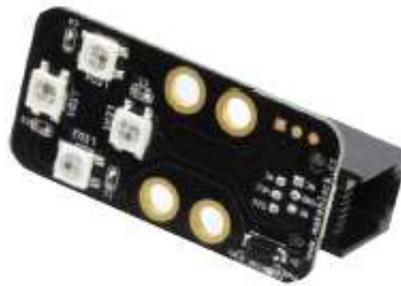


Me RGB LED



Overview

The Me RGB LED module comprises four adjustable and panchromatic RGB LEDs. The color of each LED can be decided by the values of red (R), green (G), and blue (B). With built-in control chip in each RGB LED, you need only a single signal line to implement independent full-color function. It features adjustable brightness, so the effects of running water, twinkling, and rainbow light can be achieved. Its yellow ID means that it has a single-digital port and needs to be connected to the port with yellow ID on Makeblock Orion.

Technical specifications

- Operating voltage: 5V DC
- Quantity of LED: 4 x RGB LED
- Maximum current: 60mA each, 240mA in total
- LED type: WS2812-4
- Luminance range: 0~255

- Control mode: Single-digital port control
- Angle of visibility: >140°
- Module size: 51 x 24 x 18 mm (L x W x H)

Functional characteristics

- With 256 levels of brightness for the RGB color of each pixel, it features true color display of 16,777,216 colors and scanning frequency no less than 400Hz
- With concatenated serial ports, you can complete receiving and decoding of data with a single line
- White area of module is the reference area to contact metal beams
- Anti-reverse protection – connecting the power supply inversely will not damage IC
- Support mBlock GUI programming, and applicable to users of all ages
- Adopt RJ25 port for easy connection
- Provide pin-type port to support most development boards including Arduino series

Light color	Dominant wavelength (nm)	Light intensity (mcd)	Maximum current (mA)
Red	620-630	550-700	20
Green	515-530	1100-1400	20
Blue	465-475	200-400	20

Pin definition

The port of Me Ultrasonic Sensor has three pins, and their functions are as follows:

No.	Pin	Function
1	GND	Grounding
2	5V	Connect the power
3	SIG	Signal control

Wiring mode

- Connecting with RJ25

Since the port of Me Ultrasonic Sensor has yellow ID, you need to connect the port with yellow ID on Makeblock Orion when using RJ25 port. Taking Makeblock Orion as example, you can connect to ports No. 3, 4, 5, 6, 7, and 8 as follows:

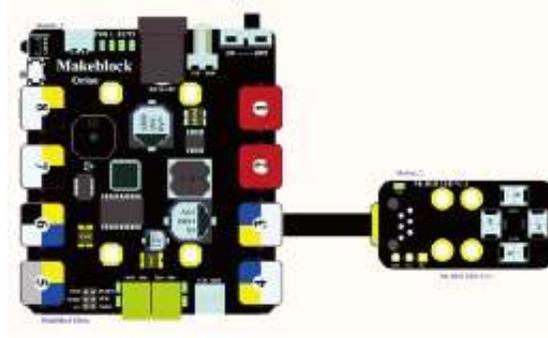


Figure 1 Connecting Me RGB LED to Makeblock Orion

- Connecting with Dupont wire

When the Dupont wire is used to connect the module to the Arduino UNO Baseboard, its SIG pin should be connected to digital port as follows:

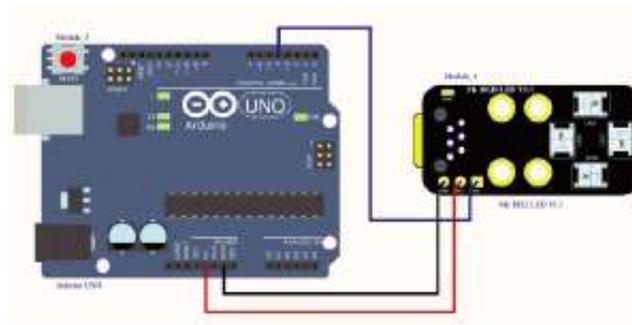


Figure 2 Connecting Me RGB LED to Arduino UNO
Note: When Dupont wire is used, pin header should be welded on the module.

Guide to programming

- Arduino programming

If you use Arduino to write a program, the Makeblock-Library-master should be invoked to control the Me RGB LED. This is a routine to change the color of four LEDs regularly to implement beautiful color cycling through Arduino programming.

```

01 #include "MeOrion.h"
02 #include <Wire.h>
03 #include <SoftwareSerial.h>
04 MeRGBLed led(PORT_3);
05 float j, f, k;
06 void setup()
07 {
08 }
09 void loop()
10 {
11   color_loop();
12 }
13
14 void color_loop()
15 {
16   for(uint8_t t=0; t<15; t++)
17   {
18     uint8_t red = 64*(1+sin(t/2.0+j/4.0));
19     uint8_t green = 64*(1+sin(t/1.0+f/9.0+2.1));
20     uint8_t blue = 64*(1+sin(t/3.0+k/14.0+4.2));
21     led.setColorAt(t, red, green, blue);
22   }
23   led.show();
24   j+=random(1,6)/6.0;
25   f+=random(1,6)/6.0;
26   k+=random(1,6)/6.0;
27 }

