

# Home Appliances Controlling using IOT technique

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**Abstract** - IoT refers to the infrastructure of connected physical devices which is growing at a rapid rate as huge number of devices and objects are getting associated to the Internet. Home security is a very useful application of IoT, and we are using it to create an inexpensive security system for homes as well as industrial use. The system will inform the owner about any unauthorized entry or whenever the door is opened by sending a notification to the user. After the user gets the notification, he can take the necessary actions. The security system will use a microcontroller known as Arduino Uno to interface between the components, a magnetic Reed sensor to monitor the status, a buzzer for sounding the alarm, and a WiFi module, ESP8266 to connect and communicate using the Internet. The main advantages of such a system includes the ease of setting up, lower costs and low maintenance.

## INTRODUCTION

: In fast moving world, time is most important factor. You can turn on/off device in the industry by giving command through your laptop using internet. It will save time as well as manpower required to control home appliances or industrial devices. By using key command on IOT, we can control five devices. We can increase the number of devices. Most important factor about this project is that it is controlled using an IOT website on laptop/desktop. The person who has logged into IOT website on his/her laptop can only interfere in the controlling devices. Also, it removes the need of carrying a remote control to turn on/off the devices. This project has integration of IOT technology and embedded system. User has to login to IOT website on his/her laptop/desktop to control the devices. Then he/she can give command using the buttons on that IOT website. For this you have to insert simcard into the GSM modem which is connected to the project. So, the main wireless controlling technique used in this project is IOT using GSM technology. This GSM Modem is connected to the circuit. It sends out a code for respective command sent by user. Then the respective device connected to the circuit will be

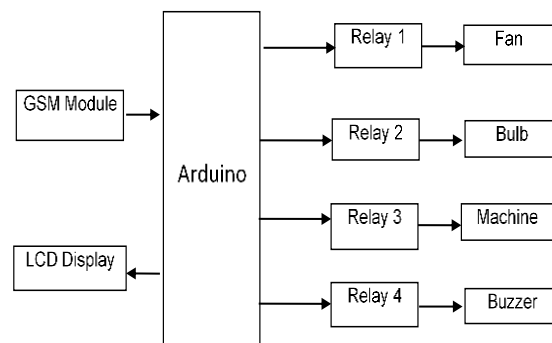
turned on or off depending on the command given. For example, turn on Fan, Turn off Fan. Turn on buzzer etc. Such that by giving commands from mobile you can control home appliance or industrial work

This is more advantages, when we have to turn on the machinery at the time when we have another urgent task to do and we cannot get up from our place. In this case we can turn on machinery by simply giving command through website. There is no need to go to field.

## LITERATURE SURVEY

We have undergone a detailed study about the IOT Technology and various applications and implementation of those apps. As a part of our circular activity we are making the project whose title is "Home Appliances Controlling using Arduino using IOT technique". We have used Arduino Uno microcontroller which is Arduino series Microcontroller as a main component of the project. Now days Microcontroller has become a main component of many of the electronic circuits.

## BLOCK DIAGRAM



### 1) Arduino

This is the most important segment of the project, i.e. the Arduino. The Arduino is responsible for detection and polling of the peripheral's status. It is responsible for making decisions for the connected devices. It is responsible for prioritizing all the tasks.

We have used the Arduino Uno. It is a High Performance, Low Power AVR 8-Bit Arduino. It also has In-System Programming by On-chip Boot Program. It has 23 Programmable I/O Lines.

It is a major part of the system which controls all the operation of the circuit such as LCD interfacing, GSM module interaction. It also decides the messages to be displayed on the LCD along with the time duration for which they should be displayed on the LCD.

2) DISPLAY

It is used to display the current values of the measuring quantities. It can be used to display the various options and all the readings that have been stored in the EEPROM. LCD or 7 segment LED display can be used. Here the LCD used is the 16x2 line LCD. We can also use 16x4 line LCD. Liquid Crystal Display which is commonly known as LCD is an Alphanumeric Display it means that it can display Alphabets, Numbers as well as special symbols thus LCD is a user friendly Display device which can be used for displaying various messages unlike seven segment display which can display only numbers and some of the alphabets. The only disadvantage of LCD over seven segments is that seven segments is robust display and be visualized from a longer distance as compared to LCD. Here I have used 16 x 2 Alphanumeric Display which means on this display I can display two lines with maximum of 16 characters in one line.

