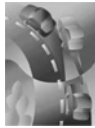


Pulse Width Modulation

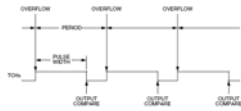
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ENG SC757 - Advanced Microprocessor Design

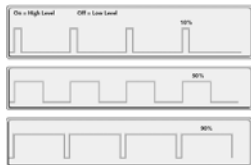
Pulse Width Modulation (PWM)

- PWM is essentially a means of transmitting information in a series of pulses, where the data being transmitted is encoded on the *width* of the transmitted pulse
- PWM is used in reducing the total power provided to a load - average power delivered is proportional to the modulation duty cycle



PWM – How it works

- If you were to connect a light bulb to a 5 volt power source, it would consume a constant amount of power
- If on the other hand you connected the light bulb to a switch and controlled it by opening and closing the switch at a period of 50 ms, the light bulb would act as though it was connected to a 2.5v power supply!



PWM – How it works

- Of course, if instead of 50 ms the switch was held open for 1 minute and closed for 1 minute, the light bulb would remain lit at 5v and 0v instead
- Therefore the frequency of modulation matters, and it is dependant on the resistive response time of the load



PWM - Examples

- PWM is used in a great number of applications:
 - Communications
 - The width of the transmitted pulse corresponds to the encoded data value
 - Is immune to noise
 - Power Delivery
 - Reduce the total amount of power delivered to a load
 - Examples: DC Motors, Light Dimmers, Anti-Lock Breaking System
 - Voltage Regulation
 - Audio Amplifiers

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