
PROGRAMMING RELAY TIME CONTROL USING ATMEGA328

**Bhupesh Jasutkar^{*1}, Nikesh Urkude^{*2}, Ankit Kolhe^{*3}, Dudeshwar Pustode^{*4},
Durvas Chamlate^{*5}, Pooja Sahastrabudhe^{*6}**

^{*1,2,3,4,5}Department Of Electrical Engineering, Abha Gaikwad Patil College Of Engineering, Wardha
Road Nagpur-441108, (Mah) India.

^{*6}Guide, Department Of Electrical Engineering, Abha Gaikwad Patil College Of Engineering, Wardha
Road Nagpur-441108, (Mah) India.

ABSTRACT

The wastage of electrical strength cannot be over-emphasised in FCT College of Education, Zuba Abuja as many lights bulbs, avenue light, electric lovers are continually ON even if now no longer in use. The university network is characterized through wattage wastage. However, the inducement for this studies changed into to curtail wattage wastage and decrease the excessive price of electricity. This studies changed into designed to manipulate the ON and OFF time of any electric equipment linked to its output and might also be used as a virtual clock. The goal of this studies changed into to manipulate the ON and OFF time of air con. The making plans protected a microcontroller (ATMEGA328) that changed into programmed to realize the timing operation. the light Emitting Diode (LED) displayed the ton (Time ON) and so the t0ff (Time OFF); 4 keys set the hour and for this reason the minutes; and so the relay changed into activated every time the time set elapsed, inflicting the air con to be energized/dis-energized automatically. A time of 3:19 changed into set to check the ON switching. An air con linked to the advanced gadget changed into activated at precisely 3:19. Also, a time of 5:fifty seven changed into set to de-spark off the already ON electric powered bulb. The electric bulb changed into shifted at precisely 5:fifty seven. The advanced switching gadget changed into examined and satisfactorily switched ON and OFF aircon as favored and pre-set through the user.

Keywords: Relay, LCD Display (16X2), Clock Unit (DS3231), ULN 2803, ATmega-328

I. INTRODUCTION

A transfer may be a tool that interrupts the float of an electrical modern-day in the course of a circuit both robotically or manually. A transfer is a tool that controls or directs the float of electrical modern-day in an exceeding circuit. Typically, a transfer lets in or disallows the float of electrical modern-day to a related load. A transfer may be a binary tool this is both absolutely ON (CLOSE) or absolutely OFF (OPEN) a circuit. There are essentially kinds of switches. These consist of mechanical and digital switches. A mechanical transfer makes bodily touch among steel plates for the prevailing to float and wreck loose each other plate to break the float of modern-day. On the alternative hand, an digital transfer may be a tool that switches an electric powered circuit, interrupting this or diverting it from one conductor to a different. All mechanical switches are manually operated at the same time as digital switches are robotically operated using a solid-kingdom tool like a microcontroller or a microprocessor. Generally, digital switches are fasters in reaction than mechanical switches. Among the digital switches may be a timing transfer that controls the float of an electrical modern-day at the concept of pre-set time via way of means of the user. A timing transfer is a tool that controls the relationship and disconnection of electrical home equipment supported pre-set time. In maintaining with Reference [4], a timing transfer is paramount in regions in which the dimension of some time is high to a success operation with out unpredictable human input. It's pretty glaring that for proper organization, activities need to be wiped out at a selected time (Ref. [6]). An sincere timing transfer is tasked to spark off ON or OFF an event at a pre- described time. It's pretty beneficial in lifestyle. Some superior digital timing switches are usually used for navy purposes. A timing transfer is of incredible significance in microwave ovens, laptop systems, college laboratory experiments, electric heaters, to mention however some. This studies layout become worried essential factors of laptop technology; software program layout, and additionally hardware layout. It were designed round a microcontroller chip (ATMEGA328). This may be a timer that gives adjustable timing controls of home equipment' operations. The evolved time switching (TS) machine grew to become AC load ON or OFF with preset time and it were programmed the usage of C synthetic language. Consistent with

Reference [7] C programming language collectively of the high-stage programming languages has now grow to be a broadly used expert language for numerous useful values. These values consist of: clean to be advised and write, use English-like phrases and symbols, established language it is problem- oriented, it produces green programs, it may cope with low and high-stage sports and it is able to be compiled on quite a number laptop platforms. The specialty of this switching machine the usage of ATMEGA328 microcontroller become in its functionalities to robotically spark off an to begin with OFF electric equipment and on the same time to robotically flip off to begin with ON equipment related to its output after a preset time. The evolved machine become pretty cheap, reliable, and simple to manipulate while evaluating to energy wastage and fee of electricity.