```

Function List of Me RGB LED

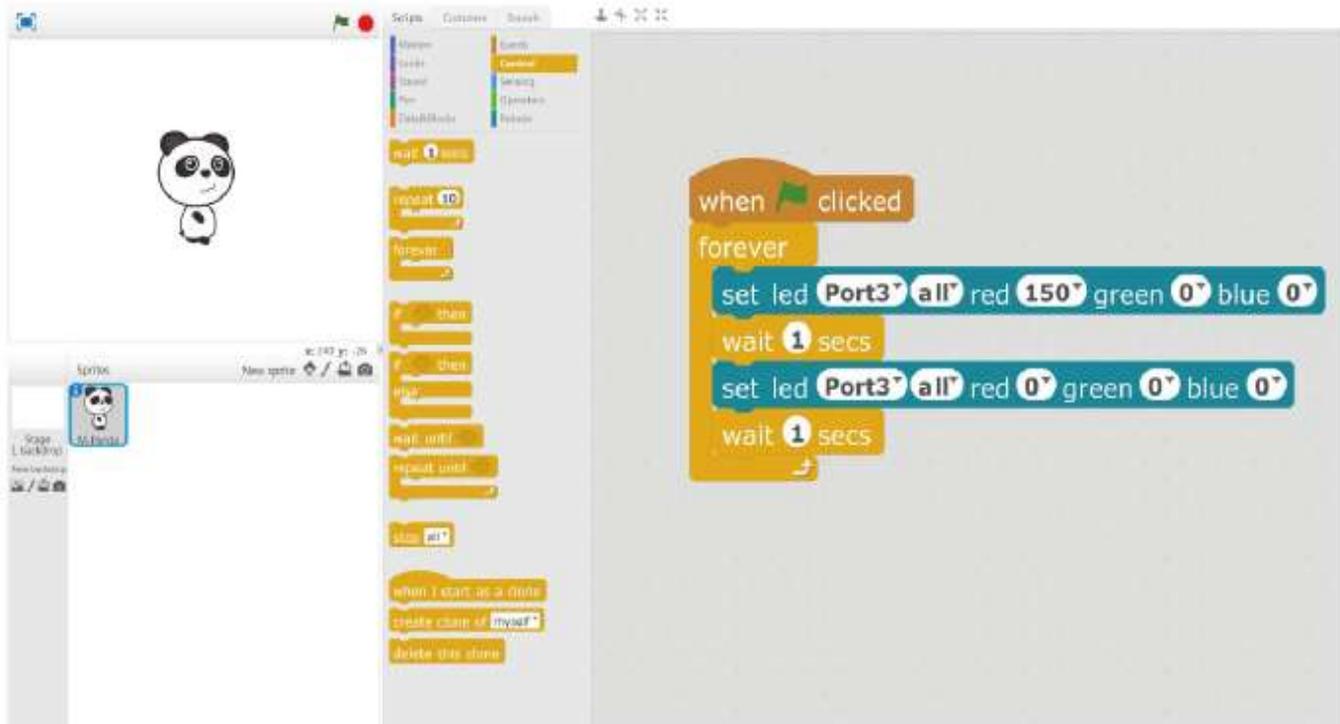
Function name	Function
MeRGBLed(uint8_t port)	Select a port
show()	Start to show
setNumber(uint8_t num_leds)	Set the number of LED
setColorAt(uint8_t index, uint8_t red, uint8_t green, uint8_t blue)	Set the RGB parameter of LED
getNumber()	Get the number of LED
getColorAt(uint8_t index)	Get the RGB parameter of LED
reset(uint8_t port);	Reset the port

- mBlock programming

Me RGB LED supports the mBlock programming environment and its instructions are introduced as follows:

Programming description	Description
	Parameter 1: Select a port Parameter 2: Set the LED number to be controlled Parameter 3: Set the red value (0-255) Parameter 4: Set the green value (0-255) Parameter 5: Set the blue value (0-255) Function: Control the RGB LED

This is the effect to control the RGB LED flashing in red every second.



Principle analysis

Me RGB LED adopts the mode of single-line-return-to-zero code as its communication protocol. When the pixel is in power and reset, the DIN end receives the data sent from the controller. The first 24 bits of the data are retrieved by the first pixel and sent to the data latch for the pixel; the rest of the data is reshaped and amplified by internal reshaping circuit, and then forwarded to the next cascaded pixel through the DO port. The signal is reduced by 24 bits transmitted through a pixel. The automatic reshaping and forwarding technology is used by the pixels, so that the number of cascaded pixels is not limited by the transmission of signal, but limited by the speed of signal transmission.

Schematic

