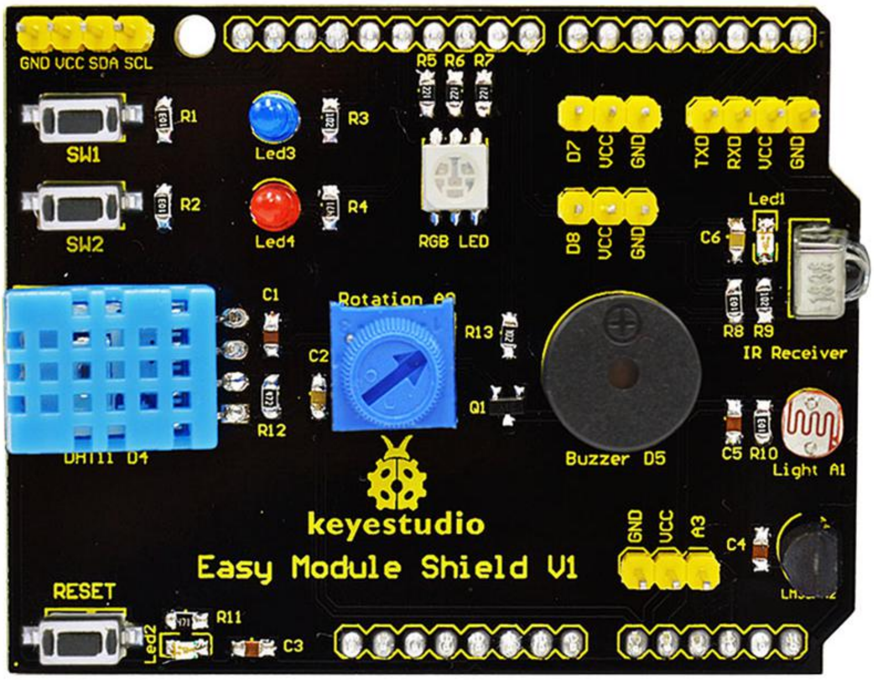
keyestudio Multi-purpose Shield V1



1. Description

Multi-purpose Shield V1 is a learning board based on Arduino. No need for soldering and connection. Download the program to complete experiment.

It is multi-purpose and we offer code libraries of all modules that have been tested. You can use them directly.

There are extension ports on the shield to help you to complete other experiments.

