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Implementation of Automatic College/Industry Bell System using Visual Studio &ATMEGA 16 Microcontroller

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Abstract: ***Today is that the world of automation, micro controller and embedded system have made lot of thing automatic and simple to use. Automation is used in homes, industries, commercial and academic sectors. During this work, a micro-controller based Automatic college Bell is intended. This project takes over the task of ringing of the bell in colleges, schools and industries. It replace the manual switching of the bell, this circuit uses an Atmega16 chip to schedule the school teaching and break period and also exam period. The bell is automatically after we set the time. The necessity of an automatic college bell is now a crucial things for accuracy and for time consuming purpose. We will change the fundamental quantity accordingly. The most important advantage of this implementation is that it gives us the precise time and no manual operation is required.***
Keywords: Atmega16, Time selecting unit –RTC, Switches, 7-segment display, Bell, Visual studio 2017.

I. INTRODUCTION

In today's life, everyone gives importance to time. Time doesn't expect anybody. Everything should be performed in time and accurately, such a limitless amount of problems are occurred. Hence to avoid such a problems we should use automatic college bell for saving time and money. During this micro-controller and software is employed for controlling all the functions and time is displayed on four 7-segment Display by using RTC. A bell is an instrument employed in schools, colleges that indicates the time for faculty kids, Faculty, Employees. When it's time to trip the category and when it's time to vary classes during the day. No other instrument is such a touch. In schools, industries, colleges, and railway stations and in real time applications bell could even be a vital instrument and it's simple to use and handle. When now equals to the bell ringing time, then relay for the bell is switched on. After every classes, once employee is engaged into operating the bell automatic use bell helps us to avoid this. to style bell software we used visual studio 2017 software. During this project we use C# language. During this software for security purpose we design authentication form. That software provides 2 modes, first is regular mode and second is exam mode. In regular mode two separate panels, one is to line the time for Monday-Friday and second is for Saturday. User can changed panel from setting panel. In exam mode we provide one panel to line different time for exam purpose. For device connection we are using serial communication port and cargo the COM port of our computer

II. LITERATURE SURVEY

This paper published for hardware implementation of a low power automatic bell which can be used in educational institutions and the power estimation details. Bell rings automatically and then displays the time in the 7-segment display continuously. The low power aspect is brought about by using" SLEEP" mode in pic micro-controller which kips the system in idle state when it is not in use. The main advantage of this project is that it gives us the accurate time and no manual operation is needed while using very low power. The system is made by introduce a serial interface between pic micro-controller (PIC16F877A) and a real time clock (RTC) IC, DS1307. The software program coding part is done using MPLAB IDE and hardware implementation is done using the components. The estimated power consumption is also given.This paper describes a full automatic teletypewriter message switching system for use in private-line networks involving one or more switching centres and a multiplicity of local or long-distance lines, each of which may have one or more stations. This system provides fast teletypewriter communication from any station to any other station or group of stations in the network. At its point of origin a message first is perforated in tape accompanied by suitable directing and end-of-message characters, thereafter it is transmitted automatically, stored temporarily in perforated tape at a switching office, and then routed at high speed to its point or points of destination. Important features are the arrangements provided to permit efficient use of long full duplex transmission lines, the full automatic handling of multiple-address messages with only a single originating transmission, and the various guards and alarms which are provided to protect against loss of messages in case of trouble. The Bell Telephone System wire spring relays have become the basic circuit components of telephone switching systems developed during the past few years. These relays are provided in many varieties to meet circuit needs.

