Wireless Monitoring And Controlling System Using Android Application

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ABSTRACT
In our day to day life science plays an important role. The various devices make our life comfortable but we still feel there should be atomization provided in our home or industry. There should be devices or remotes to control several appliances “ON” or “OFF” should be easily possible using a remote device. Also in many industries such as small-scale factories or offices controlling of various devices or machines is very difficult. In industries each motor or machines is switched “ON” or “OFF” manually. So that it increases number of labors and time is wasted. In order to avoid this, we can use a remote device. Also it can be used for controlling speed of fan or AC, various function such as power or rotation of a DC motor can be controlled using such devices. This project proposes a review on WI-FI control system of smart application based on ZigBee wireless sensor network. Status of the home appliances can be queried and controlled through the controller and application. The proposed work presents the design and implementation of a wireless sensor network based home appliances system with a modular self-reconfigurable remote controller or Android application.

Keywords- Microcontroller, Smartphone, Electronic Device, Bluetooth, Wireless Technology.

1. INTRODUCTION
Home automation system has been developed for purposed of security, controlling and monitoring. The main concept is to form a wireless controlling system for houses and offices because it gives user a comfortable environment to use home appliances. Smart home systems have captured several technologies so far and products are available in the market. In order to overcome some of the system limitation wireless home automation system has been introduced and they are widely used in recent years. Recently, Bluetooth based technology developed for high level communication protocols are used to create personal area network. In this project we present a web-based, flexible automation system, which is a basically android based home automation system with Bluetooth module for wireless communication.

2. HISTORY OF MICROCONTROLLER
Microcontrollers have only been with us for a few decades but there impact (direct or in direct)on our lives is profound. Usually these are supposed to be just data processors performing exhaustive numeric operations. But their presence is unnoticed at most of the places like at supermarkets, at home, in play, at office, in industries, on roads. What inside them makes these machines “smart”? The answer is microcontroller. Creating application for the microcontrollers is different than any other development job in electronics and computing. Before selecting a particular device for an application, it is important to understand what the different options and features are and what they can means with regard to developing the application. Microcontroller is a single chip micro-computer that has everything inbuilt i.e. circuitry of microcontroller has built in RAM, ROM, input output devices, timer, counter, interrupts etc. It has more number of multifunction pins & many bit manipulation instruction. The microcontroller design is flexible. It is cheap; microcontroller required 5V dc,100mA current for operation.

3. LITERATURE REVIEW

3.1 What Is The Bluetooth Module?
Bluetooth is selected as our way of communicating mobile with several systems. Bluetooth module receives the data serially in RS232 format from controller and sends it to wireless network. For interfacing it with the microcontroller we need to build the circuit because Bluetooth module understands data in RS232 standard and controller understands the data in TTL format. So we need to design the circuit to make these to compatible with each other. Bluetooth module we are using in LM400 from LM technology. LM400 is designed to provide Bluetooth 2.0+EDR function on a small form factor. The Bluetooth function is based on CSR blue core 4-EXT Bluetooth system, which implements the full speed class 1 Bluetooth operations with full seven slave picante support.
3.2 What is Bluetooth?
Bluetooth is a standard used to replace wired connections between electronic devices like cellular telephones, computers, and many other mobile devices. This technology allows to the users instantaneous connections of analog and digital information between several devices. The way of transmission used assures protection creates protocol against interferences and safety in sending of information. The Bluetooth is a small microchip that operates in a band of available frequency through the communication area.

3.3 How Bluetooth Works?
Every device will have to be equipped with a microchip (trans-receiver) that transmit and receives frequency of 2.4 GHz that is available in the whole world (with some variations of bandwidth in different countries). Besides the information, there are three channels of voice available. The information can be exchanged to speeds of up to 1 Mbit for second (2 Mbit for second in Second Generation of this technology). A scheme of “frequency hop” (jumps of frequency) allow to the devices to communicate inclusive in areas where a great electromagnetic interference exists. Besides that is provided with schemes of encryption and check.

4. BLOCK DIAGRAM
Block diagram representation of the system to be design and implemented. Block diagram consists of microcontroller, power supply PLC modem, Load, CT, PT. Microcontroller is the heart of the system. The 8051 microcontroller is a low power, high performance CMOS 8-bit microcontroller with 8k bytes of in system programmable flash memory. The device is manufactured using Atmel’s high density nonvolatile memory technology. AT89S52 is a powerful microcontroller which provides highly- flexible and cost effective solution to many embedded control applications. The AT89S52 provides the following features: 8K bytes of flash, 256 bytes of RAM, 32I/O Lines, watchdog timer, 2 datapointers, 3 16bit Timer/counters. The opto-isolator is used to drive the triac which provide complete pulse in order to control electrical parameters.

