International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 07 Issue: 10 | Oct 2020 www.irjet.net p-ISSN: 2395-0072

EFFICIENT LOW COST SYSTEM TO CONTROL APPLIANCES USING SMARTPHONE

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Abstract - There has been a need of controlling Electronic devices remotely for automation and security purposes. This project tries to fulfill the same using the IoT technology implementation over the electronic devices lock making it a super advanced devices locking system. The objective of achieving automation and security is simultaneously achieved using web connectivity of the project with IoT Gecko website. IOT Based Electronic devices controlled by ATmega family microcontroller. The project communicates over internet using WiFi module. We use a demo model of devices as shown in the video. On the IOT Gecko website once the authorized person logs in he/she gets a direct access of the devices to on or off it, no matter how far the devices is physically from her. When a command of on the devices us received from the web interface the controller instructs the relevant drivers to start the motor of the devices in a particular direction till the devices fully on and then stop. Likewise, when the system receives the command to off the devices the controller instructs the drivers of the motor rotate in counter direction till the devices fully offs. In this way the automatization and security is achieved using this project which gives access of the devices authorized person even though they are physically present at some remote location from the devices.

Key Words: IOT, Home automation.

1. INTRODUCTION

The Internet of Things IoT is a technology that aims to put the things around us on a network. The motivation of IoT is to provide a global infrastructure that can connect objects and intelligent services over a network as discussed by Aston. The intelligent services process the data collected from these objects to serve the purpose(s) for which it is implemented. Here purpose is used in wide sense that means the wide range of usefulness and applications these services will support depending on the domain and type of information collected and processed.

Physical world or the objects and the information about the objects are two things. The IoT makes the objects talking to each other via information they exchange. In author discusses about solutions those are smart developed around IoT. Smart home is one such application where IoT oriented solutions is being implemented to make the secure and convenient living experience. Door lock system is an essential feature in this series of Home appliances which can be remotely controlled. In this research work, we propose the design and develop a system that prevents such attacks exploiting the concept of IoT. The system is a three tier system based on IoT architecture using micro controller device, cloud and Android application. It aims to enhance several security and monitoring features based on IoT technologies. The data and information is hosted on cloud using MQTT protocol. The android based mobile application features a user admin platform which has the ability to grant and revoke permissions to users and simultaneously monitor every door lock/unlock event efficiently

1.2 PROPOSED SYSTEM

Home automation is needed to be without new wiring and to be very easy installation. The proposed system architecture generally incorporates arduino computer for the proposed of network management and provision of web page access. It can be configure according to our home system. The user will communicated to arduino through internet via Wi-Fi network.

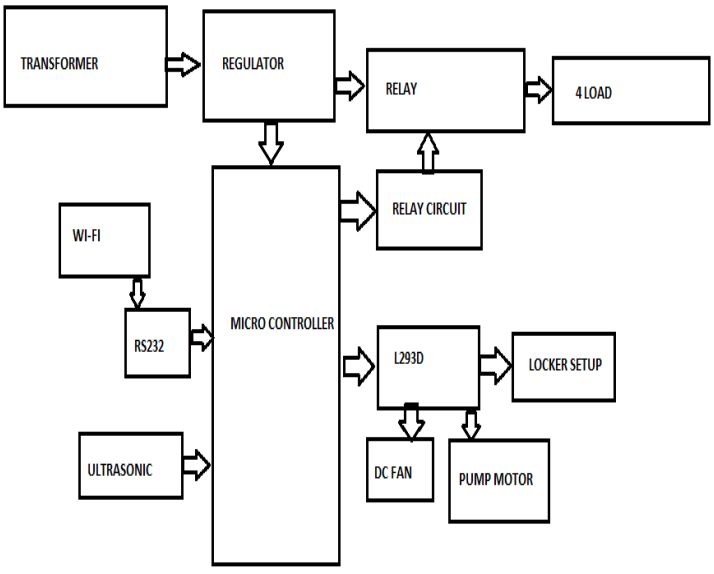

Fig- 1: Proposed diagram

2. MATERIALS AND METHODS

Here we used hardware components like Arduino UNO, DC motors, Transformer, LDR Sensor, relay, ultrasonic sensor, Esp8266, Temperature sensor.