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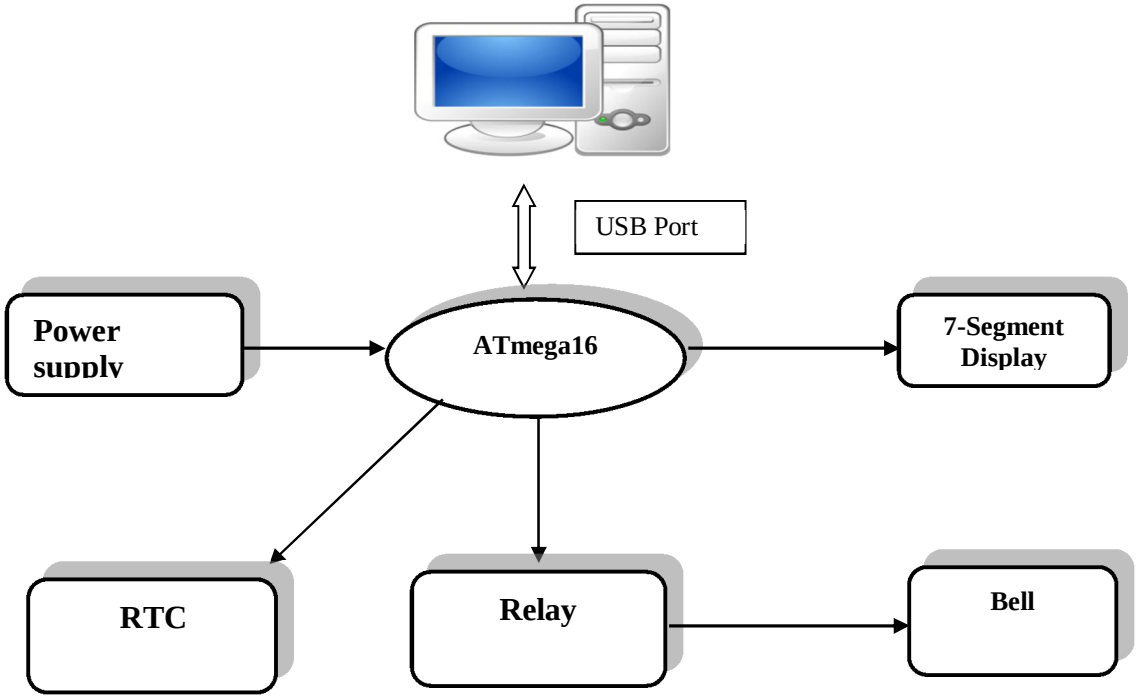
They are similar in operation and construction and have been described to a large extent in earlier publications. It is the purpose of this paper to highlight some of the design features which permit automatic control, during manufacture, of important operating characteristics.

III.BLOCK DIAGRAM



A. Atmega 16

Fig. 2. ATmega16

Atmega16 may be a 40-pin low power microcontroller which is developed using CMOS technology. CMOS is a sophisticated technology which is principally used for developing integrated circuits. It comes with low power consumption and high noise immunity.Atmega16 is an 8-bit controller supported AVR advanced RISC (Reduced Instruction Set Computing) architecture. AVR is family of microcontrollers developed by Atmel in 1996.It is one chip computer that comes with CPU, ROM, RAM, EEPROM, Timers, Counters, ADC and 4 8-bit ports called PORTA, PORTB, PORTC, PORTD where each port consists of 8 I/O pins.

B. RTC (Real Time Clock)

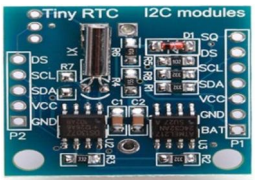


Fig. 3 .RTC

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The DS1307 serial Real-Time clock may be a low power, full binary coded decimal (BCD) clock/calendar plus 56 bytes of NV SRAM. Address and data are transferred serially via a 2-wire, bi-directional bus. The clock/calendar provides seconds, minutes, hours, day, date, month, and year information.
The tip of the month date is automatically adjusted for months with fewer than 31 days, including corrections for intercalary year. The clock operates in either the 24 hours or 12 hours format with Am/PM indicator. The DS1307 features a built-in power sense circuit that detects power failures and automatically switches to the battery supply.

C. Power Supply

The first function of an influence supply is to convert electrical phenomenon from a source to the right voltage, current, and frequency to power the load. As a result, power supplies are sometimes remarked as wattage converters. Some power supplies are separate standalone pieces of kit, while others are built into the load appliances that they power.

D. Relay

Fig. 4.Relay

Relays consist of three pins normally open pin, normally closed pin, common pin and coil. When coil powered on magnetic field is generated the contacts connected to each other.

E. 7-Segment Display

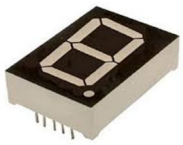

Fig. 5. 7 -segment display

A seven-segment display is a form of electronics display device for displaying decimal numerals that is an alternative to the more complex dot matrix displays. Seven-segment displays are widely used in digital clocks, electronic meters, basic calculators, and other electronic devices that display numerical information.

