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Automatic Speed and Light Intensity Control by Sensing Atmospheric Parameters

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***Abstract*: In this Arduino based project, we are going to control AC fan speed according to the room temperature and show these parameter changes on a 16x2 LCD display. It is accomplished by the data communications between Adriano, LCD, DHT22 sensor Module and DC fan that is controlled by using PWM. PWM is a technique by using which we can control voltage. This project consists of three sections. One senses the temperature by using humidity and temperature sensor namely DHT22. Second section reads the DHT22 sensor module's output and extracts temperature value into a suitable number in Celsius scale and control the fan speed by using PWM. And last part of system shows humidity and temperature on LCD and Fan driver. We can control the intensity of led bulb by using TSL2561 and shows the intensity of led on a display 16x2 LCD display. It is accomplished by the data communications between Arduino, LCD, TSL2561 sensor module and LED bulb. This project consists of three sections. One senses the intensity of the bulb by using TSL2561 sensor. Second section is to read the TSL2561 sensor module output and extract intensity value into suitable lux scale and control the intensity of bulb. And last part of system shows the intensity of bulb on the LCD display.**

***Keywords*: Network Protocols, Wireless Network, Mobile Network, Virus, Worms & Trojon.**

1. Introduction

In today's scenario energy conservation is need of our world. Fan speed needs to be manually controlled every time but by using this idea the speed of the fan will be automatically adjusted according to the surrounding. The project is working on the concept of IoT. Here, the temperature is to be controlled and the focus is on the reason of installing automatic controlled Fan is the comfort of the consumer. Temperature is controlled using DHT22 sensors. The DHT22 is an elementary, low-cost digital temperature sensor. It uses an electrical phenomenon and a semiconductor device to live the encompassing air and spits out a digital signal on the information pin. It is easy to use, but requires more time to grab information and then the DHT22 sensor sends the data to the micro-controller circuit which consist of Arduino board. Arduino refers to an open-source electronics board and it is programmed using the software. It makes the electronic design more accessible for anyone interested in creating it with suitable environments. After the sensor will sense the temperature and the fan speed will be controlled using the Pulse Width Modulation and Arduino board, then the LCD will display the result that what is the temperature and the speed of the fan. LCD is a device used for the purpose. As the name is Liquid Crystal device is uses Liquid crystals and it does not emit light-waves directly, instead of using a reflector to produce footage in colour. The temperature will automatically control according to the need of the person in that room or particular place since the human body has a higher a higher metabolism during day time and requires more cooling and at night time the body requires less cooling as compared to day time. The disadvantage of this High Intensity Lamps is that it consumes a lot of energy and another disadvantage of this is that the intensity cannot be varied according to the requirement. To overcome this limitation, this system "Automatic Light Intensity Controller by External Light Sensing Project" is developed. To overcome the limitations specified above, it makes use of LED's (Light Emitting Diodes) as light source and simultaneously its intensity can be varied and controlled as per the need.

2. Components

1) DHT22 Sensor for getting atmosphere temperature

The DHT22 is a basic, minimal effort advanced temperature sensor. It utilizes an electrical wonder and a semiconductor gadget to live the incorporating air, and lets out a computerized sign on the data pin. It is genuinely easy to utilize, however requires additionally timing to get information. The best thing of this sensor is you can just get new information from it after at regular intervals, so when utilizing library, sensor readings can be made as long as 2 seconds old.

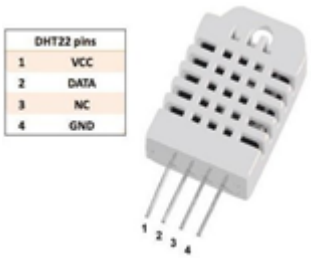

Fig. 1. DHT22

2) TSL2561

The TSL2561 radiance sensor is a progressed computerized light sensor, perfect for use in a wide range. of light circumstances. Contrasted with minimal effort Discs cells, this

sensor is increasingly exact, taking into account. precise Lux counts and can be designed for various increase/timing reaches to identify light.

Fig. 2. TSL 2561

3) Display16X2

LCD (Fluid Precious Stone Presentation) screen is an electronic showcase module and locate a wide scope of utilizations. A 16×2 LCD show is fundamental module and is generally utilized in different gadgets and circuits. These modules are favored more than seven sections and other multi fragment LEDs. The reasons being: LCDs are affordable; effectively programmable; have no impediment of showing uncommon and even custom characters (not at all like in seven portions), liveliness, etc.

Fig. 3. Display16X2

4) Relay module

Fig. 4. Relay model

This particular model features optically-isolated inputs, meaning the 5V TTL control signal is not exposed to the potentially dangerously high power levels being managed in the relay. It's safe; isolated; secure! As long as your signal can drive 15~20mA to power the opto-isolator,

This is a 4-Channel Relay interface board that allows you to control various appliances, and other equipment's with large current. It can be controlled directly by Micro-controller (Arduino, Raspberry Pi, 8051, AVR, PIC, DSP, ARM, ARM, MSP430, TTL logic).

