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Maker's life

# User Manual

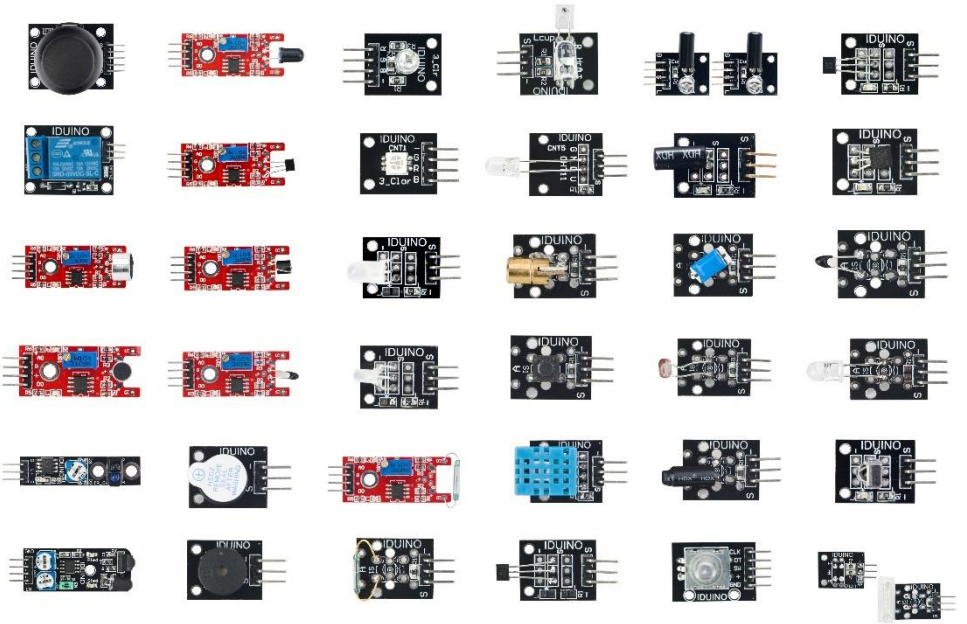
## For 37 in 1 Sensor Kit(ST1065)

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# User Manual






for








## 37 in 1 Sensor Kit(ST1065)










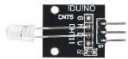






# Module List




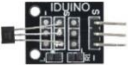



The order of modules is corresponding with the grid's location, the last grid contains two modules.





	Name	Quantity	Picture
1	Joystick Module	1	
2	Relay Module	1	
3	Large Microphone Module	1	
4	Small Microphone Module	1	
5	Line Tracking Module	1	

6	Obstacle Avoidance Sensor	1	
7	Flame Sensor Module	1	
8	Linear Magnetic Hall Sensor	1	
9	Touch Sensor	1	
10	Digital Temperature Sensor	1	
11	Buzzer Module	1	
12	Passive Buzzer/Sounder	1	

13	RGB LED Module	1	
14	SMD RGB LED Module	1	
15	Two Color LED Module(5mm)	1	
16	Two Color LED Module(3mm)	1	
17	Reed Switch Module	1	
18	Mini Reed Switch Module	1	
19	Heartbeat Sensor	1	

20	Seven Color Flashing	1	
21	Laser Module	1	
22	Tactile Switch Module	1	
23	Shock Module	1	
24	Rotary Encode Module	1	
25	Switch Light Module	2	
26	Tilt Switch Module	1	

27	Ball Switch Module	1	
28	Light Dependent Resistor Module	1	
29	Temperature and Humidity Module	1	
30	Analog Hall Effect Sensor	1	
31	Class Hall Magnetic Sensor	1	
32	Digital Temperature Module	1	
33	Analog Temperature Sensor	1	

<p><b>34</b></p>	<p>IR Transmitter Module</p>	<p>1</p>	
<p><b>35</b></p>	<p>IR Receiver Module</p>	<p>1</p>	
<p><b>36</b></p>	<p>Optical Broken Module</p>	<p>1</p>	
<p><b>37</b></p>	<p>Hit Sensor Module</p>	<p>1</p>	



## Module 1: Joystick module



### 1.Introduction

This joystick module maybe the best choice for your controller of DIY project. It has two analog input pins to control X, Y axis and also has button input, someone may call it Z axis, but it only input digital signal with 0 or 1.

