

HOME MONITORING OVER IOT BASED WIFI MODULE

T. Sowmya¹, T. Sudheer Kumar²

¹Assistant Professor Dept. of ECE, St.Martins. Engineering College, Dhulapally, Secunderabad, Telangana

²Assistant Professor Dept. of ECE, St.Martins. Engineering College, Dhulapally, Secunderabad, Telangana

Abstract - The aim of the paper presents a design and prototype implementation of new home automation system that uses Wi-Fi technology as a network infrastructure connecting its parts. The proposed system is better from the scalability and flexibility point of view than the commercially available home automation systems. The AVR family microcontroller is used by our system for processing all user commands. For the connection to the internet and to receive the user commands a Wi-Fi modem is used. WIFI modem receives the commands which are sent through the internet. The received information is decoded by the Wi-Fi modem and passed to the microcontroller. The microcontroller then takes necessary actions as per user's commands. The state of the system is displayed on the LCD display. Thus the entire industry is automated using online GUI for easy industry automation.

Key Words: Automation, AVR, WIFI modem, GUI, IOT

1. INTRODUCTION

Home automation system is getting popular and widely used in a lot of houses worldwide. It has tons of advantages to users even more to the handicapped and/or elderly users in which it will make it easier for them to control their home appliances. Home automation systems can be labeled to two medium in which how it is connected and they are either wired or wirelessly connected. The main difference between these two kinds is that home appliances are linked wirelessly a central controller if it a wireless home automation system. On the other hand, the appliances are connected to a central controller if the medium use wired communication method. Wireless system had been introduced in order to dispose of wired communication among home appliances[7]. IOT based, Bluetooth based home automation will be applied the order of reference in the running text should match with the list of references at the end of the paper. Nowadays, everyone cannot be separated from their smartphones. a number of five thousands individuals from USA, UK, South Korea, India, China, South Africa, Indonesia and Brazil took a survey regarding which was done by Time magazine. The result proved most of them is inseparable from their smartphones, eighty four percent allegedly claimed that survive without their smartphones[10].

The internet of things, or IoT, is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. The Internet of Things (IoT) is the network of physical objects or "things" embedded with electronics, software, sensors, and network connectivity, which enables these objects to collect and exchange data[1]. IoT allows objects to be sensed and controlled remotely across existing network infrastructure, creating opportunities for more direct integration between the physical world and computer-based systems, and resulting in improved efficiency, accuracy and economic benefit Home automation is computerization of the home, housework or household action.

Home automation may incorporate a control unit for controlling of lighting, HVAC (warming, ventilation and aerating and cooling), machines, and different frameworks, to give enhanced accommodation, solace, better energy saving, productivity and security. The idea of home Automation has been around for quite a while and items have been available for a considerable number of years, however nobody's arrangement has gotten through to the standard yet[2]. Home computerization for the elderly and debilitated can give expanded personal satisfaction to persons who may generally need parental figures or institutional consideration. It can likewise give a remote interface to home apparatuses or the automation system itself, through phone line, remote transmission or the web, to give control and observe and monitor by means of an smartphones or a web explorer program.

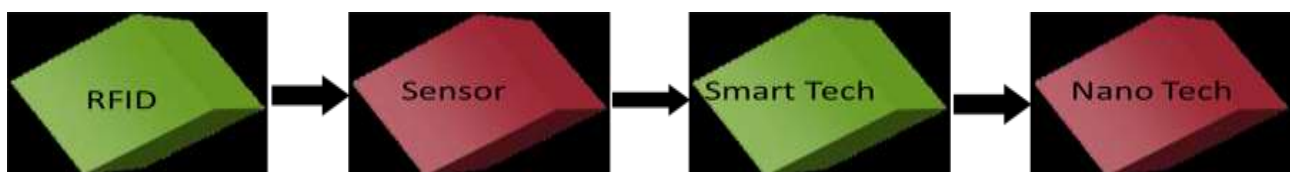


Fig. 1. Working of IoT

2. PROPOSED WORK

IOT or internet of things is an upcoming technology that allows us to control hardware devices through the internet. Here we propose to use IOT in order to control home appliances, thus automating modern homes through the internet. This system uses three loads to demonstrate as house lighting and a fan. Our user friendly interface allows a user to easily control these home appliances through the internet[3]. For this system we use an AVR family microcontroller. This microcontroller is interfaced with a Wi-Fi modem to get user commands over the internet.

