

Project IV

DC Motor Operation

Problem Statement

A DC motor is an electric motor that runs on direct current (DC) electricity. DC motors are found in small applications such as toys and disk drives, or in large sizes such as appliances, steel rolling mills, and paper machines. They can operate directly from batteries and, when appropriately controlled, can provide the motive power in both rotating directions. Our goal is to create a circuit that reads digital control signals (clockwise, counter-clockwise, and stop) and accordingly provide the appropriate voltage and currents to the motor without the need for any re-wiring or circuit modification.

Design Requirements and Performance Criteria

Your project assignment is to create a DC motor control system to be connected as shown in Figure 1. The system is to be powered by 5VDC (or 12 VDC) and must have only digital inputs (logic on and logic off). The output of the control system is a two wire terminal that is connected to the DC motor. The output should be either +5V (forward current) to create a clockwise motion in the motor or -5V (backward current) to create a counter clockwise motion in it.

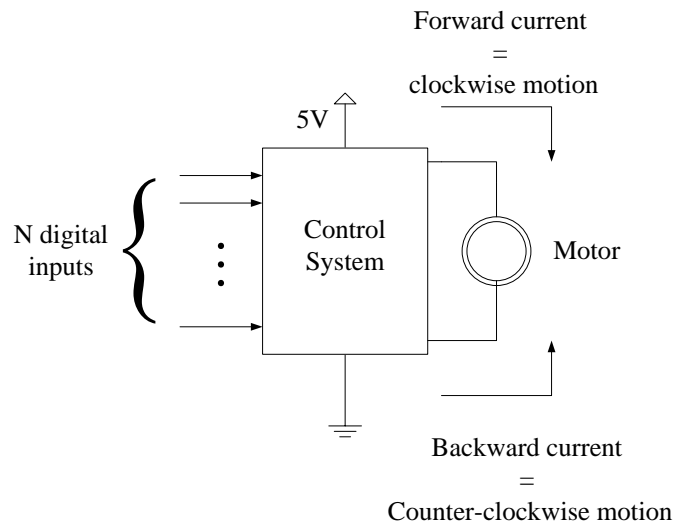


Figure 1. The control system configuration.

Testing Baseline Requirements

A successful implementation must be able to control the DC motor to turn in either direction or stop via digital switches.

Hint(s)

H-bridge