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# Smart Street Light Using 8052 Micro Controller

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## 1. ABSTRACT:

We need to save or conserve energy because most of the energy sources we depend on, like coal and natural gas can't be replaced. Once we use them up they're gone forever. Saving power is very important, instead of using the power in unnecessary times it should be switched off. In this project, we are avoiding the problem by having an automatic system which turns ON and OFF the lights at given time.Real-time clock (RTC) ICs measure time, even when the power of the main device is off. During these times, RTC ICs draw power from an auxiliary battery or super capacitor.

## 2. OBJECTIVE:

The main aim of the project is to design Smart street light which is power saving system with real time clock (RTC), this is often to avoid wasting of the power. We wish to avoid wasting power mechanically rather than doing things in a manual fashion. Therefore, it is simple to form cost effective systems. It clearly demonstrates the working of IR sensors which detects the vehicles. The working of transistor is also known microcontroller and the code is written in C language in Keil uVision3 software. Automatic light control is a simple yet powerful concept, which uses transistor as a switch. By using this system manual works are 100% removed. The aim of this project is to control the lights using RTC and IR sensors. So the power will be saved whenever any vehicle reaches a pole, along with that the upcoming 2 light will ON automatically and OFF in absence of the vehicle. In the highway junctions during the night time it will provide the indication to the vehicle which is at highway and sub-highway.

## PROBLEMS OF NORMAL STREET LIGHT

The whole Europe pays over 10 billion euros a year powering street lights, that consist for more than 38% of govt. energy bills. This translates into an approximately 39 million tons of CO2 discharge per annum which is abundant to power 21 million cars. The answer is to fashion an intelligent and smart "on-demand" street lighting system using wireless sensors. Street lights which only light up in the presence of a vehicle or person, and remain dim the rest of the time are day. Street lighting control has an effect on the upkeep budgets. It delivers the choice of central detailed checking and analysis of a lighting installation. The condition of every luminaire can thus be checked at any time and luminaire letdowns are exactly perceptible.

## 3. AIM OF THE SMART STREET LIGHT

The main aim of this project is to save power and to avoid night accidents, this is done by:

- To detect vehicle movement on highways to switch ON only a block of street lights ahead of it (vehicle), and to switch OFF the trailing lights to save energy.
- Switch ON the lights automatically when the light fall in the evening time without an interaction of any operator.
- To varies the intensity of the lights according to the time.
- To give the indication to the vehicles which are travelling in the sub-way during night time.

## 4. PROJECT BLOCK DIAGRAM

The system basically consists of IR sensors, Power supply, Resister, Real time clock and Microcontroller.

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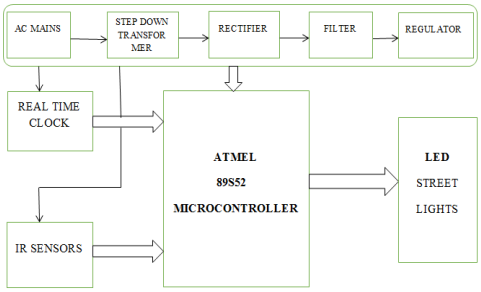
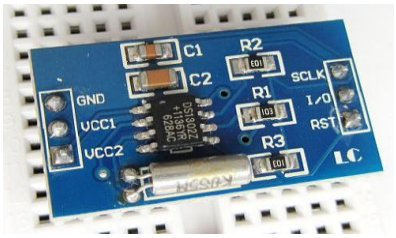



Fig. 4.1: Block diagram of Smart Street light.

## 5. REAL TIME CLOCK:




## PIN ASSIGNMENT:

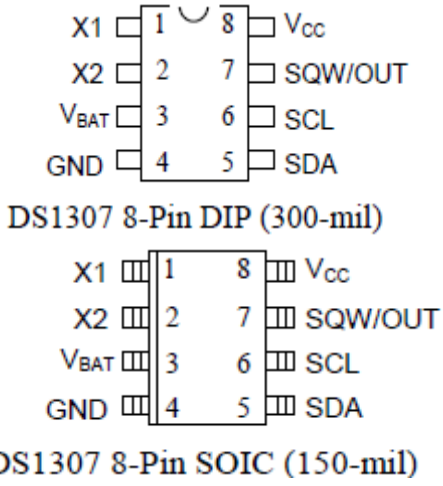



Fig. 5.2: Pin Assignment

## 6. POWER SUPPLY:

This power supply consists of 12-0-12 step-down transformer, Bridge rectifier, C filter and 7809 voltage regulator. The 9V power supply is connected to the power jack to give the power supply to the transformer. 9V power supply connected to the load. To make a 5V Dc regulated power supply we connected a voltage regulator which gives the power supply to the AT89S52 microcontroller and peripheral items.

In the AT89S52 microcontroller the VCC pin is 7th and GND pin is 8th. Two led is also interface to show the status of the power. The 9V power supply image shown in below figure.