![Block Diagram](image-url)
5. WORKING

The AC mains supply is given to device driver (IC ULN2803). Which also receives power from microcontroller (89s52). Device driver: The ULN2803 a device is a high voltage, high current Darlington transistor array. It consists of eight NPN Darlington pairs that feature high voltage output with common cathode clamp diodes for switching inductive loads. Applications include relay drivers, hammer drivers, lamp drivers, display drivers. The output (12V) from the device driver is then forwarded to the two relays, Relay 1 and Relay 2. With these relay (12V), we can switch 5A load current. These relays are used to perform switching operation i.e. ON/OFF operation. The output from Relay 1 and Relay 2 are given to the current sensor 1 and current sensor 2 respectively. These current sensors sense the incoming AC or DC current and also display output. When sensing zero current the output voltage of the current sensor is approximately equal to one half of the supply voltage.

The output from both the current sensor is supplied to ADC (IC 0808). ADC is used to convert the analog signal into digital signal. This digital output of the ADC is then given to the microcontroller and it takes the input form microcontroller. Also the output from Current Sensor 1 and Current Sensor 2 is given to the Load 1 and Load 2 respectively. According to operating condition of these loads, the output from them is provided to Voltage Divider. Voltage Divider is a simple circuit which turns a large voltage into smaller one. Using just two series resistors and an input voltage, we can create an output voltage that is a fraction of the input. The output from both the Voltage Divider is provided to the microcontroller (89s52) and also the power supply is given to microcontroller. Microcontroller is a small computer on a single integrated circuit containing a processor core, memory, and programmable input/output peripherals. These are used in automatically controlled products and devices. The 89c series is a low power, high performance CMOS 8 bit microcomputer with Flash programmable and erasable read only memory (PEROM). Here we are using ATMELS AT89s52 microcontroller. Microcontroller transmit and receives the signal from the Bluetooth Module. Bluetooth Module receives the data serially in RS232 format from controller and send it to the wireless network. Bluetooth is a standard used to replace wired connections between electronic devices like cellular telephone, computers, and many other mobile devices. It is a small microchip that operates in a band of available frequency throughout the communication area. It transmit and receives in the frequency of 2.4 GHz. The information can be exchanged to speeds of up to 1 mega bit per second.

6. FUTURE SCOPE

Mobile device. It is small microchip that operates in band of available frequency throughout the communication area. It transmit and receives frequency of 2.4 GHz. The future scope will be develop methodologies and best practices for using wireless in diagnostics, control and safety applications. Provide a standardized testing mechanism and test plan for making effective wireless reconfiguration of application. Provide design tools for the planning stage of a wireless setup.

7. APPLICATIONS

a) Home automation this project can be used to control various home and industrial appliances.
b) We can control devices from a long distance, thus it gives ease of access.

c) Faster operation and efficient.
d) No need to carry any other any controlling unit.
e) Able to control device from a long distance, thus it gives ease of access.
f) Numerous system have been developed using Wireless Sensor Network which consists of several sensor nodes in proximity and having data transmission and reception capability between nodes and central base station for wide range of application. Though initial deployment cost may be high, the operational cost of data communication within the system is negligible.

8. ADVANTAGES

a) Home automation.
b) Faster operation and efficient.
c) No need to carry any other any controlling unit.
d) Able to control device from a long distance, thus it gives ease of access.
e) Numerous system have been developed using Wireless Sensor Network which consists of several sensor nodes in proximity and having data transmission and reception capability between nodes and central base station for wide range of application. Though initial deployment cost may be high, the operational cost of data communication within the system is negligible.

c) The GSM modem used in cellular based monitoring system gives ease of access.

9. DISADVANTAGES

a) It is not a purely electrical circuit.
b) It is difficult to upgrade existing conventional control system with remote control capabilities.
c) The GSM modem used in cellular based monitoring system increases the cost of the system.

d) Faster operation and efficient.
e) No need to carry any other any controlling unit.
f) Able to control device from a long distance, thus it gives ease of access.
g) Numerous system have been developed using Wireless Sensor Network which consists of several sensor nodes in proximity and having data transmission and reception capability between nodes and central base station for wide range of application. Though initial deployment cost may be high, the operational cost of data communication within the system is negligible.

10. CONCLUSION

It can be concluded that this Wireless Monitoring And Controlling System Using Android Application is also user friendly, economical, fully automatic and efficient device by software programming interfacing for controls. The Wireless technology has been superseding the wired system design, by providing features such as mobility, low maintenance along with more security and compact systems. Moreover it can provide network communication at places where wired infrastructure would not be possible.
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REFERENCES


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