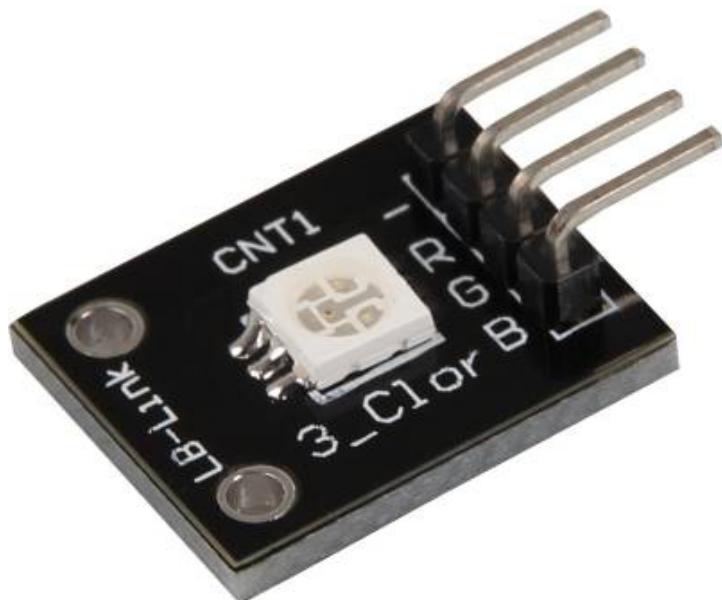


KY-009 RGB LED SMD module

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Picture



Technical data / Short description

A LED-module which provides a red, blue and green LED. These are connected with a common cathode. A resistor is necessary for different voltages.

Vf [Red]= 1,8V

Vf [Green,Blue]= 2,8V

If= 20mA

Pre-resistor:

KY-009 RGB LED SMD module

R_f (3,3V) [Green] = 100Ω

R_f (3,3V) [Red] = 180Ω

R_f (3,3V) [Blue] = 100Ω

[for example using of ARM CPU-Core based microcontroller like Raspberry-Pi]

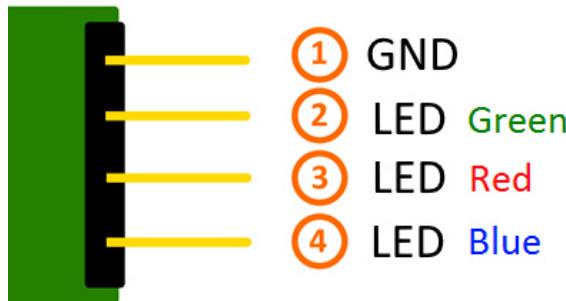
R_f (5V) [Green] = 100Ω

R_f (5V) [Red] = 180Ω

R_f (5V) [Blue] = 100Ω

[for example using of Atmel Atmega based microcontroller like Arduino]

Pinout



Code example Arduino

Code example ON/OFF

In this example you will see how the LEDs will be switched on with a defined output pin, in a 3 second clock pulse.

```
int Led_Red = 10;
int Led_Green = 11;
int Led_Blue = 12;

void setup ()
{
    // Output pin initialization for the LEDs
    pinMode (Led_Red, OUTPUT);
    pinMode (Led_Green, OUTPUT);
    pinMode (Led_Blue, OUTPUT);
}

void loop () //main program loop
{
    digitalWrite (Led_Red, HIGH);    // LED will be switched on
```

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```
digitalWrite (Led_Green, LOW); // LED will be switched off
digitalWrite (Led_Blue, LOW); // LED will be switched off
delay (3000); // Waitmode for 3 seconds

digitalWrite (Led_Red, LOW); // LED will be switched off
digitalWrite (Led_Green, HIGH); // LED will be switched on
digitalWrite (Led_Blue, LOW); // LED will be switched off
delay (3000); // Waitmode for another 3 seconds in which the LED status will be shifted.

digitalWrite (Led_Red, LOW); // LED will be switched off
digitalWrite (Led_Green, LOW); // LED will be switched off
digitalWrite (Led_Blue, HIGH); // LED will be switched on
delay (3000); // Waitmode for another 3 seconds in which the LED status will be shifted.
}
```

Example program ON/OFF download:[KY-009_LED_ON-OFF](#)**Code example PWM**

You can regulate the brightness of the LEDs via pulse-width modulation. The LEDs will be switched ON and OFF for specific time periods, in which the relation between ON and OFF leads to a relative brightness, because of the Inertia of the human eyesight, the human eye interprets the ON/OFF as a brightness change. For more information to that theme visit: [\[Artikel von mikrokontroller.net\]](#)

This module provides a few LEDs - with the overlay of the different brightness levels, you can create different colors. This will be shown in the following code example.

