Wireless Interactive Socket Equipment

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Abstract— Now a day Automation is overhead. Everyone one move toward to Automation Machine. We try to reduce human effort more and more. Smart socket can be controlled remotely by power supplied, monitor utilization condition, communication network and other functions. So here we need a device which interactive, plug & play, no installation, without internet connection, less power consumption, so we develop W.I.S.E..

Key words: Internet of Things, Smart Home, Intelligent Electrical Outlet, Wireless Communication, Smart Socket, Wireless Socket

I. INTRODUCTION

In today's world automation has become a important as the technology is improving very rapidly. Automation means that making things automatically for easing the life.

Automation started laying its roots a result of the home automation also developed. The basic concept in home automation was making things automatic using timers, android devices, LAN in short implementing the internet of things (IoT).But the usage of these devices is not affordable. Even when these things are very useful all the common people can't use it and secondly as per the normal human tendency we need something that is always cheap and benefit able. So in order to overcome this problem the WISE is been introduced. The basic concept in developing the wise is that we will be setting a timer in the device by using the software and the second is we can use the Wi-Fi to set the timer that will be turning on and off the device.

It will be a normal three pin socket that can be used as an intermediate between the device and the mains. Various modules are been assembled to make a proper use of the device so that it can satisfy the purpose.

II. WIRELESS SOCKET HARDWARE

A. Structure of Design

The internal structure of the socket mainly includes microcontroller, Wi-Fi module, electrical Switching circuit, voltage conversion circuit, Real Time Clock, the power input port and the power supply output pin, which is shown in Fig.1.The following picture presents the links between the related modules. The core is Atmega8 and BTA, which will introduced detailed in the following article.
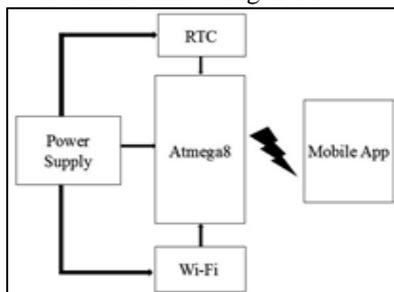

Fig. 1: Design of Wireless Socket Hardware

B. The Microprocessor Section

The microcontroller will be controlling the various modules and will be establishing the communication between the application and the Wi-Fi protocol. Besides it will be communication between the RTC and the controller will be managed by using the I2C serial communication bus.
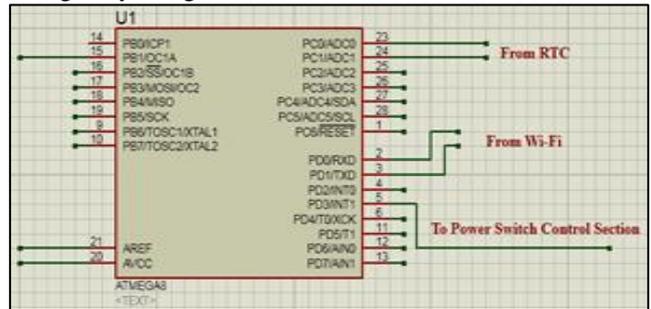

Fig. 2: Microcontroller

C. WIFI Wireless Communication Section

The Wi-Fi is used as interface between the application and device so that the timers can be set on and off.

Espressif's ESP8266EX delivers a highly integrated Wi-Fi SoC solution to meet users continuous demands for efficient power usage, compact design and reliable performance in the Internet of Things industry. With the complete and self-contained Wi-Fi networking capabilities, ESP8266EX can perform either as a standalone application or as the slave to a host MCU. WhenESP8266EX hosts the application, it promptly boots up from the flash. The integrated high speed cache helps to increase the system performance and optimize the system memory.
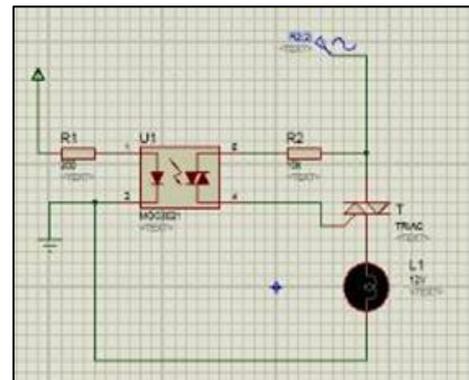
D. Switching Module

