

PULSE WIDTH MODULATION (PWM)

Pulse width modulation has various applications to electronic devices, as it can be used to control these devices using the digital outputs of a microprocessor. Pulse width modulating an electronic device means pulsing the power source at certain frequencies and pulse width. It can be applied to LED and even mechanics, as a means of control.

A very popular application is that of the LED. The use of pulse width modulation to control the brightness of an LED depends on various factors. The period of the waveform must be very low i.e. the frequency should be very high. This enables the LED to blink at a very high rate, which is not visible to the human eye. This creates the effects of the dimming of the lights when the pulse width is altered. The pulse width can also be referred to as the duty cycle. This describes the amount of time in which the voltage is on and off. For instance, if the duty cycle is fifty percent, it means that the LED is on for half a period (on-time) and off for the other half of the same period (current flows for 50% of the time). If it is 75%, the LED is on for $3/4^{\text{th}}$ of the period time and off for $1/4^{\text{th}}$ of the period time. Fortunately, the LED do not overheat, as that is one of the perks of PWM.

The main importance of pulse width modulation is that it is quite accurate and has a very quick response time and has a low cost.