

Advanced Dustbin System

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ABSTRACT

Main aim of advanced dustbin system is to help society for garbage management. Advanced dustbin system based on solar power. Our system use to protect society from Garbage overflowing. If dustbin is full of garbage it automatically send alert message to waste pickers or garbage collecting van. It is able to turn on red LED to indicate dustbin is full & closed the door of dustbin so that user can't put garbage. Green LED use to indicate dustbin is not full. Whole system is automated system. When garbage is full, system will send a message using GSM to responsible person, it will remind about the garbage. Most important thing is that power needed for our system generated with help of solar panel. Solar panel is able to track sun all the time.

Keywords :Aurdino , GSM, Ultrasonic Sensor, Solar Panel

I. INTRODUCTION

The major problem in city is collection of garbage from different area. It is necessary to remove garbage of a city. If more the population then waste material also more. It is difficult to handle garbage problem of city without using advance type of dustbin system.figure 1 is showing dustbin present at city.



Figure1.Dustbin Systems

It is necessary to remove waste of city at the right time. Public places are the most highly recommended area of its application because majority of the wastes and disposal will be collected here. [1] A dustbin is a container. Dustbin use to carry waste material until it can be removed or otherwise it disposed off. Over flowing of Garbage will form dirty situation in city area. It can attract flies & Stray animals. Garbage is

responsible for choking and overflowing of drains. Garbage overflow problem shown by figure 2. Now it is necessary to overcome the entire problem related to garbage.



Figure 2. Garbage Over Flowing

We can use solar street light with dustbin system shown in figure3. Solar panel also use to ON Streetlight in night time using LDR, in day time LDR switch OFF Light. Street Light is helpful to identify dustbin in night time. When garbage is full then sensor senses it and send signal to controller. Controller enable GSM & it will turn on motor which use to close the door of dustbin & no one can put more garbage inside dustbin. By sending message back to dustbin we can open the door.It is not needed to watch dustbin all the time. It use microcontroller for controlling system. A microcontroller not only accepts the data as inputs

but also manipulates it, Interfaces the data with various devices, controls the data and finally Provide the result.[2]



Figure 3. Solar Based Dustbin System

II. HARDWARE ARCHITECTURE

System design is shown in Figure. 4. System Contains arduino board, Ultrasonic Sensor, LED and GSM Modem. All Devices controlled by arduino. Our design is fully automated. It is not required to monitor always. Sensors use to check dustbin is full or not and it sends information to arduino and arduino will initiate GSM for transmitting message. After the receiving of message garbage picker will remove all the garbage from dustbin. It also contains red LED which indicate dustbin is full and in case of empty dustbin it indicated by green LED.

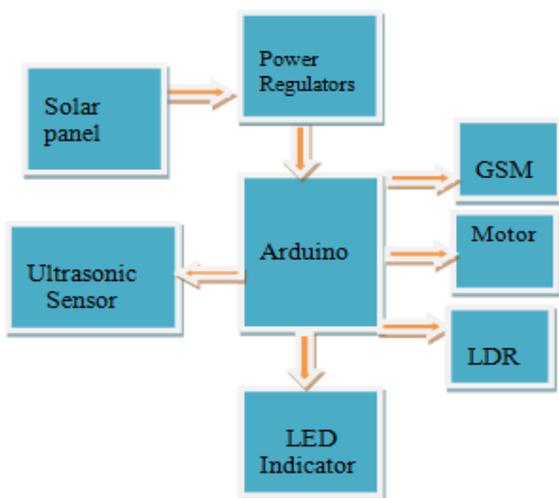


Figure 4. System architecture

Whole system can generate power using solar panel. LDR use to ON & OFF street light. It can save the power. We want to save power automatically instead of doing manual.[3]

A. Arduino

Arduino is an open-source prototyping platform. Anyone can use hardware and software. Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins, 6 analog inputs, a 16 MHz ceramic resonator etc. Arduino boards are relatively inexpensive compared to other microcontroller platforms.[6]



