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Automatic Bell System With User Friendly Graphical Time Setting Function Using Keypad And Lcd

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Abstract: The main purpose of this project is to create automation in bell system. Since the proposed system is independent of any person so as a result it increases the efficiency of the overall system. Since it is a digital system that's why it can measure time and respond accurately. The whole time table of college lectures is programmed into the memory of microcontroller. Current time can be setup by using 4x4 keypad very easily at any time and bell ring as per feed duration. The bell rings whenever the programmed time becomes equal to the real time and this bell is activated via a relay system. The timing can be edited in order to create extra lectures. The proposed system can be made password protected so that only authorized person can operate it. It is microcontroller based system which is programmed in embedded C language.

Keywords: Electric bell, LCD (Liquid Crystal Display), ATmega8, microcontroller, hex file, Embedded C, ADC (Analog to digital converter), Temperature Sensor, LM35.

I. INTRODUCTION

Clock towers can be heard over long distance which was especially important in the time when clocks were too expensive for widespread use. Still Somewhere at present bells for periods in schools are operated manually. After every class, one employee (usually a peon) has to engage into operating the bell and this can be avoided by using the proposed system. This design takes over the task of ringing the bell manually, as the bell would ring automatically at the schedule time [1].

Now a day, school/college bells are operated manually by human presence. Hence first there is a question of accuracy and second there is also necessity of manpower which also makes system money consuming. Hence we have proposed an idea, which saves manpower, money and time. A bell is a percussion instrument which is used in schools and colleges to remind the students about starting and ending of lectures within a day. It makes it an important instrument in educational institutes as well as industries where it plays a vital role by scheduling task throughout the day.

The proposed system is inbuilt with a Real Time Clock which follows actual timing. When the actual time equals to the lecture time then bell is switched ON via relay. The real time clock is displayed on LCD display. This is a practically effective design to control the working of college bell.

II. DESCRIPTION OF HARDWARE

The proposed system is based on AVR architecture based ATmega8 Microcontroller. The features of this Microcontroller include inbuilt ADC (analog to digital converter), internal oscillator and timer/counter control circuitry, both hardware 7 software interrupts; serial data communication etc. Here temperature sensor analog data is converted into digital data by inbuilt ADC and this digital data is converted into temperature value by using equation 1 & 2.

Formula used for digital value to Voltage Conversion is as follows,

$$V = \frac{5.00 \times (D+1)}{1024} \quad (1)$$

LCD is interfaced in the proposed system to visualize the output of the application. Alphanumeric 16x2 LCD has 16 columns and 2 rows so the total of 32 characters can be displayed on 16x2 LCD. Here current timing and temperature is being displayed on LCD. LCD is also being used while setting up lecture timing dynamically. Thus LCD plays a vital role in a project to see the output as well as to debug the system module wise in case of system failure in order to rectify the problem.

One of the important steps in the designing of any system is to design the power supply. There are following steps involved in the designing like first determine the total current that the system sinks from the supply and second is to determine the voltage rating required for the different components. An electric bell is a mechanical bell that functions by means of an electromagnet. It is used to produce a repetitive buzzing or

clanging sound. Electric bells have been widely used at railroad crossing, in telephones, fire and burglar alarms, as school bells, doorbells, and alarms in industrial plants, since the late 1800s, but they are now being widely replaced with electronic sounders. It consists of coils of insulated wire wound round iron rods [2].

Keypad is a set of buttons that are arranged in a block or "pad" which usually consist digits, symbols and a complete set of alphabetical letters. If it mostly contains numbers then it is called a numeric keypad. Keypads are found on many alphanumeric keyboards and on other devices such as calculators, push-buttons, telephones, combination locks, and digital door locks which require mainly numeric input.

Temperature can be measured more accurately by using LM35 temperature sensor than a using a thermostat. The sensor circuitry is sealed and not subject to oxidation. The LM35 generates a higher output voltage than thermocouples and may not require that the output voltage be amplified.

Formula used for Voltage to Temperature Conversion is as follows,

$$(2)$$

III. DESCRIPTION OF SOFTWARE

Embedded C compiler based software is used to create a hex file using Code Vision AVR(CVAVR). CVAVR-Code vision AVR is a C cross-compiler, integrated development and automatic program generator designed for the Atmel AVR family of microcontrollers. The program is designed to run under the windows 98/Me/NT 4/2000/XP/vista 32 bit operating systems. The C cross-compiler implements nearly all the elements of the ANSI C language, as allowed by AVR architecture, with some features added to take advantage of specificity of the AVR architecture and the embedded system's needs [8].

