GSM based Garbage Monitoring System

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Abstract: In the present day scenario, many times we see that the garbage bins or dust bin are placed at public placed in the cities are overflow due to increase in the waste every day. It creates unhygienic condition for the peoples and creates bad smell around the surroundings this leads in spreading some deadly diseases and human illness , to avoid such a attenuation we are planning to design "GSM based garbage monitoring system for smart cities" .In this proposed system there are multiple dustbins located throughout the city or the campus ,these dustbins are provided with low cost embedded device which helps in tracking level of garbage bins and an unique ID will be provided for every dustbin in the city so that it is easy to identify which garbage bin is full. When the level reaches threshold limits ,the device will transmit the level along with unique ID provided. These details can be accessed by the concern authorities from their place with the help of GSM and an immediate action can be made to clean the dustbins.

Keywords: GSM, Ultrasonic sensor, Arduino, LCD.

I.INTRODUCTION

This project GSM based Garbage Monitoring system is a very innovative system which will help to keep the cities clean. This system monitors the garbage bins and informs about the level of garbage collected in the garbage bins via a SMS. For this the system uses ultrasonic sensors placed over the bins to detect the garbage level and compare it with the garbage bins depth. The system makes use of arduino uno board, LCD screen, GSM modem for sending data. The system is powered by a 12V transformer. The LCD screen is used to display the status of the level of garbage collected in the bins. Whereas GSM is built to show the status to the user, monitoring it with SMS. The SMS consists of text related to all garbage bins. The LCD screen shows the status of the garbage level. The system puts on LCD screen continuously monitoring of garbage with arduino board. Thus this system helps to keep the city clean by informing about the garbage levels of the bins by providing SMS to the respective person.

II.LITERATURE SURVEY

Prof. Dr. Sandeep M. Chaware et al. [3] presents Garbage Monitoring system, which monitors the garbage bins and informs about the level of garbage collected in the garbage bins via a web page. Fig. 1 shows the System Architecture, in which system uses ultrasonic sensors placed over the bins to detect the garbage level and compare it with the garbage bins depth. The proposed system uses Arduino family microcontroller (The LPC2131/32/34//38 microcontrollers are based on a 16/32-bit ARM7TDMI-S CPU with real-time emulation), LCD screen, Wi-Fi modem(The ESP8266 supports APSD for VoIP applications and Bluetooth co-existence interface) for sending data and a buzzer, GSM (used to send message to the garbage depot if the Garbage Canexceeds the set threshold level) Ultrasonic Sensor (Sensor sends out a high-frequency sound pulse and then times how long it takes for the echo of the sound to reflect back).

III. SYSTEM ARCHITECTURE

3.1Block Diagram
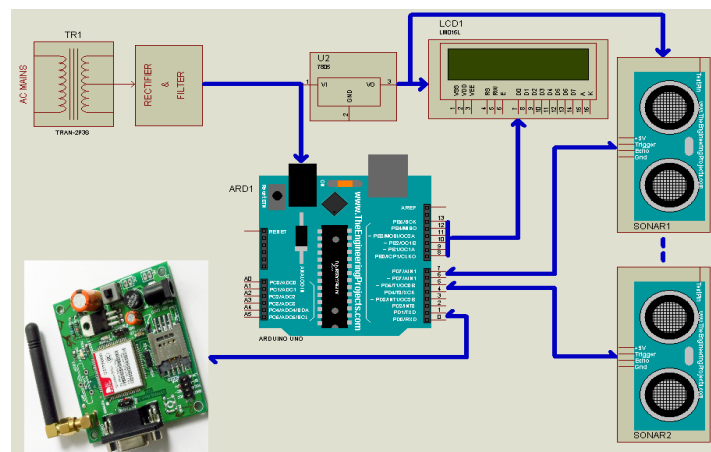
3.2 Description of block diagram

1) Power Supply

Here arduino board, GSM modem operates with 12V DC, LCD display, sensor circuit operates with DC 5V supply and this supply is provided by regulator of LM7805. 12V step down transformer with rectifier and filter is used to give power supply (or adapter can be use depends upon our requirement).

