It uses two different microcontrollers for two different operations. One is for electrical appliances control and another for security control. It has sensors interfaced to the system. Various sensors like Motion sensor, flame detector and touch sensor are interfaced to the system. It has a 4x4 keypad and 16x2 LCD display.

2.1 WORKING OF HMCS SYSTEM

Initially NODEMCU is connected to the wifi, specified in the program. The NODEMCU is connected to the webpage that is provided in the program using the MQTT protocols. Now it is able to receive the data from the webpage or to write the data on to the webpage. By clicking on the button attached with key word to control that particular thing. The change in the web page after clicking is read by the NODE MCU using the MQTT protocol and perform the operation assigned to the change. And there by the operations are send to microcontroller which is connected to the all controllers. 8052 micro controller receives the data from ESP8266 and changes the output on its pin to the corresponding value to make an action. There are indicators which provides us the information gathered from the sensors.
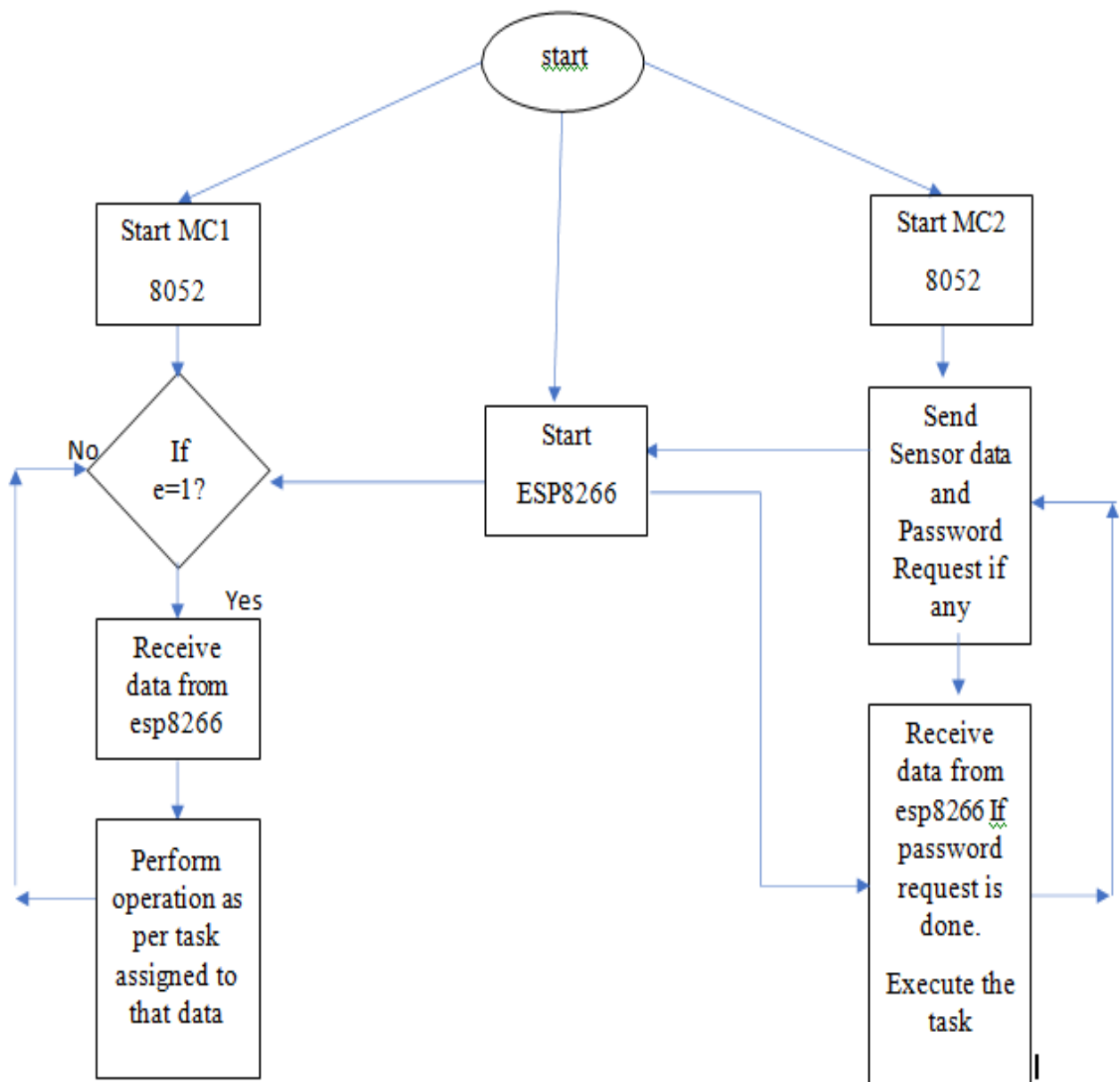
2.2 WORKING FLOWCHART