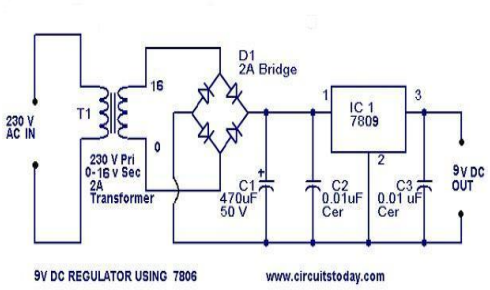
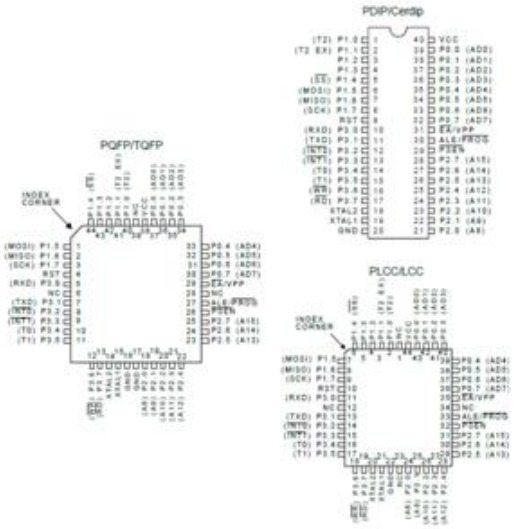
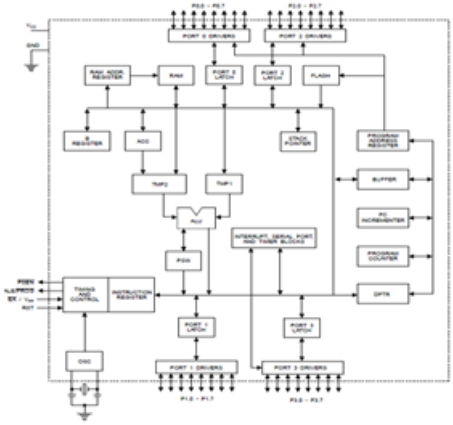



Fig. 6.1: Power supply circuit

## 7. Pin configuration:




## 8. Block diagram:



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## SMART STREET LIGHT CIRCUIT DESIGN:

The circuit diagram of this project is given below which is draw by Proteus ISP Professional software.

## CIRCUIT DIAGRAM:

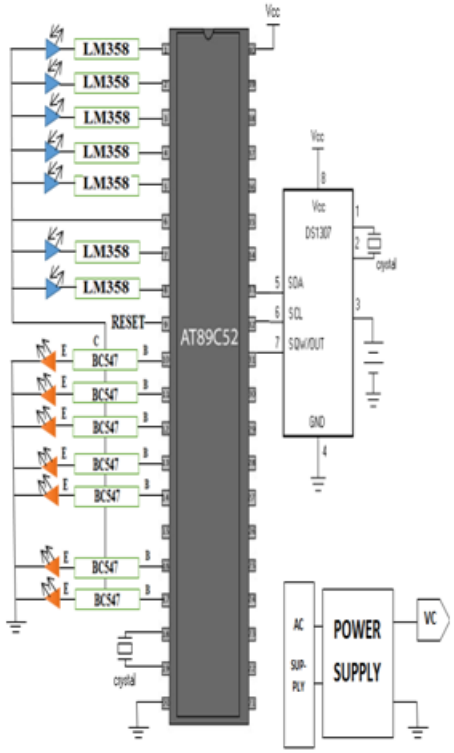


**Fig. 8.1: Circuit diagram**

## 8.2 FOUR PARTS IN THE CIRCUIT DIAGRAM

- clock
- Microcontroller
- IR sensors
- Led unit

### 8.2.1 REAL TIME CLOCK:

The DS1307 Serial Real-Time Clock is 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 end of the month date is automatically adjusted for months with fewer than 31 days, including corrections for leap year. The clock operates in either the 24-hour or 12-hour format with AM/PM indicator. The DS1307 has a built-in power sense circuit that detects power failures and automatically switches to the battery supply. The DS1307 operates as a slave device on the serial bus. Access is obtained by implementing a START condition and providing a device identification code followed by a register address. Subsequent registers can be accessed sequentially until a STOP condition is executed. When VCC falls below 1.25 x VBAT the device terminates an access in progress and resets the device address counter. Inputs to the device will not be recognized at this time to prevent erroneous data from being written to the device from an out of tolerance system. When VCC falls below VBAT the device switches into a low-current battery backup mode. Upon power-up, the device switches from battery to VCC when VCC is greater than VBAT + 0.2V and recognizes inputs when VCC is greater than 1.25 x VBAT. The block diagram in Figure 1 shows the main elements of the serial RTC.

## 9. RESULTS AND DISCUSSIONS:

The project aims were to reduce the side effects of the current lighting system, and find a solution to save power. In this project the first thing to do, is to prepare the inputs and outputs of the system to control the lights. The project shown in Fig.4 has been implemented and works as expected and will prove to be very useful.

**Fig. 9.1: Project on Smart street light system.**

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## 10. FUTURE SCOPE

The above project we can develop solar street light system with Automatic street light controller. The system can be powered from a battery, which can be charged during day time by harvesting the solar energy through a solar cell. The solar energy harvested from sunlight can be stored, inverted from DC voltages to AC voltage using sun tie converter. The AC voltage can be stepped down rectified and using the circuit. The above mentioned strategy will enable us to harvest solar energy in an effective way for the operation of the circuit and for powering the street light also.

## SAMPLE PROJECT:

## 11. CONCLUSION:

This paper elaborates the design and construction of SMART STREET LIGHT USING 8052 MICROCONTROLLER. Circuit works properly to turn lamp ON/OFF. RTC and sensor are the main components in working the circuit. If the conditions have been satisfied the circuit will do the desired work according to specific program. Each sensor controls the turning ON or OFF the lighting column. The lights have been successfully controlled by microcontroller. With commands from the controller the lights will be ON in the places of the movement when it's dark. Finally this control circuit can be used in various purposes.

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