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Air Condition Switching and Alarm Controller

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Abstract: *Electronic development growing in large has increased the necessity of social, cultural and economic communication between individuals and communities in various parts of the ground by connecting to wireless networks. This increases result of the need to communicate due to go online networks in all aspects of daily life and needs, which means the need to increase the scope of wireless network every were. The process of expansion of the wireless networks by increasing the number of network optimization Towers Responsible for the delivery of a network of areas around within limited range. So we build System aims to monitor and secure the electronic equipment inside the Point of the Transmission Stations (PTSs).*

Keywords: *Microcontroller, temp controller, Relays, ULN2003 Driver*

I. INTRODUCTION

To protect the devices inside the (PTS) where it use of the latest electronic technology in the system design by using Microcontroller Unit which has high accuracy and speed. The system is to maintain the temperature of electronic equipment room within the specified range ensures that its work efficiently and accurately, and monitors the status of (PTS) in terms of securing the site and cases of fire and leakage of fluid inside and send data directly to another unit working to communicate with a company communications operators to monitor the status of the tower and take the necessary measures to maintain the sustainability of his work efficiently.

II. RELATED STUDIES

The fundamental purpose of this paper is to Protect and ensure safety of the (PTSs).

Therefore, we have designed an electronic system works to control temperatures inside the (PTS) rooms within a specified range through the cooling units installed inside the control room where they are turned on and off by using different patterns of work in order to achieve the temperatures required. In this system has been added to read three different types of sensors the first one is Sensor door which set in the (PTS) gate room gives a reading of the state of the door (open / closed), the second one is Fluid sensors which used to detect fluid leaks inside the tower room finally the third one Smoke sensors which used to detect fire inside the tower room and it detects smoke produced by the fire. All of those data Are collected income to microcontroller then process and resent back through the free contact of relays drivers to another operating system to communicate with the communications company operating the (PTS).

III. METHODOLOGY

Through this paper the pursuing types of procedures and steps were considered:

- A. Accumulating the software.
- B. Compiling Bascom programs.
- C. Running proteus simulator.
- D. Hardware design.
- E. Evaluation of proteus simulator results from experimental test.
- F. Printed Circuit Board Design.
- G. Prototype Design.