Fig. 3: Switching Module

E. Real Time Clock Section

The DS1307 Serial Real-Time Clock is a low-power, full binary-coded decimal (BCD) clock/calendar plus 56 bytes of NV SRAM. Address and data are transferred serially via a 2-wire, bi-directional bus. The clock/calendar provides seconds, minutes, hours, day, date, month, and year

information. The end of the month date is automatically adjusted for months with fewer than 31 days, including corrections for leap year.
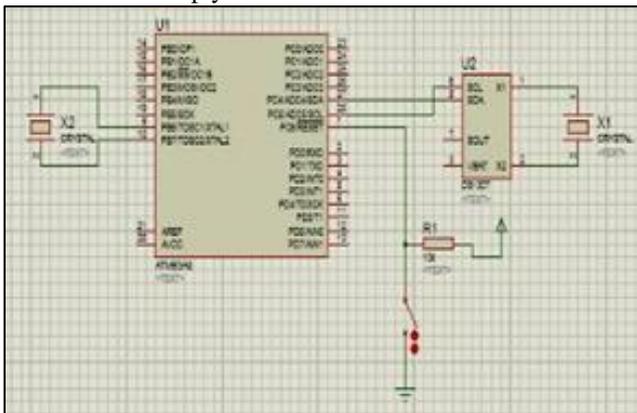

Fig. 4: Real Time Clock Section

The clock operates in either the 24-hour or 12-hour format with AM/PM indicator. The DS1307 has a built-in power sense circuit that detects power failures and automatically switches to the battery supply.

F. Other Modules

Protection circuit is mainly be made of resistance and fuse. When the current is larger than the rated current, the fuse will disconnect automatically in order to ensure safety. If the voltage turns to unwanted fluctuations, and the transient voltage is greater than the specified voltage, through the resistance's short circuit effect, it will force fuse disconnected to ensure the safety of electricity.

III. THE SOFTWARE DESIGN OF THE SYSTEM

The intelligent socket's essence is the socket as a carrier, and it accomplishes a remote smart home system through WIFI wireless. That is to say, If we have a super smart socket, no matter where we go, we can control the home air conditioning, lights, television and other household appliances just only with the phone.

A. The Main Program Flow

Client applications send a connection request to the server, after setting up the connection the client will send request to the server for reading data, the server processes the request and sends data, the client then starts the corresponding thread for processing. The server establishes TCP/IP connection with MCU firstly, then starts receiving data thread, being responsible for receiving the corresponding data; once the thread has processed the data and displayed then stored it in the database server. To monitor the client connection thread, it is responsible for establishing user socket and listening socket connection.

The system uses the way to connect client applications to the server even in the face of application, platform or network failure. Once a connection is successfully made, the next task often is to read the data thread, read correspondent datum from the buffer, then write the information to a table, avoid the loss of data. View and update data for tables and views: Show as well as update data for tables and views.

B. The design of the App client software

The demo application of the device is been showed in the figure App1 and App2, the application basically consists of the timer section and the control section to turn on and off the device.

In the timer section the timer duration of the device is set and then send to the controller the controller will turn the device for that duration of time.

The control section is simply used to turn on and off the device using the wifi module the status will be transmitted to the microcontroller and the action of turning on and off the device will be done.
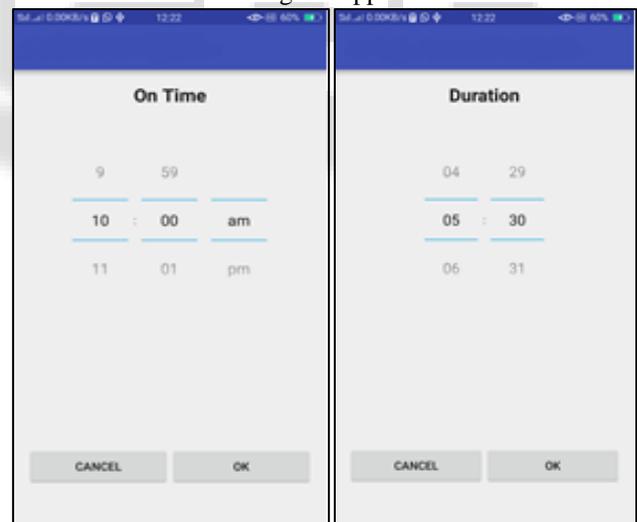

Fig. 5: App1

Fig. 6: App2

IV. CONCLUSION

Thus the estimated results are been observed on the simulation. The power supply secession was been assembled and tested. Signal Testing is been done on the PCB layout of all the individual sections. Next is building power supply, configuration of WiFi.

The control section output has been checked it is giving the expected results. Android app used currently is the app which is available in free licenses, after this prototype we are developing our own application.

We are still trying to reduce the bulkyness of the device with new innovative ideas to bring the project to the next era.

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