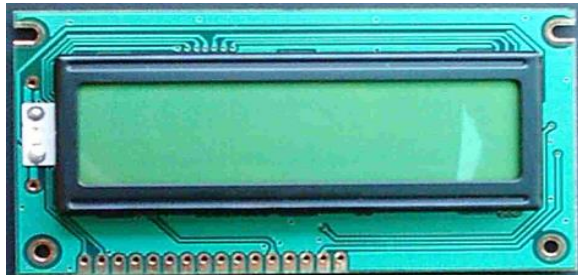


Figure: Photograph of A typical 16 by 2 alphanumeric LCD display

4) GSM modem: user has to insert simcard into GSM modem. The GSM modem is interfaced to Arduino using serial port. Arduino sends AT commands which are used to send and receive data from IOT

5) Relay: -Relay is used to control the on/off operation of device. Relays are driven by the transistors. We are using single pole double throw (SPDT) relay.

To perform switching of relay transistor BC 548 is used

Relay can switch AC & DC, whereas transistor can only switch DC.

Relays can switch high voltage, transistor cannot.

Relays are a better choice for switching large currents (i.e.>5A).

Relays can switch many contacts at once.

Relay acts as a switch which is used to control the 230-volt AC supply. This relay will be turned off if there is no person inside the room. This relay can be used to turn off the electrical appliances like fan, tubes etc.



POWER SUPPLY

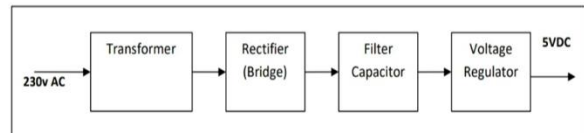
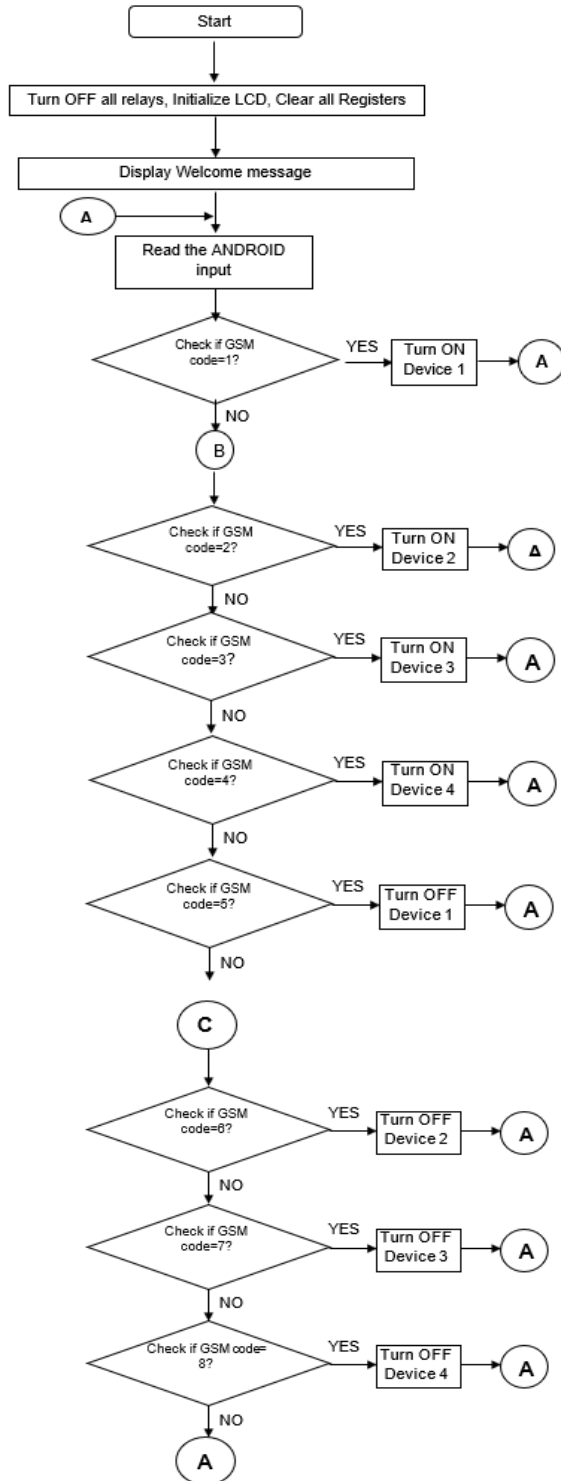


Fig. shows the block diagram of a typical power supply. The AC mains is given to the transformer primary to get the required voltage at the secondary. Then it is applied to the bridge rectifier, which converts the sinusoidal input into full wave rectified output. The output of the rectifier contains some ripple voltage. To remove this voltage filter circuit is used. A ripple voltage is nothing but a small value of AC over DC signal. Then a pure DC is given to the regulator. The function of the regulator is to give the constant or stable output DC in spite of changes in the load current. The reasons for choosing IC regulator is that they are versatile in operation and relatively inexpensive with features like programmable output, current/voltage boosting, internal short circuit current limiting, thermal shutdown. The 78XX are popularly known for regulation has been used. The 78XX series is a 3-terminal positive voltage regulator and 79XX series is a 3-terminal negative voltage regulator.

