



Intelligent Device TO Device Communication Using IoT

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Abstract - Internet is becoming the most intrinsic part of the human life. There are many users of the internet but the devices will be the main users in the Internet of Things (IoT). These devices communicate with each other efficiently and gather the information to transfer the data to particular device. The quality of this information depends on how smart the devices are. IoT coverage is very wide and consists of the things or devices connected in network like camera, android phones, sensors etc. Once all these devices are connected with each other, they are capable of processing smartly and satisfying basic needs of environment. Thus the communication between the devices is achieved using various technologies and devices.

Keywords - *IoT, Intelligent Device, Device to Device Communication, Bluetooth, WIFI, Sensor*

I. INTRODUCTION

The idea of Internet of Things (IoT) has attracted the researchers and the industries due to its impact on our daily lives. In the concept of IoT electrical appliances are not only connected in network but also it connects even the smallest thing in the house in the network for example machine, table, bottle, needle etc. This can be used in the real world application for creating smart home where the human does not need to interfere in the communication only the user gets the notification on his or her Android phone. In Device to Device communication, WIFI, Bluetooth, Sensor etc. In this system there is a server, Android application and the hardware. The hardware consists Of all the devices mounted on the board, such as ADC, Max232, and Bluetooth etc.

II. ABBREVIATIONS

D2D: Device to Device Communication
IoT: Internet of Things
WSN: Wireless Sensor Network
PCB: Printed Circuit Board

III. HARDWARE

The hardware consist of the PCB layout on which the ULN, Max232, Bluetooth are mounted. To draw the PCB layout the software called Express PCB is used.

Express PCB is the free PCB software. For the beginner designing circuit boards is simple and efficient for the professional. It is the software that is used for designing the circuit board the hardware. Our electronic software includes two applications,

one for drawing schematics, and the other for PCB layout.

1 .MAX232

The MAX232 IC is used to convert the TTL/CMOS logic levels. The controller operates at TTL logic level (0-5V). This makes it difficult to establish a link between Max232 and PC to communicate with each other.

The input taken by transmitters from controller's serial transmission pin and then send the output to RS232's receiver. The receivers, on the other hand, take input from transmission pin of RS232 serial port and give serial output to microcontroller's receiver pin. MAX232 needs four external capacitors whose value ranges from 1 μ F to 22 μ F.

2. ADC 0808

ADC0808 is an 8 bit analog to digital converter with eight input analog channels. It can take eight different analog inputs. The input which is to be converted to digital form can be selected by using three address lines. By using Vref+ and Vref- the voltage reference are set. The step size is decided based on set reference value. The default step size is 19.53mV corresponding to 5V reference voltage.

3. 8051 MICROCONTROLLER

There are many versions of the 8051 having different speeds and amounts of on-chip ROM. The 8051 is the original member of the 8051family. Intel refers to it as MCS-51.It contains 40 pins IC. There are two members in the 8051 family of microcontrollers.

4. ULN 2803

Featuring continuous load current ratings to 500 mA for each of the drivers. It is device driver which connect the peripheral devices to the system. All devices feature open-collector outputs with integral clamp diodes.

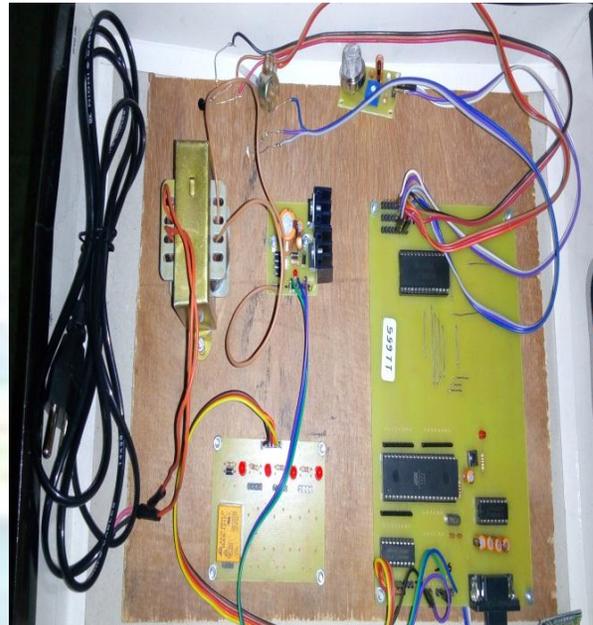


Figure 1. Hardware kit

IV. SYSTEM ARCHITECTURE

The system consists of central server, android application and the hardware. The connection between the central server and the android application is done with the help of WIFI. And the connection between the application and the hardware is done with Bluetooth. Initially the network is created and the connections are established. Then the server is deployed. Once the connections are established then the welcome page is displayed on the android application, it asks for the IP address of the server so that the connection is done. If the IP address is accepted then the login page comes up, it asks for the username and the password for authentication. As the system is authenticated then the Bluetooth connectivity is done to connect with the hardware, the application asks for the connectivity and the Bluetooth devices names are displayed and the Bluetooth which we are using is HC-05. After the connection is done then the sensors starts their work, they start sensing the surrounding and display the values on the screen.

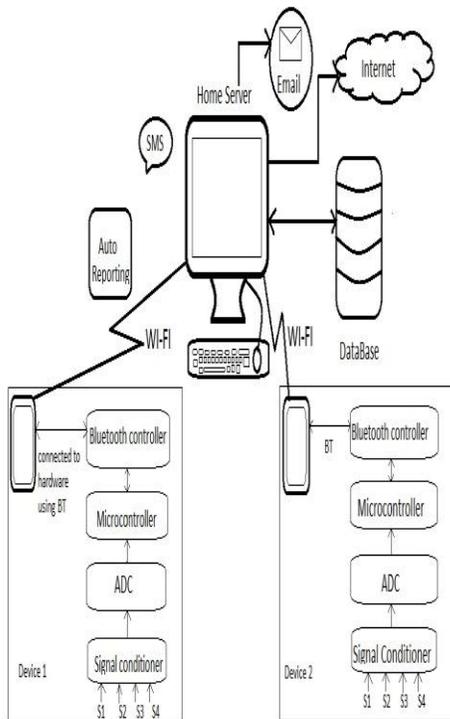


Figure 2. System Architecture

The sensor values can be in bound or the out bound. The threshold is set and the system works shows the output. The results are on the basis of the threshold decided, if the threshold is inbound then the value below it will show the result otherwise it will be above the threshold value. The signals are generated and the alert message is given to the user and the notification is given to the server.

1) SENSOR

Sensors are used to detect the particular thing in the device.

2) BLUETOOTH

It is wireless technology standard for interchange of information for the limited distances. The distance of the devices in which it can be operated is 10 meters. The IEEE Standards for Bluetooth is 802.15.1.HC-05

3) WIFI

It is a wireless computer network technology. It uses the 2.4 gigahertz. IEEE standard for Wi-Fi is 802.11.

V. RESULTS

Case 1: The connection once gone and if we use another WIFI the IP address should be checked.

Case 2: The threshold once set can be updated and the readings can be taken again. The sensors such as light sensor and the gas sensor sense the surrounding and take the reading and generate the alert.

Case 3: Proper connection between the server, application and the hardware is required for successful communication.

VI. CONCLUSION

Thus, the communication is established between the devices and by using these technologies the communication is done. WIFI and the Bluetooth technologies are of most importance in this system.

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