

## DC MOTOR SPEED CONTROL USING SMS APPLICATION

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### ABSTRACT

This paper presents an easy method to control the speed of DC motor by sending SMS message from mobile phone. This system is designed to bring convenience to the user to control the motor speed from anywhere by using SMS application. Siemens TC35 GSM module has been used as a SMS receiver and is connected with MCU PIC16F877A to process the SMS. MCU is connected to dual H- Bridge Motor Driver L293D IC in order to control the speed of the motor where PWM method is used. The hardware is developed and practically the process is successfully achieved.

**Keywords:** DC motor, mobile phone, SMS application, dual H- Bridge Motor Driver

### 1. INTRODUCTION

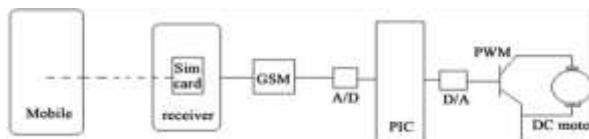
Motors are normally used for industrial control, automation and home electrical appliance. It spans everything from residential washing machines, fans, hand-held power tools, automotive window lift, traction control system, industrial drives and many more. Motor application is not completed without a control system. The inventions of microprocessor and microcontroller make the control system become easier. This control system is basically controlling the switch, speed, and direction of motor. Control signal is generated by a switch that is connected directly to the control circuit. In order to control and monitor the motor, user need to be at the place where the switch is located. In this system, mobile phone is used as a control switch. By sending text message using short message service (SMS) which is a part of the Global System for Mobile Communications (GSM), control signal is sent wirelessly to the control circuit. By implementing GSM module on the control circuit of motor, it can enable the user to send text message that contain command from any mobile phone to that GSM module. The GSM module will receive the text command and send it to the microcontroller to be processed and converted. Barsoum, I. F. B. Moidi 206 into desired control signal. Controlling motor using SMS is really convenient and give mobility as the user is able to control and monitor the motor from anywhere as long as the places have coverage. Moreover, sending text message is considered very low cost and most of people have their own mobile phones and it already becomes one of the basic needs in life.

### 2. METHODOLOGY

To control a DC motor's speed using an SMS application, you can use a GSM module to receive SMS messages and an MCU to process them:

1. Receive SMS: A GSM module receives SMS messages.
2. Process SMS: An MCU processes the SMS messages and extracts the speed.
3. Change duty cycle: The MCU changes the speed to a suitable duty cycle for the PWM.
4. Control motor: The MCU controls the motor's speed using a dual H-bridge Motor Driver.

### CIRCUIT DIAGRAM



### PROJECT IMAGE



### **3. WORKING PROCESS**

DC motor speed control system using an SMS application works by sending text messages from a mobile phone to a GSM module connected to a microcontroller, which then interprets the message content as a desired motor speed and generates a corresponding PWM signal to control the motor's rotation speed; essentially, the user sends an SMS with a speed command, the GSM module receives it, and the microcontroller translates that command into a voltage level to adjust the motor speed via Pulse Width Modulation.

### **4. PROBLEM IDENTIFICATION**

When controlling a DC motor speed using an SMS application, potential problems include: network connectivity issues, message parsing errors, delays in response time, security vulnerabilities, limited control granularity, power fluctuations affecting the GSM module, and potential for unintended commands due to user error; all of which can lead to erratic motor behavior or inability to reliably control the motor speed from a remote location.

### **A. THEORETICAL FINDINGS**

A DC motor speed control system using an SMS application, theoretically, allows users to adjust the speed of a DC motor remotely by sending text messages to a GSM module connected to a microcontroller, which then translates the message into a control signal to adjust the motor speed, providing convenient wireless control from anywhere with cellular network coverage.

### **5. FUTURE SCOPE**

A DC motor speed control system using an SMS application has a promising future scope, allowing for remote control of motor speeds from anywhere with a mobile phone, with potential applications in areas like industrial automation, home appliances, robotics, and agriculture, where flexible speed adjustments are needed, and future developments could include: more advanced user interfaces, integration with IoT platforms, enhanced security features, and adaptation to control multiple motors or complex systems; essentially making the system more user-friendly, versatile, and connected to the wider smart home/industrial network.

Key areas for future development:

- a. Advanced User Interface:
- b. Graphical user interfaces on mobile apps for intuitive speed adjustments and visual feedback on motor status.
- c. Voice commands to control motor speed.
- d. Customizable speed profiles for different applications.

### **6. ADVANTAGES**

- Remote control
- Reduces manual work
- Reduces wiring costs
- Safe
- Saves time and energy

### **7. DISADVANTAGES**

- Higher initial costs
- the operator may not know the status of the DC motor
- Requires complex circuitry.
- Limited speed range compared to other methods.

### **8. APPLICATION**

- You can use an SMS application to control the speed of a DC motor by implementing a GSM module on the motor's control circuit.
- In the farm related things like Motor.4

### **9. CONCLUSION**

It is seen that controlling a motor using SMS gives user many advantages. Controlling the speed of a motor by giving instruction to the MCU will reduce the manual work.

This technology will also save the cost of wiring.

Implementation of the system is very easy as long as particular motor is controlled by PWM which can be modified with dual H Bridge driver and coding the duty cycle to accept the desired speed that keyed by the SMS.

This system is also suitable for implementation in industries and homes.

It is thus a promise that this method is very useful to control the speed

Of DC motor wirelessly from far distance.

## 10. REFERENCES

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