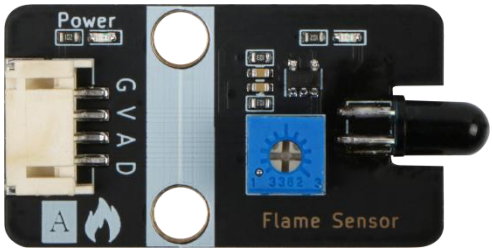
Fire Alarm Experiment of Flame Sensor Module

Module Introduction

In public places, such as hotels, buildings and other places are equipped with fire alarm, so how does the fire alarm sense fire? It is well known that when a fire breaks out, there will be a particularly strong infrared ray, which can detect the fire through infrared ray. The flame sensor can be used to detect the intensity of infrared rays. However, the sensor is particularly sensitive to flame, so it can be used to detect flame. When the flame sensor senses the flame, it will output a low-level digital signal and the corresponding analog signal.



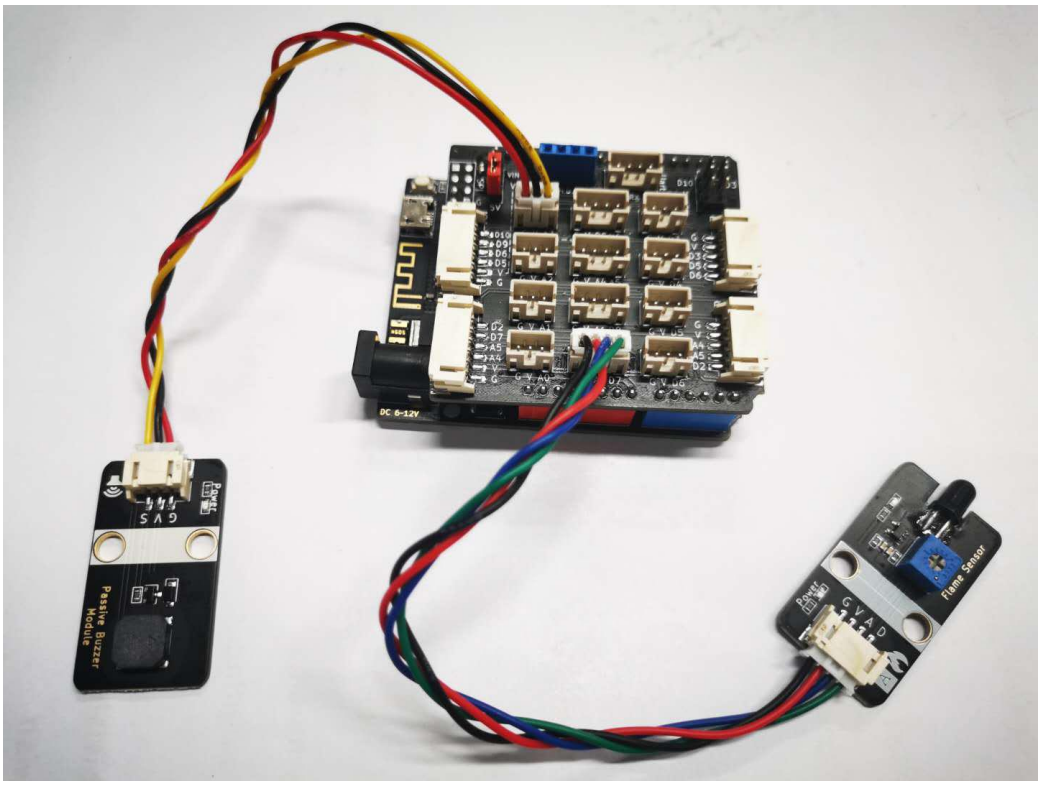
Purpose of the Experiment

Learn how to use the flame sensor and understand its working principle; try to make a self-made fire alarm.

Device List

- BLE-UNO Main Board: 1
- Expansion Board of PH2.0 Sensor Board: 1
- USB Data Wire: 1
- Flame Sensor Module: 1
- 4PIN Wire Jumper: 1
- Buzzer Module: 1
- 3PIN Wire Jumper: 1

