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IOT Based Home Automation

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Abstract: **The purpose of this project is to monitoring and controlling electrical devices in home remotely using Wi-Fi and get the status alert through SMS by using GSM modem whenever Required. The GSM modem provides the communication mechanism between the user and the microcontroller system by means of SMS.**

User can monitor the status and also control multiple electrical devices by sending suitably formatted SMS to the microcontroller based control system. These SMS commands are interpreted by microcontroller system and are validated. If the SMS command received is valid that means if password is matched then it takes the necessary action on the said devices and also it always monitors the home, if any one crosses the fencing then alerts will be sent to owners mobile in the form of SMS.

Index terms: **Home Automation, Physically Challenged, Electronic Devices, Energy Conservation Portability.**

I. INTRODUCTION

The purpose of this project is to controlling electrical devices in home remotely using WIFI Module. The Wifi modem provides the communication mechanism between the user and the microcontroller system by means of an IOT webpage.

User can monitor the status and also control multiple electrical devices by sending suitably formatted selection in IOT webpage to the microcontroller based control system. These accessing commands are interpreted by microcontroller system and are validated.

This system provides a modern era automation system where we can control the status of the appliances from anywhere in the world. Here the devices to be controlled are interfaced to Microcontroller unit through switches Relay and controller which receives command through wifi module interfaced to it, processes them and performs appropriate action on the devices.

II. LITERATURE OF SURVEY

One of the buzzwords in the information technology is Internet of Things(IOT). The future is IOT whoch will transform the real world objects into intelligent virtual objects. The IOT aims to unify everything in our world under a common infrastructure, giving us not only control of things around us, but also keeping us informed of the state of the things. In Light of this, present study addresses IOT concepts through systematic review of scholarly research papers, corporate white papers, professional discussions with experts and online databases. Moreover this research article focuses on definitions, geneses, basic requirements, characteristics and aliases of Internet of Things. The main objective of this paper is to provide an overview of Internet of Things, architectures, and vital technologies and their usages in our daily life. However, this manuscript will give good comprehensions for the new researches, who want to do research in this field of Internet of Things (Technology GOD) and facilitate knowledge accumulation in efficiently.

The most profound technologies are those disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it was Mark Weiser's central statement in his seminal paper [Weis 91] in Scientific America in 1991. There is a sea in humans's daily life as well as in working conditions in organizations after the arrival of IT and ITeS technologies. This is becoming well-known concept across many horizontal and vertical markets including a common man's everyday life in the society, as it has several applications.

The development of the Internet of Things [IOT] has been primarily driven by needs of large corporations that stand to benefit greatly from the foresight and predictability afforded by the ability to follow all objects through the commodity chains in which they are embedded. The ability to code and track objects has followed companies to become more efficient, speed up process, reduce error, prevent theft, and incorporate complex and flexible organizational systems through IOT. The IOT is a technological revolution that represents the future of computing and communications, and

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its development depends on dynamic technical innovation in a number of important fields, from wireless sensors to nanotechnology.

III. EXISTING MODELS

1. GSM based home automation
2. Bluetooth based home automation
3. Phone based home automation
4. Wireless control system

In all the above models the major drawbacks are:

- Status of the devices cannot be monitored
- Power consumption is more
- Efficiency is less
- Internal storage capacity is less

IV. PROPOSED MODEL

The block diagram of the project and design aspect of independent modules are considered. Block diagram is shown in fig: 3.1:

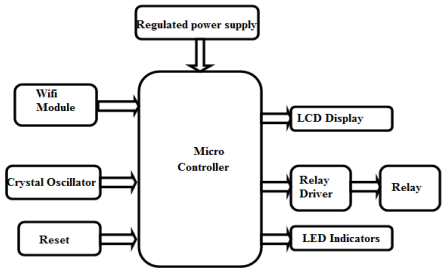


Fig: Block diagram of IOT based home automation

The main blocks of this project are:

1. Micro controller (16F73)
2. Reset button
3. Crystal oscillator
4. Regulated power supply (RPS)
5. LED Indicator
6. Wifi module
7. Relay

Micro controller:

Fig: Microcontrollers

The microcontroller used in this project is PIC16F73. The PIC families of microcontrollers are developed by Microchip Technology Inc. Currently they are some of the most popular microcontrollers, selling over 120 million devices each year. There are basically four families of PIC microcontrollers:

PIC12CXXX 12/14-bit program word

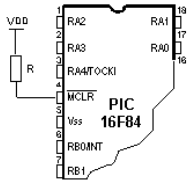
PIC 16C5X 12-bit program word

PIC16CXXX and PIC16FXXX 14-bit program word

PIC17CXXX and PIC18CXXX 16-bit program word

Reset:

Reset is used for putting the microcontroller into a 'known' condition. That practically means that microcontroller can behave rather inaccurately under certain undesirable conditions. In order to continue its proper functioning it has to be reset, meaning all registers would be placed in a starting position.



