

EXPERIMENT 8

Aim:

Interfacing of DC motor using L293D motor driver module controlled by Arduino UNO.

Components Required:

1. L293D motor driver
2. DC motor
3. Arduino UNO
4. Bread Board
5. Jump wires
6. USB cable

Theory:

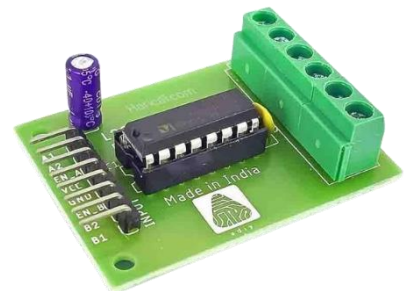
A DC (Direct Current) motor converts electrical energy into mechanical energy through electromagnetic induction. It consists of a stationary part (stator) and a rotating part (rotor). When voltage is applied, a magnetic field is generated, causing the rotor to rotate. By controlling the voltage or current direction, the motor's speed and direction can be managed. In this experiment, we interface a DC motor with an Arduino UNO using an L293D motor driver module to control its speed and direction.



The L293D is a popular motor driver IC that can drive two DC motors in both directions simultaneously. It is widely used in robotics and other projects requiring motor control. The Arduino UNO is a microcontroller board that serves as the brain of the project, generating control signals to drive the motor through the L293D module.

The L293D motor driver module typically has the following pin configuration:

- VCC: Power supply for the motor (5V to 36V)
- GND: Ground connection
- Input pins for controlling motor direction and speed (IN1, IN2, IN3, IN4)
- Output pins to connect to the motor terminals (OUT1, OUT2, OUT3, OUT4)



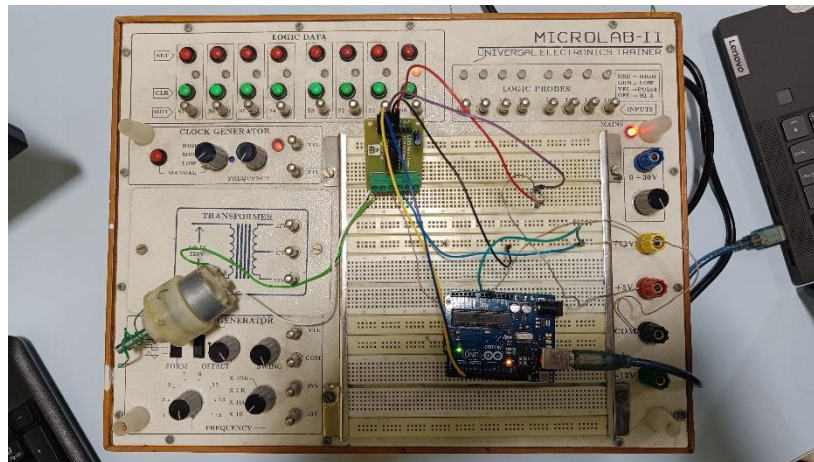
The Arduino UNO communicates with the L293D module using digital output pins to control the direction and speed of the motor. By varying the PWM (Pulse Width Modulation) signal on the input pins, the speed of the motor can be adjusted.

Sketch Code:

```
void setup() {  
  pinMode(2, OUTPUT);  
  pinMode(3, OUTPUT);  
}  
void Forward() {  
  digitalWrite(2, HIGH);  
  digitalWrite(3, LOW);  
}  
void Reverse() {  
  digitalWrite(2, LOW);  
  digitalWrite(3, HIGH);  
}  
void Stop() {  
  digitalWrite(2, LOW);  
  digitalWrite(3, LOW);  
}  
void loop() {  
  Forward();  
  delay(2000);  
  Stop();  
  delay(100);  
  Reverse();  
  delay(2000);  
  Stop();  
  delay(100);  
}
```

Result:

Upon completion of the experiment, the DC motor should be successfully interfaced with the Arduino UNO using the L293D motor driver module. The motor should be controllable in both directions and the speed should be adjustable.



Conclusion:

In this experiment, we successfully interfaced a DC motor with an Arduino UNO using an L293D motor driver module. We learned how to control the direction and speed of the motor using digital output pins of the Arduino UNO and PWM signals. This experiment serves as a fundamental building block for various robotics and automation projects requiring motor control.

Vikash Kumar Shaw

22052694