II. METHODOLOGY

The layout of this studies become basically divided into categories: hardware layout and software program development. A. Hardware Design The hardware layout worried drawing and simulation of applicable digital additives to obtain the said goals of this studies. However, the diagram of the studies is illustrated in Figure 1. There were six (6) useful modules inside the layout: the power supply, controller, the digit display, digit switch, keys and consequently the activation.

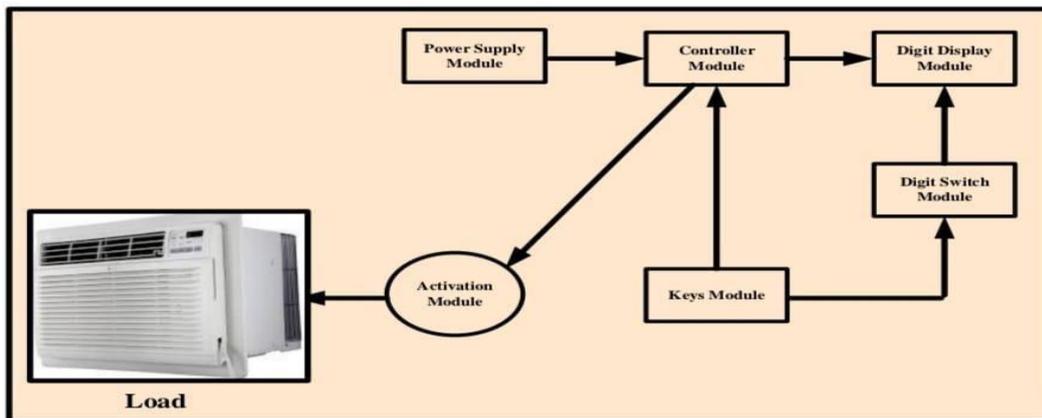


Fig: overview Block Diagram

1) Power supply module:- Power deliver module:- This module furnished the regulated voltage to energize the microcontroller and different components. It's materials i.e. the AC deliver and consequently the DC strength deliver from the battery. The battery acts as a power backup for the AC deliver, simply in case there may be a failure from the maximum supply, (i.e. PHCN). The time settings made through the customers are secured and protected from loss through a constant deliver of strength from the backup battery to the reminiscence of ATMEGA328 chip.

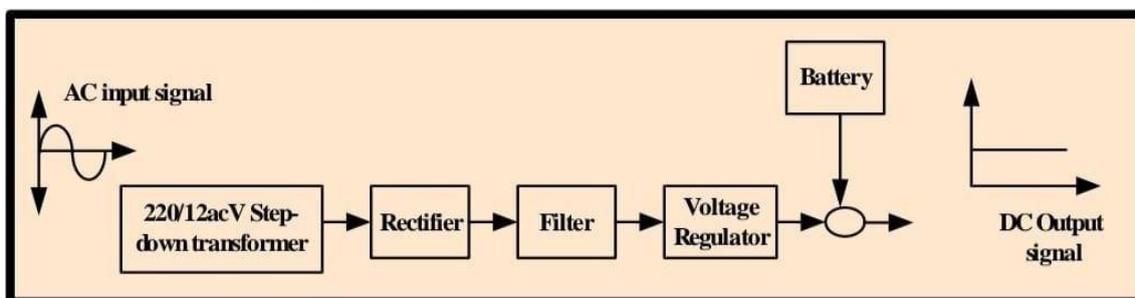


Fig: power supply module

2) Controller module:- .This module performed an crucial position in attaining the goal of this design. All indicators flowed IN and OUT of the module The module accommodated the instructions/codes (programs), coordinated the electric sports of sub-circuits, thus; it operated the relay in the activation module and despatched corresponding timing settings to the output show for visible understanding. A reset circuitry consisted of resistor and capacitor related in parallel through RST pin of the microchip. The connection resets

the microchip routinely while booting up. However to result in a reset time of however one (1) 2nd the really well worth of the resistor and additionally the capacitor need to be cautiously selected. A tool and circuits like this factor switching machine require an instantaneous current (DC) supply for their operation. Dry cells and batteries are varieties of DC reassets. They want the benefit of being transportable and ripple-free. However, the voltages are low; those reassets want common substitute and are steeply-priced in comparison to the conventional DC Power deliver. The conventional DC strength supply became accomplished from the maximum supply through changing the AC to DC.