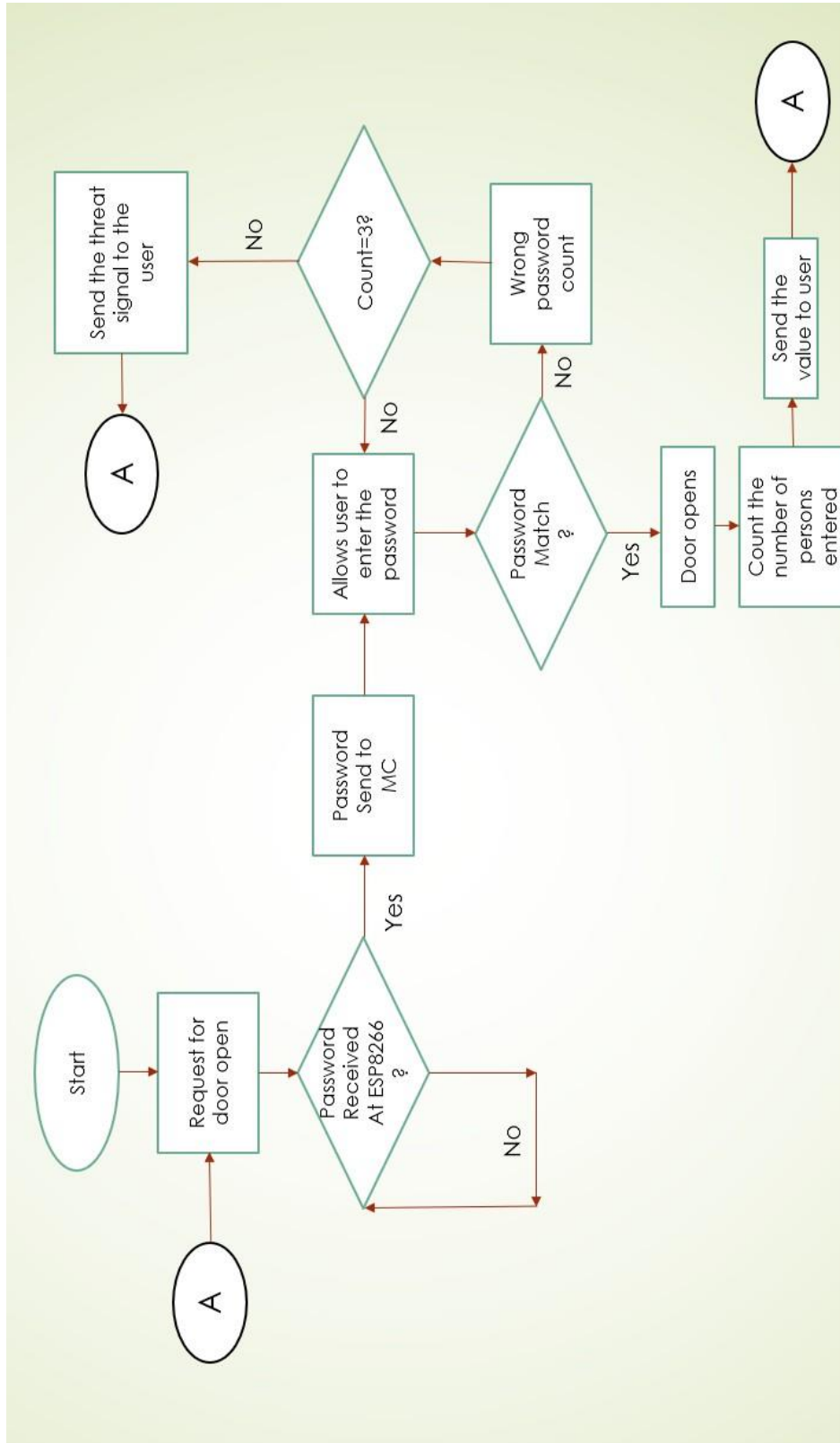Fig 2. Working flow chart

2.3 SECURITY FLOWCHART

Fig 3. security control flowchart

ADVANTAGES

1. Password varies every time a new request received
2. Long distance monitoring
3. Easy to monitor and control
4. Less wiring required
5. Manual control is available
6. Easy to implement with old system
7. Less cost