### Specifications:

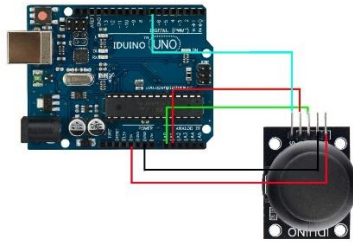
- Two analog pin(X, Y axis), one digital pin(button).
- Input voltage: 5V
- Output voltage: 2.5V
- Size: 37\*25\*32mm
- Weight: 8g

### 2.PinOut

Pin	Description
<b>GND</b>	Ground
<b>+5v</b>	Power
<b>VRX</b>	X axis analog signal input
<b>VRX</b>	Y axis analog signal input
<b>SW</b>	Button key, value is 0 or 1

### 3.Example

Here is an example, connect the circuit as below and run the code, you will see the analog value from X, Y axis and button through the Serial Monitor.



```
*****Code begin*****  
  
int sensorPin = 5;  
int value = 0;  
void setup() {  
  pinMode(3, OUTPUT);  
  Serial.begin(9600);  
}  
void loop() {  
  value = analogRead(0);  
  Serial.print("X:");  
  Serial.print(value, DEC);  
  value = analogRead(1);  
  Serial.print(" | Y:");  
  Serial.print(value, DEC);  
  value = digitalRead(7);  
  Serial.print(" | Z: ");  
  Serial.println(value, DEC);  
  delay(100);  
}  
*****Code End*****
```

## Module 2: Relay Module



### 1. Introduction

The module uses SRD relay module to control high-voltage electrical device. It can be used in interactive projects and can also be used to control the lighting, electrical and other equipment. It can be controlled directly by a wide range of microcontrollers and can be controlled through the digital IO port, such as solenoid valves, lamps, motors and other high current or high voltage devices.

*Remarks: This is declare that the relay module is only for low voltage (below 75 V/DC and 50 V/AC).*

### specifications:

- Number of I/O Channels: 1
- Input Voltage: 5V DC
- Type: Digital
- Control signal: TTL level
- Max allowable output Voltage: 50V AC/75V DC
- Indication LED for Relay's Status

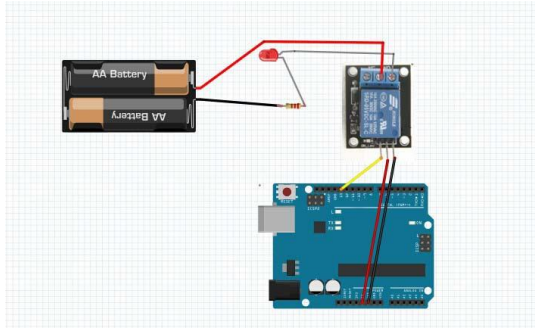
### 2. Pinout

Pin Name	Description
“+”	Power(5V DC)
“-”	GND
“S”	Signal pin, connected with Arduino
“NO”	Normally open terminal
“NC”	Normally closed terminal
“C”(middle pin)	Common terminal, Which connected with the power for the load.

### 3. Example

This example controls a LED(or other high power load) via the Relay module.

Physical connection as below:



The example code as below:

```
*****Code begin*****  
  
int led = 13;  
// the setup routine runs once when you press reset:  
void setup() {  
  // initialize the digital pin as an output.  
  pinMode(led, OUTPUT);  
}  
// the loop routine runs over and over again forever:  
void loop() {  
  digitalWrite(led, HIGH); // turn the LED on (HIGH is the voltage level)  
  delay(1000);             // wait for a second  
  digitalWrite(led, LOW);  // turn the LED off by making the voltage LOW  
  delay(1000);            // wait for a second  
}  
*****Code End*****
```

## Module3. Large Microphone Module



### 1. Introduction

It's a high sensitivity sound detection module, which has two output signal pin. one digital pin(D0), When it detect some sound up to certain threshold, it can output High or Low level. One analog pin(A0), it can real-time output voltage signal of the microphone.

### Specification

- Voltage:5V/3.3V
- Electret microphone(It's different from module4)
- there is a mounting screw hole 3mm
- the use 5v DC power supply
- with analog output
- there is threshold level output flip
- high sensitive microphone and high sensitivity.
- a power indicator light
- the comparator output is light
- Weight: 4g
- Frequency Response range:50Hz~20kHz
- Impedance: 2.2K ohm
- Sensitivity: 48~66dB
- polar pattern: Universal
- Operating temperature: -40 to 85 degrees Celsius
- Operating humidity: <90%

- Storage temperature : -40 to 85degrees Celsius
- Storage humidity : <75%
- product size: 45\*15mm

## 2. Pinout

Pin	Description
A0	Analog signal output pin
G	Ground
+	Power(5V/3.3V)
D0	Digital signal output pin

## 3. Example

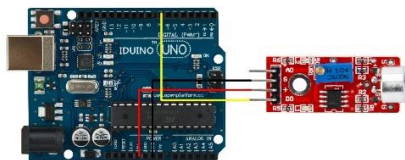
We will use three example to show the different function of this module.

