International Journal of Multidisciplinary Engineering in Current Research - IJMEC
Volume 8, Issue 1, January-2023, http://ijmec.com/, ISSN: 2456-4265

IOT based speed control of the AC motor control and security using OTP

Mrs. Sharea takreem1, syed junaid2, Syed hasan noori3, syed junaid4

1Assistant Professor Department of ECE, Lords Institute of Engineering and Technology Hyderabad, India
2,3,4,5Department of ECE, Lords Institute of Engineering and Technology Hyderabad, India

Abstract: Every system has been automated at this point in time in order to meet the new problems that are posed by the current circumstance. As a result, automated control systems are preferred in every industry. When you go to certain regions of the globe, the only sort of cellular service that is accessible to you is IOT. IOT was designed to operate as a digital system using TDMA technology rather of providing analogue services.

I. INTRODUCTION

The objective of the project is to design a system that makes use of mobile technology to maintain control of alternating current (AC) motors in a variety of applications and operates in accordance with the signal that is sent by the mobile device. Just by entering the keypad of a distant telephone from where you are calling, you are able to execute ON/OFF operations and at the same time we are able to manage the speed at which an AC motor is operating. There is a wide variety of home electronics that can be operated by remote control, and there are many of these systems available.

II. LITERATURESURVEY

A review of the literature on Single Phase Induction Motor Automatic Speed Control with Variations in Ambient Temperature The Automated Speed Control of Single Phase Induction Motors with Variation of Ambient Temperature is the foundation of this work. Temperature detector, control circuit, and loading circuit make up the system's circuitry. There are relays, amplifiers, and comparators included into the control circuit. The computational technique, flowchart, and algorithm are started here. The complete circuit diagram is provided. This system has successfully completed testing, and by examining its temperature vs load curve, its behaviour may be seen. The curve's equation is included using Newton's interpolation technique. Being comfortable is a crucial aspect of human nature. The human mind is constantly drawn to something easier. This invention belongs in a far more sophisticated area than a fan controlled manually. By detecting the surrounding temperature, this gadget automatically regulates the speed of an induction motor used in a fan. It does not need any attention, like typical domestic fan regulators, to regulate the fan's speed, which minimises human effort, which is quite obvious to us. It makes use of TRIAC (Triode for AC) circuitry, which consumes less energy and conserves power. It offers the user extensive control over the operating temperature range and manual control when necessary. Since they are inexpensive to purchase and maintain, these characteristics are both fascinating and very helpful for the middle class. The whole of this idea will be covered in the points that follow. Regulation of Induction Motor Speed Sliding Mode Controller use Induction Due to their simplicity of construction, high level of resilience, and typically sufficient efficiency, motors have been the workhorse in the industry for a very long time. They are far more difficult to regulate than DC motors, however. The time-varying nature of the parameters and variables that

ISSN: 2456-4265

DOI: https://doi-ds.org/doilink/03.2023-63212378

could be modified when working with the motion systems is one of the issues that might result in failed efforts to develop a good controller. Use of Sliding Mode Control is one of the finest recommended solutions to this issue (SMC). The design of a novel controller for a vector control induction motor drive that uses an outer loop speed controller and SMC is presented in this work. To assess the effectiveness of the novel controller approach and two existing sliding mode controller methods, many experiments were performed. The results of the comparison simulations show that the new controller law has high performance dynamic features and is resilient to changes in plant parameter. High performance electric drives that can properly fulfil torque, speed, or position criteria are in great demand. Due to this, the quantity and complexity of control measures used to address this issue have inevitably increased. The induction motor (IM) has received special consideration because to its low cost, small size, light weight, dependability, simplicity, efficiency, and ease of production. The increasing power and falling prices of microprocessors and digital signal processors have made it feasible to use complex control systems for position or speed control of the IM. Field oriented control (FOC) or vector control (VC) techniques have been widely used in industry over the past ten years for high performance induction motor drives, where the phase transformation frequently requires knowledge of synchronous angular velocity to achieve the desired decoupling control. A vector controlled IM drive system is typically implemented using two feedback loops. The outside loop is a position or pee regulation loop, whereas the inner loop is a current regulation loop.