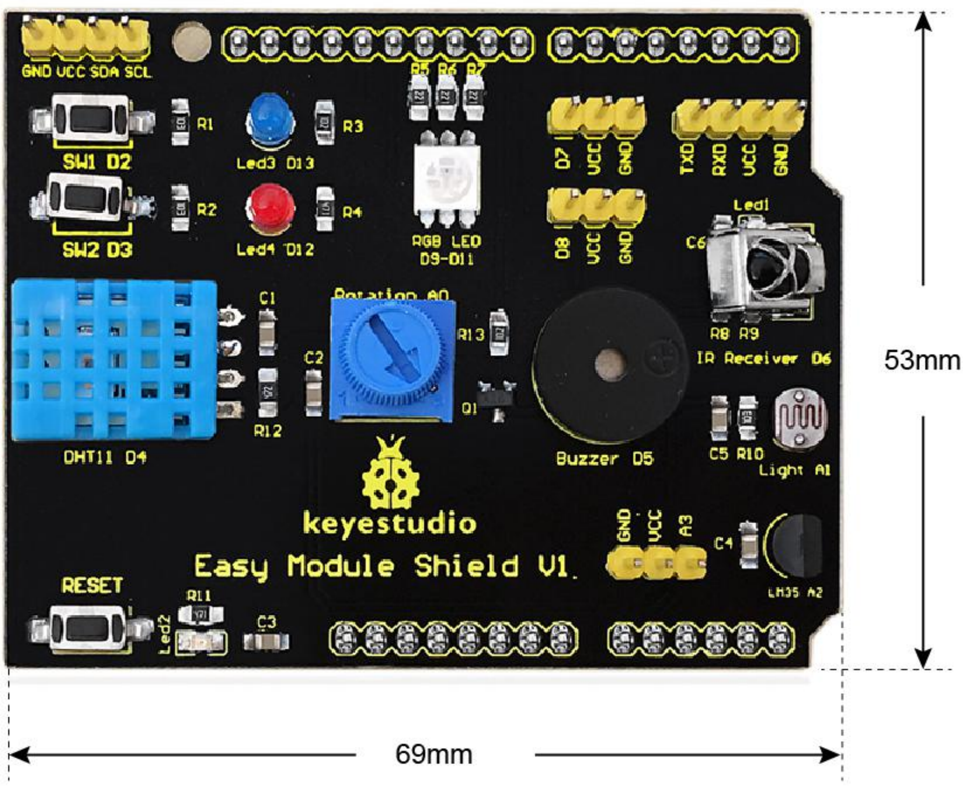
2. Features

1) Compatible with main controllers such as UNO R3 and MEGA 2560.
2) Comes with 2 LED indicators to show the program status.
3) Comes with 2 switches for external interrupt experiment.

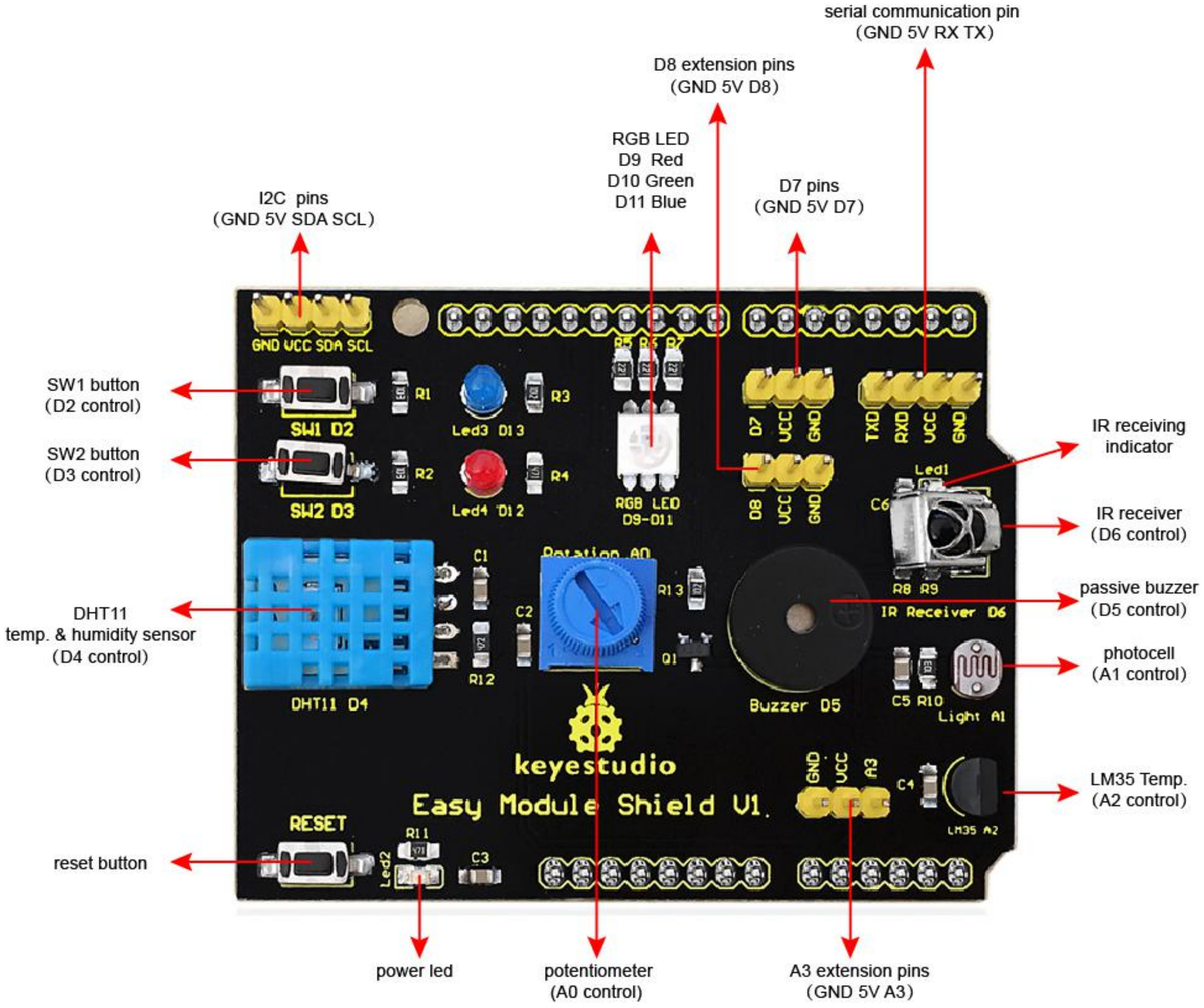
4) Comes with a reset button
5) Comes with DHT11 sensor for measuring temperature and humidity.
6) Comes with a potentiometer for analog input
7) Comes with a passive buzzer for alarm.
8) Comes with a full-color RGB LED
9) Comes with a photocell to detect the brightness of light
10) Comes with LM35D temperature sensor
11) Comes with an infrared receiver
12) 2 digital pins（D7 and D8）
13) 1 analog pin（A3）
14) One IIC interface
15) One TTL serial pin