Then simulation software (PROTEUS) is used to test the prepared code as shown in fig.1. Khazama AVR programmer is software used to burn the hex file into the microcontroller.

IV. ADVANTAGES

Time table can be modified as per change in requirement by using without having any prior technical knowledge. It is an automatic system which does not depend upon any human resources. It is very cheaper to make.

V.CIRCUIT DIAGRAM

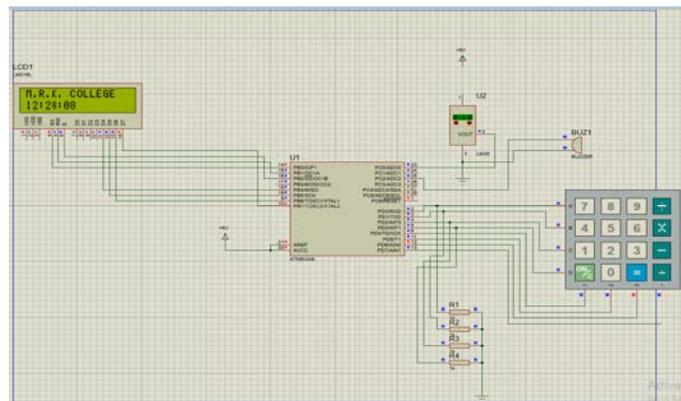


Fig.1. Proteus view of proposed system

VI. WORKING

The keypad is programmed so that it can be used as per requirement. The working of the keypad is described as the four pins of the microcontroller are used as outputs, and other four pins are used as inputs. In order for keypad to work properly, pull down resistors should be placed on the microcontroller's input pins, thus defining logic gates when input pin is pressed. Then, output pins are set to logic 1 and input pins logic state is read. By pressing any button, logic 1 appear on same input pin. By combining zeros and ones on the output pin, it can be determined the button which has been pressed.

Initially time table of lecture is set in microcontroller by programming. Then it is required to set the current time by the keypad. As the lecture ends, the bell will start ringing for few seconds and then it automatically stop and then the time will be continue and so on. As an added feature it also checks the temperature of environment and show on LCD display.

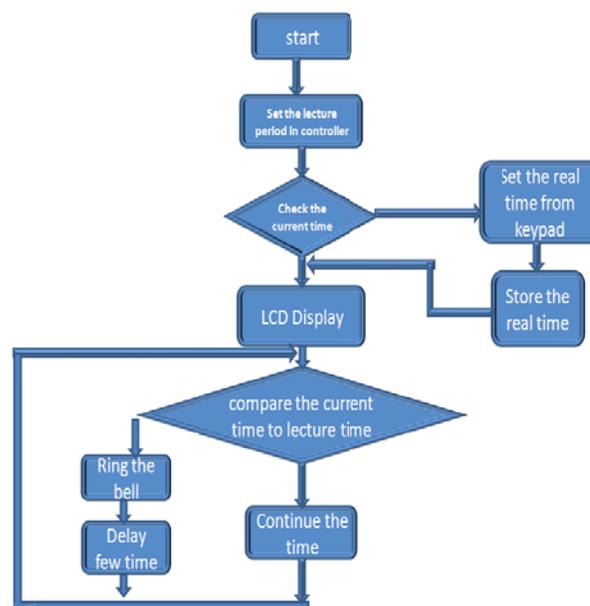


Fig.1. Proteus view of proposed system

As shown in the flowchart, First of all user need to start the system and after that “set the time” displays on LCD. As user sets the current time and click ok button, the timer will start continuously like a clock. When the time becomes equal to the lecture ending time then the bell is started ringing and keep ringing for the programmed time.

VII. FUTURE DEVLEPMENT

A lot more advancement can be done in this design. It can be made password protected so that only authorized person can change its setting. It can also be made by using GSM technology [1] & [3] where the system can be controlled by GSM. Automatic bell system can be updated to create announcements.

VIII. CONCLUSION

In the present day, bell system is carried out manually in colleges or schools and therefore it comes to big disadvantage that one person has to be alert always; this makes him unavailable for another task. To overcome this problem, we have decided to propose the circuit which will be operated automatically and the bell rings by its own time. Another main point is that the lecture duration can be edited as per requirements. This circuit is simple to prepare and easy to install. It will be much useful for colleges or schools or other educational institutions.

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