Switchless Fan Control System

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Abstract- *In recent years, the home environment has seen a rapid introduction of network enabled digital technology. This technology offers new and exciting opportunities to increase the connectivity of devices within the home for the purpose of home automation.This paper describes how to control and monitor fans by using just a simple software .SWITCHLESS FAN COTROL SYSTEM is a software based application that allows the user to monitor and control their home using their personal computers or laptops. This paper aims to develop a low-cost means of switchless fan using Arduino ,pencil battery ,wires 1hc05 bluetooth etc.. This deals with the software that is made to control arduino on PC. Data is continually received and processed by Arduino Uno board which acts as a microcontroller unit. In case of untoward situations, the Arduino will trigger an alarm and we will be notified on our personal computers. The system can also be used for various other purposes in offices where the employees can have the access in their laptops as soon as they finsih their job they can easily turn off fans. It is meant to save the electric power*

Keywords- Arduino,bluetooth hc-05, fan, LM-35,Visual Basic

I. INTRODUCTION

In todays world people are more dependent on the gadgets such as laptops,mobiles,tablets etc.These gadgets have played important role in revolutionizing the world. Home automation is one key brach that allows a person to control the appliances using their gadgets. Automation of the surrounding environment of a modern human being allows increasing his work efficiency and comfort. There has been a significant development in the area of an individual's routine tasks and those can be automated. In the present times, we can find most of the people clinging to their mobile phones and smart devices throughout the day. Hence with the help of his companion-This project deals with the idea of controlling the fans using a software that is coded in C sharp and using Visual basics. The automated approach of controlling the devices in a household that could ease the tasks of using the traditional method of the switch. The most efficient technology for short range wireless communication- Bluetooth is used here to automate the system by controlling the microcontroller (Arduino).The Arduino is programmed to switch on and off the fan and control its speed .

II. PROPOSED SYSTEM

This project is primarily concerned with the switching on and off fan. System which uses Bluetooth for interaction between the software on laptop and the appliances under the control of the system. The paper will shed light on the features & design of the system. This switchless fan control system controls the fan using the software on laptop which controls the Arduino which is a microcontroller.
It uses Bluetooth hc01. A Bluetooth module is widely used with Microcontroller to enable Bluetooth communication. This module cam be interfaced using the UART in 8051 microcontroller where the data are transmitted in the form of packets.

III. WORKING PRINCIPLE

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The Arduino board is interfaced with the temperature sensor keeping in mind the end goal to control the fan speed. We can differ the speed of fan contingent upon the temperature at our home. Temperature is estimated by utilizing LM35 sensor. The status of fan are shown on the LCD show. The Bluetooth hc-05 module and the Arduino board are connected.The light and fans are associated with Arduino board through hand-off which goes about as switch. This module is the most prevalent Bluetooth module out there. The fundamental rendition is entirely modest. The problem of connecting wires between the module and the Arduino can be dodged by utilizing a Bluetooth Shield or an adaptation in the Bee shape, the BTBee and a Bee shield. The microcontroller is associated with the apparatuses through relays.All these machines are controlled utilizing a product that is all inclusive can be keep running on X stage utilizing visual essentials coded in c sharp.

IV. DESIGN AND IMPLEMENTATION

The block diagram shown below shows the work-flow of the system. The user would be initially logging into the system with his/her login credentials. On authentication, the user will be presented with the options for controlling the fan and its speed. On receiving the input, the application will convert this input into byte format and transmit this signal to the Arduino microcontroller via Bluetooth module. The

microcontroller is connected with the fans through relays. The microcontroller converts the byte signal it has received to string format and passes it to the respective relay. The software is coded using C sharp and visual basics which would help in controlling the system.

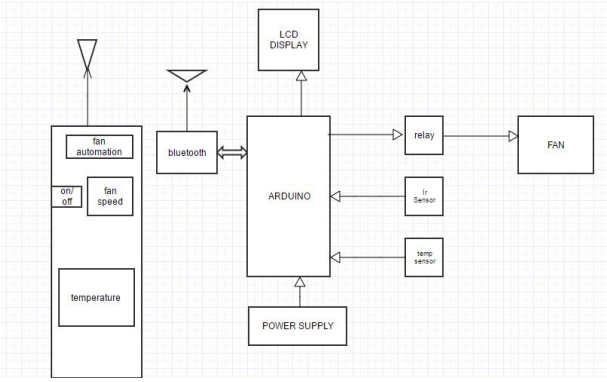

Fig1-Block diagram

ARDUINO : Arduino is an open-source electronics prototyping platform based on flexible, simple to use hardware and software[5]. It's proposed for artists, designers, hobbyists, and anyone interested in creating interactive objects or environments. In simple terms, the Arduino is a small computer system that can be programmed with instructions to interact with different forms of input and output. The current Arduino board model, the Mega, is small in size compared to the average human hand. It has many analog and digital IO pins. It operates with 5v power supply, which is connected from either USB port or External power supply. It can function between 5V – 20V.It has ATmega1280 micro controller. This microcontroller has many features. It has 128KB of flash memory, 4 KB of which are used for the Boot loader, 8 KB SRAM and 4 KB EEPROM