III. WORKINGPRINCIPLE

The node mcu makes wifi connections possible. Gpio builds an independent system. The system's primary core, the esp 8266 chip, is used by the node mcu. The whole system is looked after by the chip. This uses wifi to connect. The development board is node mcu. 10 GPIO pins and 1 analogue pin are available. Moreover, a serial connection port is included. On the built-in server of the node mcu, we employ access codes. These access codes are used to establish a local area network. Wi-fi links the node mcu to a computer that is linked to the internet. They establish a local area network and the node mcu may access the computer. By employing repeaters, this local area network's coverage area may be increased. We can now visit the static html page for our local area network at 192.168.4.1. To increase the coverage to a wide area network and for global access, we may utilise a bridge or an open source broker, respectively.

IV. BLOCKDIAGRAM

A. TRANSMITER SECTION

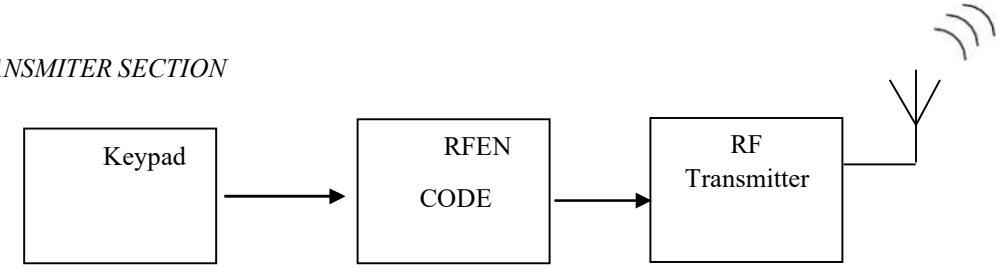


Figure:Block diagram of Traffic priority for ambulance (Transmitter)

DOI: https://doi-ds.org/doilink/03.2023-63212378

B. RECEVIER

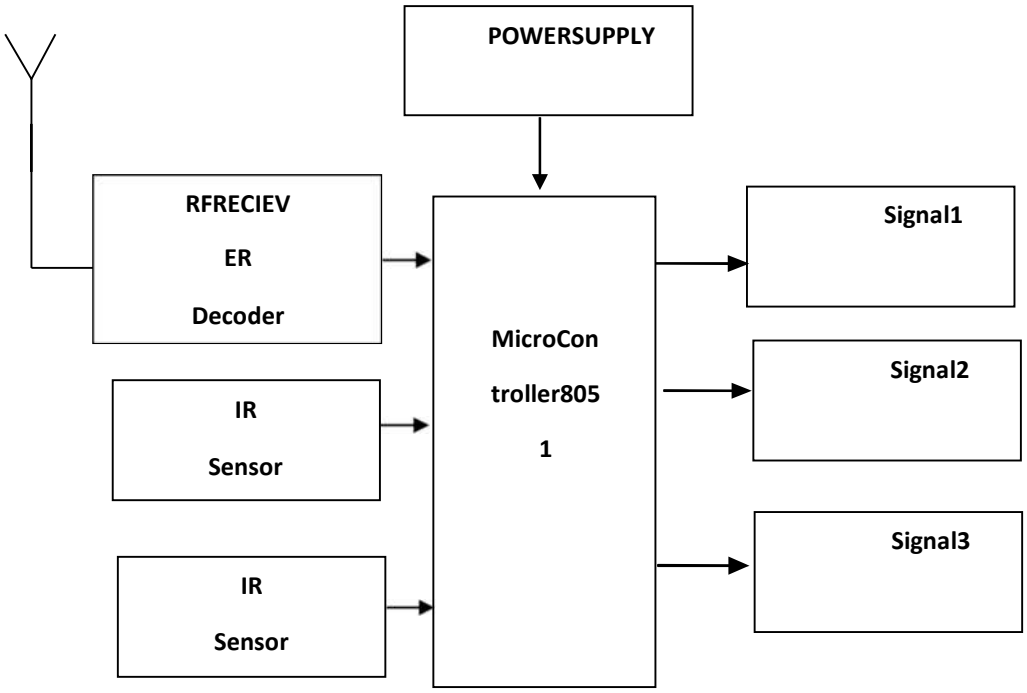
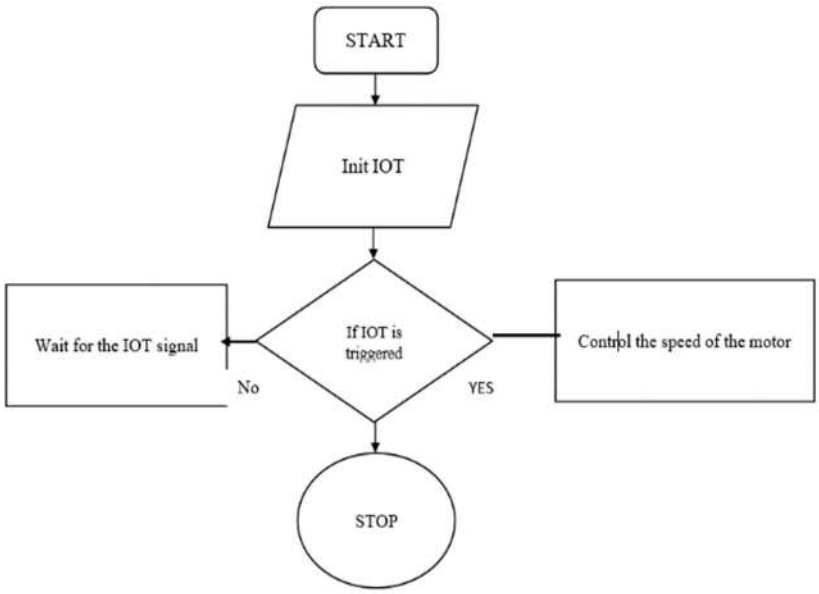