3) Digit display module:- .This module displayed the ON or OFF time. It is made out of four seven-phase displays. Any adjustment in time putting became displayed for the person’s confirmation.

4) Digit transfer module:- This module furnished and managed this from the microcontroller chip to each show, amplified the voltage, and furnished a more potent switch function feature among the microcontroller and consequently the timer show module. This module assisted the show module to increase its using capabilities

5) Keys module: This module allowed the person to line the ON and OFF time of the weight related to the output to the advanced time switching machine. There were 4 keys to be pressed to line the required time.

The person may also interrupt the already set time manually if desired

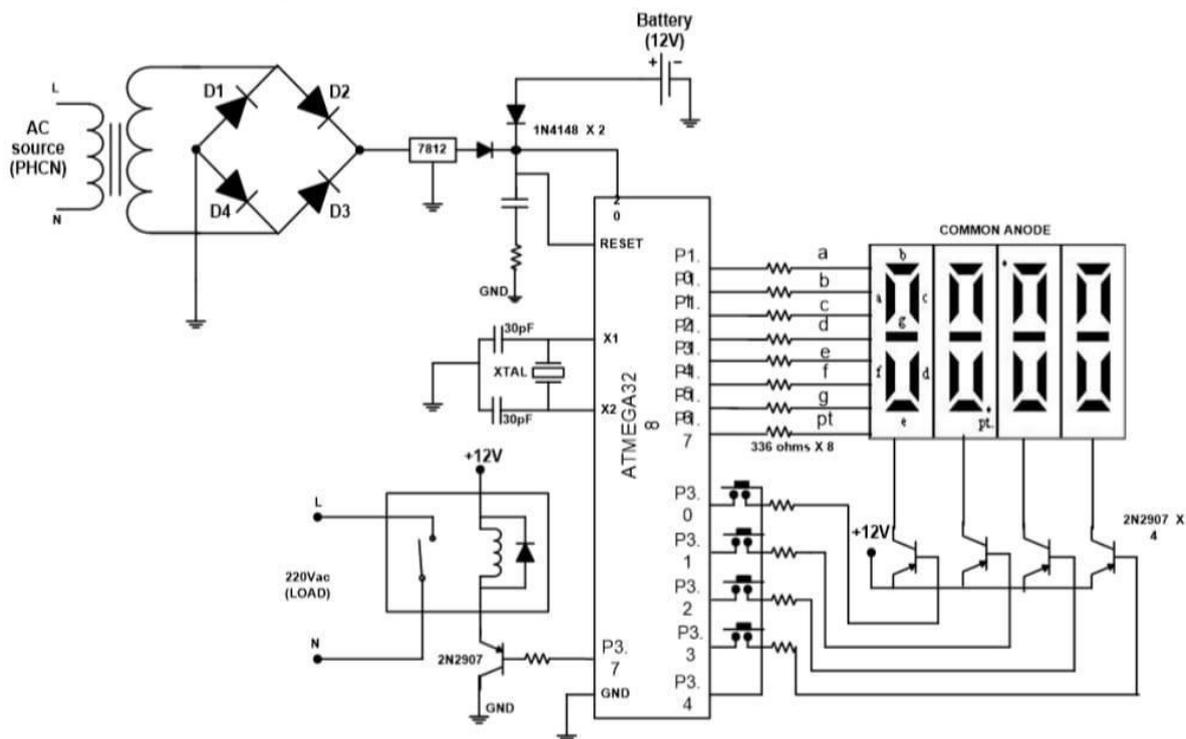


Fig: Circuit diagram of the developed system

6) Activation module: The module had a relay that activated or deactivated any electric equipment supported the pre-set time. A pulse generated through the microcontroller from its output pin (p3.7) decided if a relay became to be energized or de-energized as informed through the programs/codes and consequently the time settings through the person.

