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TECHNOLOGY****LETTER BOX WITH COUNTING LETTER****Shubham Bhor, Deepak Kulawade, Avinash Kale, Rajesh Chakve**

Department of Electronics &amp; Telecommunication Engineering, Jaihind Polytechnic Kuran, India.

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**ABSTRACT**

Lower power consumption is a godsend in this increasingly energy conscious world. Thus, a visitor counter is designed to save the usage of electrical energy and to avoid wastage. This project takes over the task of display counting the letters in the letter-box precisely. When a letter enters the room, the counter incremented by one .IR sensors are placed at the opening of letter-box and used to detect the presence of letter. The numbers of letters are displayed using a liquid crystal display. In this report, the project is introduced with a system block diagram followed by literature review that investigates the previous work done regarding the project. The methodology covers the technical explanations about the sensor circuits, main board and the significant components of the project. Programming related software, flow chart and source codes are also elaborated for better understanding. The report continues with the results that show the completed circuit boards that able to function as designed. The project achieved its aim and can be implemented in any letter-box to save energy and to provide an automated lifestyle.

**KEYWORD** AT89S52, Infrared sensor, LCD (16\*2), Power Supply, DC motor.

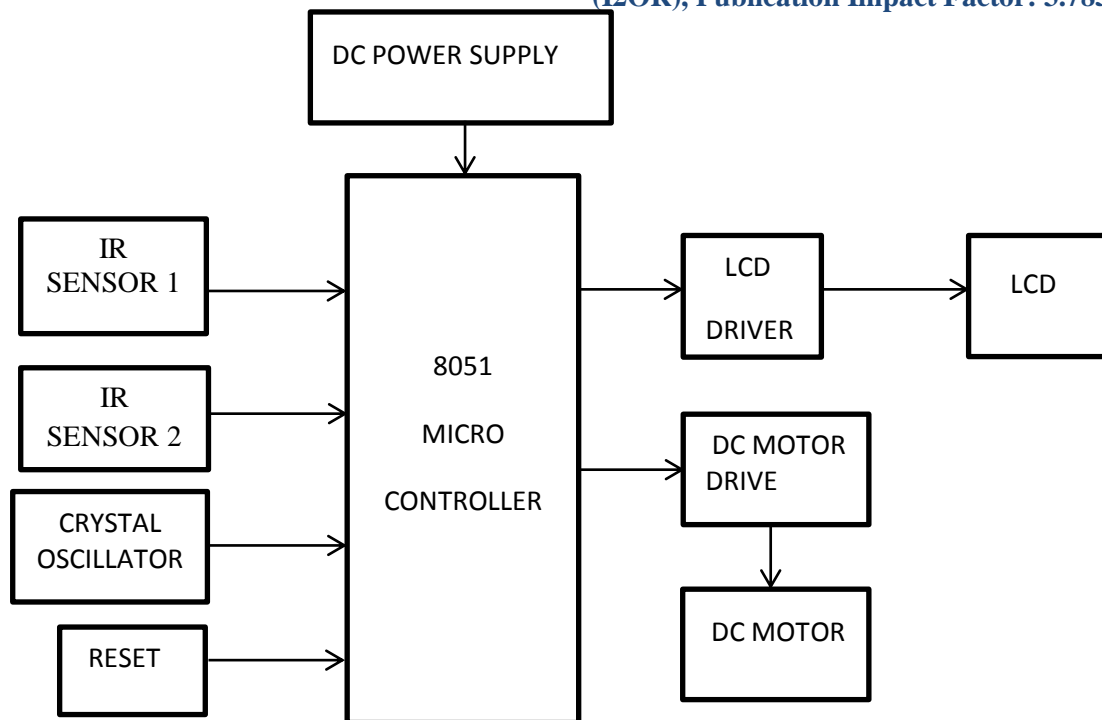
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**INTRODUCTION**

The objective based model to count number of letters visiting particular letter-box. In today's world , there is a Here we can use sensor and can know present number of letters .continuous need for automatic appliances .With the increase in standard of living; there is a sense of urgency for Developing circuits that would ease the complexity of life. Also if at all one wants to know the number of letters present in letter-box so as not to have congestion, this circuit proves to be helpful.

