**Neopixel RGB LEDs Datasheet**

**Description**

An ‘intelligent’ or ‘smart’ LED device that can be customised in colour and brightness. Each LED has four pins and is designed to be connected in a chain of other LEDs.

Each ‘LED’ has three LEDs inside: One Red, One Blue and One Green. By varying the brightness of each internal LED the just under 16.8 million colours can be ‘mixed’.

**LED Pinout**

Single LED:

**Vcc**

**Data Out**

**R**

**G**

**B**

**GND**

**GND**

**Vcc**

**Data In**

**Inputs**

**Outputs**

Chain of LEDS :

**…**

**R**

**G**

**B**

**Vcc**

**R**

**G**

**B**

**GND**

**Data In**

**Operating Conditions**

**Vcc : 5V**

**Data Packets on Data IN**

Each LED will receive a Data Packet that is 24 bits long representing three 8 bit binary numbers corresponding to the relative brightness of each LED.

E.G.

10001010 00100110 11001011

**Red Green Blue**

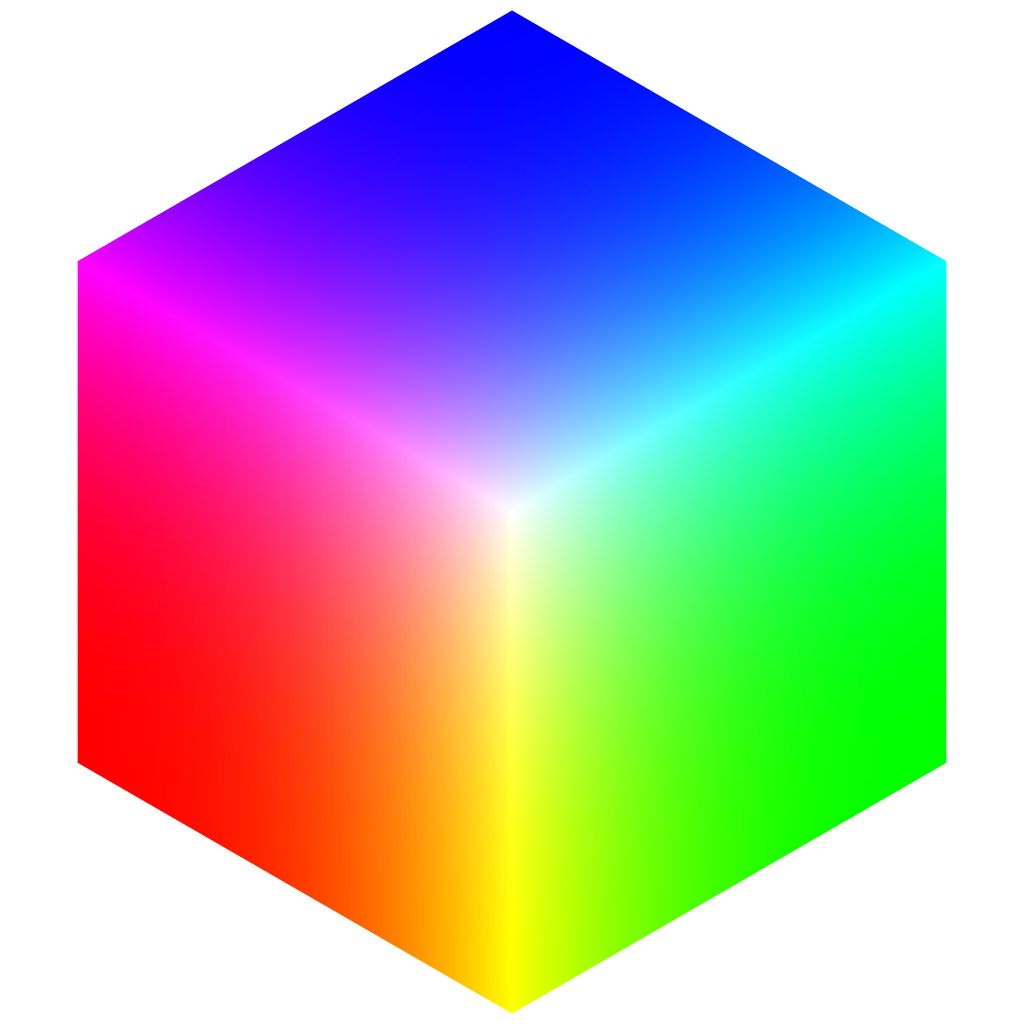
Maximum brightness (Fully On) of each LED is 11111111 (binary) = 255 (decimal)

Minimum brightness (Fully Off) of each LED is 00000000 (binary) = 0 (decimal)

The host (Arduino UNO) will send out Data Packets equal to the number of LEDs in the chain. The host then pauses for 50 us to reset the counters in the LEDs before sending another round of data packets.

Each LED takes the first 24 bits it sees then passes through all subsequent bits through its data out. This allows the next packet to reach the next LED. After a pause of 50 us it will reset.

**Colour Mixing**



**Red Green**

**Blue**