

DESCRIPTION

The 3 LED module is small compact module that integrates 3 LED's with the necessary resistors and breadboard/Arduino friendly pin headers. The 3 LED module is part of Layad Circuits' Kimat series of rapid prototyping products.

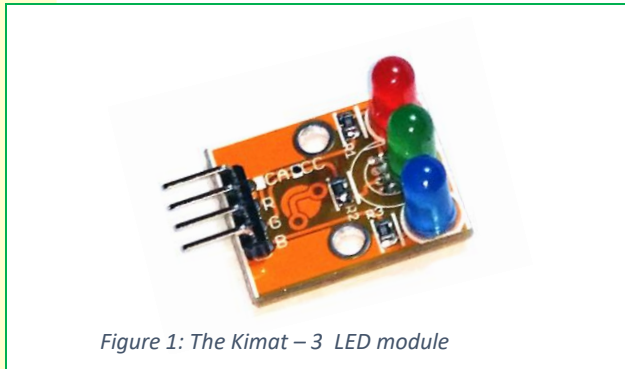


Figure 1: The Kimat – 3 LED module

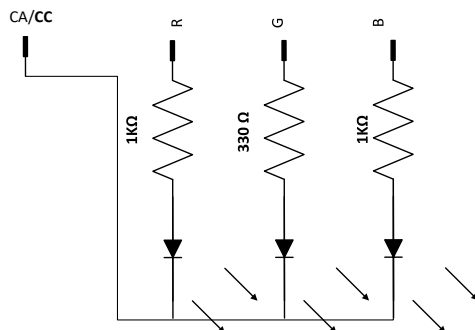
FEATURES

- 3x 5mm LED's with integrated resistors
- Compatible with 3.3V or 5V controllers
- Compact form factor, board dimensions: 20x23mm
- Standard 2.54mm pitch headers. Breadboard friendly.

PIN FUNCTIONS

Pin Label	Function/Operation/Remarks
CA/CC	Common Ground Pin.
R,G,B	Pins for the red, blue and green LEDs.

SCHEMATIC



APPLICATIONS NOTES

This module contains a very simple circuit - 3 standard 5mm LED's with current limiting resistors. Simple things may prove troublesome to build though when you have to do it often or when your project is time critical. This is especially true for something very useful as LED's. This is why we have this module. This has been used extensively as an indicator from simple 3 channel digital state tester to power indicators.

Wiring and Testing

You may always use connectors (or breadboard) for the pins and connect them individually to whichever GPIO or voltage source you want to use. For Arduino users, a trick for avoiding the use of wires is to employ 1 digital pin as a ground pin by setting it as an output and initializing it to the low state. This will allow you to insert the module into any 4 adjacent pins.

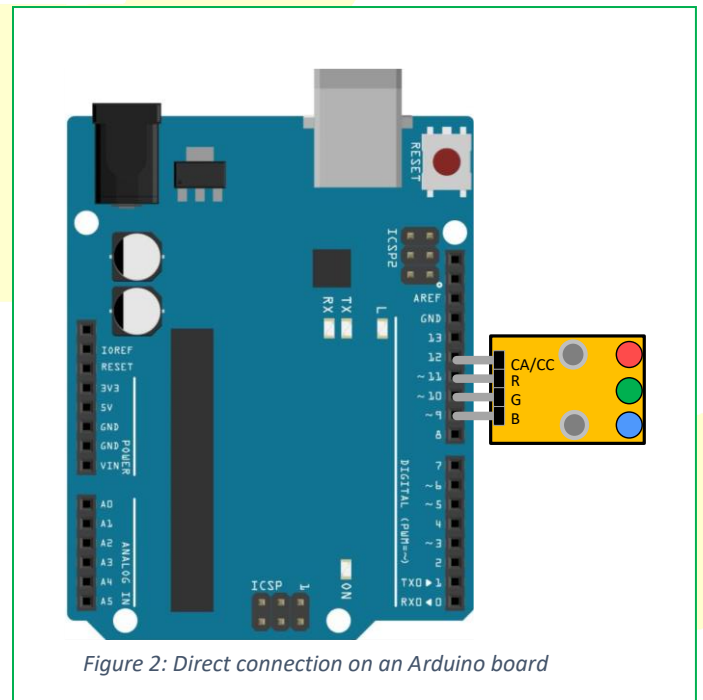


Figure 2: Direct connection on an Arduino board

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We use the following Arduino sketch in testing these modules. It generates PWM signals on pins 9~11 to fade each LED. This sketch follows the connection shown in figure 2.

```
const byte PIN_R = 11;
const byte PIN_G = 10;
const byte PIN_B = 9;
const byte GROUND = 12;

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

void loop() {
  for(byte i=0;i<255;i++)
  {
    analogWrite(PIN_R, i);
    analogWrite(PIN_G, i);
    analogWrite(PIN_B, i);
    delay(5);
  }
  for(byte i=255;i>=0;--i)
  {
    analogWrite(PIN_R, i);
    analogWrite(PIN_G, i);
    analogWrite(PIN_B, i);
    delay(5);
  }
}
```

Important Notes

When all 3 LED's are fully on, the current consumed by the module would typically be at ~25mA which is still well within the 40mA source/sink current limit of each of the Arduino (AVR-based boards) pins. For non-AVR Arduino boards or other microcontrollers / microprocessors, you would want to consult your device's maximum current per pin.

Note that the current limiting resistors for the R and B lines are 1K Ω while the G line has a 330 Ω resistor. This is not an issue for 5V devices, such as AVR-based

Arduinos, or 3.3V devices, like the Raspberry Pi. For higher voltages, as in the case of power indicators, the maximum voltage for the R and B channels should be 20V and 6V for the G channel to keep us within the 20mA LED forward current.

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