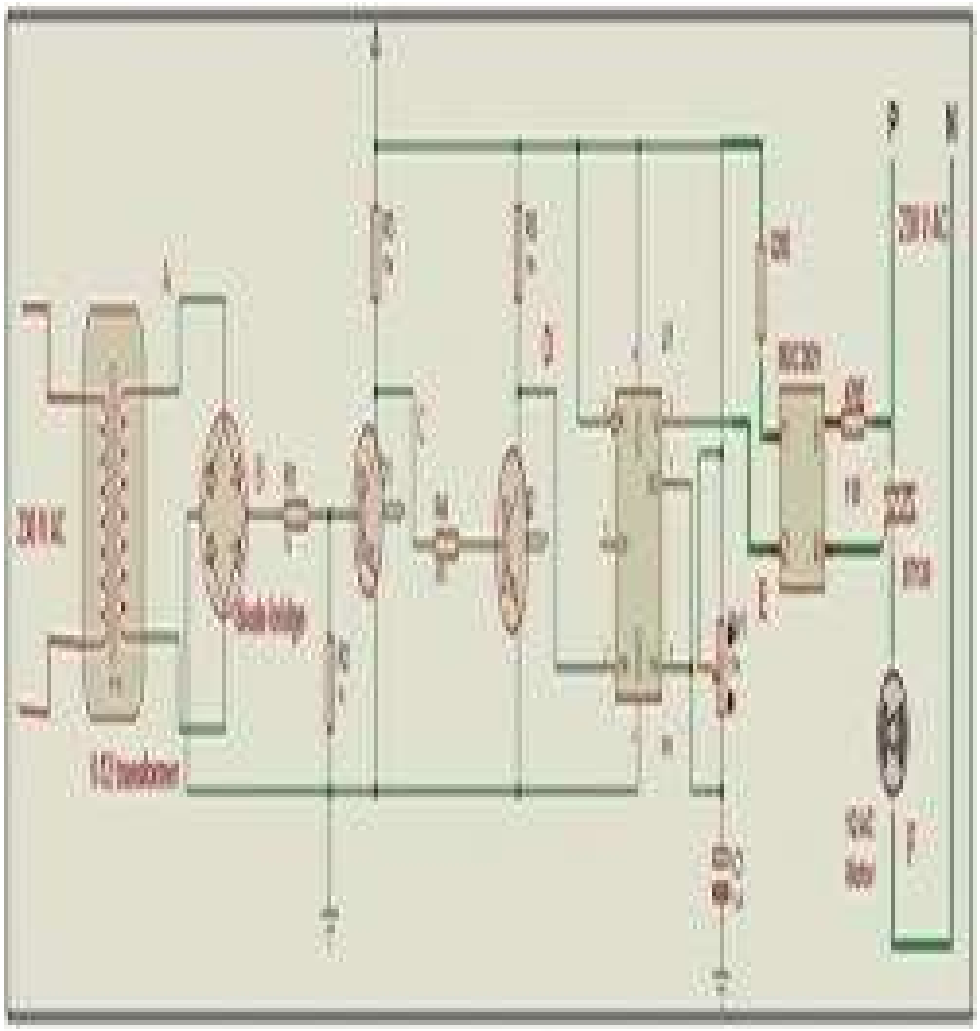
Figure: Blockdiagram of Traffic priority for ambulance (Receiver)

I. FLOWCHART



DOI: https://doi-ds.org/doilink/03.2023-63212378

V. SCHEMATIC DIAGRAM:



VI. HARDWAREDESCRIPTION

A. POWERSUPPLY

The power supply section is the part that gives the parts +5V so they can work. The ICLM7805 is used to provide constant +5V power.