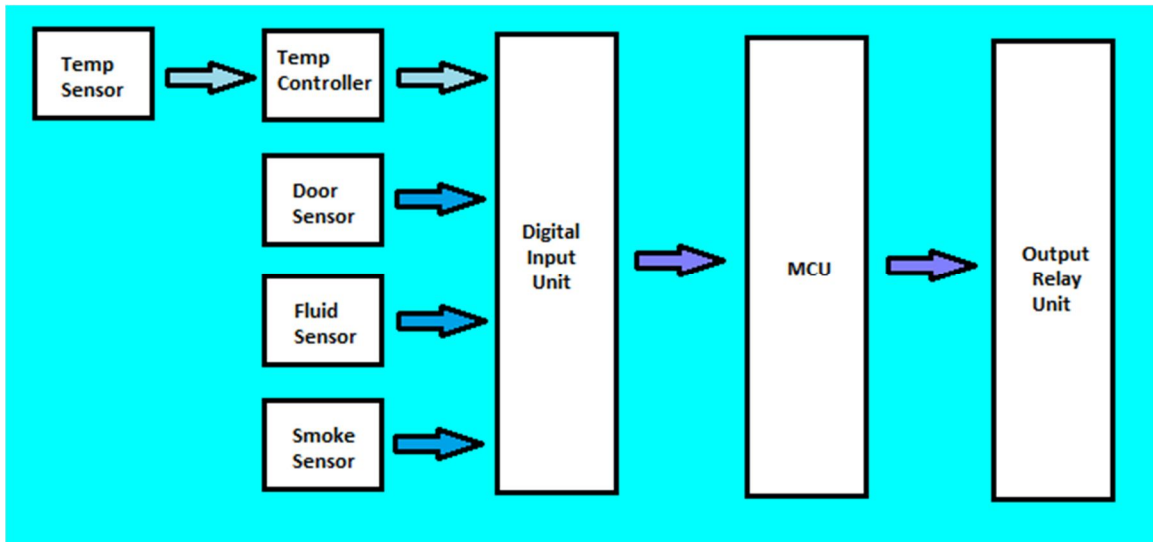


Figure 1: Block diagram of the system

IV. REQUIREMENTS OF AIR CONDITION SWITCHING AND ALARM CONTROLLER

A. ATMEGA32 Microcontrollers

ATmega32 is an 8-bit microcontroller high performance of Atmel's Mega AVR family which is based on enhanced RISC (Reduced Instruction Set Computing) architecture with 131 strong instructions. Instructions execute in one machine cycle. [1, 2]



Figure 2: ATMEGA32

B. Light-emitting Diode (LED)

A light-emitting diode (LED) is a semiconductor light. It is used as indicator for the operator worker inside the room of (PTS). [3, 4]



Figure 3: LED

C. Relay 12VDC

A relay is an electrically operated switch controlling the contactor coil which handles high power which required controlling an electric Air Condition, and another used is Delivering data to another unit device through free contact. [6]



Figure 4: Relays

D. Temperature Controller

Used to measuring temperature using different types of Thermocouple, and it has display and setting modes. [7]

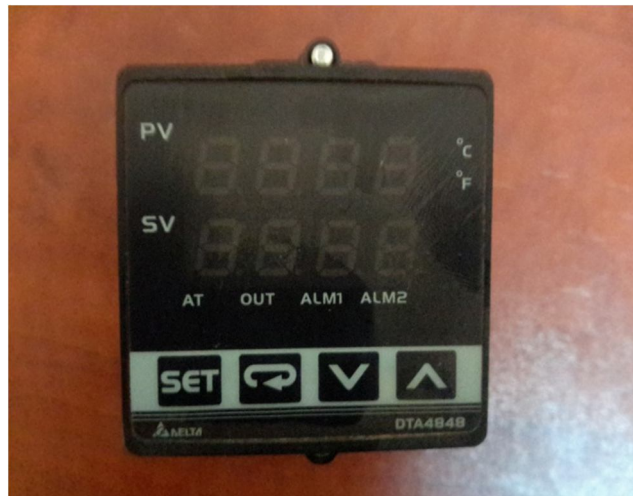


Figure 5: Temperature Controller



Figure 6: Thermocouple J Type

V. DISCUSSION

The system is designed so that it works with two modes manual and auto mode:

A. Manual mode

The operator can control the air conditions (ON/OFF) through Push Button for each one.

B. Auto mode

Controlling of the air conditions operation comes in three cases depend on the temperature degree which can be read from the room of (PTS)

- 1) Temperature degree of the (PTS) room in between the desired target, in this case the system operates each of the two air condition alternately for 6 hours.
- 2) Temperature degree of the (PTS) room up of the desired target, in this case the system shutting down each of the two air condition.
- 3) Temperature degree of the (PTS) room under of the desired target, in this case the system operates each of the two air condition at the same time.

During all that's cases the sensors allowed to read the states of door, smock and fluid and received it by microcontroller to process it and send it through the free contact of relays to another electronic communication unit.