Example 1 show you how to use the digital pin(D0), Example 2 show you how to use the digital pin(A0), In Example 3, we can try to combine this two function into one experiment.

### 3.1 Example 1

This example shows you the digital pin function, connect Pin12(Arduino) to a LED light, and connect this module as below, and upload the code.

Then turn the variable resistor until the LED12 turns off. Now you can handclap or make a sound, you will see the LED12 turns on.



Code for Example1

```
*****Code begin*****
```

```
int Led = 12 ;// define LED Interface
int buttonpin = 7; // define D0 Sensor Interface
int val = 0;// define numeric variables val
void setup ()
{
  pinMode (Led, OUTPUT) ;// define LED as output interface
  pinMode (buttonpin, INPUT) ;// output interface D0 is defined sensor
}
void loop ()
{
  val = digitalRead(buttonpin);//
  if (val == HIGH) //
  {
    digitalWrite (Led, HIGH);
  }
  else
  {
    digitalWrite (Led, LOW);
  }
}
*****Code End*****
```

### 3.2 Example 2

This example shows you the Analog pin function, connect this module as below picture, and upload the code.

Then open the Serial monitor, you can see some number between 0 to 1023. And now if you make some high or low voice, the number is changing.



### Code for Example2

```
*****Code begin*****
```

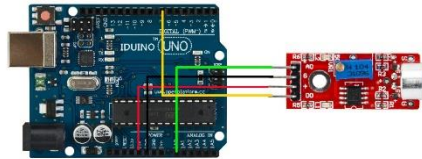
```
int sensorPin = A5; // select the input pin for the potentiometer
void setup ()
{
  Serial.begin (9600);
}
void loop ()
{
  sensorValue = analogRead (sensorPin);
  delay (500);
  Serial.println (sensorValue, DEC);
}
```

```
*****Code End*****
```

### 3.3 Example 3

In this example we try to combine digital pin and analog pin together to control two LED lights, connection and code as below.





Code for example 3

\*\*\*\*\*Code begin\*\*\*\*\*

```
int Led=13;
int ledPin=12;
int buttonpin=7;
int sensorPin = A0;
int sensorValue = 0;
int val;
void setup()
{
  Serial.begin(9600);
  pinMode(Led,OUTPUT);
  pinMode(ledPin, OUTPUT);
  pinMode(buttonpin,INPUT);
}
void loop()
{
  sensorValue = analogRead(sensorPin);
  digitalWrite(ledPin, HIGH);
  delay(sensorValue);
  digitalWrite(ledPin, LOW);
```

```
delay(sensorValue);
Serial.println(sensorValue, DEC);
val=digitalRead(buttonpin);
if(val==HIGH)
{
digitalWrite(Led,HIGH);
}
else
{
digitalWrite(Led,LOW);
}
}
}
*****Code End*****
```

## Module 4: Small microphone module



### 1.Introduction

This module is similar with the large microphone module(ST1146). The only difference is the microphone, not only the size, but also the function. The large microphone module has an electronic microphone, and the small microphone module just has a normal microphone. The electret microphone has more high sensitivity, but they share the same work method.

### Specification

- Voltage:5V/3.3V
- there is a mounting screw hole 3mm

- the use 5v DC power supply
- with analog output
- there is threshold level output flip
- high sensitive microphone and high sensitivity.
- a power indicator light
- the comparator output is light
- Weight: 4g
- Frequency Response range:50Hz~20kHz
- Impedance: 2.2K ohm
- Sensitivity: 48~66dB
- polar pattern: Universal
- Operating temperature: -40 to 85 degrees celsius
- Operating humidity: <90%
- Storage temperature : -40 to 85 degrees celsius
- Storage humidity : <75%
- product size: 45\*15mm

## 2. Pinout

Pin	Description
A0	Analog signal output pin
G	Ground
+	Power(5V/3.3V)
D0	Digital signal output pin

## 3. Example

We will use three example to show the different function of this module.

