



AUTOMATIC TIMER SIREN

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Abstract: In today's life, everyone gives importance to time. Time does not wait for anybody. Everything should be performed in time & accurately. Now a day's in industry used siren manually. Hence there is a big question of accuracy also there is necessity of manpower & money. Hence here we should use automatic control system, which saves our manpower & money & also highest accuracy. Hence we select the project. It replaces the Manual Switching of the Bell in the industry. This is suitable as per the requirement of industry time. Today's microcontrollers are much different from what it were in the initial stage, and the number of manufacturers are much more in count than it was a decade or two ago. At present some of the major manufacturers are Microchip (publication: PIC microcontrollers), Atmel (publication: AVR microcontrollers), Hitachi, Phillips, Maxim, NXP, Intel etc. Our interest is upon ATmega32. It belongs to Atmel's AVR series micro controller family.

Keywords:-ATmega328/p, 16*2 LCD display, Relay, Real Time Clock(DS3231), Regulator IC7805, Double Mounting Siren.

1. INTRODUCTION

This project is an innovative idea which can be developed and implemented to Automatic Timer Siren. As we all know that communication is the vast developing field and we are the witness of several such developments. Day today in our life we experiences these development and only because of the communication our life style, mode of living, culture etc had been changed. Manual operation of siren creates lot of disturbances caused by human errors. If the siren operator forgets to ring the siren in a specific period, or delayed to ring the siren, it creates disturbances for entire the industry. All the workers on that day will be completely disturbed. This problem is more present if the siren operator is on leave. Our Project takes over the task of Ringing of the Siren in Industry. It replaces the Manual Switching of the Siren in the Industry. It has an Inbuilt Real Time Clock which tracks over the Real

Time. When this time equals to the Ringing time, then the Relay for the Siren is switched on. The Siren Ringing time can be edited at any Time, so that it can be used at Normal Timings . The Real Time Clock is displayed on LCD display. The Microcontroller ATmega328 is used to control all the Functions, it get the time through the keypad and store it in its Memory. And when the Real time and Siren time get equal then the Siren is switched on for a predetermine.

2. EXISTING TECHNOLOGY

We offer the automatic Time Ring system for school & industrial bell/siren system .we make custom based product design. Unique Features Programmable Up to 20 different Timings. Independently settable for seven days in a week. LCD Screen Automatic Timer Switch For Lights/curtains/bells With Multiple time Settings, Find Complete Details about LCD Screen Automatic Timer Switch For Lights/curtains/bells With Multiple time Settings, Wall Switch Timer, Timer Switch, Timer Lights. Alarm Bell / Siren It's widely used in Industry. One-six different tones for choose .111-118dB Alarm Bell / Siren horn: SC508Electronic characters:ModelRatedCurrent(mA)SPL(dB/lm)Power Out(W)G.

3. HARDWARE MODULES

The automatic control system adopted the ATmega328/p, the principle of the hardware chart as show in fig.1.

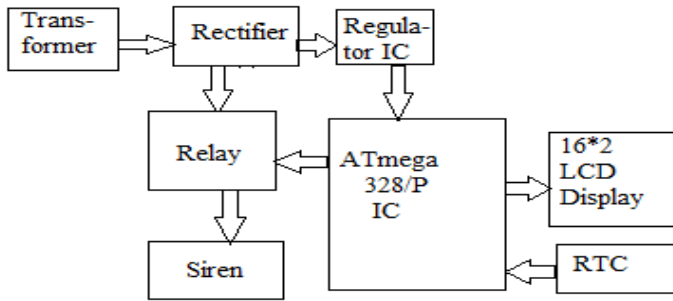


Fig.1: Block Diagram of Automator Timer Siren

3.1 ATmega328/p Microcontroller: The Atmel® pico Power® ATmega328/P is a low-power CMOS 8-bit microcontroller based on the AVR® enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega328/P achieves throughputs close to 1MIPS per MHz. This empowers system designer to optimize the device for power consumption versus processing speed. The ATmega328/P is supported with a full suite of program and system development tools including: C Compilers, Macro Assemblers, Program Debugger/Simulators, In-Circuit Emulators, and Evaluation kits.