Specifications:

- 4-Channel Relay interface board, and each one needs 15-20mA Driver Current.
- Both controlled by 12V and 5V input Voltage
- Equipped with high-current relay, AC250V 10A; DC30V 10A.
- Standard interface that can be controlled directly by microcontroller (Arduino, 8051, AVR, PIC, DSP, ARM, ARM, MSP430, TTL logic active low).
- Opto-isolated inputs.
- Indication LED's for Relay output status.

Specifications:

- 5V 4-Channel Relay interface board
- Requires 15-20mA signal drive Current
- TTL logic compatible
- High-current AC250V/10A, DC30V/10A relay
- Status LED
- Equipped with 3.1mm screw holes for easy installation
- 61g
- 75 x 55 x 19.3mm (2.95 x 2.16 x 0.76″)

5) Fan

It can be placed on a table or the floor, or just about on anything with a firm base. The remarkable thing about this kind of design is that you can direct the cool breeze in the direction you prefer, and you could even let it swing. Not to forget, the best feature about this type of fan is, it is portable. They are sometimes referred to as personal fans

Fig. 5. Fan

6) LED Bulb

Driven lights require an electronic Drove driver circuit when worked from mains electrical cables, and misfortunes from this circuit mean the effectiveness of the light is lower than the productivity of the Drove.

Fig. 6. Bulb

7) Arduino

Fig. 7. Arduino UNO

The Arduino Uno is an open-source microcontroller board

based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type

B USB cable. It can be powered by the USB cable or by an external 9-volt battery though it accepts voltages between 7 and 20 volts.

It is also similar to the Arduino Nano and Leonardo The hardware reference design is distributed under a Creative Commons Attribution Share-Alike 2.5 license and is available on the Arduino website. Layout and production files for some versions of the hardware are also available.

The word "UNO" means "one" in Italian and was chosen to mark the initial release of Arduino Software the Uno board is the first in a series of USB-based Arduino boards it and version 1.0 of the Arduino IDE were the reference versions of Arduino, which have now evolved to newer releases. The ATmega328 on the board comes preprogrammed with a bootloader that allows uploading new code to it without the use of an external hardware programmer.

Technical specifications

- Microcontroller: Microchip ATmega328P
- Operating Voltage: 5 Volts
- Input Voltage: 7 to 20 Volts
- Digital I/O Pins: 14 (of which 6 can provide PWM output)
- Analog Input Pins: 6
- DC Current per I/O Pin: 20 mA
- DC Current for 3.3V Pin: 50 mA
- Flash Memory: 32 KB of which 0.5 KB used by bootloader
- SRAM: 2 KB
- EEPROM: 1 KB
- Clock Speed: 16 MHz
- Length: 68.6 mm
- Width: 53.4 mm
- Weight: 25 g

Peripheral Features

- Two 8 bit timer/counters with separate pre scaler and compare mode
- One 16-bit timer/counter with separate pre scaler compare mode and capture mode
- Real time counter with separate oscillator
- Six PWM channels
- 8-channels 10-bit ADC in TQFP and QFN/MLF package
- Temperature measurement
- Programmable serial USART
- Master/slave SPI serial interface
- Byte-oriented to wire serial interface (Phillips I²C compatible)
- Programmable watchdog timer with separate on- chip oscillator
- On-chip analog comparator
- Interrupt and wake-up on pin change
- Power-on reset and programmable brown-out detection
- Internal calibrated oscillator
- External and internal interrupt sources
- Six sleep modes idle, ADC noise reduction, power-save, power-down, standby, and extended standby

I/O and Packages

- 23 programmable I/O lines
- 32-lead TQFP, and 32-padQFN/MLF

Operating Voltage

- 2.7V to 5.5V forATmega328P

Temperature range

1. Automotive temperature range: - 40 °C to+125°C

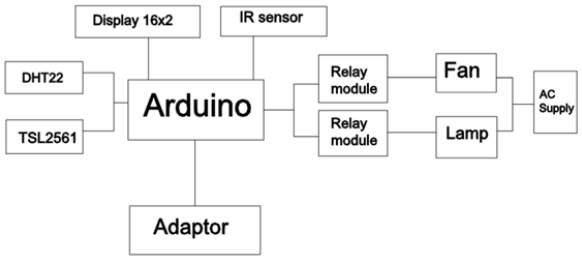

Fig. 8. Block diagram

3. Conclusion

Arduino based temperature controlled fan is actualized. In this manner, here fan speed has been constrained by utilizing Heartbeat Width Regulation and Arduino board as indicated by the temperature detected by the assistance of Temperature and Mugginess Sensor (DHT22). The possibility of the task is to change the fan temperature naturally. PWM procedure is found to be the best strategy for controlling the fan speed utilizing the detected temperature. The framework is working appropriately. The speed of fan relies upon the temperature and there is no requirement for controlling the fan speed physically over and over.

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