Example 1 show you how to use the digital pin(D0), Example 2 show you how to use the digital pin(A0), In Example 3, we can try to combine this two function into one experiment.

### 3.1 Example 1

This example shows you the digital pin function, connect Pin12(Arduino) to a LED light, and connect this module as below, and upload the code.

Then turn the variable resistor until the LED12 turns off. Now you can handclap or make a sound, you will see the LED12 turns on.



Code for Example1

```
*****Code begin*****
```

```
int Led = 12 ;// define LED Interface
int buttonpin = 7; // define D0 Sensor Interface
int val = 0; // define numeric variables val
void setup ()
{
  pinMode (Led, OUTPUT) ;// define LED as output interface
  pinMode (buttonpin, INPUT) ;// output interface D0 is defined sensor
}
void loop ()
{
  val = digitalRead(buttonpin); //
  if (val == HIGH) //
  {
    digitalWrite (Led, HIGH);
  }
  else
  {
```

```
digitalWrite (Led, LOW);  
}  
}  
*****Code End*****
```

### 3.2 Example 2

This example show you the Analog pin function, connect this module as below picture, and upload the code.

Then open the Serial monitor, you can see some number between 0 to 1023. And now if you make some high or low voice, the number is changing.



Code for Example2

```
*****Code begin*****  
int sensorPin = A5; // select the input pin for the potentiometer  
void setup ()  
{  
  Serial.begin (9600);  
}  
void loop ()  
{  
  sensorValue = analogRead (sensorPin);  
  delay (500);  
  Serial.println (sensorValue, DEC);  
}
```

```
}

```

```
*****Code End*****

```

### 3.3 Example 3

In this example we try to combine digital pin and analog pin together to control two LED lights, connection and code as below.



Code for example 3

```
*****Code begin*****

```

```
int Led=13;
int ledPin=12;
int buttonpin=7;
int sensorPin = A0;
int sensorValue = 0;
int val;
void setup()
{
Serial.begin(9600);
pinMode(Led,OUTPUT);
pinMode(ledPin, OUTPUT);
pinMode(buttonpin,INPUT);
}
void loop()

```

```
{
  sensorValue = analogRead(sensorPin);
  digitalWrite(ledPin, HIGH);
  delay(sensorValue);
  digitalWrite(ledPin, LOW);
  delay(sensorValue);
  Serial.println(sensorValue, DEC);
  val=digitalRead(buttonpin);
  if(val==HIGH)
  {
  digitalWrite(Led,HIGH);
  }
  else
  {
  digitalWrite(Led,LOW);
  }
}
*****Code End*****
```

## Module5: Line tracking module



### 1.Introduction

With this module your DIY car or robot can walk only along one line way. When the detector move from white to black, it could output TTL signal, So if you draw one black line between

in the two wheels of your car, it will walk along your expecting road.

**Specification:**

- Voltage: 3.3V to 5V
- Operating current: 20mA @ 5V
- Operating temperature range: 0°C ~ + 50°C
- Black for LOW output, White for HIGH output
- Size:45x10mm

**2 Pinout**

Pin	Description
S	Digital output pin, black is Low, white is High
V+	Power(5V DC)
G	Ground

**3. Example**

The example show that when the sensor detect black area, the “s” pin output Low TTL signal, then the LED13 turn off meanwhile the light “L” on this module turns on. On the contrary, LED13 turns on.

The connection as below:



\*\*\*\*\*Code begin\*\*\*\*\*

```
int Led=13;
int buttonpin=3;
```



```

int val;
void setup()
{ pinMode(Led,OUTPUT);
pinMode(buttonpin,INPUT);
}
void loop()
{
val=digitalRead(buttonpin);
if(val==HIGH)
{ digitalWrite(Led,HIGH); }
else { digitalWrite(Led,LOW); }
}

```

\*\*\*\*\*Code End\*\*\*\*\*

## Module 6: Obstacle Avoidance Sensor



### 1. Introduction

Infrared obstacle avoidance sensor is designed for the design of a wheeled robot obstacle avoidance sensor distance adjustable. This ambient light sensor adaptable, high precision, having a pair of infrared transmitter and receiver, transmitter tubes emit a certain frequency of infrared, When detecting the direction of an obstacle (reflector), the infrared receiver tube receiver is reflected back, when the indicator is lit, Through the circuit, the signal output interface output digital signal that can be detected by means of potentiometer knob to adjust the distance, the effective distance From 2 ~ 40cm, working voltage of 3.3V-5V, operating voltage range as broad, relatively large fluctuations in the power supply voltage of the situation Stable condition and still work for a variety of microcontrollers, Arduino

controller, BS2 controller, attached to the robot that  
 Can sense changes in their surroundings.

