Automation of Dry-Wet Dust Collection to Support Swachh Bharat Abhiyaan

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ABSTRACT:

Swachh Bharat Abhiyan (English: Clean India Mission and abbreviated as SBA or SBM for "Swachh Bharat Mission") is a national campaign by the Government of India, covering 4,041 statutory cities and towns, to clean the streets, roads and infrastructure of the country.The aim of the mission is to cover all the rural and urban areas of the country to present this country as an ideal country before the world. This project is designed for the effective dry and wet dirt collection using Embedded System. The main motto of this application collecting of dry and wet waste separately into the dumping vehicles. We will place a conveyor belt on which the dry waste collected dust bins are placed left side and wet waste collected bins on right side. The system gets the input through the dust collecting boy through switches.The switches send the signal to the Micro controller using RF technology and that makes theH-bridge to rotate the conveyor belt. When the belt is rotating the dust bins are emptied to the dumping vehicle in sequence. Here we are using AT89S52 as our controller.This project uses regulated 5V, 500mA power supply. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac output of secondary of 230/12V step down transformer.

Keywords:Power Supply, Microcontroller, LCD, RF Transreceiver, Dc Motor, Motor Driver

INTRODUCTION TO EMBEDDED SYSTEM:

An Embedded System is a combination of computer hardware and software, and perhaps additional mechanical or other parts, designed to perform a specific function. A good example is the microwave oven. Almost every household has one, and tens of millions of them are used every day, but very few people realize that a processor and software are involved in the preparation of their lunch or dinner.

This is in direct contrast to the personal computer in the family room. It too is comprised of computer hardware and software and mechanical components (disk drives, for example). However, a personal computer is not designed to perform a specific function rather; it is able to do many different things. Many people use the term generalpurpose computer to make this distinction clear. Asshipped, a general-purpose computer is a blank slate; the manufacturer does not know what the customer will do wish it. One customer may use it for a network file server another may use it exclusively for playing games, and a third may use it to write thenext great American novel. Frequently, an embedded system is a component within some larger system. For example, modern cars and trucks contain many embedded systems. One embedded system controls the anti-lock brakes, other monitors and controls the vehicle's emissions, and a third displays information on the dashboard. In some cases, these embedded systems are connected by some sort of a communication network, but that is certainly not a requirement. At the possible risk of confusing you, it is important to point out that a general-purpose computer is itself made up of numerous embedded systems. For example, my computer consists of akeyboard, mouse, video card, modem, hard drive, floppy drive, and sound card-each of which is an embedded system. Each of

these devices contains a processor and software and is designed to perform.

LITERATURE REVIEW:

The current system for wet and dry dust collection is very useless and without any management. There is no any process for separate dry and wet dust collection. For metro cities, it is now necessary to study for new and updated options for dust collection. Because day to day building get high so it is difficult to collect dust by going door to door. It is very hectic and for municipality workers, it is just physical stress. So this system is very important in metro cities where buildings are high.
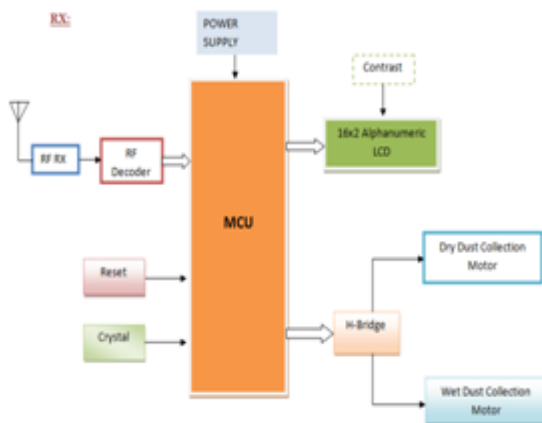
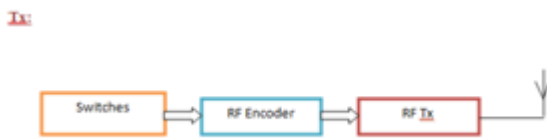## BLOCK DIAGRAM:

Figure. Block diagram of the system

Figure. Block diagram of RF module

POWER SUPPLY

The input to the circuit is applied from the regulated power supply. The a.c. input i.e., 230V from the mains supply is step down by the transformer to 12V and is fed to a rectifier. The output obtained from the rectifier is a pulsating d.c voltage. So in order to get a pure d.c voltage, the output voltage from the rectifier is fed to a filter to remove any a.c components present even after rectification. Now, this voltage is given to a voltage regulator to obtain a pure constant dc voltage.
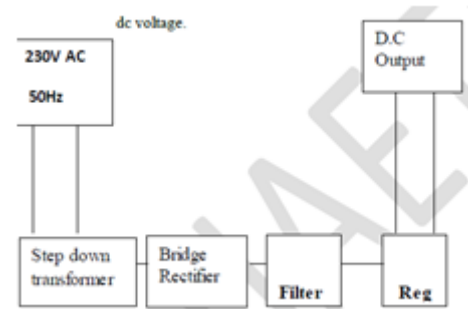

Fig. power supply

TRANSFORMER

Usually, DC voltages are required to operate various electronic equipment and these voltages are 5V, 9V or 12V. But these voltages cannot be obtained directly. Thus the a.c input available at the mains supply i.e., 230V is to be brought down to the required voltage level. This is done by a transformer. Thus, a step down transformer is employed to decrease the voltage to a required level.

