Autodroid Home Automation System-An Iot Based Approach

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Abstract - With advancement of Automation technology, life is becoming simpler and easier in all aspect. Nowadays, everyone preferring Automatic system instead of manual system. With the increase of user in field of internet, it has become a basic part and parcel of life in comparison of previous years.IOT is the latest and emerging technology. The main aim of this paper is to describe how to connect microcontroller to an android application through Wifi connection. This paper offers a new approach to control home appliances from an android application. This system is designed to control on/off to a button, to control the intensity of light, to control the socket. With this advance technology, the main aim is to make it easier to use with the help of android application.

Keywords: Home Automation System, IOT(Internet of things), Wi-Fi network, ESP8266, ATMEGA8A, ICs(Integrated circuits).

I. INTRODUCTION

The paper demonstrates the functioning of smart home using IOT. The vision of the system is to provide an efficient internet or wifi based system to control home appliances. Electronic environment with respect of this consists of appliances such as bulbs, led lights, socket, fan etc. A remotely accessible environment can be an android application through which anyone can control the appliances. The main purpose of this project is to make home automation by using Wifi module.

I. PROPOSED METHODOLOGY

This system consists of Hardware and Software. When the hardware gets on it automatically make an TCP Connection with an android application. With the presence of ESP8266 WiFi Module it automatically search for the ssid and password as configured.The hotspot is created from an Android device with the specific ssid and password. The connection made is a one way communication for the security purpose on the basic level. After the establishment of connection, Esp8266 makes serial communication with an microcontroller which gives instruction to relays which after receiving the signals makes appliances ON/OFF.

II(a).HARDWARE

A. ESP8266 WIFI MODULE.

The ESP8266 is a low cost Wifi Chip with full TCP/IP stack and MCU capability to get access to wifi network . It is basically used for making hotspot connection with an android application with its SSID and
PASSWORD. The ESP8266 is capable of

offloading all Wi-Fi networking functions. Each ESP8266 module comes with a preprogrammed AT command set firmware, which means you can simply look this up to your Arduino device. When ESP8266 wifi module hosts the application, and when it is the only application processor in the device. It is able to boot up directly from an external flash.

Alternatively, serving as a Wi-Fi adapter, wireless internet access can be added to any microcontroller based design with simple connectivity through UART interface.

ESP8266 Wi-Fi module has on board processing and storage capabilities allow it to be integrated with the application specific devices through its GPIOs with minimal development up-front and minimal loading during runtime.

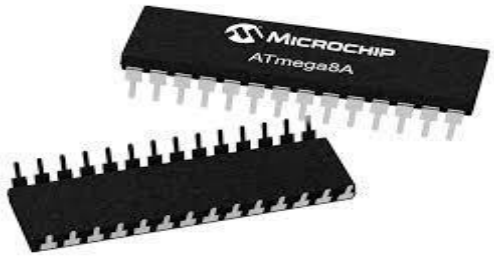
Integrated TCP/IP protocol stack

1. 1MB flash memory
2. 32-bit RISC CPU

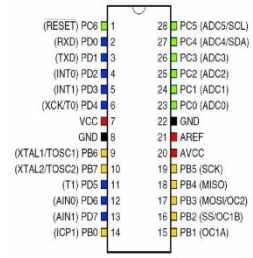
3. 64 KiB of instruction RAM
4. 96 KiB of data RAM
5. 16 GPIO Pins
6. Wakeup and transmit packets in<2m

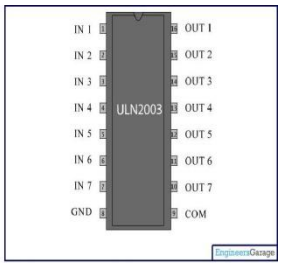
B.ATMEGA8a Micro-Controller

The ATMEGA8a is a 8-bit high performance low power AVR RISC-based Microcontroller combines 8kB ISP flash memory with read-while-write capabilities,512B EEPROM, 1Kb SRAM,23 general purpose I/O lines,32 general purpose working registers, three flexible timer/counters with compare modes, internal and external interrupts, serial programmable USART, a byte oriented Two-Wire serial interface, 6-channel 10-bit A/D convertor, SPI serial port. The devices operates between 2.7 to 5V.