LIMITATIONS

8. Requires a good internet connection.

9. If internet connection lost, communication will stop until internet is ON.

10. Need different DC supplies for different circuits to avoid low supply problems (More supplies required).

APPLICATIONS

11. Smart Home

12. Office applications

13. Industries

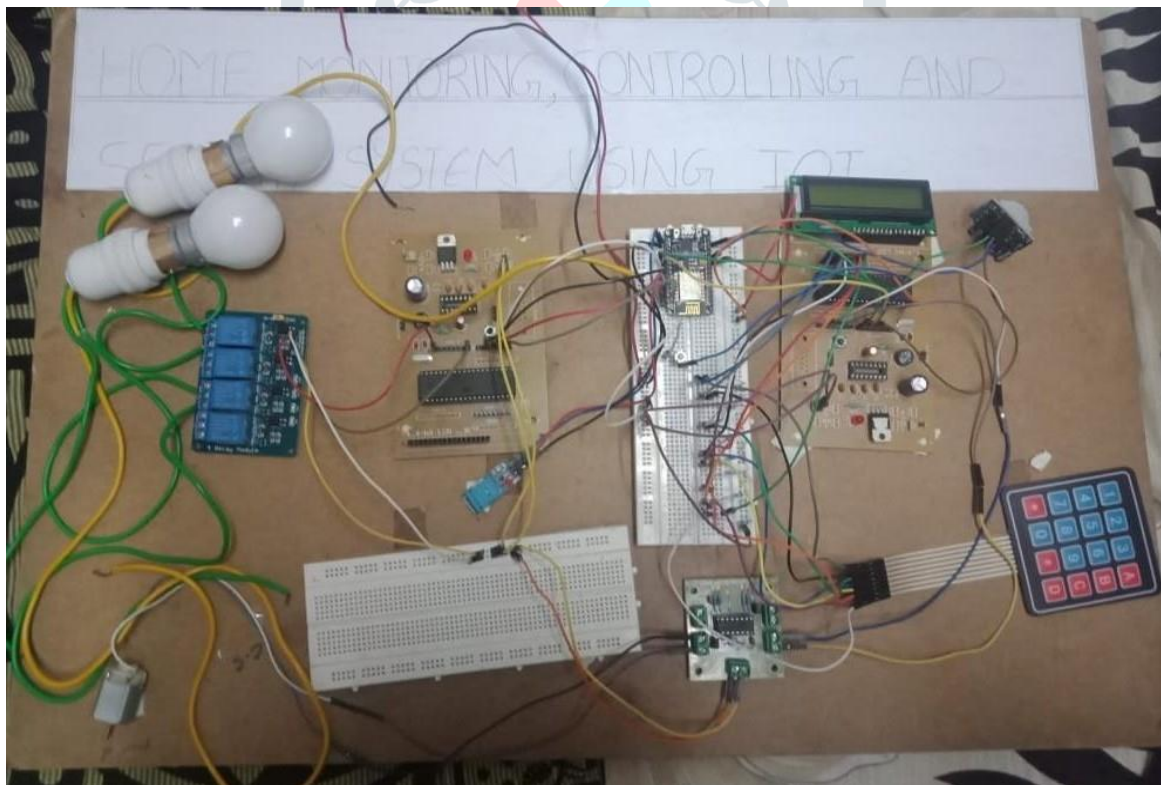3. **RESULTS**

HARDWARE IMPLEMENTATION OF THECIRCUIT

Fig 4.Hardware Implementation of Circuit

      The connections are made according to the circuit diagram shown in figureFig:4. Hardware circuit diagram. A bread board is used to interface with various components to the microcontroller. To make connections male-male, male-female, female-female wires are used.
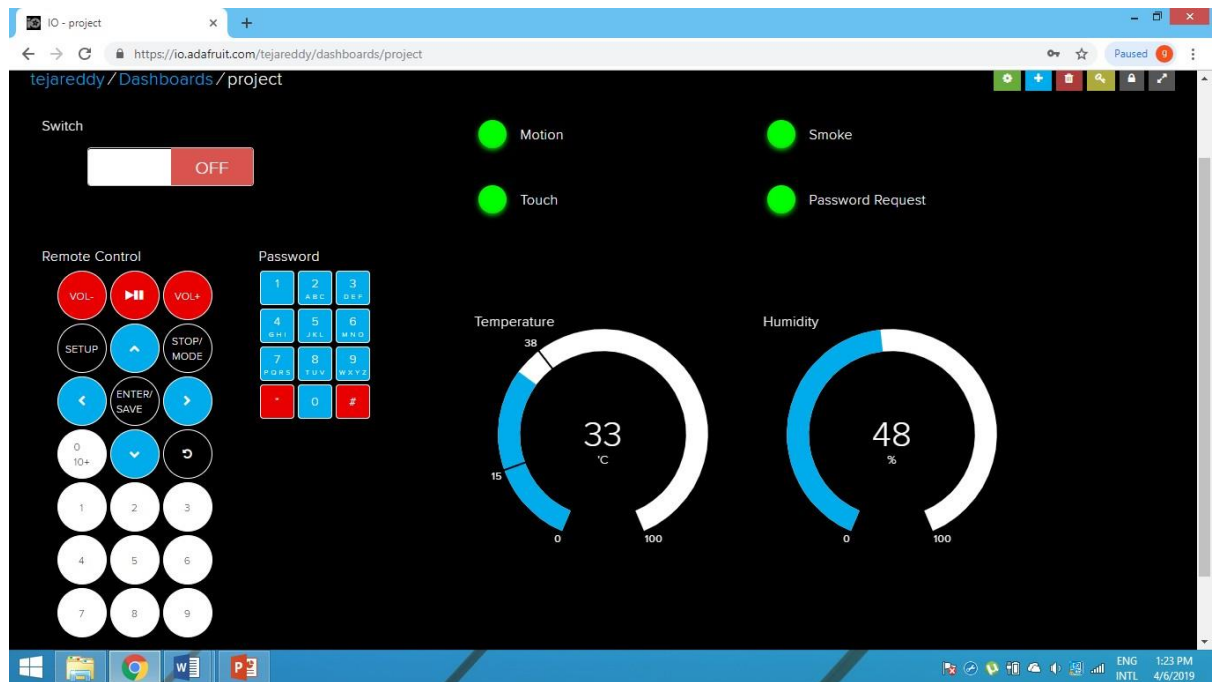
4.1 DASHBOARD

Fig 5.Dashboard created in Adafruit.

Adafruit.io is a cloud service that is used in building this embedded system. It can be connected over the internet for storing and then retrieving data. This cloud service displays the data in real time. This make the project internet connected and helps to control home like lamps fans, TV etc., In this project it is used to monitor temperature and humidity. In addition to it also monitor motion, smoke etc.,
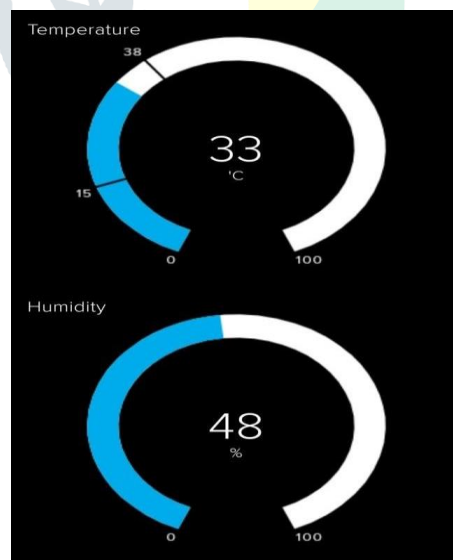
4.2 Real Time Outputs on Dashboard

Fig 6.Temperature and Humidity outputs observed on Dashboard

Fig 6. shows the real time outputs on website.When the website is signed in the data is collected from sensors and data is displayed for the user. Here, it shows the humidity as 48% and temperature as 33`C.

LCDOUTPUT

Fig 7.LCD Output

Fig 7 shows the LCD display output. When user want to enter in to the home,the user has to request for generating a password.During this process LCD show a text " PLEASE WAIT". This is clearly shown in the above figure.

5.   CONCLUSION

As the technology increasing, the home appliances and security systems are given more priority to develop a smart home. By using this system, a person can control, monitor and secure his home from anywhere in this world if he has an internet access. It is cheaper and can easily implemented with the regular home appliances. It makes a home more secure and smart with in our hands.

5.1   FUTURE SCOPE

By using the latest processors and microcontrollers, it is easy to implement a system that can be used to monitor and control of large building with many rooms and floors. By using google talk, we can control this system with the voice (keywords) By using the Zigbee or Bluetooth or using RF communication, it is possible to make internal connections as wireless but it is not cost effective

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