3. Details

- Dimensions: 69mm*53mm*19mm
- Weight: 21g

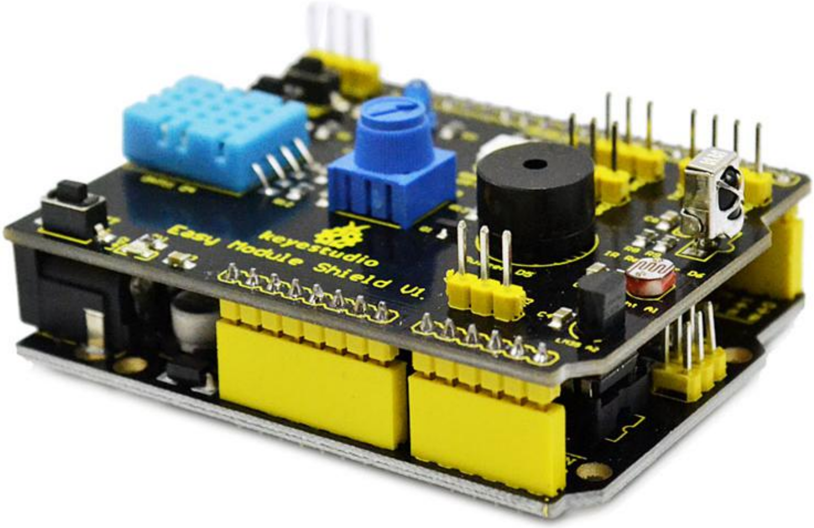


4. Interface Instruction



5. Hookup Guide

Simply plug the shield into UNO R3 board.



6. Upload the Code

Note: Before compile the code, do remember to add the necessary libraries inside the libraries directory of Arduino IDE.

You can download all the libraries from the link here:

https://drive.google.com/open?id=1Fsr5NW8Ez8ziYh0jVmiviS9ldvR9NDei

You can click here to download the code or directly copy the code below.