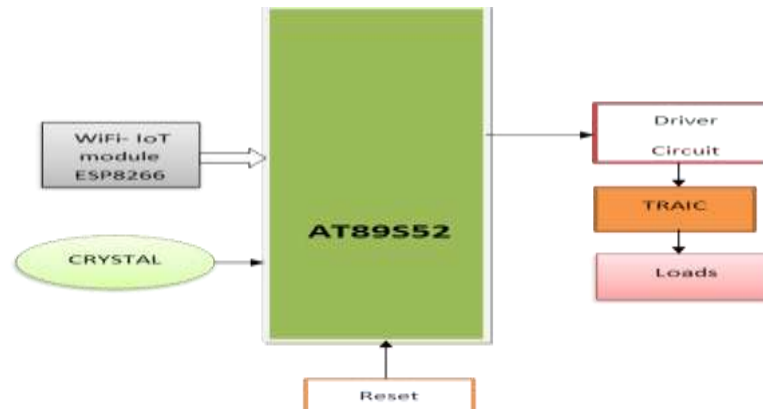


Fig: 2.Block Diagram

Hardware components

ATMEGA-AT89S52

The AT89S52 comes from the popular 8051 family of Atmel Microcontrollers. It is an 8-bit CMOS microcontroller with 8K as Flash memory and 256 bytes of RAM. Since it is similar to the trust worthy 8051 architecture these microcontrollers are as per industry standard. It has 32 I/O pins comprising of three 16-bit timers, external interrupts, full-duplex serial port, on-chip oscillator and clock circuitry. The Microcontroller also has Operating mode, Idle Mode and Power down mode which makes it suitable for battery operated applications. Few considerable drawback of the microcontroller is that it does not have in-built ADC and does not support SPI or I2C protocols [4]. However you can utilize external modules for the same.



Fig 2.1 Microcontroller

WIFI MODULE

ESP8266 is Wi-Fi enabled system on chip (SoC) module; It is mostly used for development of IoT (Internet of Things) embedded applications. The chip first came to the attention of western makers in August 2014 with the ESP-01 module, made by a third-party manufacturer Ai-Thinker. This small module allows microcontrollers to connect to a Wi-Fi network and make simple TCP/IP connections using Hayes-style commands. However, at first there was almost no English-language documentation on the chip and the commands it accepted[5]. The very low price and the fact that there were very few external components on the module, which suggested that it could eventually be very inexpensive in volume, attracted many hackers to explore the module, chip, and the software on it, as well as to translate the Chinese documentation. The ESP8285 is an ESP8266 with 1 MB of built-in flash, allowing for single-chip devices capable of connecting to Wi-Fi[9].



Fig 2.2 Wi-Fi Module

AC LOAD (BULB)

An incandescent light bulb, incandescent lamp or incandescent light globe is an electric light with a wire filament heated to such a high temperature that it glows with visible light (incandescence). The filament is protected from oxidation with a glass or fused quartz bulb that is filled with inert gas or a vacuum. In a halogen lamp, filament evaporation is slowed by a chemical process that redeposit metal vapor onto the filament, thereby extending its life. The light bulb is supplied with electric current by feed-through terminals or wires embedded in the glass. Most bulbs are used in a socket which provides mechanical support and electrical connections[6].



Fig 2.3 Bulb

3. WORKING AND RESULTS

ALGORITHM

- The User has to install the TELNET app in android mobile.

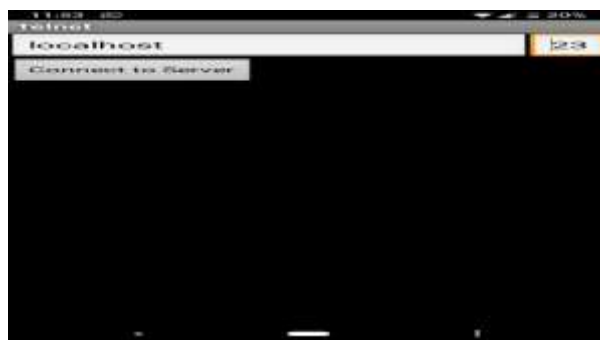


Fig 3.1 Telnet local host

- Switch ON the mobile's WIFI and WIFI module of the project.