```
int Led_Red = 10;
int Led_Green = 11;
int Led_Blue = 12;

int val;

void setup () {
    //Output pin initialization for the LEDs
    pinMode (Led_Red, OUTPUT);
    pinMode (Led_Green, OUTPUT);
    pinMode (Led_Blue, OUTPUT);
}

void loop () {
    // In this for-loop, the 3 LEDs will get different PWM-values
    // Via mixing the brightness of the different LEDs, you will get different colors.
    for (val = 255; val> 0; val--)
    {
        analogWrite (Led_Blue, val);
        analogWrite (Led_Green, 255-val);
        analogWrite (Led_Red, 128-val);
        delay (1);
    }
    // You will go backwards through the color range in this second for loop.
    for (val = 0; val <255; val++)
    {
        analogWrite (Led_Blue, val);
        analogWrite (Led_Green, 255-val);
        analogWrite (Led_Red, 128-val);
        delay (1);
    }
}
```

KY-009 RGB LED SMD module

Example program PWM download:[KY-009_LED_PWM](#)**Connections Arduino:**

LED Red	= [Pin 10]
LED Green	= [Pin 11]
LED Blue	= [Pin 12]
Sensor GND	= [Pin GND]

Code example Raspberry Pi**Code example ON/OFF**

In this example you will see how the LEDs will be switched on with a defined output pin, in a 3 second clock pulse.

```
# Needed modules will be imported and configured.
import RPi.GPIO as GPIO
import time

GPIO.setmode(GPIO.BCM)
# The output pins will be declared, which are connected with the LEDs.
LED_Red = 6
LED_Green = 5
LED_Blue = 4

GPIO.setup(LED_Red, GPIO.OUT, initial= GPIO.LOW)
GPIO.setup(LED_Green, GPIO.OUT, initial= GPIO.LOW)
GPIO.setup(LED_Blue, GPIO.OUT, initial= GPIO.LOW)

print "LED-Test [press ctrl+c to end]"

# main program loop
try:
    while True:
        print("LED Red is on for 3 seconds")
        GPIO.output(LED_Red,GPIO.HIGH) #LED will be switched on
        GPIO.output(LED_Green,GPIO.LOW) #LED will be switched off
        GPIO.output(LED_Blue,GPIO.LOW) #LED will be switched off
        time.sleep(3) #Waitmode for 3 seconds
        print("LED Green is on for 3 seconds")
        GPIO.output(LED_Red,GPIO.LOW) #LED will be switched off
        GPIO.output(LED_Green,GPIO.HIGH) #LED will be switched on
        GPIO.output(LED_Blue,GPIO.LOW) #LED will be switched off
        time.sleep(3) #Waitmode for 3 seconds
        print("LED Blue is on for 3 seconds")
        GPIO.output(LED_Red,GPIO.LOW) #LED will be switched off
        GPIO.output(LED_Green,GPIO.LOW) #LED will be switched off
        GPIO.output(LED_Blue,GPIO.HIGH) #LED will be switched on
        time.sleep(3) #Waitmode for 3 seconds

# Scavenging work after the end of the program
except KeyboardInterrupt:
    GPIO.cleanup()
```

KY-009 RGB LED SMD module

Example program ON/OFF download[KY009_RPi_ON-OFF](#)

To start, enter the command:

```
sudo python KY009_RPi_ON-OFF.py
```

Code example PWM

You can regulate the brightness of the LEDs via pulse-width modulation. The LEDs will be switched ON and OFF for specific time periods, in which the relation between ON and OFF leads to a relative brightness, because of the Inertia of the human eyesight, the human eye interprets the ON/OFF as a brightness change. For more information to that theme visit: [Artikel von mikrokontroller.net](#)

This module provides a few LEDs - with the overlay of the different brightness levels, you can create different colors. This will be shown in the following code example. At the Raspberry Pi, only one Hardware-PWM channel is carried out unrestricted to the GPIO pins, that's why we have used Software-PWM on this example.

```
# Needed modules will be imported and configured.
import random, time
import RPi.GPIO as GPIO

GPIO.setmode(GPIO.BCM)
<br /># Declaration of the output pins, which are connected with the LEDs.
LED_Red = 6
LED_Green = 5
LED_Blue = 4

# Set pins to output mode
GPIO.setup(LED_Red, GPIO.OUT)
GPIO.setup(LED_Green, GPIO.OUT)
GPIO.setup(LED_Blue, GPIO.OUT)

Freq = 100 #Hz
# The different colors will be initialized.
RED = GPIO.PWM(LED_Red, Freq)
GREEN = GPIO.PWM(LED_Green, Freq)
BLUE = GPIO.PWM(LED_Blue, Freq)
RED.start(0)
GREEN.start(0)
BLUE.start(0)
# This function generates the actually color

def LED_color(Red, Green, Blue, pause):
    RED.ChangeDutyCycle(Red)
    GREEN.ChangeDutyCycle(Green)
    BLUE.ChangeDutyCycle(Blue)
    time.sleep(pause)

    RED.ChangeDutyCycle(0)
    GREEN.ChangeDutyCycle(0)

print "LED-Test [press ctrl+c to end the test]"

# Main program loop:
# The task of this loop is to create for every single color an own variable.
# By mixing the brightness levels of the colors, you will get a color gradient.
```

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```
try:  
    while True:  
        for x in range(0,2):  
            for y in range(0,2):  
                for z in range(0,2):  
                    print (x,y,z)  
                    for i in range(0,101):  
                        LED_color((x*i),(y*i),(z*i),.02)  
  
    # Scavenging work after the end of the program.  
except KeyboardInterrupt:  
    GPIO.cleanup()
```

Example program PWM download:[KY-009_RPi_PWM](#)

To start, enter the command:

```
sudo python KY-009_RPi_PWM.py
```

Connections Raspberry Pi:

LED Red	= GPIO6 [Pin 22]
LED Green	= GPIO5 [Pin 18]
LED Blue	= GPIO4 [Pin 16]
Sensor GND	= GND [Pin 6]