2) Ardiuno Uno Board
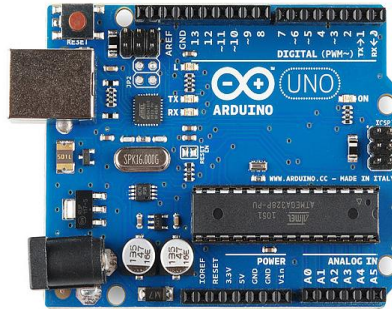
Power (USB / BARREL JACK)

Every Arduino board needs a way to be connected to a power source. The Arduino UNO can be powered from USB cable coming from your computer or a wall power supply that is terminated in a barrel jack. In the picture above the USB connection is labeled (1) and the barrel jack is labeled (2). The USB connection is also load code onto your Arduino board

PINS (5V, 3.3V, GND, ANALOG, DIGITAL, PWM, AREF)

The pins on your Arduino are the places where you connect wires to construct a circuit (probably in conjuction with a bread board / PCBs and some wire. They usually have black plastic 'headers' that allow you to just plug a wire right into the board. The Arduino has several different kinds of pins, each of which is labeled on the board and used for different functions.

GND (3)**:** Short for 'Ground'. There are several GND pins on the Arduino, any of which can be used to ground your circuit.

5V (4) & 3.3V (5)**:** As you might guess, the 5V pin supplies 5 volts of power, and the 3.3V pin supplies 3.3 volts of power. Most of the simple components used with the Arduino run happily off of 5 or 3.3 volts.

Analog (6)**:** The area of pins under the 'Analog In' label (A0 through A5 on the UNO) are Analog In pins. These pins can read the signal from an analog sensor (like a light sensor) and convert it into a digital value that we can read.

Digital (7): Across from the analog pins are the digital pins (0 through 13 on the UNO). These pins can be used for both digital input (like telling if a button is pushed) and digital output (like powering an LED).

PWM (8)**:** You may have noticed the tilde (~) next to some of the digital pins (3, 5, 6, 9, 10, and 11 on the UNO). These pins act as normal digital pins, but can also be used for something called Pulse-Width Modulation (PWM).

AREF (9)**:** Stands for Analog Reference. Most of the time you can leave this pin alone. It is sometimes used to set an external reference voltage (between 0 and 5 Volts) as the upper limit for the analog input pins.

RESET BUTTON

The Arduino has a reset button **(10)**. Pushing it will temporarily connect the reset pin to ground and restart any code that is loaded on the Arduino. This can be very useful if your code doesn't repeat, but you want to test it multiple times.

POWER LED INDICATOR

Just beneath and to the right of the word "UNO" on your circuit board, there's a tiny LED next to the word 'ON' **(11)**. This LED should light up whenever you plug your Arduino into a power source. If this light doesn't turn on, there's a good chance something is wrong. Time to re-check your circuit!

3) Ultrasonic Module

Ultrasonic module has 4 pins i.e. Vcc, Gnd, Trigger, Echo.