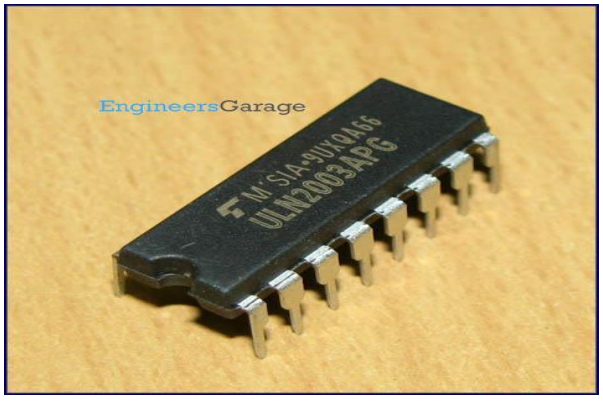


PIN DIAGRAM OF *ATMEGA8A and ULN2003 RELAY IC*



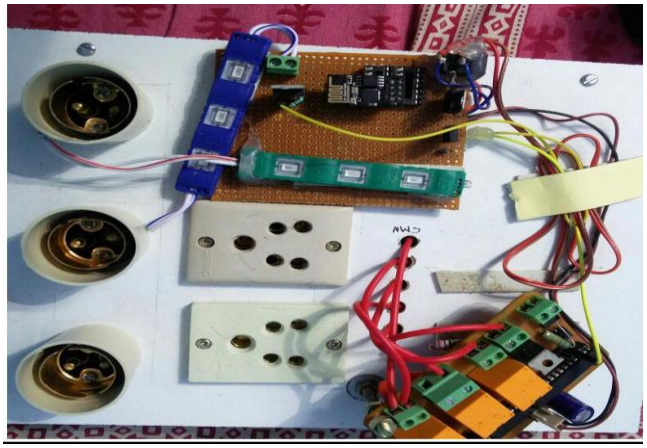


C.ULN2003 RELAY IC



ULN2003 is a high voltage and high current array IC. It belongs to the family of ULN200X series of ICs. Different versions of this IC interface to different logic ICs. ULN2003 is for 5V TTL,CMOS logic devices.

FULL DIAGRAM OF HARDWARE .



II. SIMULATION/EXPERIMENTAL RESULTS

SOFTWARE IMPLEMENTATION

After the implementation of hardware, there is an another module that is an software in which an Android Application is implemented. This application consists of three buttons and one seekbar. The ESP8266 automatically search for the hotspot with its SSID and PASSWORD and the android.

application made the hotspot . The connection made is one way communication for security purpose at basic level.

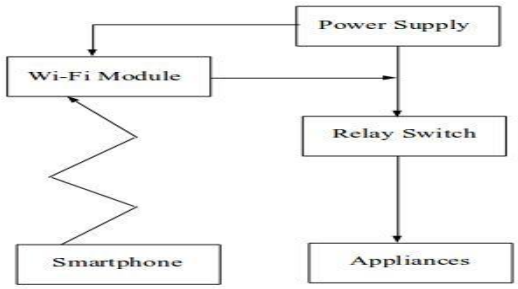
The software consists of Android IDE which is used to burn code on board.

ARDUINO IDE

ARDUINO IDE is a open source software that make it easy to write code and upload it to the board. It runs on Windows, Linux and Mac OS X. The environment is written in Java and based on processing and other open source software. This software can be used with any ARDUINO board.

Steps:

1. Open the Program Arduino IDE.
2. Type the program.
3. Select the board.
4. Select the Baud rate.
5. Compile the program.
6. Upload.



ANDROID APPLICATION

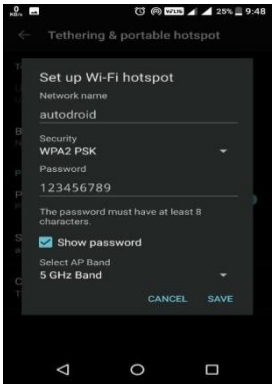
An android application is an application running on Android platform. The android platform is built for smartphones devices and a simple Android App is designed for a smartphones running on the Android OS. The application consists of three buttons and one

seekbar. Here application made the wifi hotspot from

RESULT AND DISCUSSION

In this column, after testing the modules results can be displayed in form of figures and images.

HOTSPOT



CONNECTION ESTABLISHED

LIGHT ON

LED BLINKS

III. FUTURE SCOPE

1- Future Automation as Surveillance through motion sensor camera.

2- Regulation or Intensity control of motors through MOSFET.

IV. REFERENCES

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