The ac voltage, which is usually 220V, is connected to a transformer, which steps down the ac voltage to the level of the desired dc output. Then, a full-wave rectified voltage from a diode is first filtered by a simple capacitor filter to make a dcvoltage. Most of the time, this dc voltage has some ripple or ac voltage changes.

DOI: https://doi-ds.org/doilink/03.2023-63212378

A regulator circuit gets rid of ripples and keeps the dc value the same even if the dc voltage coming in changes or if the load connected to the dc voltage coming out changes. Most of the time, one of the popular voltage regulator IC units is used to do this.

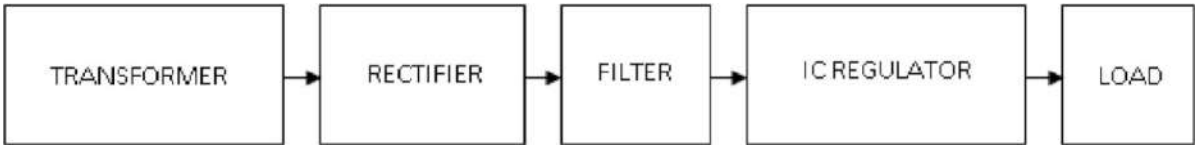


Figure3.1 BlockDiagram of Power Supply

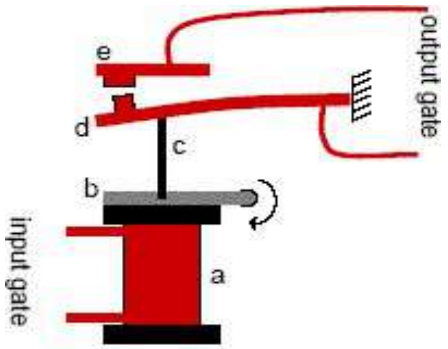
B. MICROCONTROLLER

A microcontroller, or MCU, is a little computer that may be programmed to manage various electrical functions. Unlike a general-purpose microprocessor, which is designed to do a wide variety of tasks, this kind of microprocessor is focused on efficiency and independence (the kind used in a PC). Unlike a general-purpose microprocessor, which needs extra chips to provide capabilities like memory and interfaces, a basic microcontroller has everything required for a simple application.

The following are the defining characteristics of a microcontroller, an integrated circuit that performs many tasks:

- RAM for data storage Input/output connections like serial ports CPU ranging from modest and basic 8-bit CPUs to complex 32- or 64- bit processors
- ROM, EEPROM or Flash memory for software storage
- Clock generator - commonly an oscillator for a quartz timing crystal, resonator or RC circuit Microcontrollers are within various sorts of electronic devices.

They account for the overwhelming bulk of processor chips sold. Approximately 50% are "basic" controllers, with the remaining 20% being more sophisticated digital signal processors (DSPs) (ref?). A typical house in a developed nation will contain one or two general-purpose microprocessors but between one and two dozen microcontrollers. A typical mid-range automobile has up to 50 microcontrollers. They are also found in practically every electrical device: washing machines, microwave ovens, cellphones, and so on.



electromechanical relay

DOI: https://doi-ds.org/doilink/03.2023-63212378

C. RFMODULE(Radiofrequency)

It is made up of a stationary coil (a) and a moving armature (b) that is mechanically connected (c) to a moving contact (d). A magnetic field is created by feeding the coil with electrical electricity. The moving armature is then attracted to the coil, allowing the contact to be shifted. The contact's movement either establishes or destroys an electrical connection with a stationary contact (e). When the coil's feeding current is released, the armature and feed contact return to their relaxed positions through a spring or the contact's elasticity. While in the break state, an electromechanical relay has galvanic insulation between the input and output gates, as well as between the terminals of the contacts.