As name suggests it transforms the voltage level from one level to another. Transformer used is the step-down transformer to step 230 V to +9 V. It provides isolation too from the mains

FLOWCHART



CONCLUSION

With the knowledge of new techniques in ‘Electronics’ we are able to make our life more comfortable. One such application of electronics is used in “Home Appliances Controlling using Arduino using IOT technique” The approach we followed and which is explained in this project report is novel and has achieved the target of “Home Appliances Controlling using Arduino using IOT technique” satisfying user needs and requirements.

Home Appliances Controlling using Arduino using IOT technique is automatic versatile system. It can be implemented in industry, home, agricultural field, remote and hazardous applications. It provides the flexibility & system reliability with low cost as well as less maintenance. It provides remote access to the system to deliver service at any time of the day. With this system, we can control as well as monitor the devices at remote location.

The development of this project has shown how much hard work goes into the creation of a system. “Home Appliances Controlling using Arduino using IOT technique” was a project based on microcontroller, due to which hardware requirement is reduced. Embarking of this project has helped us in developing a team spirit, patience, and time management necessary for today's technical professionals.

Hence, we can conclude that the required goals and objectives of our project have been achieved.

This project has built in us confidence that any problem can be solved with sheer determination, hard work and optimism. We feel that our product serves something good to this world and we like to present it before this prosperous world. By doing this project, we were better able to understand the various facets of doing an embedded system project which is emerging as one of the most 'in demand' technologies right now.

APPLICATIONS:

1. Industrial automation - This project can be used to control various devices in the Industry
2. Can also be used for security purpose after modification (we can control gate system, or we can interface wireless camera and can control it using our mobile)

A) INDUSTRIAL CONTROL -

It is used to control or switch on any automatic process control machinery.

Electric grid could be controlled remotely.

Automatic production machinery could be controlled even during odd hours with your mobile phone.

#### B) HOME AUTOMATION –

1. To monitor status of home appliances
2. To control (ON/OFF) the home appliances according to their status when we are going away from home.

#### C) FARM AUTOMATION -

1. To control & monitor the various irrigation equipment in the farm.

#### ADVANTAGES

1. Can control device from a long distance, thus it gives ease of access.
2. Faster operation and efficient.
3. No need to carry separate remote or any other controlling unit.

Eliminates the continuously monitoring, it facilitates 24 hours a day, 365 days in year communication between system and user.

Commands can be given through remote place, directly to the machine.

By further modification security system can be added.

Easy to install & simple in operation.

Low cost, high reliability & flexibility.

#### LIMITATIONS

If the GSM network used in mobile does not have any coverage, then the operation cannot perform.

It is not useful for large number of application but by using multiple keys for device operation we can increase number of applications.

#### FUTURE SCOPE

Data logging facility can be included in case of recording historical data, special data, special events and system data.

Computer can be interfaced for more complex & precise application.

System reliability can be improved.

Voice interactive services can be added to offer better interaction with user.

#### REFERENCES

- [1] Ravi Kishore kodali and Vishal jain “IOT based smart security and Home Automation system” International conference on computing, communication, and automation (ICCCA 2016)
- [2] S. Sen, S. Chakrabarty, R. Toshniwal, A. Bhaumik, “Design of an intelligent voice-controlled home automation system”, International Journal of Computer Applications, vol. 121, no.15, pp. 39-42, 2015
- [3] A. R. C. Y. O. K. Withanage, C., “A comparison of the popular home automation technologies,” pp. 1 – 11, May 2014
- [4] H. AlShu'eili, G. S. Gupta and S. Mukhopadhyay, "Voice recognition based wireless home automation system," Mechatronics (ICOM), 2011 4th International Conference On, Kuala Lumpur, 2011, pp. 1-6.
- [5] R. Teymourzadeh, Salah Addin Ahmed, Kok Wai Chan and Mok Vee Hoong, "Smart GSM based Home Automation System," Systems, Process & Control (ICSPC), 2013 IEEE Conference on, Kuala Lumpur, 2013, pp. 306-309.
- [6] R V Prasad Bhokya, Nitesh Gaikadwad, ‘IOT Based Secured Smart Home Automation Using Raspberry PI’, International Journal of Ethics in Engineering & Management Education, Volume: 04, Issue: 3, March-2017
- [7] Prof. (Dr.) Khanna SamratVivekanand Omprakash, ‘Wireless Home Security System with Mobile’, International Journal of Advanced Engineering Technology, Volume:02, Issue 4, October-December 2011
- [8] Jayashri Bangali, Arvind Shaligram, ‘Design and Implementation of Security Systems for Smart Home based on GSM technology’, International Journal of Smart Home, Volume:07, Issue:6, 2013.