2.1 ARDUINO UNO

The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features an ATmega16U2 programmed as a USB-to-serial converter. This auxiliary microcontroller has its own USB boot loader, which allows advanced users to reprogram it. The Arduino Uno R3 is a microcontroller board based on a removable, dual-inline-package (DIP) ATmega328 AVR microcontroller. It has 20 digital input/output pins (of which 6 can be used as PWM outputs and 6 can be used as analog inputs). Programs can be loaded on to it from the easy-to-use Arduino computer program. The Arduino has an extensive support community, which makes it a very easy way to get started working with embedded electronics. The R3 is the third, and latest, revision of the Arduino Uno. There are many varieties of Arduino boards that can be used for different purposes. Some boards look a bit different from the one below, but most Arduino have the majority of these components in common.

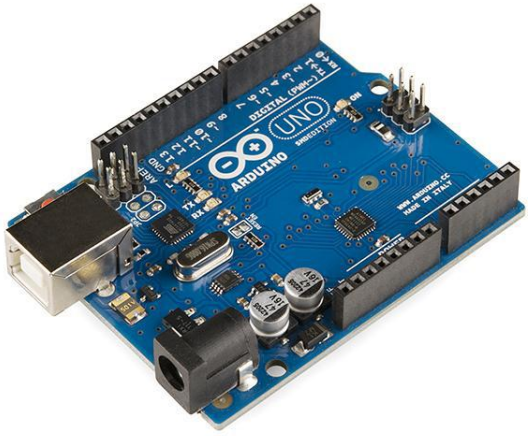

Fig-2: Arduino UNO

2.2 DC MOTOR

Geared DC motors can be defined as an extension of DC motor which already had its Insight details demystified here. A geared DC Motor has a gear assembly attached to the motor. The speed of motor is counted in terms of rotations of the shaft per minute and is termed as RPM .The gear assembly helps in increasing the torque and reducing the speed. Using the correct combination of gears in a gear motor, its speed can be reduced to any desirable figure. This concept where gears reduce the speed of the vehicle but increase its torque is known as gear reduction. This Insight will explore all the minor and major details that make the gear head and hence the working of geared DC motor.

Fig-3: DC motor

2.3 ULTRASONIC SENSOR

Ultrasonic sensors work by emitting sound waves at a frequency too high for humans to hear. They then wait for the sound to be reflected back, calculating distance based on the time required. This is similar to how radar measures the time it takes a radio wave to return after hitting an object.

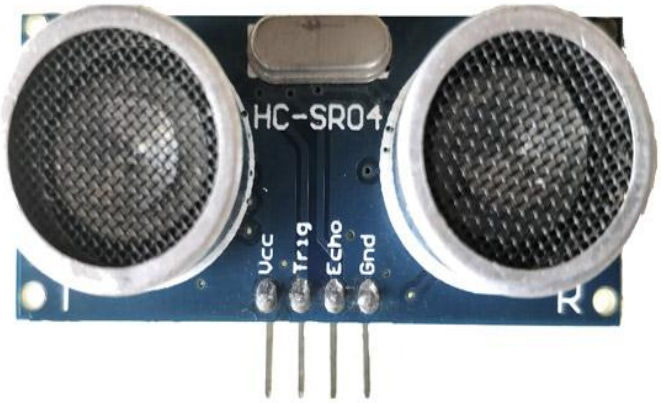

Fig-4: Ultrasonic sensor

2.4 Esp8266 Wi-Fi Module

ESP8266 is a 3V Wi-Fi module very popular for its Internet of Things applications. ESP 8266 maximum working Voltage is 3.6V and it's very important to note. You must know how to power it, how to serial-connect it with Arduino safely, how to ping and many other things. You should use software like Circuito.io, Tinkercad, Fritzing to simulate and

work with the board safely. You should also use Logic Level Controller to use with ESP8266 module.