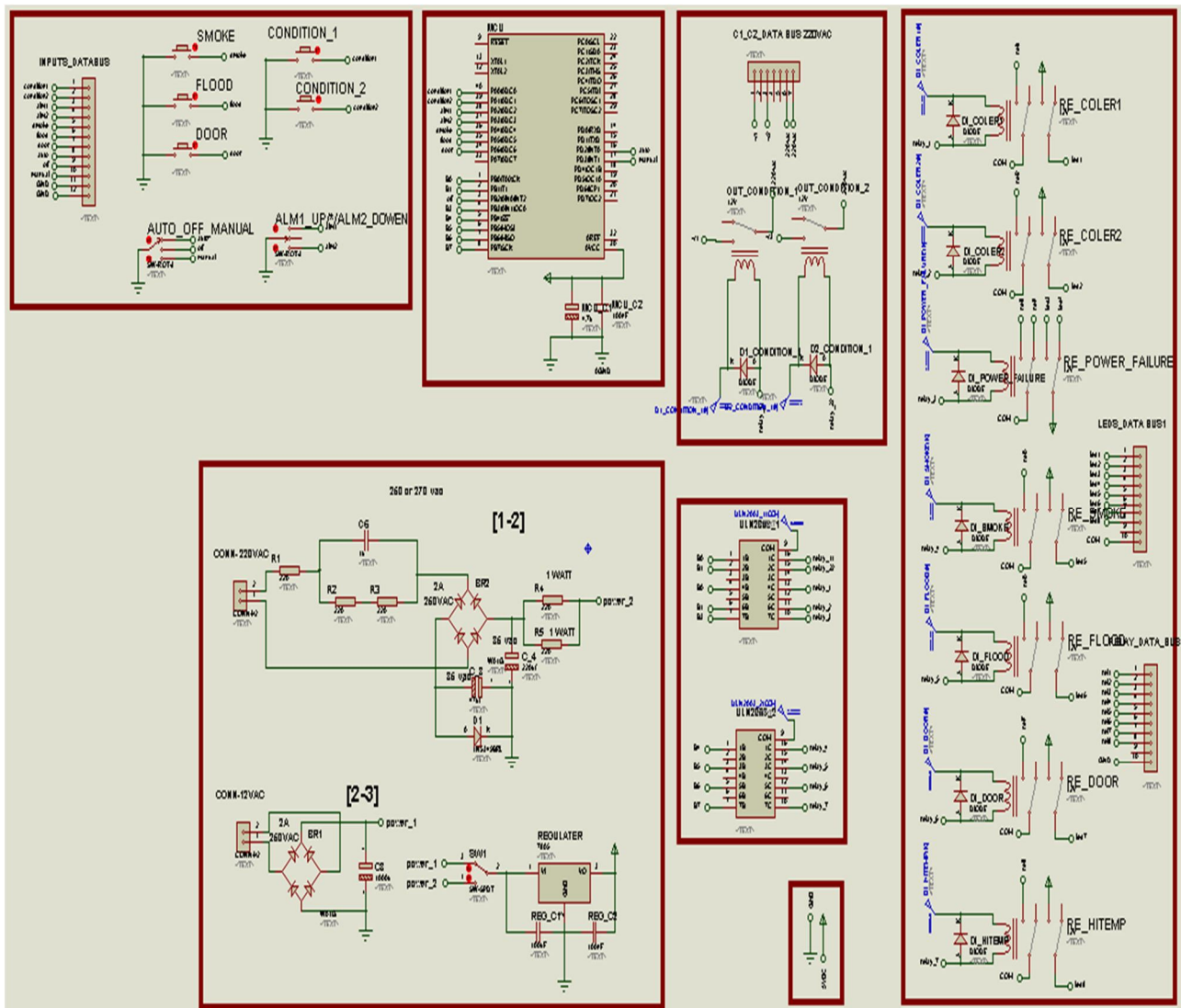


Figure7. Air Condition Switching & Alarm Controlle

Usually display alarm unit just be added to the system case to help the Maintenance worker during doing his job.

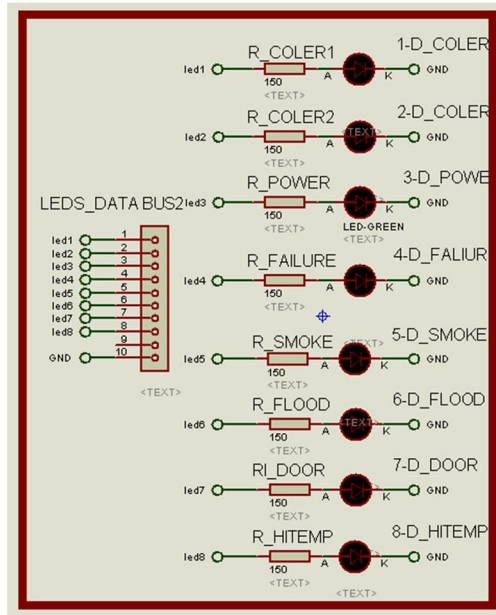


Figure 8: Display Unit

After make simulation for electronic circuit of the system and making sure that the process going correct that’s called debugging for the hex code.