RECTIFIER

The output from the transformer is fed to the rectifier. It converts A.C. into pulsating D.C. The rectifier may be a half wave or a full wave rectifier. In this project, a bridge rectifier is used because of its merits like good stability and full wave rectification. The Bridge rectifier is a circuit, which converts an ac voltage to dc voltage using both half cycles of the input ac voltage. The Bridge rectifier circuit is shown in the figure. The circuit has four diodes connected to form a bridge. The ac input voltage is applied to the diagonally opposite ends of the bridge. The load resistance is connected between the other two ends of the bridge. For the positive half cycle of the input ac voltage, diodes D1 and D3 conduct, whereas diodes D2 and D4 remain in the OFF state. The conducting diodes will be in series with the load resistance R_L and hence the load current flows through R_L.

For the negative half cycle of the input ac voltage, diodes D2 and D4 conduct whereas, D1 and D3 remain OFF. The conducting diodes D2 and D4 will be in series with the load resistance R_L and hence the current flows

through R_L in the same direction as in the previous half cycle. Thus a bi-directional wave is converted into a unidirectional wave.

AT89S52 MICROCONTROLLER

Microprocessors and microcontrollers are widely used in embedded systems products. Microcontroller is a programmable device. A microcontroller has a CPU in addition to a fixed amount of RAM, ROM, I/O ports and a timer embedded all on a single chip. The fixed amount of on-chip ROM, RAM and number of I/O ports in microcontrollers makes them ideal for many applications in which cost and space are critical.

The Intel 8052 is Harvard architecture, single chip microcontroller (μC) which was developed by Intel in 1980 for use in embedded systems. It was popular in the 1980s and early 1990s, but today it has largely been superseded by a vast range of enhanced devices with 8052-compatible processor cores that are manufactured by more than 20 independent manufacturers including Atmel, Infineon Technologies and Maxim Integrated Products.8052 is an 8-bit processor, meaning that the CPU can work on only 8 bits of data at a time. Data larger than 8 bits has to be broken into 8-bit pieces to be processed by the CPU.

8052 is available in different memory types suchas UV-EPROM, Flash and NV-RAM.The present project is implemented on KeiluVision. In order to program the device, proload tool has been used to burn the program onto the microcontroller.The features, pin description of the microcontroller and the software tools used are discussed in the following sections.

LCD 16 * 2 DISPLAY

Fig. 16*2 LCD module

LCD remains for Liquid Crystal Display. LCD is finding far reaching use supplanting LEDs (seven portion LEDs or other multi fragment LEDs) due to the accompanying reasons:
1. The declining costs of LCDs.
2. The capacity to show numbers, characters and illustrations. This is rather than LEDs, which are constrained to numbers and a couple characters.
3. Joining of a reviving controller into the LCD, accordingly alleviating the CPU of the undertaking of invigorating the LCD. Interestingly, the LED must be invigorated by the CPU to continue showing the information.
4. Simplicity of programming for characters and illustrations.

Particulars:
Show: - 16 Char* 2 Lines
Controller:-LSI HD44780 IN BUILT
Control Supply: - + 5v Dc
Show Color:- Gray

RF COMMUNICATION
Radio frequency (RF) is a frequency or rate of oscillation within the range of about 3 Hz to 300 GHz. This range corresponds to frequency of alternating current electrical signals used to produce and detect radio waves. Since most of this range is beyond the vibration rate that most mechanical systems can respond to, RF usually refers to oscillations in electrical circuits or electromagnetic radiation.

Properties Of RF: Electrical currents that oscillate at RF have special properties not shared by direct current

signals. One such property is the ease with which it can ionize air to create a conductive path through air. This property is exploited by 'high frequency' units used in electric arc welding. Another special property is an electromagnetic force that drives the RF current to the surface of conductors, known as the skin effect. Another property is the ability to appear to flow through paths that contain insulating material, like the dielectric insulator of a capacitor. The degree of effect of these properties depends on the frequency of the signal.
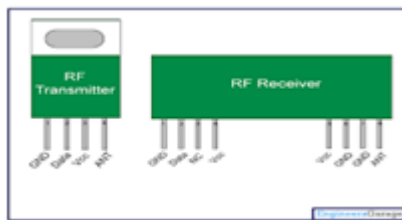

Fig. RF module

L293D (H BRIDGE)

- Wide Supply-Voltage Range: 4.5 V to 36 V
- Separate Input-Logic Supply
- Internal ESD Protection
- Thermal Shutdown
- High-Noise-Immunity Inputs
- Functionally Similar to SGS L293 and SGS L293D
- Output Current 1 A Per Channel (600 mA for L293D)
- Peak Output Current 2 A Per Channel (1.2 A for L293D)
- Output Clamp Diodes for Inductive Transient Suppression (L293D)