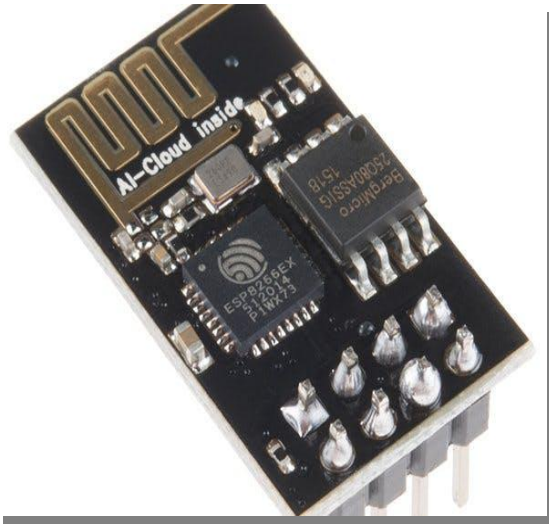

Fig-4: Esp8266

2.5 Battery

All lead acid batteries consist of flat lead plates immersed in a pool of electrolyte. Regular water addition is required for most types of lead acid batteries although low-maintenance types come with excess electrolyte calculated to compensate for water loss during a normal lifetime. Lead acid batteries used in the RV and Marine Industries usually consist of two 6-volt batteries in series, or a single 12-volt battery. These batteries are constructed of several single cells connected in series each cell produces approximately 2.1 volts. A six-volt battery has three single cells, which when fully charged produce an output voltage of 6.3 volts. A twelve-volt battery has six single cells in series producing a fully charged output voltage of 12.6 volts. A battery cell consists of two lead plates a positive plate covered with a paste of lead dioxide and a negative made of sponge lead, with an insulating material (separator) in between.

2.6 ARUDINO IDE

The Arduino Integrated Development Environment (IDE) is a cross-platform application (for Windows, macOS, Linux) that is written in functions from C and C++. It is used to write and upload programs to Arduino compatible boards, but also, with the help of 3rd party cores, other vendor development boards. The source code for the IDE is released under the GNU General Public License, version 2.The Arduino IDE supports the languages C and C++ using special rules of code structuring. The Arduino IDE supplies a software library from the Wiring project, which provides many common input and output procedures. User-written code only requires two basic functions, for starting the sketch and the main program loop, that are compiled and linked with a program stub main() into an executable cyclic executive program with the GNU tool chain, also included with the IDE distribution. The Arduino IDE employs the program to convert the executable code into a text file in hexadecimal encoding.

3. SYSTEM IMPLEMENTATION

The main purpose of using the microcontroller in our project is because high-performance CMOS 8-bit microcontroller with 8K bytes of in-system programmable Flash memory. By combining a versatile 8-bit CPU with in-system programmable Flash on a monolithic chip, the ATMEGA 328 is a powerful microcontroller which provides a highly-flexible and cost-effective solution to many embedded control applications.

The programs of the microcontroller have been written in Embedded C language and were compiled using ARDUINO, a compiler used for microcontroller programming. The communication between PC and the microcontroller was established MAX 232 standard and those programs were also done in C language. The following programs are used at various stages for the mentioned functions. Serial communication in this program, the various special function registers of the microcontroller are set such that they can send and receive data from the PC. This program uses the serial library to communicate with the ports.

Fig-5: Top view of the system

4. CONCLUSION

We have designed an electronic door lock system that can be operated remotely by harnessing the power of IoT (Internet of things), which has better security features and is user friendly. This system has the capability to lock and unlock doors over the internet enabling keyless entry and solves the problem of losing a key. It improves user convenience by allowing the user to lock and unlock the door remotely, along with enhanced security and sharing features.

[10] The door lock system is in the process of being commercialized into a security system for corporate sectors and households. It is expected to be far better than already existing door lock systems.

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