Microcontroller Controlled Automatic College Bell with Display By Using RF

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Abstract- *This paper describes the automatic control of electrical overhead smarttrolley craneAEOSTC. An overhead travelling crane, also known as a bridge crane, is a type of crane where the hook-and-line mechanism runs along a horizontal beam that it runs along two widely separated rails. The advantage of the box girder type configuration results in a system that has a lower deadweight yet a stronger overall system integrity. Also included would be a hoist to lift the items, the bridge, which spans the area covered by the crane, and a trolley to move along the bridge. The operation of overhead travelling crane is completely controlled by using Programmable Logic Controller (PLC) which is used for automation of real-world processes, such as control of machinery on factory assembly lines.*

The need for an automatic school/college bell is now a necessity which has been evolved with the revolution in technology and boost in the education system where time is a major factor affecting the educational system where the time has to be accurate. Man power can also be saved with the use of automatic college bell as it is not to be operated manually and manpower can be saved it is also more accurate than the manual bell systems.

The bell ringing time can be edited at any time, so that it can be reused again and again at normal class timings as well as at exam times. Also it can be made password protected so that no unintended person can operate this system except for the operator. For this a microcontroller has to be programmed using the C language or assembly language for controlling the circuit.

Keywords- Automation, microcontroller AT89S52, time selecting unit, break period, keypad.

I. INTRODUCTION

The AT89s52 a lower power, high-performance CMOS 8-bit microcontroller with 8k bytes of insystem programmable flash memory. The device is ATMEl manufactured high density non-volatile memory technology and is compatible with the industry standard 80c51 instruction set and pin out. The inbuilt flash allows the program memory to be programmed in-system or by usual programming. By passive components formed in a single chip, the ATMEL at89c51 is a powerful microcontroller which provides the following standard features: 8k bytes of flash, 256 bytes of RAM, 32 I/O lines, and architecture, a full duplex serial port, on-chip oscillator, and clock circuitry [1-2]. The at89s52 is an easily available microcontroller with more memory than any other microcontroller. Its port are totally functional and can be used with the real time clock without any other IC being used its inbuilt flash makes it easier for the user as we do not need any external memory for the circuit.

Hence there is a big question of accuracy. Also there is necessity of manpower and money. Hence here we have presented a system, which saves our manpower and money & also give highest accuracy. A bell is a percussion instrument used in schools and colleges that indicates the students when it is time to go to the class in the morning and when it is time to change classes during the day.

In today's life automation is very important in real time for saving the time and its accuracy. Each and every second's is precious for everyone in the competitive world. "Time is the most valuable thing a man can spend, Nothing can stop automation" so here automation is used to give the accuracy and save the man power. In now a day's school/college bells are operated manually. Hence there is a big question of accuracy also there is a necessity of man power and money. Hence here we have presented a system which saves our man power and give accuracy

POWER SUPPLY:

On the power supply of the circuit the circuit is used to convert AC supply into DC supply. The supply is basically used for LCD display, microcontroller and also to all the functions of the circuit.

PIC MICROCONTROLLER:

PIC stand for peripheral interface controller it is very convenient choice to get start with microcontroller project.PIC is a smallest microcontroller and programmed to carry out a huge range of tasks. These are found in many electronic device such as computer controlled and embedded system

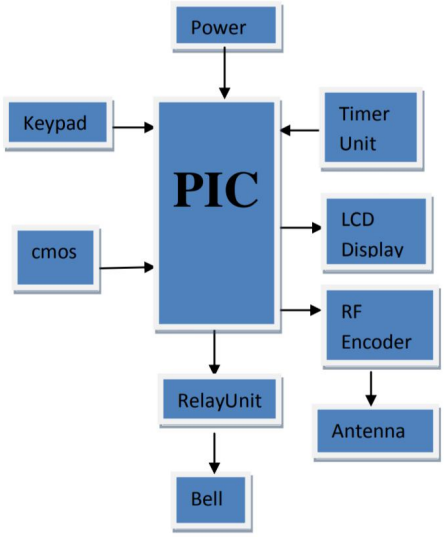

Fig.1: Block diagram of automatic bell control system

Relay:

Relay is electro-mechanical device which is used to isolate one electrical circuit from another. It allows a low current control circuit to make or break an electrically isolated high current circuit path. Total isolation is provided by the relay between the triggering source applied to the terminal and the output. This total isolation is a feature that makes relay different from other integrated circuits and is also important in many digital applications. It is a feature that certain semiconductor switches (e.g. transistors, diodes and integrated circuits) cannot provide. In this circuit a 12V magnetic relay is used. In magnetic relay, insulated copper wire coil is used to magnetize and attract the plunger .

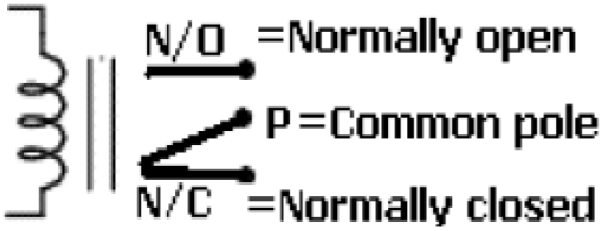

Fig.2: Relay circuit

Display unit:

This is the first interfacing example for the Parallel Port. This example doesn't use the Bi-directional feature found on newer ports, thus it should work with most, if not, all Parallel Ports. It however doesn't show the use of the Status Port as an input. These LCD Modules are very common these days, and are quite simple to work with, as all the logic required to run them is on board. The LCD panel's Enable and Register Select is connected to the Control Port. The Control Port is an open collector / open drain output. While most Parallel Ports have internal pull-up resistors, there are a few which don't. So we can add external pull resistors which makes the circuit more portable. Therefore by incorporating the two 10K external pull up resistors, the circuit is more portable for a wider range of computers, some of which may have no internal pull up resistors. We hard wire the R/W line of the LCD panel, into write mode. This will cause no bus conflicts on the data lines.

