Pulse Width Modulation

Pulse width modulation, more commonly known as PWM is a brilliant method to control the voltage on a digital pin. This involves switching the digital pin on and off at a particular frequency.

The Bolt WiFi module is equipped with the capability to adjust the voltage on it's digital pin using PWM. The PWM signal generated by the module, switches at a frequency of 1kHz. That means that the Bolt is capable of switching it's digital GPIO HIGH and LOW, 2000 times per second. So the pin cycle of switching is about 1ms long. This time is called the duty cycle.

In the PWM technique, the voltage is controlled by setting the time for which the pin will be on or off during a cycle.

For example,

If the pin is on for 0.5ms and off for 0.5ms, the Bolt will maintain a voltage of 3.3 volts on the pin for 0.5ms and 0 volts for 0.5ms. So the final voltage on the pin will be close to 1.65v.

Similarly, if the pin is on for 0.9 ms and off for 0.1ms, then the final voltage on the pin will be 3v.

The Bolt WiFi module takes a PWM value with which it calculates the period for which the pin has to be kept on, and the period for which the pin has to be kept off.

The PWM value should be in the range of 0 to 255. A value of 0, sets the on time of the pin to 0ms, and a value of 255 sets the on time of the pin to 1ms.

So if you set the PWM value to 0, the final voltage on the pin will be 0v, and for a PWM value of 255, the final voltage on the pin will be 3.3v.

Similarly, for a PWM value of 128, the voltage on the pin will be 1.65 volts.