Physical Wiring Diagram

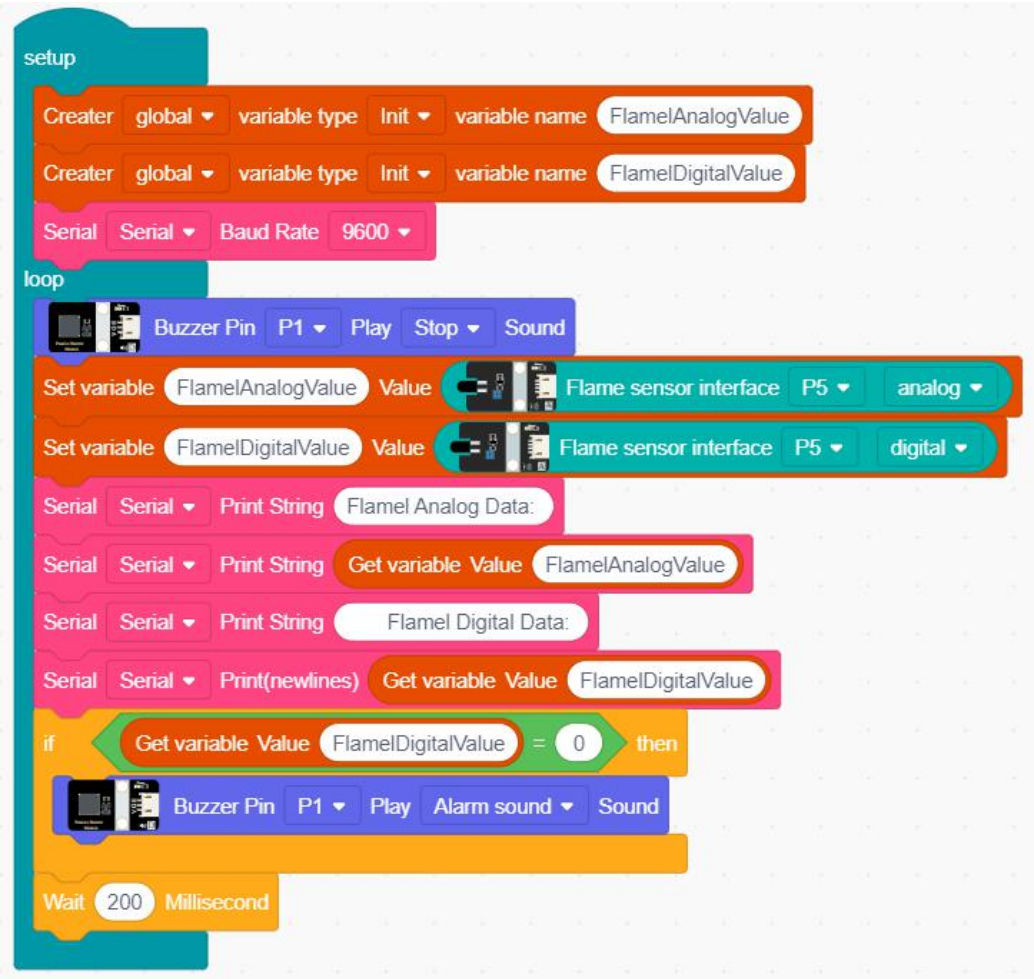


Program Code

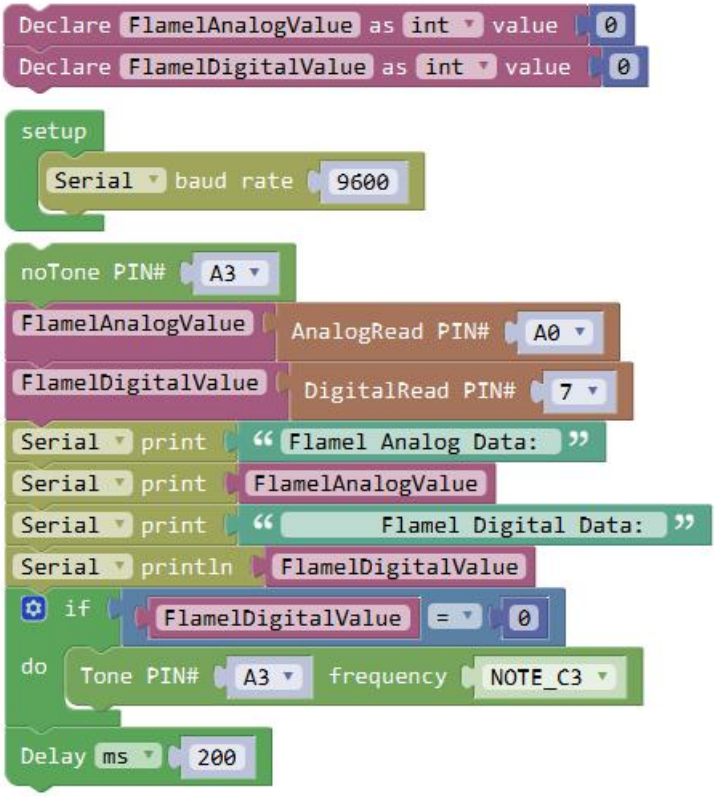
```
#include "Buzzer.h"

#define FlamelDigitalPin    7//Define flame sensor digital pin
#define FlamelAnalogPin      A0//Define flame sensor analog pin
#define BuzzerPin A3//Define passive buzzer block pins

Buzzer buzzer(BuzzerPin) ;
int    FlamelAnalogValue = 0 ;//Define digital variables and read flame analog values
int    FlamelDigitalValue = 0 ;//Define digital variables and read the flame digital value
void setup()
{
   Serial.begin(9600);//Set the serial port baud rate
   pinMode(FlamelDigitalPin, INPUT);//Set flame sensor digital pin as input
   pinMode(FlamelAnalogPin, INPUT);//Set flame sensor analog pin as input
   pinMode(BuzzerPin, OUTPUT);//Set the passive buzzer module pin as output
}
void loop()
{
   buzzer.noTone();//Buzzer stop
   FlamelAnalogValue = analogRead(FlamelAnalogPin);//Read the flame sensor analog value
```

```
    FlamelDigitalValue = digitalRead(FlamelDigitalPin);//Read digital value of flame sensor
    Serial.print("FlamelAnalog Data:    ");
    Serial.print(FlamelAnalogValue);//Print flame sensor analog value
    Serial.print("            FlamelDigital Data:    ");
    Serial.println(FlamelDigitalValue);//Print flame sensor digital value
    if (FlamelDigitalValue == 0) {//Judge whether the flame sensor detects flame or not, the buzzer
alarms
        for(int i = 200; i <= 800; i++)
        {
          buzzer.tone(i, 10);
        }
        for(int i= 800; i >= 200; i--)
        {
           buzzer.tone(i, 10);
        }
    }
    delay(200);
}
```

MagicBlock Program



Mixly Program



Experimental Conclusion

The simulated value of the flame sensor will decrease according to the size of the flame and the distance from the flame; The digital value of flame sensor is to output low level when the analog value read is less than the threshold value, and output high level if it is greater than the threshold value. The threshold value can be adjusted by adjusting the size of adjustable resistance.