The L293 and L293D are quadruple high-current half-H drivers. The L293 is designed to provide bidirectional drive currents of up to 1 A at voltages from 4.5 V to 36 V. The L293D is designed to provide bidirectional drive currents of up to 600-mA at voltages from 4.5 V to 36 V. Both devices are designed to drive inductive loads such as relays, solenoids, dc and bipolar stepping motors, as well as other high-current/high-voltage loads in positive-supply applications. All inputs are TTL compatible. Each output is a complete totem-pole drive circuit, with

a Darlington transistor sink and a pseudo-Darlington source. Drivers are enabled in pairs, with drivers 1 and 2 enabled by 1,2EN and drivers 3 and 4 enabled by 3,4EN. When an enable input is high, the associated drivers are enabled, and their outputs are active and in phase with their inputs. When the enable input is low, those drivers are disabled, and their outputs are off and in the high-impedance state. With the proper data inputs, each pair of drivers forms a full-H (or bridge) reversible drive suitable for solenoid or motor applications.

DC MOTOR

60RPM 12V DC geared motors for robotics applications. Very easy to use and available in standard size. Nut and threads on shaft to easily connect and internal threaded shaft for easily connecting it to wheel.

Features

- 60RPM 12V DC motors with Gearbox
- 3000RPM base motor
- 6mm shaft diameter with internal hole
- 125gm weightSame size motor available in various rpm
- 2kgcm torque
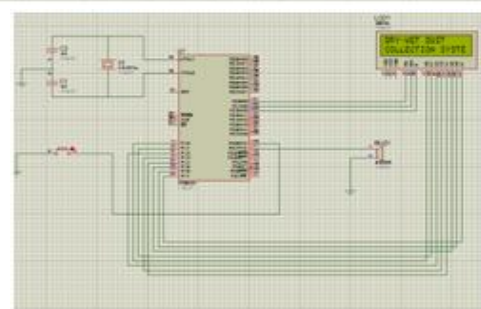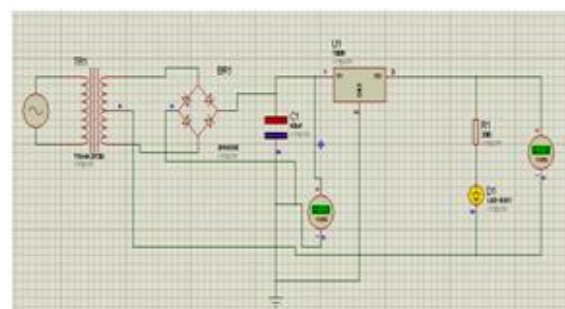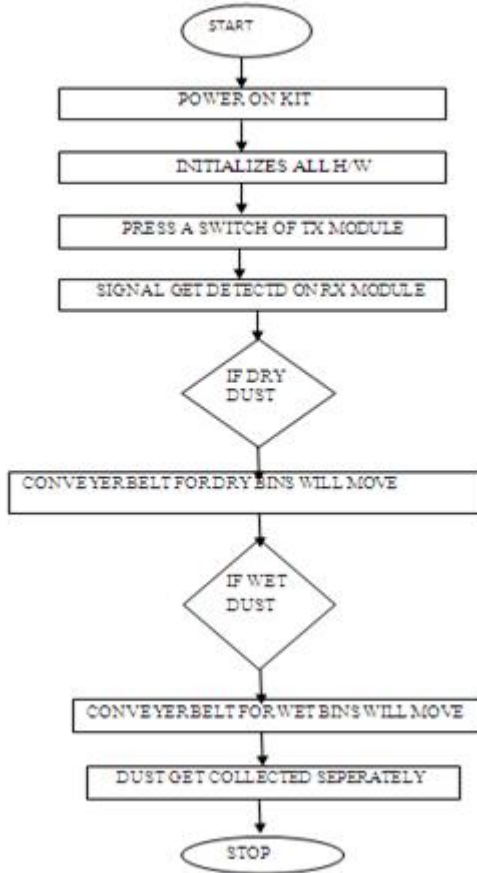- No-load current = 60 mA(Max), Load current = 300 mA(Max)

CONNECTION DIAGRAM

Fig. Proteus simulation

FLOWCHART:

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                    START

              POWER ON KIT

            INITIALIZES ALL H/W

         PRESS A SWITCH OF TX MODULE

       SIGNAL GET DETECTD ON RX MODULE

                 IF DRY
                 DUST

      CONVEYER BELT FOR DRY BINS WILL MOVE

                 IF WET
                 DUST

      CONVEYER BELT FOR WET BINS WILL MOVE

         DUST GET COLLECTED SEPERATELY

                   STOP
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ADVANTAGES
- Can maintain Hygienic health conditions.
- Easy way collecting the waste.
- Limited labor and time allocation

APPLICATIONS
- Urban cities
- Metros
- Industries

CONCLUSION
Hence by this project we can deals with RF controlled collection of garbage to make the premises clean.

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