IR Transmission and IR Receiving

The experiment consists of two parts, one is to transmit date, and the other is to receive signal. Arduino board1 is used to transmit, and arduino board2 used to receive. So please separately download program for arduino1 and arduino2. Especially emphasize that: don't download the wrong programs of transmission and receiving, this document is divided into transmission and receiving parts, program also has indicated, otherwise experiment will fail. When wiring, just follow the document circuit picture take on it

IR transmission circuit connection:

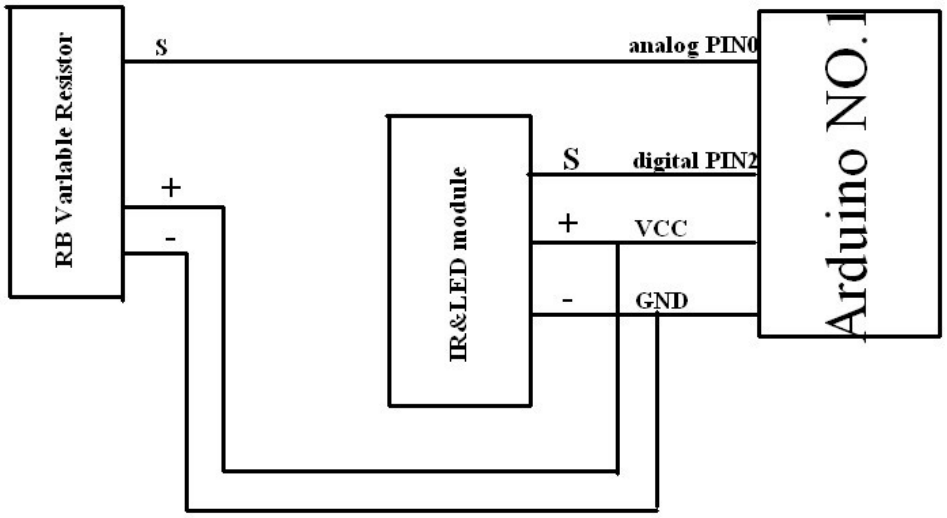
The components in the Circuit GND (-) and VCC (+) are respectively connected to power GND and VCC (5V) at arduino1. The rheostat signal terminal S connected to the analog PIN0 of arduino1, and transmission infrared module signal terminal S connected to digital PIN2 of arduino1. Then download the transmission program (program 1) to board1.

IR receiving circuit connection:

The components in the Circuit GND (-) and VCC (+) are respectively connected to power GND and VCC (5V) at arduino2. LED series with a 1K or 220 ohm resistor and connected to the digital PIN9 on the arduino2. The IR receiving module signal terminal S connected to digital PIN2 of arduino2. Then download the program2 to arduino2.

This experiment use only a computer and two arduino boards of transmission and receiving for serial interface communication. Please note that the choice of compute COM interface. When debugging, turn on the communication window for receiving, baud rate 115200 baud. When the experiment is successful, mobilize the transmission rheostat, the communication window would receive different data. And LED lamp brightness will continue to change.

Arduino NO.1(IR send):
Circuitry picture NO.1:



Send Circuitry

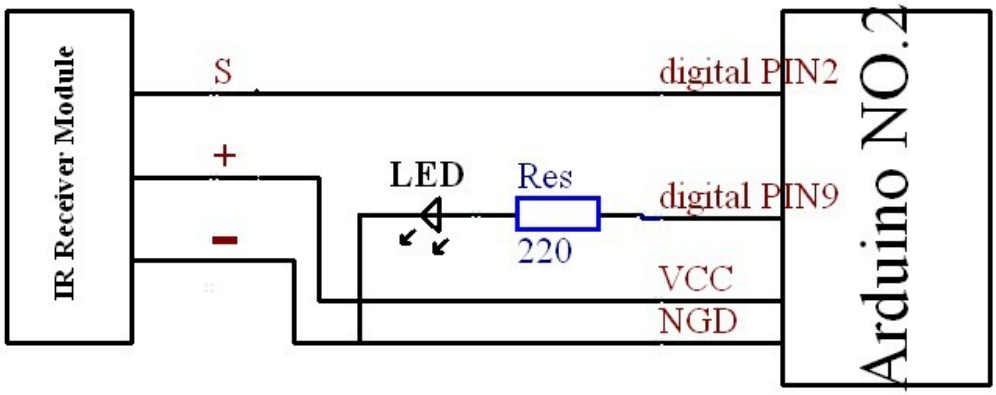
Incept Code(download Arduino NO.1):

```
#define ADD 0x00
int IR_S = 2;
int a;
void setup()
{
pinMode(IR_S,OUTPUT);
Serial.begin(115200);
}
void loop()
{
uint8_t dat,temp;
{
a=analogRead(0);
temp = a/4;
Serial.println(temp,DEC);
IR_Send38KHZ(280,1);
IR_Send38KHZ(140,0);
IR_Sendcode(ADD);
dat = ~ADD;
IR_Sendcode(dat);
IR_Sendcode(temp);
```

```
dat=~temp;
IR_Sendcode(dat);
IR_Send38KHZ(21,1);
}
delay(200);
}
void IR_Send38KHZ(int x,int y)
{
for(int i = 0;i<x;i++)
{
if(y==1)
{
digitalWrite(IR_S,1);
delayMicroseconds(9);
digitalWrite(IR_S,0);
delayMicroseconds(9);
}
else
{
digitalWrite(IR_S,0);
delayMicroseconds(20);
}
}
}
void IR_Sendcode(uint8_t x)
{
for(int i=0;i<8;i++)
{
if( (x&0x01) == 0x01 )
{
IR_Send38KHZ(23,1);
IR_Send38KHZ(64,0);
}
else
{
IR_Send38KHZ(23,1);
IR_Send38KHZ(21,0);
}
x=x>>1;
}
```

}

Arduino NO.2(IR incept)：
Circuitry picture:



Incept Circuitry

Incept Code(download Arduino NO.2):

```
#define IR_LED 2
#define MAX 128
#define MICRO_STEP 10
#define IDLE_PULSE 4000
unsigned long pulses[MAX];
unsigned char IRCOM[7];
unsigned long z;
int w;
byte f = B00000000;
int n;
int ledpin=9;
void setup()
{
pinMode(IR_LED,INPUT);
Serial.begin(115200);
pinMode(ledpin,OUTPUT);
}
```

```
void loop()
{
if(digitalRead(IR_LED)==LOW)
{
int count = 0;
int exit = 0;
while(!exit)
{
while(digitalRead(IR_LED)==LOW)
delayMicroseconds(MICRO_STEP);
unsigned long start = micros();
int max_high = 0;
while(digitalRead(IR_LED)==HIGH)
{
delayMicroseconds(MICRO_STEP);
max_high += MICRO_STEP;
if(max_high > IDLE_PULSE)
{
exit = 1;
break;
}
}
unsigned long duration = micros()-start;
pulses[count++]=duration;
}
for(int i=3;i<4;i++)
{
for(int j=0;j<8;j++)
{
if(pulses[i*8+j+1]>IDLE_PULSE)
{
  IRCOM[i]=IRCOM[i]>>1;
if((pulses[i*8+j+1])>1000 )
{
IRCOM[i]=IRCOM[i]|0x80;
}
}
z=pulses[i*8+j+1];
if(z<800)
w=10000000;
```

```
else
w=00000000;
f=f>>1;
f=f+w;
}
}
n=int(f);
Serial.print(n);
analogWrite(ledpin,n);
}
}
```