

ARDUINO BASED HOME AUTOMATION CONTROL USING WI-FI

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ABSTRACT

This paper provides a low cost-effective and flexible home control and monitoring system with the aid of an integrated micro-web server without internet protocol connectivity for access and to control of equipment and devices remotely using Android-based smartphone app. Smart home interfaces and device definitions to ensure interoperability between Wi-fi devices from various manufacturers of electrical equipment, meters and smart energy enables products to allow manufactured. In this paper gives the intelligent operation for lamps and fans The proposed home energy control systems design intelligent services for users and provides, The proposed system are implemented with smartphone.

I.INTRODUCTION

The Intelligent management of the power system facilitates the joint use the current and minimizes power loss during transmission and power consumption is highlighted by the global community. The use of Web Services is an open and interoperable method for providing remote access service or applications can communicate with each other. An attractive market for home automation and network of busy families and individuals will have physical limitations. ARDUINO and Wi-fi shield, and it was the smart home micro web server. Arduino is an open source electronics proto typing platform on the basis of flexible, easy to use hardware and software. The Arduino board have the microcontroller with 54 digital input / output pins. The Wi-fi interface in Arduino through the serial peripheral interface (SPI) pins.

II.RELATED WORK

2.1 General smart home design

The objective of this paper is to offer a Small Smart Home System designed and created by utilizing WLAN network based on Arduino microcontroller. The system is able to monitor and control lights, room temperature, alarms and other household appliances. Results from testing the system show proper control and control monitoring functions can be performed from a device connected to the proposed system hardware and software are implemented in this work.

III.REQUIREMENTS

3.1 Hardware requirements

- ❖ Arduino UNO kit
- ❖ ESP 8266 node mcuwifi shield
- ❖ Loads
- ❖ Power supply
- ❖ Driver circuit
- ❖ Relay circuit

3.2 Software requirements

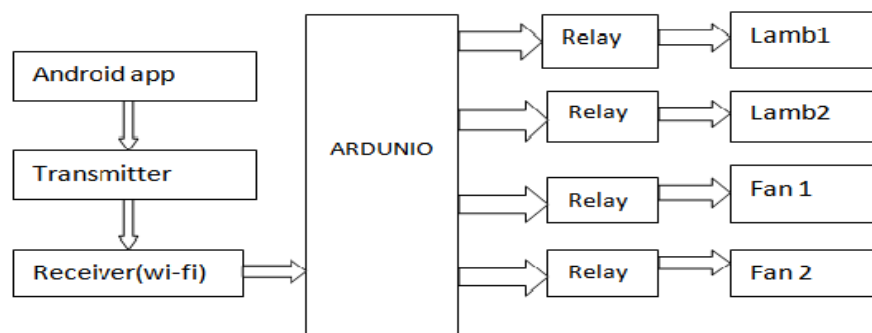
- ❖ Arduino IDE
- ❖ Android apk
- ❖ Fritzing compiler
- ❖ Virtual Bread board

Arduino Uno is an open-source microcontroller that uses ATMEGA 328, an Atmel AVR processor which can be programmed by the computer in C language via USB port. Arduino Uno also has on-board 5 analog pins and 13 digital pins for input and output operations, supporting SPI and I2C which can be used to interface with other devices.