This Project "A letter counter using Microcontroller" is a reliable circuit that takes over the task of counting number of letters in the letter-box very accurately. When letter enters into the letter-box then the counter is incremented by one .The total number of letters inside the room is also displayed on the LCD the microcontroller does the above job. It receives the signals from the sensors, and this signal is operated under the control of software which is stored in ROM.

**BLOCK DIAGRAM WITH DESCRIPTION**



*Fig: Block Diagram*

### 1. MICROCONTROLLER:

The AT89S51 is a low-power, high-performance CMOS 8-bit microcontroller with 4Kbytes of in-system programmable Flash memory. The device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the industry-standard 80C51 instruction set and pin out. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a versatile 8-bit CPU with in-system programmable Flash on a monolithic chip, the Atmel AT89S51 is a powerful microcontroller which provides a highly-flexible and cost-effective solution to many embedded control applications.

### 2. LCD:

Alphanumeric displays are used in a wide range of applications, including palmtop computers, word processors, photocopiers, point of sale terminals, medical instruments, cellular phones, etc. The 16 x 2 intelligent alphanumeric dot matrix displays is capable of displaying 224 different characters and symbols. A full list of the characters and symbols. This booklet provides all the technical specifications for connecting the unit, which requires a single power supply (+5V).

### 3. IR SENSOR 1:

IR Sensors work by using a specific light sensor to detect a select light wavelength in the Infra-Red (IR) spectrum. By using an LED which produces light at the same wavelength as what the sensor is looking for, you can look at the intensity of the received light. When an object is close to the sensor, the light from the LED bounces off the object and into the light sensor. This results in a large jump in the intensity, which we already know can be detected using a threshold. Since, the sensor works by looking for reflected light, it is possible to have a sensor that can return the value of the reflected light. This type of sensor can then be used to measure how "bright" the object is. This is useful for tasks like line tracking.

### 4. IR SENSOR 2:

Here is a sensor that starts counting when you insert a letter in the letterbox at your home or office. It is designed to save your time from going to the letterbox to check if there are letters inside. The number of letters present in the box is indicated by a LCD.

### 5. DC MOTOR:

Opening and closing of the box is done automatically using geared dc motor. Driver is used to boost the current. The current from microcontroller is not sufficient enough to rotate the motors a current amplifier is used. L293D is used to drive the motor. L293 Device is a monolithic integrated high voltage, high current four channel driver designed to accept standard DTL or TTL logic levels and drive inductive loads. To simplify use as two bridges each pair of channels is equipped with an enable input.

A separate supply input is provided for the logic, allowing operation at a lower voltage and internal clamp diodes are included. The L293D is assembled in a 16 lead plastic package which has 4 center pins connected together and used for heat sinking. The L293D is assembled in a 20 lead surface mount which has 8 center pins connected together and used for heat sinking

**6.LCD:**

LCD is output device which input pin D0 to D7 are connects to Port1 of microcontroller. The resistor pack connected to Port0 in which P0.0 is connected to RS, P0.1 is connected to RW & enable pin of LCD is connected to P0.2.