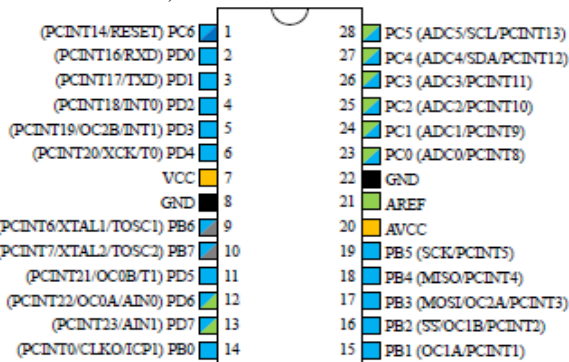


Fig.2: Pin Diagram of ATmega328/p

3.1.1 FEATURES:

High Performance, Low Power Atmel®AVR® 8-Bit Microcontroller Family

- Advanced RISC Architecture
 - combine 32KB ISP flash memory with read-while-write capabilities
 - 2KBytes Internal SRAM
 - 1024B EEPROM
 - Two 8-bit Timer/Counters with Separate Prescaler
 - 23 general purpose I/O lines
 - 32 general purpose working registers
 - Two Master/Slave SPI Serial Interface
 - One Programmable Serial USART
 - One On-chip Analog Comparator
 - 3 flexible timer/counters with compare modes
 - internal and external interrupts
 - 23 Programmable I/O Lines
 - 28-pin PDIP, 32-lead TQFP, 28-pad QFN/MLF and 32-pad QFN/MLF
- Operating Voltage:
 - 1.8 - 5.5V
- Temperature Range:
 - -40°C to 105°C

3.2 Real Time Clock(DS3231): The DS3231 is a low-cost, extremely accurate I2C real time clock (RTC) with an

integrated temperature compensated crystal oscillator (TCXO) and crystal. The device incorporates a battery input, and maintains accurate timekeeping when main power to the device is interrupted. The integration of the crystal resonator enhances the long-term accuracy of the device as well as reduces the piece-part count in a manufacturing line. The DS3231 is available in commercial and industrial temperature ranges. The purpose of an RTC or a real time clock is to provide precise time and date which can be used for various applications. **RTC** is an electronic device in the form of an Integrated Chip (IC) available in various packaging options. It is powered by an internal lithium battery. As a result of which even if the power of the system is turned off, the **RTC** clock keeps running. Using RTC for designing such application has always been a good designer's choice although the beginning might be a bit difficult.



fig.3: RTC DS3231 Module

3.3 Regulator IC7805: The 78xx (also sometimes known as LM78xx) series of devices is a family of self-contained fixed linear voltage regulator integrated circuits. The 78xx family is a very popular choice for many electronic circuits which require a regulated power supply, due to their ease of use and relative cheapness. When specifying individual ICs within this family, the xx is replaced with a two-digit number, which indicates the output voltage the particular device is designed to provide (for example, the **7805** has a 5 volt output, while the 7812 produces 12 volts).

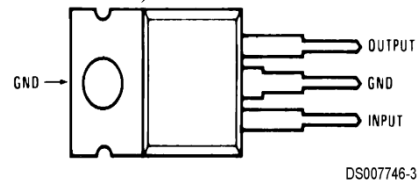


Fig.4: Regulator IC7805

The 78xx line are positive voltage regulators, meaning that they are designed to produce a voltage that is positive relative to a common ground. There is a related line of **79xx** devices which are complementary negative voltage regulators. 78xx and 79xx ICs can be used in combination to provide both positive and negative supply voltages in the same circuit, if necessary.

3.3.1 Features:

- 3-Terminal Regulators Output
- Current up to 1.5 A
- Internal Thermal-Overload Protection
- High Power-Dissipation Capability
- Internal Short-Circuit Current Limiting
- Output Transistor Safe-Area Compensation

3.4 RELAY: A relay is an electrically operated switch. When the current to the coil is switched off, the armature is returned by a force, approximately half as strong as the magnetic force, to its relaxed position. Relays find applications where it is necessary to control a circuit by a low-power signal, or where several circuits must be controlled by one signal.

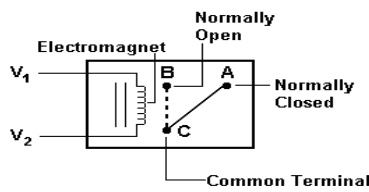


Fig.5: Relay

3.4.1 Main Features:

- Switching capacity available by 10A in spite of small size design for highdensity P.C. board mounting technique.
- UL,CUL,TUV recrecognize
- Selection of plastic material for high temperature and better chemical solution performance.
- Simple relay magnetic circuit to meet low cost of mass production.