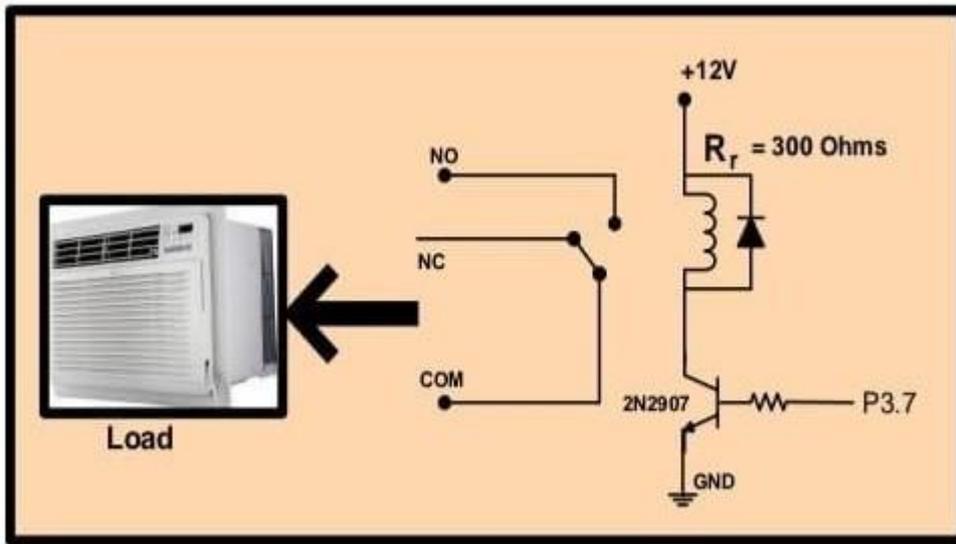


Fig: Relay driver

B. Software Development:-

1) The operations of advanced switching machine had been programmed in C language. The C codes had been compiled and edited the usage of Crimson editor and consequently the edited codes had been transferred into Small Device compiling program (SDCC) to collect the supply codes into HEX CODES wished through the chip for proper execution. The HEX codes had been transferred into the reminiscence of the microcontroller. Figure 7 suggests the screenshots of the advanced time switching machine



Fig: Screenshot of the developed system

III. RESULTS AND DISCUSSION

By implication, software of this newly evolved time switching machine could put off electric sign wastage thereby growing profits for maximum productivity. The price of strength invoice could be technically decreased with this new time switching. Furthermore, an electrical kettle become related to the output of the evolved switching machine. A switching time of two.07 become pre-set to routinely activate the kettle and 4.eleven had been pre-described to extrade OFF the kettle. The kettle become left on statement and findings at the desired instances. The experimental outcomes indicated that at precisely 2.07 and 4.eleven of pre-set instances for ON and OFF instances, the ability deliver become regulated as favored and not using a energy wastage recorded.

IV. CONCLUSION

The center technology of the advanced gadget concerned the making use of of a microcontroller to control the switching instances of any electric home equipment as favored via way of means of the customers. There changed into a power deliver to the microcontroller and guidelines supported the consumer's instances set, had

been performed via way of means of the controller thru a corresponding indicators to the activation module in which the electric equipment changed into related. The relay in the activation module changed into both activated or de-activated to alter ON or OFF of the equipment. As consumer pre-set or pre-described the times for ON and OFF, the commands had been saved in the reminiscence of the microcontroller for corresponding actions. The studies changed into targeted on designing and implementation of a time switching gadget the usage of the Atmega328 microcontroller. The circuit changed into designed, simulated and soldered the usage of the recognized digital additives and values. The codes had been written, compiled into HEX document and transferred into the reminiscence of the microcontroller. The advanced switching gadget changed into examined and satisfactorily switched ON and OFF air conditioning as favored and pre-set via way of means of the consumer. With of those experimental outcomes, it would be concluded that the goals of this studies were carried out due to the fact the instances to extrade ON and OFF of electrical home equipment had been technically managed and electric powered strength wastage changed into solved

V. REFERENCES

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