F. USB Port

Fig.6. USB Port

Short for universal serial bus, USB is that the plug and play interface that enables a computer to speak with the peripheral and other devices. USB connected devices cover a board range; anything from keyboards and mice, to music players and flash drivers. USB may be accustomed send power to send devices, like smart phones and tablets, still as charge the batteries. The primary commercial releases of theUSB (version 1.0) was in January 1996. This industry standard was then quickly adopted by Intel, Compaq, Microsoft, and other companies.

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G. Bell

Fig. 7. Bell

An electric bell may be a mechanical or electronic bell that functions by means of an electromagnet. When an electrical current is applied, it produces a repetitive buzzing, clanging or ringing sound. Electric bells are widely used at railroad crossings, in telephones, fire and burglar alarms, as school bells, doorbells, and alarms in industrial plants, since the late 1800s, but they're now being widely replaced with electronic sounders. an electrical bell consists of 1 or more electromagnets, fabricated from a coil of insulated wire around an iron bar, which are a magnet for an iron strip armature with a clapper. When an electrical current flows through the coils, the electromagnet creates a field which pulls the armature towards it, causing the hammer to strike the bell.

IV. WORKING

Power ON the switch and connected USB port to the computer. In this project we used two switches are provided in the circuit. First is used for increasing hours and second is for increasing minute by pressing this switch. We should adjust the timing in hours and minute according to our computer time. After adjusting the time, controller write this time in the RTC. The RTC will increment time accordingly and send it to the micro-controller. This command is using I2C protocol. When controller get the time, it convert the data in digit to 7-segment and send it to 7-segment to display it. After that we have to set the bell time in the software. For that first we have to open the software name as Bell. To design bell software we used visual studio 2017 software. In this project we have use C# language. In this software for security purpose we design authentication form. That software provides 2 modes, first is regular mode and second is exam mode. In regular mode two separate panels, one is to set the time for Monday-Friday and second is for Saturday. User can changed panel from setting panel. In exam mode we provide one panel to set different time for exam purpose. For device connection we are using serial communication port and load the COM port of our computer.

A. Software Description

1) *Visual studio 2017:*To design this switch we used Visual studio 2017 software. In this project we have using c# language used. In this software for security purpose we design authentication form. For device connection we are using serial communication port. In this switch we have 2 mode first mode is Monday-Friday and second mode is for exam. In regular mode two separate panels one is for Monday-Friday and second is for Saturday. User can changed panel from setting panel.Visual Studio is an Integrated Development Environment (IDE) developed by Microsoft to develop GUI (Graphical User Interface), console, Web applications, web apps, mobile apps, cloud, and web services, etc. With the assistance of this IDE, you'll be able to create managed code similarly as native code. It uses the assorted platforms of Microsoft software development software like Windows store, Microsoft Silver light, and Windows API, etc. it's not a language-specific IDE as you'll be able to use this to put in writing code in C#, C++, VB (Visual Basic), Python, JavaScript, and lots of more languages. It provides support for 36 different programming languages. It’s available for Windows similarly as for macros.

V. ADVANTAGES

A. It is an automation system.
B. Human errors can be avoided.
C. Safety is assured.

VI. APPLICATIONS

A. It is used in colleges, schools.
B. Also used in industries.
C. In railway station and airport.
D. Digital watches, washing machine, oven.

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VII. RESULT

Fig. 8. Result

VIII. CONCLUSIONS

Now a day's bells are operated manually in schools and colleges because of this there are many problems occurs. To overcome from this, we have decided to prepare the circuit as well as software which will be operated manually and the ringing of bell will starts by its given time.

Automatic college bell can be used in school, colleges as well as industries for accuracy purpose. As per to save man power and also to save time its cost effective project which can be built using easily available equipment. It can be used in real time in the school and in the colleges, this can included in every educational institution. As per the timing we can easily programmed by common laymen and can also vary timing for some classes as per the schedule of the school or collages. They display of the time in the project also increases its effectiveness.