Bell controller:

It gives the bell sound according to the given time. It is used to hear the bell sound after particular time period programmed in the circuit. We can also reuse the programagain and again for the different time period.

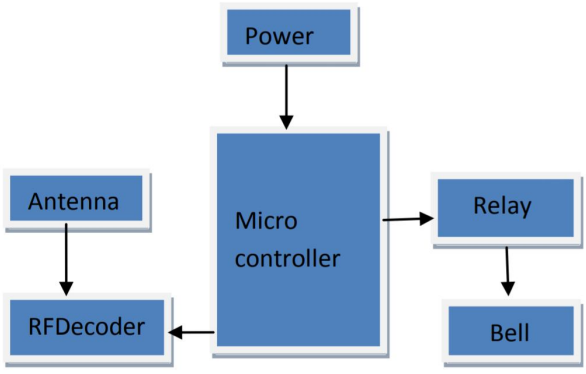

Fig.3: Bell micro controller

Keypad:

Keypad is a set of buttons that are arranged in a block or "pad" which usually bear 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. 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, a logic 1 appear on same input pin. By combining zeros and ones on the output pin, it can be determined which button has been pressed.

Table 1: Keypad inputs and readings

Column	0111	1011	1101
0111	1	2	3
1011	4	5	6
1101	7	8	9
111 0	*	0	#

A 4X3 keypad unit is used here. It is used to initialize the RTC, display day, display/modify the alarm timings.

Alarm unit :

When the real time and alarm time becomes equal, the alarm unit is invoked. It consists of a relay and a buzzer. When the time becomes equal, the relay is switched and buzzer sounds.

Power supply unit:

A power supply of +12V and +5V is required for circuit operation. A supply of +12V is required by the relay. +5V supply is required by the microcontroller, RTC and the pull-up resistors. A step-down transformer of 12V rating and Power regulator IC LM7805 is used. The AC mains power supply of 230V, 50Hz is step-down using the transformer to +12V. A bridge rectifier circuit using diodes is connected at the secondary of the transformer. This is fed to the relay and power regulator.

Voltage regulator:

Voltage regulator ICs 7805 are available with fixed (typically 5, 12 and 15V) or variable output voltages. The maximum current they can pass also rates them. Negative voltage regulators are available, mainly for use in dual supplies. Most regulators include some automatic protection from excessive current (over load protection) and overheating (thermal protection). Many of fixed voltage regulator ICs has 3 leads. They include a hole for attaching a heat sink if necessary.

Future development:

A lot more advancement can be done in this design. The advantage of this design is that the timings can be edited according to an individual's requirement. Hence it can be reused infinite number of times. Another advantage is that it provides security since it uses a password. It can also be made by using gsm. Through gsm the RTC can be controlled and so the timings can be edited. Automatic bell system with announcement can be made. In future much advanced automatic bell system can be made.

RADIO FREQUENCY:

RF is a small electronic device to transmit and receive radio signals between two devices. In embedded system it is often desirable to communicate with another device wirelessly.

HARDWARE TOOLS:

- LCD Display
- PIC Micro controller Power supply
- Keypad
- Relay unit Bell
- Timer switch unit RF
- Encoder
- decoder
- Micro controller (Atmel)

SOFTWARE TOOLS:

Keil s/ Rows
Version
C Programming

FUTURE DEVELOPMENT:

A future development can be done with the GSM. A lot more advancement can be done in this design. The advantage of that the timings can be edited according to an individual's requirement. Hence it can be reused infinite number of times. Another advantage is that it provides security since it uses a password. It can also be made by using gsm. Through gsm the RTC can be controlled and so the timings can be edited.

II. CONCLUSION

A automatic college bell can be successfully designed and can be applicable in school and colleges as per to save

manpower and also to save time it's a cost effective project which can be built using easily available equipment and can be used in real time in the school and in the colleges this can be included in every educational institution as per the timing which can be easily reprogrammed by a common laymen and can also vary timing for some classes as per the schedule of the school. The display of time in the project also increases it effectiveness.

Present day ringing the bell in colleges or schools are carried out manually. The main disadvantage of this is that one person has to be alert for this. At the same time during that time he could not be engage in another task. To overcome from this, we have decided to prepare the circuit which will be operated automatically and the ringing of bell will start by its own time. The time input can be edited as per requirements. This circuit is simple to prepare and easy to install. We can say that it will be much useful for colleges or schools or other educational institutions.

The basic design of the Automatic School Bell (mainly for Primary and Secondary Schools) in this work remains the same though extra functions can be included. This will ring the School Bell at pre-scheduled times of periods on each day. There are different times per period varying from one school to the other. The basic design provides an opportunity of selecting the suitable time schedule for every school by momentarily pressing one of the push-to-on switches. This signals the microcontroller to carry out the specific task, thereby ringing the bell at a regular time interval.

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