PWM Method of Controlling of DC Motor

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Abstract- *The moto of this project is to control Dc motor with the help of pulse width modulator (PWM) is a device that may be used as an efficient DC motor speed controller. In many industry such as paper mills, rolling mills, printing machine machine tools, excavators and cranes etc the dc motor is used for weighing a product from one place to another on the conveyer belt due to these the speed and direction control of the dc motor is very important for this purpose. Motor speed controller is to take a signal representing the required speed and to drive a motor at that speed For that purpose wireless speed and direction control of dc motor by radio frequency technique is very crucial with pulse width modulation and H-Bridge converter. The microcontroller W78E052D is used to control the dc motor speed and Transistorised h-bridge converter is used for direction control. By adjusting the duty cycle of pulse from Pulse Width Modulation technique simultaneously the terminal voltage of motor is change and hence speed will be vary with terminal voltage.*

I. INTRODUCTION

The main objective of this project is to controlling of motor like speed and direction control wirelessly. The controlling of motor places very important role in industries such as paper and rolling mills. Suppose if there is any change in direction of rotation of motor whatever the process is taking place is done in reverse direction so there may be a huge production loss .In order to overcome this problem controlling of motor is necessary.

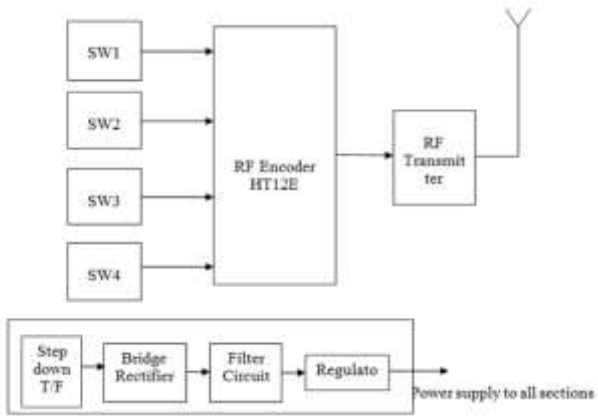
In this project the four switches are used to control DC motor. This are used to rotate the motor in forward, reverse, high speed low speed respectively. They are interfaced to the RF transmitter through RF Encoder. The encoder continuously reads the status of the switches, passes the data to the RF transmitter and the transmitter transmits the data. At the receiving end, the RF receiver receives this data, gives it to RF decoder. This decoder converts the single bit data into 8-bit data and presents it to the microcontroller. The function of micro controller is to read the data and perform the corresponding action i.e., to rotate the dc motor clockwise, anticlockwise, increase or decrease the speed of the dc motor.16X2 LCD is connected at the receiver end to display the speed level of the motor and the direction and also the temperature by using temperature sensor. LED indication is also provided for visual indication.

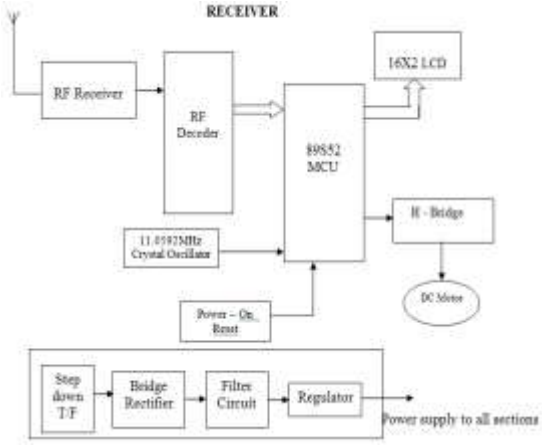
II. PROBLEM STATEMENT

This system provides control over different parameters such as speed and direction control wirelessly using PWM method such as few meters away .whenever the motor gets heated up motor automatically turn off with the help of temperature sensor hence damage caused to the motor is avoided.it detects the change in the direction of rotation of Dc motor hence reduces the huge production loss in the Industries like paper and rolling mills.

III. BLOCK DIAGRAM

TRANSMITTER





COMPONENTS

1. RF 433MHZ Transmitter and Receiver
2. DC motor

3. H-Bridge L293D
4. Relay
5. Temperature sensor LM35
6. 16*2 LCD
7. Microcontroller W78E052D
8. Pulse Width Modulation

APPLICATIONS

1. In industries for controlling of various process. Commercial applications
2. Automotive companies employing RF for wireless remote control, remote keyless entry and safety applications.
3. Consumer products including electronic toys, home security, gate and garage door openers, intercom, fire and safety systems and irrigation controller

ADVANTAGES

1. Speed and direction control of motor can be done from remote place so that it saves the time of operation
2. For easy visual Speed level and direction of motor is displayed on LCD
3. This method is more Reliable and easy to operate.

IV. CONCLUSION

The speed control and the direction control of the dc motor is achieved from the wireless and radio frequency technology with Pulse Width Modulation and H-Bridge. By using microcontroller programming speed control has been achieved with higher performance, reliable operation, easy control and better protection.

REFERENCES

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