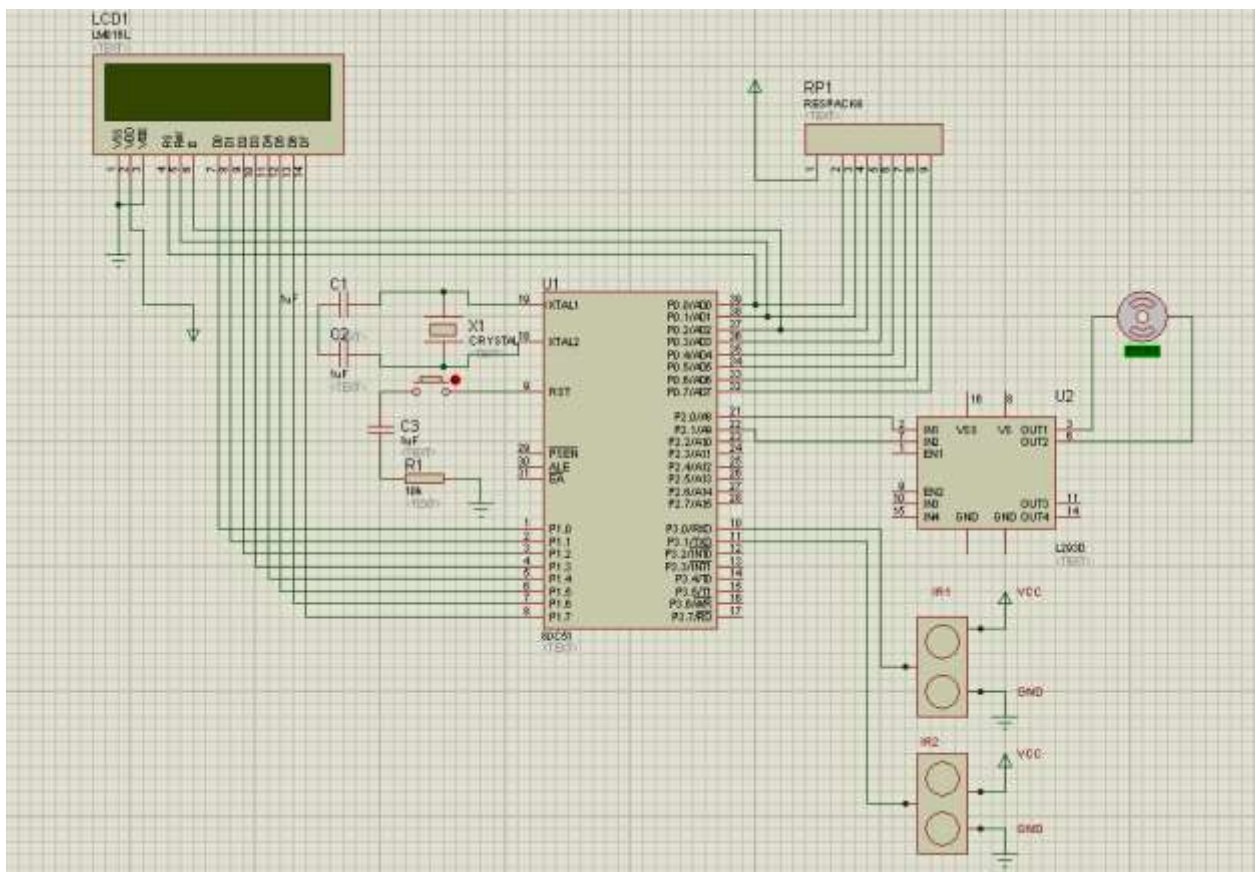
**7. IR Sensors:**

IR Sensors1 is connected across P3.0 for drive motor through motor driver at P2.0 &P2.1 are connected to input pin no 1&2 of L293D.DC motor is connected to pin no 3&6 of motor driver. IR Sensors2 is connected to P3.1 to count letter when you insert a letter in the letterbox at your home or office.

**8.Crystal oscillator:**

Crystal oscillator is connected to pin no 19&18 of microcontroller. At pin no 9 reset switch is connected through capacitor & resistor to ground.

**CIRCUIT DIAGRAM & DESCRIPTION**



**Fig: Circuit Diagram**

**ADVANTAGES**

1. Overall reduced rate of mail delivery error
2. Less human errors, more efficient working hours in sorting and deliveries
3. Satisfied customers who trust the system
4. Real-time up-to-date database
5. Less vandalism of mailboxes
6. Reduced handling costs for customers, increased competitiveness
7. More efficient and flexible operations, shorter delivery times
8. Enhanced security and safety

9. Cheaper return package costs (for online shopping)
10. Highly efficient and user friendly design
11. Easy to operate
12. Low power consumption
13. Efficient design

#### **DISADVANTAGE**

1. If increase in no. of letters complexity increases & cost will automatically increase.

#### **APPLICATION**

1. Can be use at government postal offices & Post boxes.
2. Use in bank for cheque drop box also.

#### **FUTURE SCOPE**

1. We are sending the courier using RFID & GSM.
2. Also, sending the information of courier using RFID & GSM.

#### **CONCLUSION**

Anyone drops the, letter light falling on the IR is obstructed and its output goes high. The project achieved its aim and can be implemented to counting numbers of letters to save energy and to provide an automated lifestyle.

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