Electromechanical Relays Are Used:

- To operate a high-voltage circuit via a low-voltage signal, such as in some kinds of modems;
- To operate a high-current circuit using a low-current signal, such as an automobile's starting solenoid.
- To detect and isolate faults on transmission and distribution lines by opening and closing circuit breakers (protection relays); • To isolate the controlling circuit from the controlled circuit when the two circuits are at different potentials, such as when controlling a mains-powered device with a low-voltage switch. Although low voltage lines are readily inserted in partitions, which are often relocated as requirements change, the latter is commonly used to regulate office lighting. In order to preserve energy, they may also be regulated by room occupancy monitors.
- To execute logical operations. For instance, the AND function is implemented by connecting NO relay contacts in series, while the OR function is implemented by connecting NO relay contacts in parallel. The XOR (exclusive or) function is performed by the changeover or Form C contacts. NC contacts fulfil similar roles for both NAND and NOR. Owing to the failure modes of a relay in comparison to a semiconductor, they are often utilised in safety-critical logic, such as the control panels of radioactive waste-handling equipment.
- To execute time delay operations. Relays may be altered to postpone the opening or shutting of a group of connections. A copper disc would be used to create a very brief (fraction of a second) delay between the armature and moving blade assembly. Flowing current in the disc maintains magnetic field for a little duration, hence extending release time. For a delay of up to one minute, a dashpot is used. A dashpot is a piston containing fluid that is allowed to gently escape. By raising or reducing the flow rate, the time period may be altered. Installing a mechanical clockwork timer for extended durations.

RELAY

Joseph Henry created the first relay in 1835. The term relay is derived from the French word relays, which refers to the postman's horse swap location. A relay is often an electrical hardware component with an input and output gate. When the input gate is electrically activated, the output gate consists of one or more electrical contacts that switch. It is capable of implementing a disconnected, a router or circuit breaker for the electrical power, a negation, and, depending on the wiring, complex logical operations like and, or, and flip-flop. Relays were widely used in the past,

DOI: https://doi-ds.org/doilink/03.2023-63212378

for example in telephone switching and railway routing and crossing systems. Notwithstanding technological advancements (programmable devices), relays continue to be utilised in situations where robustness, simplicity, long life, and high dependability are essential (for instance in safety applications).

Figure7.1: Receiver Side

VII. RESULT & DISCUSSION

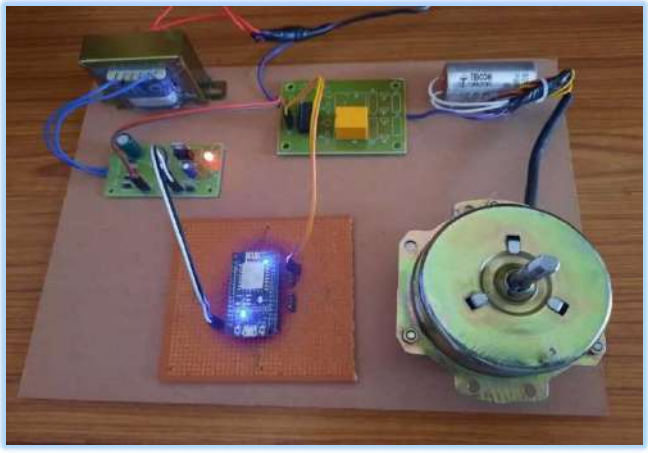


Figure: Transmitting Side

VIII. CONCLUSION

The project "IOT based speed control of the AC motor control and security using OTP" has been successfully designed and tested. It has been developed by integrating features of all the hardware components used. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit. Secondly using highly advanced IC's and with the help of growing technology the project has been successfully implemented.

C. REFRENCES

[1] SudharaniPotturi and Dr. Rajashekar P. Mandi "Critical Survey on IOT Based Monitoring and Control of Induction Motor'', IEEE 16th Student Conference on Research and Development , Bangy(Malaysia)26- 28Nov 2018.

DOI: https://doi-ds.org/doilink/03.2023-63212378

[2] Seenivasan, Ponkumar, Venkatraman and Jeslindrusilanesamalkar, " Induction Motor Condition Monitoring And Controlling Based On IOT", International Research Journal Of Engineering and Technology(IRJET) Volume:06 Issue:3 Mar 2019.

[3] V.S.D Rekha and Dr. K. Srinivasa Ravi , " Induction Motor Condition Monitoring And Controlling Based On IOT", International Journal of Electronics, Eletrical,And Computational System IJEECS Volume 6, Issue:9 September 2017, ISSN 2348-117X. [4].

DOI: https://doi-ds.org/doilink/03.2023-63212378