IX. ACKNOWLEDGMENT

It is our great pleasure to present the honour and sincere gratitude to our guide Mr. A. J. Chinchwade. Dept. of Electronics and Telecommunication. Sharad Institute of Technology Polytechnic, Yadrav helped in joining the hands in developing each and every steps of this project and for valuable guidance and constant encouragement during completion of project work. It was our privilege and pleasure to work under his valuable guidance. We are indeed gratefully to him for providing us helpful suggestions. Due to his constant encouragement and inspiration we could complete our project work.

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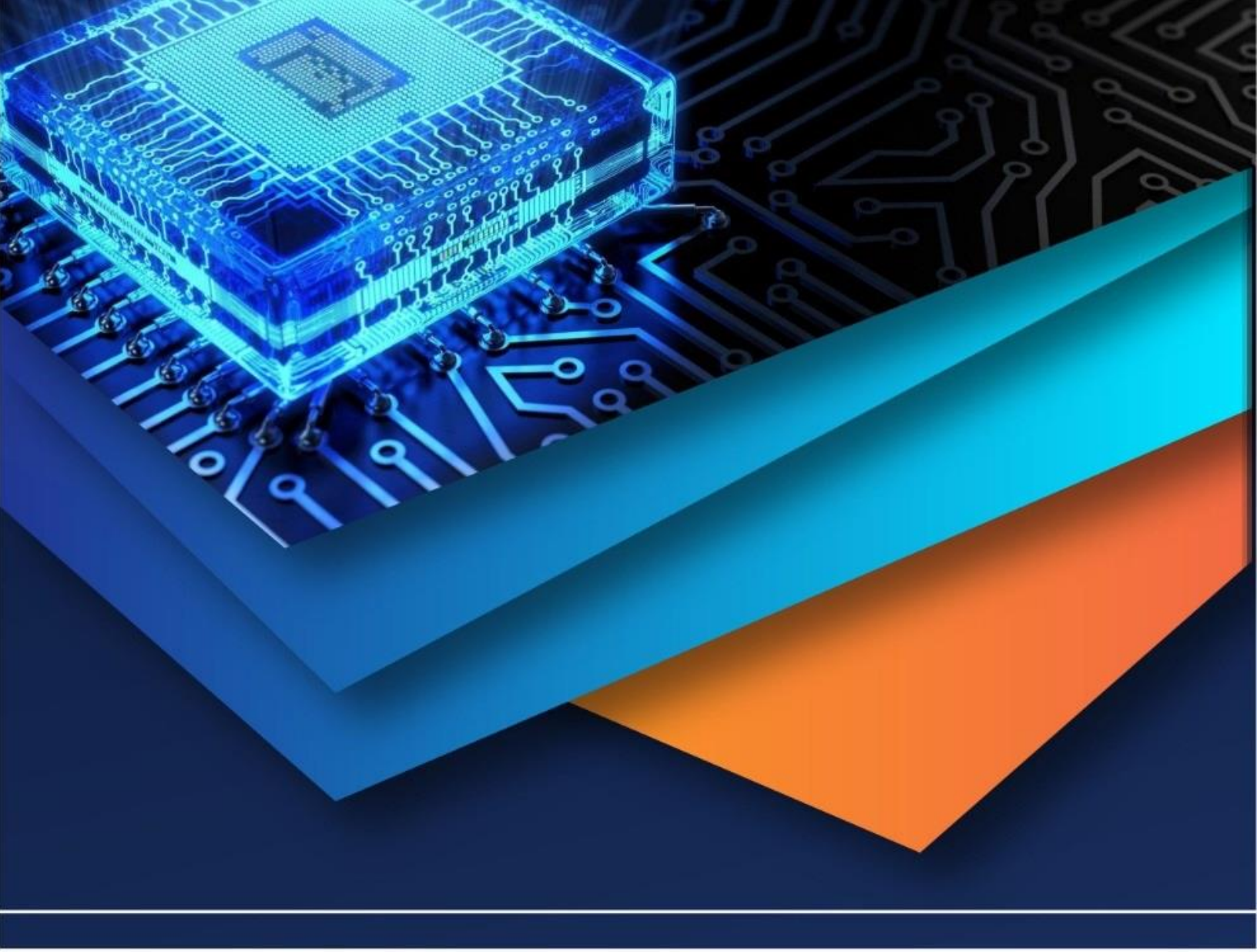

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