**VIDEO :02:PWM**

* Controlling LED brightness can be efficiently achieved using Pulse Width Modulation (PWM), allowing for dimming without excessive heat generation or energy waste. This method applies to various LED types including strips and high-power LEDs.
* Dimming LEDs by lowering voltage is a simple method, but it's not practical when using a fixed voltage power supply. PWM presents a better solution.
* PWM, or pulse width modulation, is an effective method for controlling LED brightness. By adjusting the duty cycle, you can dim LEDs without wasting energy, using either a microcontroller like Arduino or a 555 timer chip. This technique allows for efficient dimming of various LED types, including strips and high-power LEDs.
* Using a potentiometer for dimming can lead to energy waste as it generates heat, making it less efficient for high-power LEDs or long strips. PWM avoids this issue.
* PWM allows for controlling the brightness of LEDs by adjusting the duty cycle, which determines how long the LED stays on versus off. This method is versatile across different LED types.
* The video explains how to control LED brightness using PWM (Pulse Width Modulation) by adjusting the duty cycle, which affects the voltage output. A potentiometer is used for varying the input to dim the LED effectively.
* Duty cycle percentages determine the brightness of an LED, with 100% being fully bright and lower percentages resulting in dimmer lights. Understanding this concept is crucial for effective LED control.
* The tutorial also introduces the 555 timer chip as an alternative method for generating PWM signals to control LED brightness using simple wiring and potentiometer adjustments.
* Using a MOSFET allows for higher power outputs when controlling LED strips, ensuring that the PWM signal can effectively manage more demanding lighting setups.