3.4 16*2 LCD Display: LCD(Liquid crystal display) screen is an electronic display module and find a wide range of application. It is used to show current time and various messages. A 16*2 LCD display is very basic module and is very commonly used in various devices and circuits.

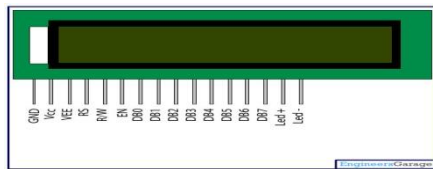


Fig.6 Liquid Crystal Display

3.5.1 Features

- 5*8 dot with cursor
- 16 character 2 lines display
- 4-bit or 8-bit MPU interface
- 1/16 duty cycle
- Built in controller(KS 0066 or equivalent)

3.6 Double Mounting Siren:

- Electrically operated siren:- Horizontal double mounting single phase 220/250v 6000RPM 50Hz,AC
- Audible range in KMS:- 0.50kms
- Model:- DS-050

4. CIRCUIT DIAGRAM

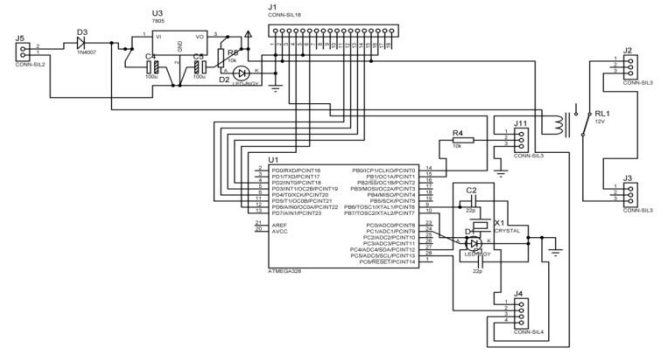


Fig.7: circuit diagram

5. WORKING PRINCIPLE

In the circuit shown above, provide 230V A.C. power supply to the “Step-Down Transformer” which converts 230V A.C. into 5V DC with the help of “Full Wave Rectifier”. Two different voltage levels are required for our circuit – One is 12V D.C. to operate relay switch. Second is 5V D.C. supply to operate microcontroller “ATmega328”. For this purpose it is use voltage regulator “LM7805” which can take 8V -25V as I/P & provide 5V constant voltage. Here in this project used “Atmel ATmega328” microcontroller to control various timing of the ringing. Here we also use a Real time clock DS3231give a accurate time. The accuracy of the clock is dependent upon the accuracy of the crystal and the accuracy of the match between the capacitive load of the oscillator circuit and the capacitive load for which the crystal was trimmed. Here it has been used 16x2 LCD display for the displaying the real time. The microcontroller can operate on 5V and 10mA current maximum but we have to operate 12V relay switch which consume more than 100A current. So, we have to amplify this current and voltage. For this purpose we are using transistor. Transistors are often used in digital circuits as buffers to protect ICs. Here,2-port MCB are used as switch which automatically turns off when the current flowing through it passes the maximum allowable limit. Generally MCB are designed to protect against over current and overheating.

6. ADVANTAGES

- Automatic scheduling of industry is possible.
- The components used for the assembling of this circuit are much cheaped are easily available in the market. Hence the initial cost of setting up the circuit is minimal.
- No need of assigning a person for ringing siren in industry.
- It gives a accuracy.

- No manual intervention is required.
- It saves money and manpower.
- It is easy to use.
- If we want to ring the siren before leaving of shift or few minute late from start of shift then the manually we can operate it.

7. APPLICATION

Automatic timer siren is used for ringing siren schedule in schools, factories, hostels, offices, institutions, training campus, canteen etc; for each day of week. This helps in maintaining the exact schedule as per real time clock and maintain discipline.

8. CONCLUSION

Present day ringing the siren in industry are carried out manually. The main disadvantages of this is that one person has to be alert for this. To overcome from this, we have decided to prepare the circuit which will be operated automatically.

9. RESULT

Therefore, from the results obtained, it can be concluded that the aim of this work has been practically and theoretically achieved.

10. REFERENCE

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