Using the internal reset circuit

Crystal oscillator:

The crystal oscillator speed that can be connected to the PIC microcontroller range from DC to 20Mhz. Using the CCS C compiler normally 20Mhz oscillator will be used and the price is very cheap. The 20 MHz crystal oscillator should be connected with about 22pF capacitor. Please refer to my circuit schematic.

There are 5 input/output ports on PIC microcontroller namely port A, port B, port C, port D and port E. Each port has different function. Most of them can be used as I/O port.

V. REGULATED POWER SUPPLY

Power supply is a supply of electrical power. A device or system that supplies electrical or other types of energy to an output load or group of loads is called a **power** supply unit or PSU. The term is most commonly applied to electrical energy supplies, less often to mechanical ones, and rarely to others.A power supply may include a power distribution system as well as primary or secondary sources

Regulated Power supply

LED:

A light-emitting diode (LED) is a semiconductor light source. LED's are used as indicator lamps in many devices, and are increasingly used for lighting. Introduced as a practical electronic

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component in 1962, early LED's emitted low-intensity red light, but modern versions are available across the visible, ultraviolet and infrared wavelengths, with very high brightness.

ESP8266 MODULE:

Express if Systems' Smart Connectivity Platform (ESCP) of high performance wireless SOCs, for mobile platform designers, provides unsurpassed ability to embed Wi-Fi capabilities within other systems, at the lowest cost with the greatest functionality.

RELAY

A **relay** is an electrically operated switch. Many relays use an electromagnet to operate a switching mechanism, but other operating principles are also used. Relays find applications where it is necessary to control a circuit by a low-power signal, or where several circuits must be controlled by one signal.

LCD DISPLAY:

One of the most common devices attached to a micro controller is an LCD display. Some of the most common LCD's connected to the many microcontrollers are 16x2 and 20x2 displays. This means 16 characters per line by 2 lines and 20 characters per line by 2 lines.

This project is implemented using following software's:

- Express PCB – for designing circuit
- PIC C compiler - for compilation part
- Proteus 7 (Embedded C) – for simulation part

VI. EXPERIMENTAL RESULT

The project "**IOT based home automation**" was designed such that any device of electrical home appliances at homes can be operated through webpage. The controlling of electrical appliances is done wirelessly through Wifi.

VII. ADVANTAGES AND LIMITATIONS

Advantages:

1. Controlling of AC devices wirelessly through mobile phone..
2. IOT wireless transmission.
3. Manual operation is eliminated.
4. Monitoring and Controlling is possible.
5. Efficient and low cost design
6. Low power consumption

Disadvantages:

Interfacing high voltage devices, and also IOT module to Micro Controller is sensitive.

Applications:

1. In pharma industries.
2. In chemical labs
3. In power grid stations.
4. In sub stations.

VIII. CONCLUSION

Integrating features of all the hardware components used have been developed in it. Presence of every module has been reasoned out and placed carefully, thus contributing to the best working of the unit. Secondly, using highly advanced IC's with the help of growing technology, the project has been successfully implemented. Thus the project has been successfully designed and tested.

IX. ACKNOWLEDGEMENT

We acknowledge the efforts and hardwork by the experts who have contributed towards development of the different IOT based home automation. We also acknowledge the efforts of Dr. N.A.V. Prasad, HOD, M.Tech;Ph.D, Dr.C.Murali Mohan, M.Tech;Ph.D our guide and project co-ordinator for their constant support, suggestions and modifications to improve the quality of paper and to help for development of IOT based home automation.

X. FUTURE SCOPE

Our project "**IOT based home automation**" is mainly intended to control the electrical home appliances using. IOT. This project has a IOT module, a 4-relay board to connect the home electrical appliances which are interfaced to the micro controller. The Micro Controller is programmed in such a way that depending on the received data from the phone the devices are operated that is will be switched ON/OFF automatically based on the input received by the IOT module. This project can be extended by adding GSM technology. GSM module can be used to get SMS alert about the status of the appliances of multiple devices like lights, fans, coolers…etc

XI. REFERENCES

The sites which were used while doing this project:

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