****

```
#include <IRremote.h>

#include <dht11.h>
dht11 DHT;
#define DHT11_PIN 4

//buzzer pin
int buzzer = 5;

//button pins
int KEY2 = 2;
int KEY3 = 3;
```

```
//pin definition of flowing light
int led5 = 13;
int led4 = 12;
int led3 = 11;
int led2 = 10;
int led1 = 9;

int RECV_PIN = 6; //define input pin on Arduino
IRrecv irrecv(RECV_PIN);
decode_results results;

char i=0,flag=2;
void setup ()
{
   Serial.begin(9600);

   irrecv.enableIRIn(); // Start the receiver

   attachInterrupt(0, falling0, FALLING);
   attachInterrupt(1, falling1, FALLING);

   pinMode(buzzer,OUTPUT);
   digitalWrite(buzzer,HIGH);

   pinMode(led1,OUTPUT);
   pinMode(led2,OUTPUT);
   pinMode(led3,OUTPUT);
   pinMode(led4,OUTPUT);
   pinMode(led5,OUTPUT);
   for(char i=9;i<14;i++)
     digitalWrite(i,LOW);
}

void loop()
{
   if(flag==0)
   {
   buzzer_();                          //testing buzzer
   led_display();                    //testing LED
   }
   if(flag==1)
   {
   Serial.println("status,    Hum(%),    Tem(C)         analog_val          light_val          lm35_val");
```

```
  DHT11();
  Serial.print("            ");
  analog();                         //testing analog input
  Serial.print("              ");
  Light();
  Serial.print("             ");
  LM35();
  Serial.println("            ");
  delay(800);
  }
  if(flag!=0 & flag!=1)
  {
    if (irrecv.decode(&results))
     {
       Serial.println(results.value, HEX);
       irrecv.resume(); // Receive the next value
     }
  }
}

void DHT11()
{
int chk;
chk = DHT.read(DHT11_PIN);      // READ DATA
switch (chk)
  {
    case DHTLIB_OK:
                Serial.print("OK          ");
                Serial.print(DHT.humidity,1);
                Serial.print("         ");
                Serial.print(DHT.temperature,1);
                break;
    case DHTLIB_ERROR_CHECKSUM:
                Serial.print("Checksum error          ");
                break;
    case DHTLIB_ERROR_TIMEOUT:
                Serial.print("Time out error          ");
                break;
    default:
                Serial.print("Unknown error           ");
                break;
  }
}
```

```
void buzzer_(void)
{
 char i;
 for(i=0;i<80;i++)// output a frequency sound
 {
  digitalWrite(buzzer,LOW);// sound
  delay(1);//delay1ms
  digitalWrite(buzzer,HIGH);//not sound
  delay(1);//ms delay
 }
 for(i=0;i<100;i++)// output a frequency sound
 {
  digitalWrite(buzzer,LOW);// sound
  digitalWrite(buzzer,HIGH);//not sound
  delay(2);//2ms delay
 }
}

void led_display()
{
 digitalWrite(led1,HIGH);
 delay(500);
 digitalWrite(led1,LOW);
 digitalWrite(led2,HIGH);
 delay(500);
 digitalWrite(led2,LOW);
 digitalWrite(led3,HIGH);
 delay(500);
 digitalWrite(led3,LOW);
 digitalWrite(led4,HIGH);
 delay(500);
 digitalWrite(led4,LOW);
 digitalWrite(led5,HIGH);
 delay(500);
 digitalWrite(led5,LOW);
}

void analog()
{
int val;
val=analogRead(A0);
Serial.print(val);
}
```

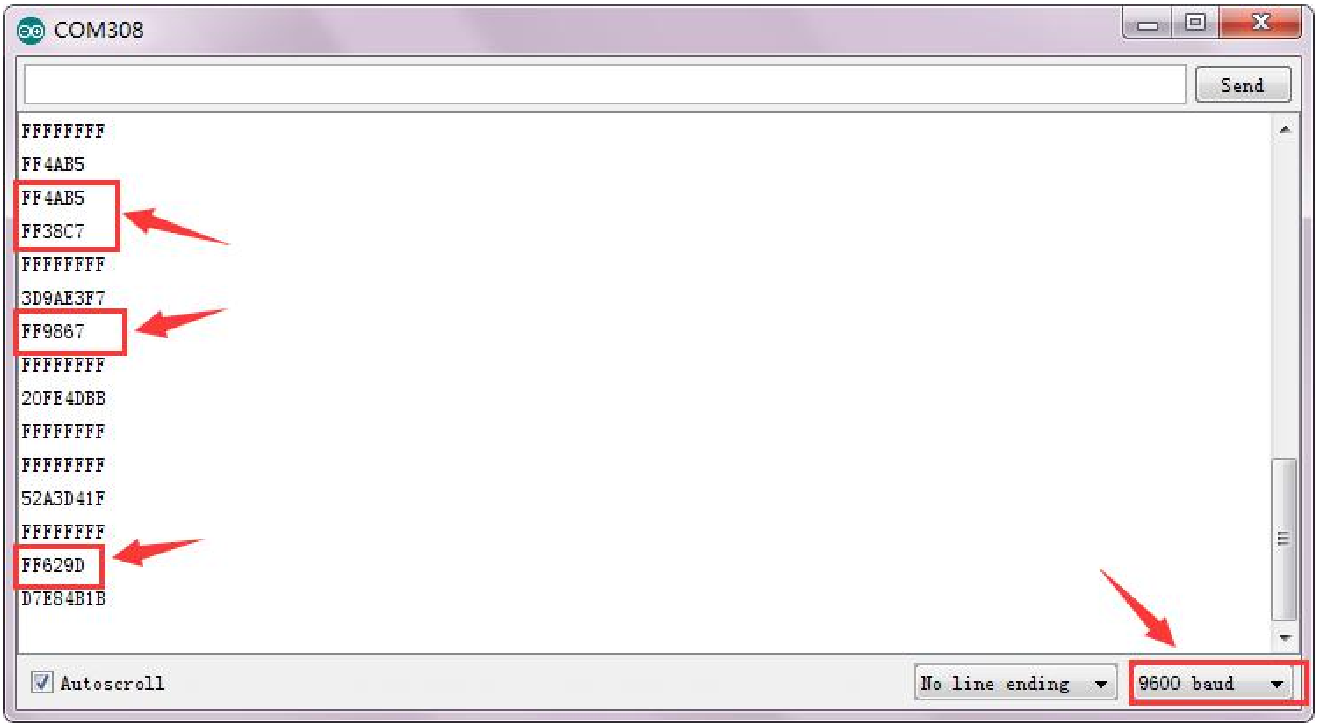
```
void Light()
{
int val;
val=analogRead(A1);
Serial.print(val);
}

void LM35()
{
int val;
val=analogRead(A2);
Serial.print(val);
}

void falling0()
{
flag=0;
}
void falling1()
{
flag=1;

}
```
****

