

# Speed Control Of Dc Motor Using Micro Controller



## ENGINEERING

**KEYWORDS:** proposed method, components, working model

**ROMAL BASNET**

( B.E ELECTRICAL AND ELECTRONICS ENGINEERING)  
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### ABSTRACT

*the aim of this project is to control the speed of dc motor in an electronic way i.e. by using micro controller. It is an easiest and less time consuming with a great reliability and high accuracy.*

## I. introduction

Motion control is required for all manufacturing plants in industries like chemical, pharmaceutical, plastic and textile. Hence motion control plays vital role in automation which may be a flow-control application, flat belt application, or mixing of substances. On the basis of their application different types of motor like AC, stepper motor or DC motors are used .Among the various type of motor used in industrial purpose DC motor are widely been accepted since its speed can be varied very easily . Servo motors are used in robotics.

## II. proposed method

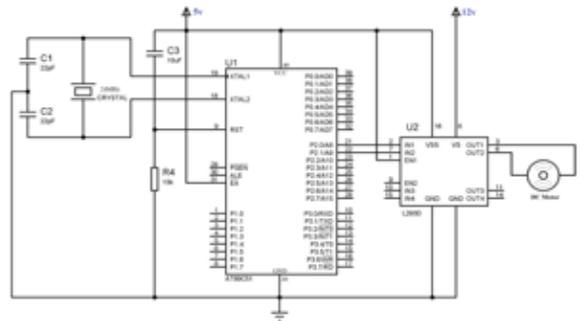
The traditional way of controlling the speed of DC motor i.e. by controlling armature voltage and current reduces the efficiency, a large amount of power is wasted in controller resistance and this might be costly too. Therefore an electronic way is proposed to control speed of a DC motor which reduces cost, has higher efficiency, greater reliability, and quick response.

## III. working principle

In designing embedded robotic projects, interfacing DC motor to 8051 forms an essential part. A well designed 8051-DC motor system has essentially two parts. The first part is a suitable software to operate and second part is a suitable driver circuit. Interfacing the DC motor directly to 8051 microcontroller is not possible. Connecting DC motor with microcontroller directly, causes many problems like voltage spikes produced while reversing the direction of rotation could easily damage the microcontroller, maximum current that can be sourced or sunk from a 8051 microcontroller is 15 mA at 5v. But a DC Motor need more currents than the current delivered by microcontroller and to operate motor, can only be fulfilled if the voltages are 6v, 12v, 24v etc, depending upon the type of motor used .The proper functioning of the microcontroller is also affected by the back emf produced by motor. Therefore to overcome such problem H-bridge using free wheeling diode, transistor or clamp diodes are used. Clamp diodes are used to overcome the effect of back emf. But using transistor, diodes makes our circuit bulky. Hence to overcome this we use L293D drivers. It is a quadrapole half H-bridge driver .such type of ics needn't need to connect any transistor or diode. We can easily control the switching of L293D using a microcontroller. And hence speed of DC motor is controlled via micro controller.

## IV. CIRCUIT DIAGRAM

## V. CONSTRUCTION



The first pair of drivers is connected to DC motor and it is enabled by connecting EN1 to logic HIGH (5V). L293D receives the logic voltage from the  $V_{ss}$  pin; hence the logic voltage is 5V. The motor supply is given to  $V_s$  pin of L293D.

Component	Type	Range	Numbers
AT89C51	ATMEL		
Crystal oscillator	X1	24 mhz	1
DC motor	AMETEK	12V	1
L293D	-	-	1
Capacitor	C1,C2,C3	22pf,22pf,10pf	3
Resistor	R4	10k	1

## VI. WORKING OF COMPONENTS

### 1. AT89C51 (micro controller)

Micro controller (AT89C51) provides the following standard features: 4Kbytes of Flash, 128 bytes of RAM, 32 I/O lines, two 16-bit timer/counters, five vector two-level interrupt architecture, a full duplex serial port, on-chip oscillator and clock circuitry. It is to be noted that dc motor is not directly connected with micro controller because a micro controller can't supply the current for the working of DC. The negative voltages created due to the back emf of the motor may affect the proper functioning of the microcontroller.

### 2. DC motor (AMETECK):

This dc fan runs at 12v dc supply. The cost for this fan is also very cheap. The advantages of using these types of motors over conventionally used AC motors are stated below.

- DC motors have higher controller efficiency.
- DC motors have typical 98% efficiency.
- DC motors have better overload and peak voltage characteristics.
- DC motors are widely used because its speed- torque characteristics can be varied to almost any useful form.

**VII .CRYSTAL OSCILLATOR**

An electronic circuit with a precise frequency that uses the mechanical resonance of a vibrating crystal of piezoelectric material to create an electrical signal is Crystal oscillator. The role of the system is very large; it is a combination of MCUs internal circuitry, resulting in the need micro controller clock frequency, single chip implementation of all the directives are built on this basis.

**VIII. RESISTOR-**

We are using two 10kΩ resistors. The function of a resistor is to contain the flow of electric current in an electronic circuit

**IX. CAPACITOR**

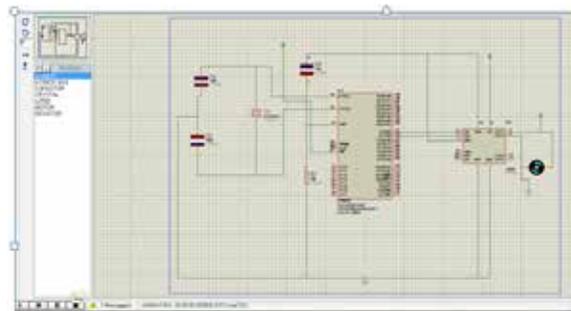
Three capacitors are used as break in circuit.

**X. SOFTWARE DESCROPTION**

```
#include<reg52.h>
#include <stdio.h>
Void delay (void);
Sbit motor_pin_1= p2^0;
Sbit motor_pin_2= p2^1;
Void main ( )
{
do
{
Motor_pin_1=1;
Motor_pin_2=0;
delay ( );
Motor_pin_1=1;
Motor_pin_2=1;
delay ( );
Motor_pin_1=0;
Motor_pin_2=1;
delay ( );
Motor_pin_1=0;
Motor_pin_2=0;
delay ( );
} while (1);
}
Void delay ( )
{
Int i, j;
for (i=0; i<1000;i++)
{
for (j=0;j<1000; j++)
{
}
```

**XI. DATA AQUINTEED**

P2.0/IN1	P2.1/IN2	Motor Status
LOW	LOW	Stops
LOW	HIGH	Clockwise
HIGH	LOW	Anti-clockwise
HIGH	HIGH	Stops



**XII. RESULT AND DISCUSSION**

The result expected can be got from the data acquainted and from simulation by proteus software . A pulse with fixed frequency is generated by the microcontroller which is fed to the base of transistor. Transistor acts here as a switch. The output voltage of the motor is dependent on the amount of the on time of the transistor. The more time transistor remain on more the voltage will produce.

**XIII. CONCLUSION**

The microcontroller based automatic speed control of dc motor has been introduced. Controlling a permanent magnet DC motor with speed feedback will be implemented using an AT89C51 microcontroller. The system can be operated by anybody without any trouble since it is user friendly. No mechanical work is to be done so it reduces cost and labor.

**XV. WORKING MODEL**



**REFERENCE**

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