Ultrasonic ranging module HC - SR04 provides 2cm - 400cm non-contact measurement function, the ranging accuracy can reach to 3mm. The modules includes ultrasonic transmitters, receiver and control circuit. The basic principle of work: (1) Using IO trigger for at least 10us high level signal, (2) The Module automatically sends eight 40 kHz and detect whether there is a pulse signal back. (3) IF the signal back, through high level , time of high output IO duration is the time from sending ultrasonic to returning. Test distance = (high level time×velocity of sound (340M/S) / 2,
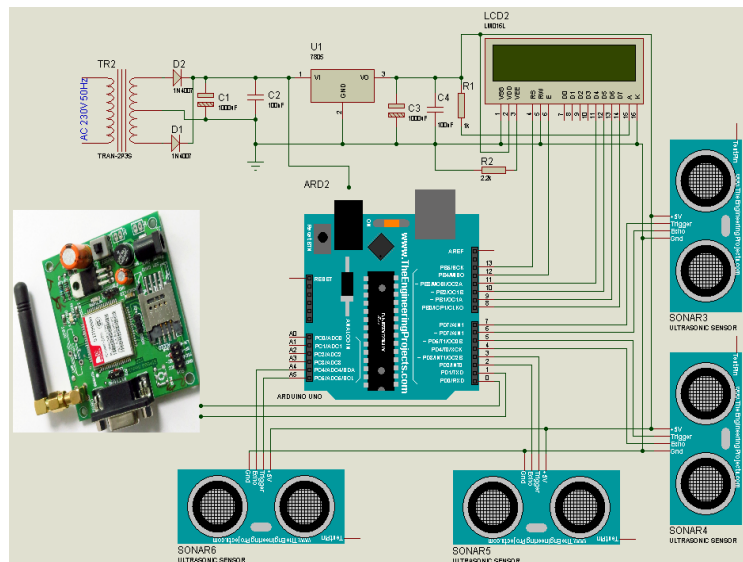
4) LCD Display
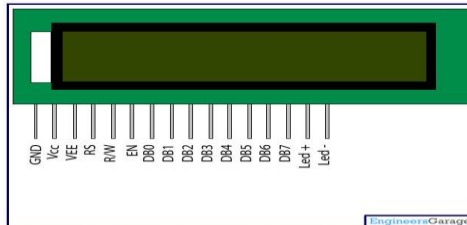
LCD stands for liquid crystal display. They come in many sizes 8x1 , 8x2 , 10x2 , 16x1 , 16x2 , 16x4 , 20x2 , 20x4 ,24x2 , 30x2 , 32x2 , 40x2 etc. Many multinational companies like Philips Hitachi Panasonic make their own special kind of lcd's to be used in their products. All the lcd's performs the same functions (display characters numbers special characters ASCII characters etc). Heir programming is also same and they all have same 14 pins (0-13) or 16 pins (0 to 15).

5) GSM Modem

A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. From the mobile operator perspective, a GSM modem looks just like a mobile phone.GSM Modem comes in interfaces like USB, and Serial. GSM Modem is however the main difference is that GSM Modem is wireless, while dial-up modem is wired (telephone previously).GSM is used here to interface with microcontroller and microcontroller command to the GSM modem with AT (abbreviation of ATtention) command set implemented in our program.

3.3 Circuit Diagram

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IV. RESULT & DISCUSSION

Thus our group actively with project, and we develop this project named as "**GSM based Garbage wastage monitoring system**".

The system detects garbage to dustbin & send message through GSM module. The message is received to the no. which we have given in the program. It gets details of the details of the dustbin status from the SMS. It sends SMS in the form of percentage.

V. ACKNOWLEDGEMENT

REFERENCES

[1] Prof. R.M.Sahu, Akshay Godase, Pramod Shinde, Reshma Shinde, "Garbage and Street Light Monitoring System Using Internet of Things" INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH IN ELECTRICAL, ELECTRONICS, INSTRUMENTATION AND CONTROL ENGINEERING, ISSN (Online) 2321 – 2004, Vol. 4, Issue 4, April 2016.
[2] Kanchan Mahajan, Prof.J.S.Chitode, "Waste Bin Monitoring System Using Integrated Technologies", International Journal of Innovative Research in Science, Engineering and Technology (An ISO 3297: 2007 Certified Organization) Vol. 3, Issue 7, July 2014.
[3] Twinkle sinha, k.mugesh Kumar, p.saisharan, "SMART DUSTBIN", International Journal of Industrial Electronics and Electrical Engineering, ISSN: 2347-6982 Volume-3, Issue-5, May 2015.
[4] Richu Sam Alex, R Narciss Starbell, "Energy Efficient Intelligent Street Lighting System Using ZIGBEE and Sensors", International Journal of Engineering and Advanced Technology (IJEAT).