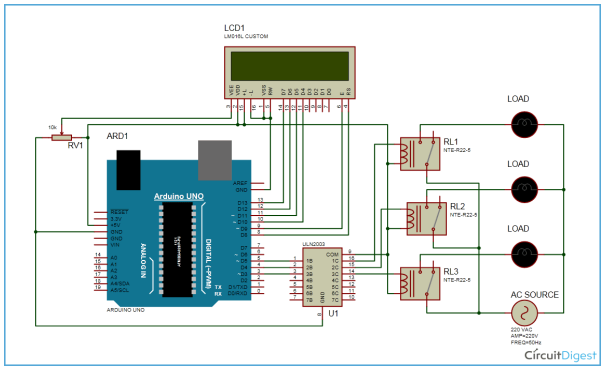

Fig-2 Circuit diagram

Identify the Headings Arduino has e 54 digital IO pins. To select the input or output pin, we use the pinMode(), digitalWrite(), and digitalRead() functions. All this pins works at a maximum current of 40mA. These digital pins have some special functions. They are Serial 0: pin 0(RX), pin 1(TX), Serial 1: pin 19(RX), pin 18(TX), Serial 2: pin 17(RX), pin 16(TX), Serial 3: pin 15(RX), pin 14(TX). The TX is used to transmit the data and the RX is used to receive the data. The other special function pins are the SPI pins, SPI: MISO pin 50, MOSI pin 51, SCK pin 52, SS pin 53. It also has 16 analog input pins provides 10 bits of resolution (1024 different values) and uses the analogRead() function. In this we have 10 bit SAR ADC to convert analog data into digital form.

LM-35:

The LM35 series are precision integrated-circuit temperature devices with an output voltage linearlyproportional to the Centigrade temperature. The LM35 device has an advantage over linear temperature sensors calibrated in Kelvin, as the user is not required to subtract a large constant voltage from the output to obtain convenient Centigrade scaling. The LM35 device does not require any external calibration or trimming to provide typical accuracies of ±¼°C at room temperature and ±¾°C over a full −55°C to 150°C temperature range. Lower cost is assured by trimming and calibration at the wafer level. The low-output impedance, linear output, and precise inherent calibration of the LM35 device makes interfacing to readout or control circuitry especially easy. The device is used with single power supplies, or with plus and minus supplies. As the LM35 device draws only 60 µA from the supply, it has very low self-heating of less than 0.1°C in still air.

BLUETOOTH MODULE:

BLOCK: Communication
TYPE: HC-05
ANALOG/DIGITAL: Digital
PINS FOR INTERFACE: 4 Pins
PHOTO /CKT SYMBOL

Bluetooth is a specification for a small form-factor, lowcost radio solution providing links between mobile computers, mobile phones and other portable handheld devices, and connectivity to the Internet. It will enable users to connect a wide range of computing and telecommunications devices easily and simply, without the need to buy, carry, or connect cables.It is a wireless technology that operates on an unlicensed radio spectrum.

RELAYS:

A relay is an electrical switch that uses an electromagnet to move the switch from the off to on position instead of a person moving the switch. It takes a relatively

small amount of power to turn on a relay but the relay can control something that draws much more power. A relay is used to control the air conditioner in your home.

V. RESULTS AND ANALYSIS:

In this proposed system the main objective is to control the fan using the software installed on laptop that can run on any X platforms (windows,linux,ios).This software controls the sped of fan and switching it on and off .Connection is set up between the software and arduino using Bluetooth module. After establishing the connection we can control the fan .

In this system the LDR will give the intensity levels and display it on LCD and LM-35 is used to control the fan speed according to the room temperature.Whenever the temperature decreases in room the fan speed decreases accordingly and vice versa.LM-35 measures the room temperature . It has Arduino, LDR, LM35, LCD, relay, motor, motor driver circuit and bluetooth module. All the fans are connected to relay board. In this all the devices are controlled by using software. In this we can control the light intensity and fan speed based on LDR and LM35 sensor values respectively.

VI. CONCLUSION

This project proposes a low cost, secure, universally accessible, auto-configurable, remotely controlled solution. The approach discussed in the paper is original and has achieved the mark to control fans using the Bluetooth technology to connect system parts, satisfying user needs and requirements. The system design and architecture were discussed, and prototype presents the basic level of fan control and remote monitoring has been implemented. Finally, the proposed system is better from the scalability and flexibility point of view .

VII. ACKNOWLEDGMENT

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