The system now is ready to make it is Printed Circuit Board (PCB).

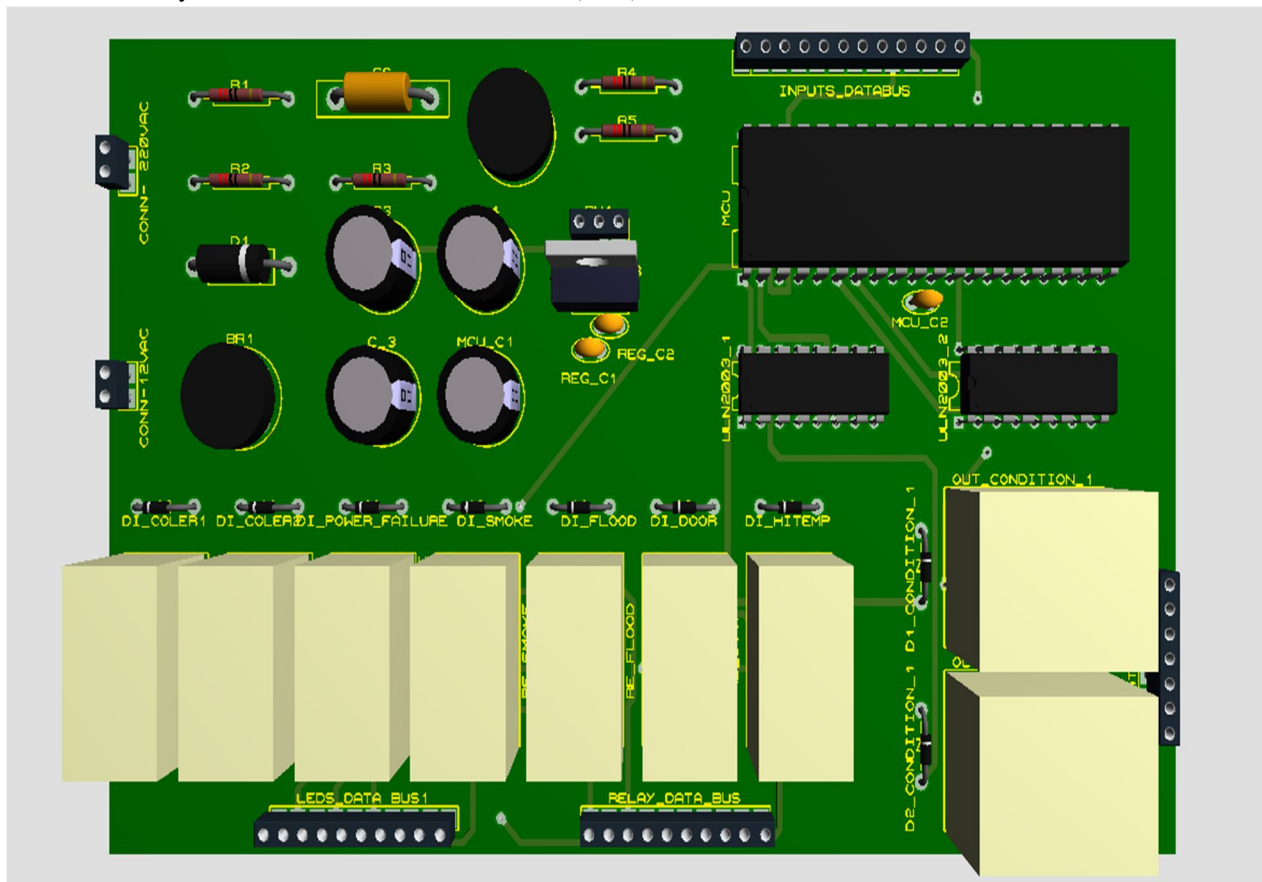


Figure 9: 3D Hardware of Main Control

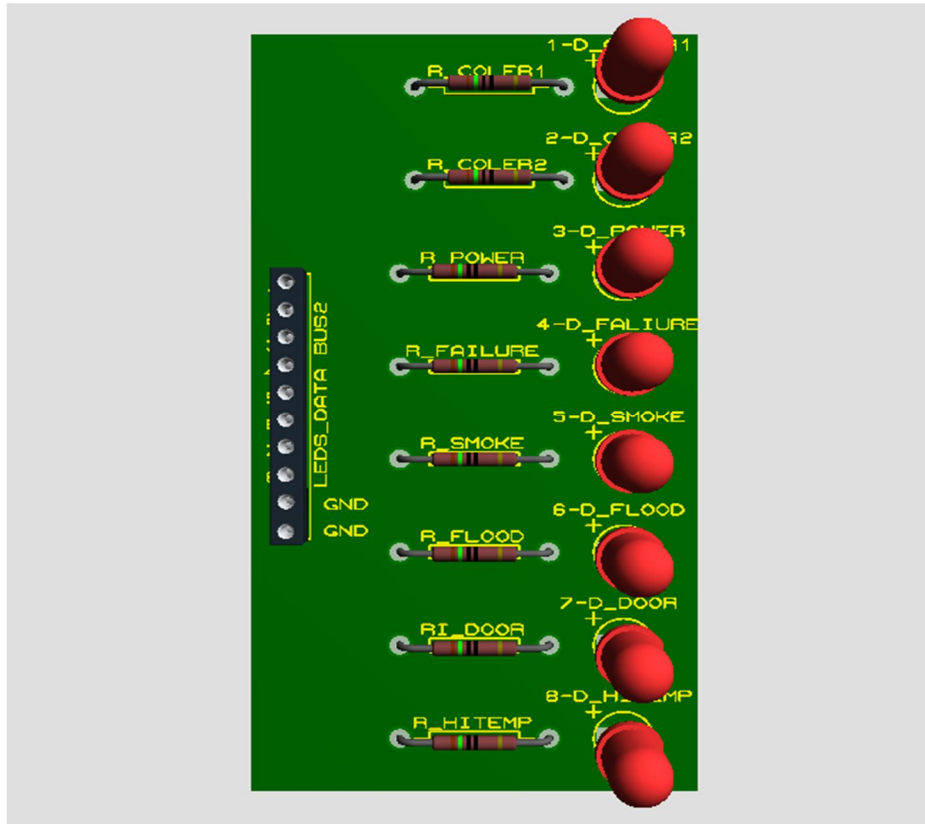


Figure 10: 3D Hardware of Display Unit



Figure 11: Hardware Prototype Out Look



Figure 12: Hardware Prototype from inside

VI. Result and Conclusion

It has been experimenting with the final prototype in one of the (PTS) rooms and the results were very satisfying where it was reducing the cost of the system by the use of a cheap processor cost compared with the classic system. The possibility of failures lower compared with the many faults of classical systems and the possibility of saving maintenance fast and inexpensive for low cost electronic components used on the new design.

REFERENCES

- [1] ATmega32 | Mega32 AVR Microcontroller - Engineers Garage, <https://www.engineersgarage.com/electronic-componenets/atmega32-avr-microcontroller/>; 11/3/2017 time 6:30 pm
- [2] ATmega32/L Datasheet - Atmel datasheets, <http://www.atmel.com/images/doc2503.pdf>; 11/3/2017 time 6:32 pm
- [3] Light-emitting diode - Wikipedia, https://en.wikipedia.org/wiki/Light-emitting_diode ; 11/3/2017 time 7:33 pm
- [4] Light Emitting Diode datasheet, www.nteinc.com/specs/3000to3099/pdf/nte3019.pdf; 11/3/2017 time 7:35 pm
- [5] Relay - Wikipedia, <https://en.wikipedia.org/wiki/Relay>; 11/3/2017 time 8:02 pm
- [6] Power Relays PCB Type , <http://www.ebay.com/bhp/dpdt-relay-12v>; 11/3/2017 time 8:03 pm
- [7] DELTA Temperature Controller - DTB Series - Manual, www.bb-elec.com/Products/Manuals/DTB48-TempController-Manual1-3-06.pdf; 12/3/2017 time 9:05 pm



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