7. Test Result

Done uploading the code to the board, the power led 2 is normally on, open the serial monitor and set the baud rate to 9600.

Aimed at the IR receiver, press the buttons on IR remote control, you should see the decoding value of button is displayed on the monitor.

Do not press too long, or else appear the data error like FFFFFF.

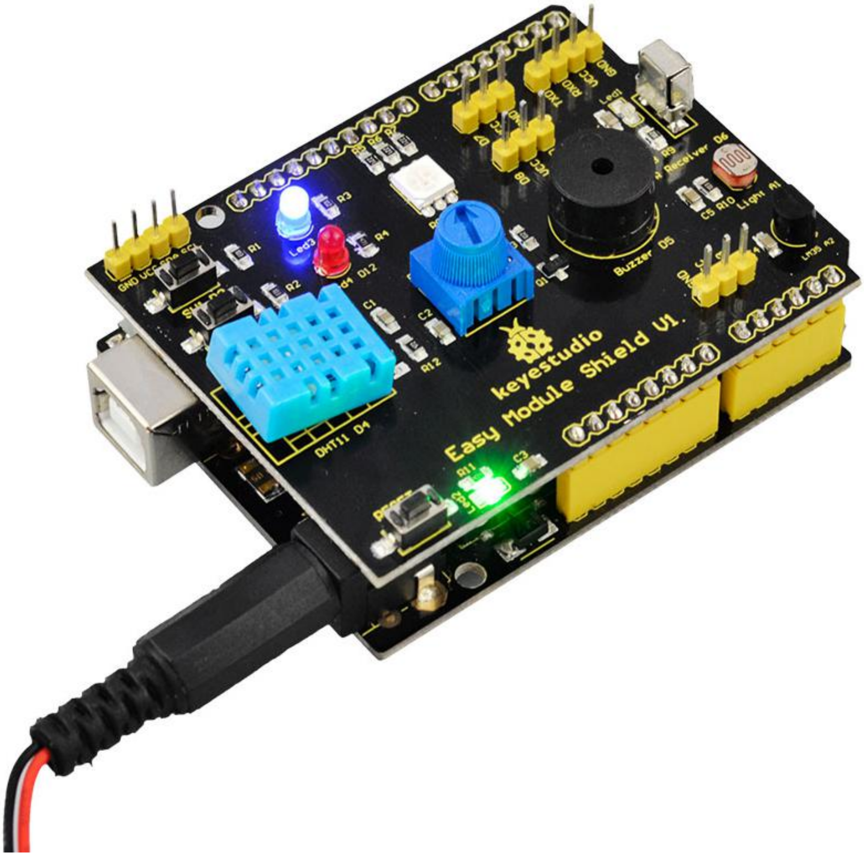


COM308

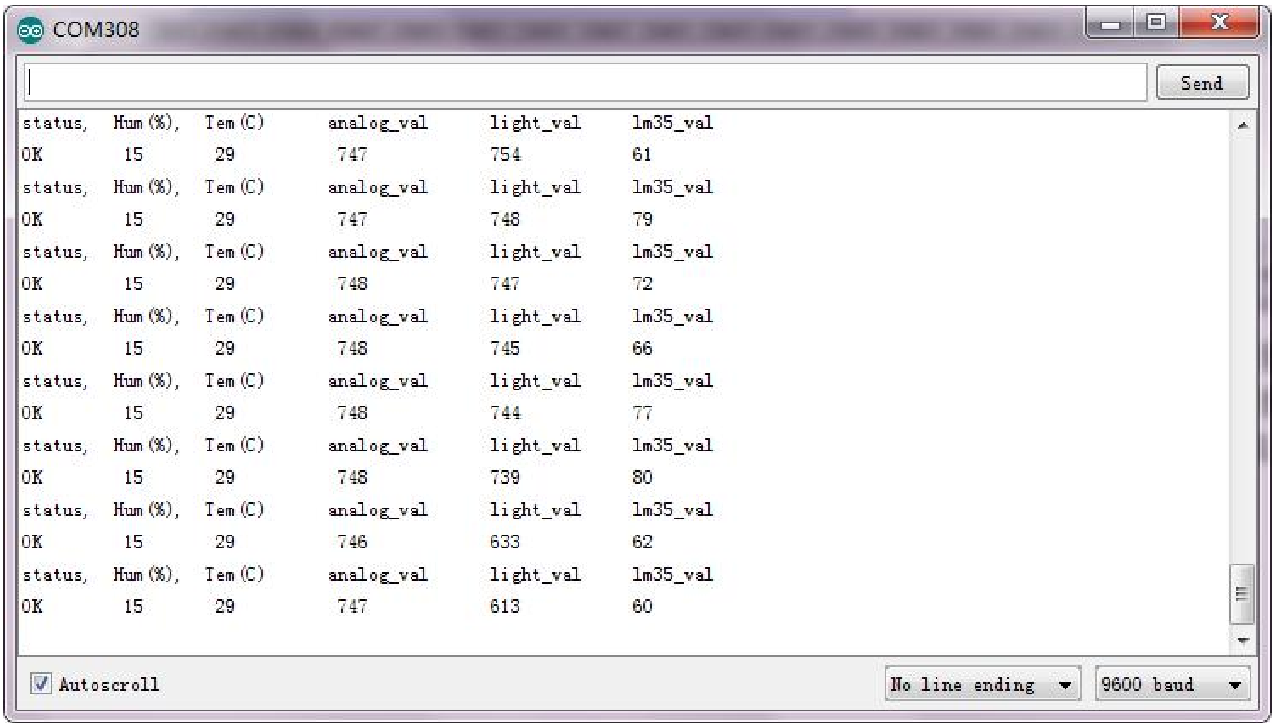
```
FFFFFFFF
FF4AB5
FF4AB5
FF38C7
FFFFFFFF
3D9AE3F7
FF9867
FFFFFFFF
20FE4DBB
FFFFFFFF
FFFFFFFF
52A3D41F
FFFFFFFF
FF629D
D7E84B1B
```

☑ Autoscroll   No line ending   9600 baud

If press the SW1 button, passive buzzer beeps and then RGB LED will emit the red, green and blue light in sequence. Also the red led3 and blue led 4 light up, circularly.



If press the SW2 button, passive buzzer stops beeping and LEDs not light. Then open the serial monitor and set the baud rate to 9600. Press the SW2 button again, the serial monitor will display the data shown below.



```
status,  Hum(%),  Tem(C)     analog_val     light_val     lm35_val
OK         15       29        747           754           61
status,  Hum(%),  Tem(C)     analog_val     light_val     lm35_val
OK         15       29        747           748           79
status,  Hum(%),  Tem(C)     analog_val     light_val     lm35_val
OK         15       29        748           747           72
status,  Hum(%),  Tem(C)     analog_val     light_val     lm35_val
OK         15       29        748           745           66
status,  Hum(%),  Tem(C)     analog_val     light_val     lm35_val
OK         15       29        748           744           77
status,  Hum(%),  Tem(C)     analog_val     light_val     lm35_val
OK         15       29        748           739           80
status,  Hum(%),  Tem(C)     analog_val     light_val     lm35_val
OK         15       29        746           633           62
status,  Hum(%),  Tem(C)     analog_val     light_val     lm35_val
OK         15       29        747           613           60
```

From the data shown on the monitor, you can get the details as follows:
The first column is status OK.
The second column is the humidity value measured by DHT11 sensor;
The third column is the temperature value measured by DHT11 sensor;
The fourth column is the analog value measured by potentiometer, in the range of 0-1023;
The fifth column is the analog value measured by photocell. The stronger the light is, the greater the value is.
The sixth column is the analog value measured by LM35 temperature sensor, which can be used to calculate the specific temperature value.