Figure 5. Arduino

B. GSM

SIM900 is an ultra-compact and reliable wireless SMT (Surface Mount Technology) type quad band GSM/GPRS module designed with a powerful single chip processor. It delivers GSM/GPRS 850/900/1800/1900 MHz performance for voice, SMS and data. It is a low power consumption module.[6]



Figure 6. SIM300

C. DC motors

DC motors use for different types of applications. It is mostly used in automation and process control areas. When we turn the motor on, it starts rotating round & round.

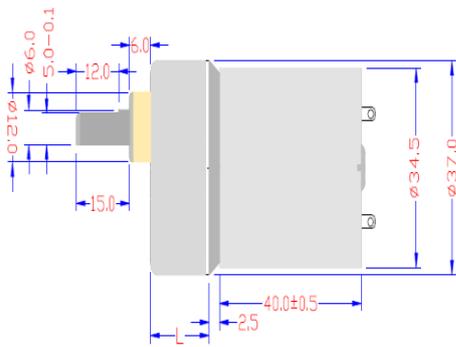


Figure7.DC motor

D.Solar Panel

The solar panel is used to receive sunlight and store charge into battery which use for future use.A solar panel module contain Solar cells. The panel is adjusted at specific angle so that it can receive maximum power. The panel that we are using of has a rated capacity of 12 volts and 5 Watts power.[6].

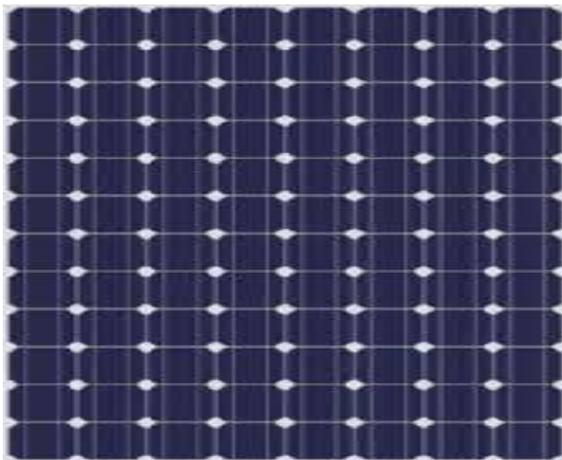


Figure8. Solar Panel

E. Motor driver

L293D is Motor Driver. It allows DC motor to drive on either direction. L293D contain 16-pin.It able to control a set of two DC motors. It contain H-bridge, H-bridge is a circuit which allows the voltage to be flown in either direction. Voltage need to change its direction for being able to rotate the motor in clockwise or anticlockwise direction. Single L293D contain two H-Bridge circuit . .It is very useful for robotic application for controlling DC motors. L293D IC contain two Enable pins.



Figure9. Pin diagram of L293D.

F. Ultrasonic Sensors

It known as transceivers when they both send and receive work on a principle similar to radar or sonar, which evaluate attributes of a target by interpreting the echoes from radio or sound waves respectively. Ultrasonic sensor is able to send high frequency sound waves and echo received back by the sensor.Time interval between, sending and receiving of echo use to determine the distance to an object. Ultrasonic sensor is in figure10.



Figure 10.Ultrasonic Sensor

III. RESULTS AND DISCUSSION

Proposed design is completely automated dustbin system .System design useful for urban city for garbage management.Whole system based on solar energy.



Figure 11 . Advanced Dustbin with solar panel

IV. CONCLUSION

This design is useful for garbage management. It is not required to see dustbin regularly when the dustbin full it automatic generate SMS to responsible person for garbage handling & protect garbage overflow. It can able to provide effective system. Dustbin system is able to detect & alerting of garbage automatically. It is reliable real time system .The primary applications of this design to resolve garbage problem of city.

V. REFERENCES

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