IV.PIN DIAGRAM



V.BLOCK DIAGRAM



5.1 Hardware architecture and implementation diagram

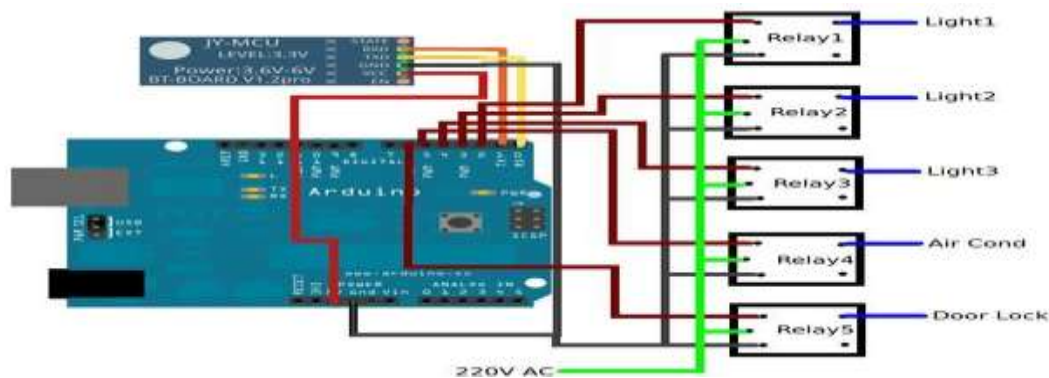


Figure : Hardware architecture and implementation diagram

Figure shows the hardware architecture and implementation. The features that the proposed design offers are the control of energy management systems such as lightings, power plugs and HVAC (heating, ventilation and air conditioning) systems.

VI.HOME AUTOMATION DEVICES

On the user side, provides a portable interface to the system as a whole through an easy-to-use application. Can either be wired mobile device of the central control unit (through the USB cable, for example), or in connection with this wirelessly. Within the home, wireless connectivity can be achieved by using the Wi-fi shield on the central console.



Figure: Whole process smart home automation

Figure shows the whole process Smart home automation system. Hence need for server (at the application level, any piece of code that can respond to client requests) is closely linked to the company.

6.1. Automatic Lamp control

Connection circuit of arduino with PIR Sensor for lamp control. Here the LDR is responsible for lamp control and LM35 is responsible for controlling the operation of fan. In lamp control, LDR values are previously set. Then the darkness falling on the LDR due to sunset. The microcontroller receives the resistance value from LDR.]When the controller attains the limit, the lamp will glow, or otherwise it will turn off.

6.2. Automatic Fan and control

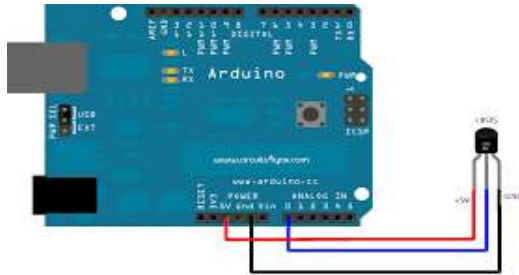


Figure: Connection Circuit with LM35 Sensor

Figure : proposed smart home app

Automatic fan and control circuit connection is shown in Figure. In fan/AC control, the temperature values are previously set. During daytime, the temperature values are about 35°C. Then the microcontroller will receive the signal from LM35, and turns ON the port, which is connected to AC/fan. During winter season temperature reduced as below 20°C. Then there is no need of fan/AC. Hence the fan/AC will turn off.

VII. MAIN COMPONENTS

7.1. Arduino controller

Arduino is a unique Arduino board which features a WIZ net Wi-fi port, a Wi-fi socket, nRF24L01+ module interface and an ATmega328. This board will add wireless ESP8266 wi-fi shield control as well as internet connectivity to the project.

7.2. Wi-fi Shield

The Wi-fi specification is developed by a growing consortium of companies that make up the Wi-fi Alliance. Wi-fi Series 2 The difference between Series 1 (S1) and Series 2 (S2) is that the latter enhances the power output of the antenna to 2mW. S2 also enhances the data protocol of the Wi-fi module. S2 is similar to S1 in enabling simple and easy communication between microcontrollers and supporting point-to-point and point-to-multi point communication.

7.3. Power supply

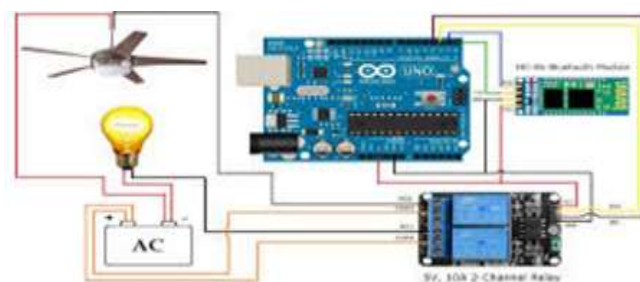


Figure: Power supply

VIII.CONCULUSION

This paper presents the new circuit topology for monitoring and controlling the home electrical devices by using flexible home-based Android smart phone at a reasonable price and is implemented by wireless transceiver and IBOARD. By using the Arduino as well as using android app for system control configuration. The proposed new circuit topology is used in a quiet based web services in an interoperable application layer for communication between the remote user and the home device.

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