DESCRIPTION

The RGB LED module is small compact module that integrates an RGB LED with the necessary resistors and breadboard/Arduino friendly pin headers. The diffused RGB LED is able to display multiple colors using simple digital output pins. PWM signals allow intensity control of each color component and thereby producing even more colors.

The RGB LED module is part of Layad Circuits' Kimat series of rapid prototyping products.

Figure 1: The Kimat – RGB LED module

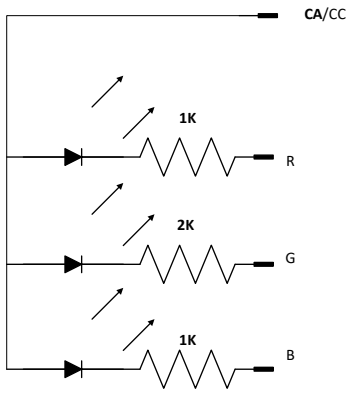
FEATURES

- 8mm RGB LED with integrated resistors
- Compatible with 3.3V or 5V controllers
- Compact form factor, board dimensions: 20x23mm
- Standard 2.54mm pitch headers. Breadboard friendly.
- Comes in either Common Anode or Commode Anode variant.

PIN FUNCTIONS

Pin Label	Function/Operation/Remarks
CA/CC	Common pin. For CA variant, this is to be connect to Vcc. For CC variant, connect this to ground
R,G,B	Pins for the red, blue and green LEDs.

SCHEMATIC



APPLICATION NOTES

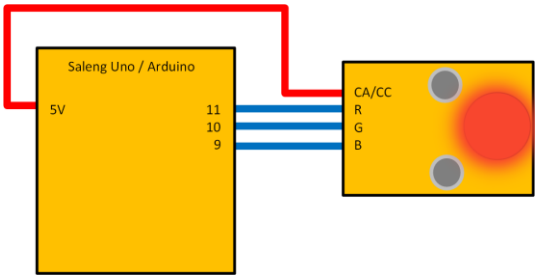


Figure 2: Wiring the RGB LED module with an Arduino.

Usage of the module is straight forward. Connect each color pin to a digital pin on the microcontroller. For a CA board, connect the CA/CC pin to 5V. For CC variants, connect this pin to GND. Turn each color on and off a high or a low respectively. Generating PWM signals on each color pin produces more colors.

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Below is an example Arduino sketch demonstrating how the module may be used. This follows the connection as shown in figure 2. The sketch outputs 7 basic colors using simple low and high signals. The sketch is for the CA variant of the module. For CC variants, simply invert the LOWs with HIGHs and HIGHs with LOWs.

```
// sketch for CA variant
const byte PIN_R = 11;
const byte PIN_G = 10;
const byte PIN_B = 9;

void setup() {
  pinMode(PIN_R,OUTPUT);
  pinMode(PIN_G,OUTPUT);
  pinMode(PIN_B,OUTPUT);
}

void loop() {

  // RED
  digitalWrite(PIN_R,LOW);
  digitalWrite(PIN_G,HIGH);
  digitalWrite(PIN_B,HIGH);
  delay(1000);

  // GREEN
  digitalWrite(PIN_R,HIGH);
  digitalWrite(PIN_G,LOW);
  digitalWrite(PIN_B,HIGH);
  delay(1000);

  // BLUE
  digitalWrite(PIN_R,HIGH);
  digitalWrite(PIN_G,HIGH);
  digitalWrite(PIN_B,LOW);
  delay(1000);


  // CYAN
  digitalWrite(PIN_R,HIGH);
  digitalWrite(PIN_G,LOW);
  digitalWrite(PIN_B,LOW);
  delay(1000);

  // PURPLE
  digitalWrite(PIN_R,LOW);
  digitalWrite(PIN_G,HIGH);
  digitalWrite(PIN_B,LOW);
  delay(1000);

  // YELLOW-GREEN
  digitalWrite(PIN_R,LOW);
  digitalWrite(PIN_G,LOW);
  digitalWrite(PIN_B,HIGH);
  delay(1000);

  // WHITE
  digitalWrite(PIN_R,LOW);
  digitalWrite(PIN_G,LOW);
  digitalWrite(PIN_B,LOW);
  delay(1000);
}
```

Generating PWM signals on the color pins produces more colors. In case of the Saleng Uno/Arduino Uno, pins 9~11 are capable of PWM signals using the analogWrite() function. Of course, you can generate PWM with some other method such as with timer interrupts and still get the same results.

The following Arduino sketch demonstrates simple color mixing using PWM signals.

```
// sketch for CA variant
const byte PIN_R = 11;
const byte PIN_G = 10;
const byte PIN_B = 9;

void rgb(byte r, byte g, byte b)
{
  // use this for CA variant
  analogWrite(PIN_R,255-r);
  analogWrite(PIN_G,255-g);
  analogWrite(PIN_B,255-b);
  //for CC variant, use this instead:
  //analogWrite(PIN_R,r);
  //analogWrite(PIN_G,g);
  //analogWrite(PIN_B,b);
}
void setup() {
  pinMode(PIN_R,OUTPUT);
  pinMode(PIN_G,OUTPUT);
  pinMode(PIN_B,OUTPUT);
}
void loop() {
  /*RED*/        rgb(255,0,0); delay(1000);
  /*GREEN*/      rgb(0,255,0); delay(1000);
  /*BLUE*/       rgb(0,0,255); delay(1000);
  /*SKY BLUE*/   rgb(0,64,255); delay(1000);
  /*PINK*/       rgb(255,0,64); delay(1000);
  /*CYAN*/       rgb(0,128,255); delay(1000);
  /*YELLOW*/     rgb(128,96,0); delay(1000);
  /*PURPLE*/     rgb(255,0,255); delay(1000);
  /*ORANGE*/     rgb(255,32,0); delay(1000);
  /*WHITE*/      rgb(255,255,255); delay(1000);
  /*VIOLET*/     rgb(48,32,160); delay(1000);
  /*BLUE-GREEN*/ rgb(0,255,64); delay(1000);
  /*OFF*/        rgb(255,128,32);
}
```

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