- Thus after Switching ON the WIFI module the Lcd will display as “WAITING FOR CONNECTION”.
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Fig 3.2 Kit connection

- Connect it with the Wi-Fi module’s server using its server name “org_6327_”.
- Enter the DNS address i.e. “198.162.4.1” of the Wi-Fi server and connect to it.

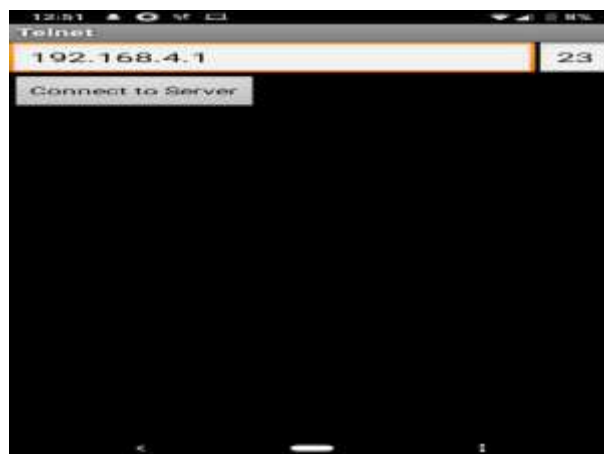


Fig 3.3 Connect to server

- After connecting to the wifi module’s server the lcd will be displayed as figure below.



Fig 3.4 LED display working

- Now the mobile is connected to the Wi-Fi module and can be operated through entering commands.
- The data sent from mobile to WIFI will be received by WIFI module connected to Micro controller.

- Thus the output loads can be controlled through mobile by entering the commands given below:-
 - “*1” for turning ON the DC motor.
 - “*2” for turning OFF the DC motor.
 - “*3” for turning ON the LED lights.
 - “*4” for turning OFF the LED lights.
 - “*5” for turning ON the AC incandescent bulb.
 - “*6” for turning OFF the AC incandescent bulb.
- By entering the command “*1” in the mobile, the “relay 1” connected to the DC motor will be switched ON and the motor operates.

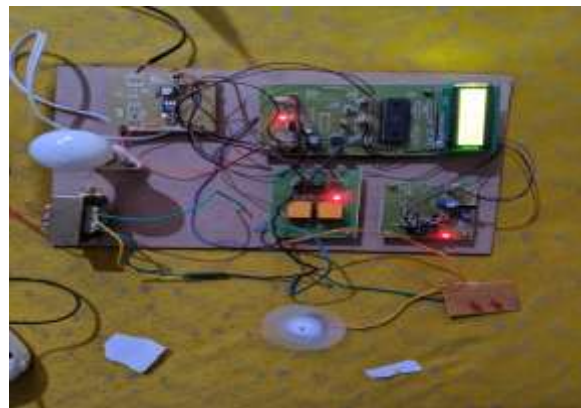


Fig 3.5 Working of DC motor load

- By entering the command “*2” in the mobile, the “relay 1” will be switched off and the DC motors turns OFF.
- By entering the command “*3” in the mobile, the “relay 2” connected to the DC LED will be switched ON and the LED lights are turned ON.

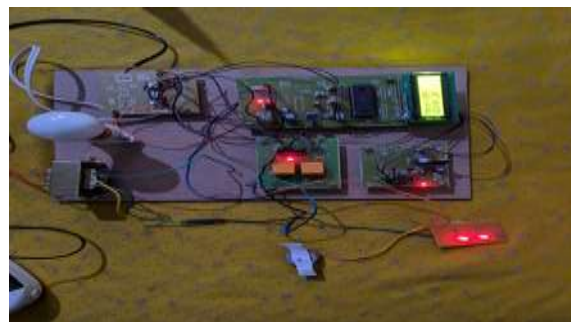


Fig 3.6 Working of incandescent bulb load

- By entering the command “*4” in the mobile, the “relay 2” will be switched OFF and the LED lights turns OFF.
- By entering the command “*5” the AC incandescent light bulb will be turned ON.



Fig 3.7 Working of bulb load

- By entering the command “*6” the AC incandescent light bulb will be turned OFF.
- Through this procedure the project can be operated through our mobile at any time within the WIFI module’s range.

4. CONCLUSION

Earlier we used to monitor the things by using RFID system where it was only used for short distance communication. To reduce the manual overhead, the thing which we are introducing is automation of industries using internet of things which can overcome the RFID shorter distance problem. Using IOT in industries we can monitor and control the industrial machineries more easily

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