

CONCEPT Controlling the speed and direction of electric motors is important to many applications of electricity.

Pulse Width Modulation (PWM) has been used to control the speed and direction of electric motors.

BACKGROUND

With the development of microprocessors, the control of voltage level through PWM became much easier. Microprocessors can count very quickly over short time intervals making for very high PWM frequencies. Usually, motors are controlled by a motor controller which has its own motor power supply. The motor controller receives an input PWM from a microprocessor and provides the voltage to the motor.

APPLICATION

Create a PWM dimmer with your hand

Hold your hand close to your eyes so you block a small bright light source

The plane of your hand should be parallel to the plane of your face

Rapidly move your hand from left to right (or up and down)

You should see each finger one at a time go past your eyes

Slowly separate your fingers to create small openings

The distance from finger to finger represents the PWM period

The distance between your fingers represents the PWM duty cycle

The light appears to get brighter as you increase the distance between your fingers