**Specification:**

- Working voltage: DC 3.3V-5V
- Working current: ≥ 20mA
- Operating temperature: -10 °C - +50 °C
- detection distance :2-40cm
- IO Interface: 4-wire interfaces (- / + / S / EN)
- Output signal: TTL level (low level there is an obstacle, no obstacle high)
- Adjustment: adjust multi-turn resistance
- Effective angle: 35 °
- Size: 45mm × 23mm

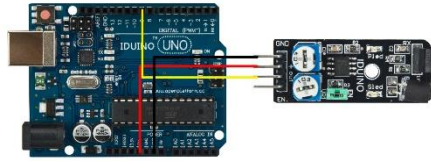
**2. Pinout**

Pin	Description
“+”	Power(3.3V~5V DC)
Gnd	ground
out	Signal pin
EN	Enable pin that Low level works, usually useless

**3.Example code**

Here is a small example to test the sensor. By default, the sensor returns 1 on the Serial Monitor. When detecting something, the sensor return 0.

The connection as below:



\*\*\*\*\*Code begin\*\*\*\*\*

```
int count;
void setup() {
  Serial.begin (9600);
  pinMode (9, INPUT); //Sensor output
}
void loop() {
  Serial.print ("Sensor: ");
  Serial.println (digitalRead(9)); //print the sensor output
  delay (500); //wait half a second
}
```

\*\*\*\*\*Code End\*\*\*\*\*

## Module 7: Flame Sensor Module



### 1.Introduction

This is a flame sensor module that can be used to detected whether a flame source exist or not. It's sensitive to IR wavelength at 760nm~1100nm. Usually, the detection angle is about 60 degrees.

### Specification

- Operation voltage: 5V for analog, 3.3V for digital
- Both digital and analog output pin
- Adjustable sensitive
- Detect IR wavelength: 760nm~1100nm
- Size: 45\*15mm
- Weight: 3g

### 2.Pinout

Pin	Description
<b>A0</b>	Analog output pin, real-time output voltage signal on thermal resistance
<b>D0</b>	Digital output pin, output Low or High signal when the temperature reaches a certain threshold
<b>+</b>	Power(5V for analog, 3.3V for digital)
<b>G</b>	Ground

### 3.Example

Here is an example for how to use both the analog pin(A0) and digital pin(D0), connect the circuit as below, upload this sketch, open the Serial Monitor, you will see the real-time value of the thermal resistance, and once the flame closing to it, the value will change. If the value reaches a certain threshold, the D0 pin will output High signal meanwhile the LED13 turns on. And threshold can be adjusted by potentiometer.



\*\*\*\*\*Code begin\*\*\*\*\*

```
int Led = 13 ;// define LED Interface
int buttonpin = 3; // define the flame sensor interface
int analog = A3; // define the flame sensor interface
int val ;// define numeric variables val
float sensor; //read analog value
void setup ()
{
  pinMode (Led, OUTPUT) ;// define LED as output interface
  pinMode (buttonpin, INPUT) ;// output interface defines the flame sensor
  pinMode (analog, INPUT) ;// output interface defines the flame sensor
  Serial.begin(9600);
}
void loop ()
{
  sensor = analogRead(analog);
  Serial.println(sensor); // display temperature
  val = digitalRead (buttonpin) ;// digital interface will be assigned a
value of 3 to read val
  if (val == HIGH) // When the flame sensor detects a signal, LED flashes
  {
```

```

digitalWrite (Led, HIGH);
}
else
{
digitalWrite (Led, LOW);
}
delay(1000);
}
*****Code End*****

```

## Module 8: Linear Magnetic Hall Sensor (SE014)



### 1 Introduction

This module is analog hall sensor module, it can both output an analog and digital voltage at the signal pin of this module. This module is different from hall magnetic sensor (Module 31), which just output digital signal, like a magnetic switch.

#### Specification

- Operation voltage: 5V
- 4Pin
- Size: 45\*12mm
- Weight: 3g

#### 2 Pinout

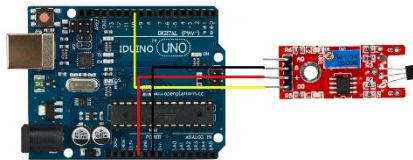
Pin	Description
A0	Analog output pin, real-time output voltage

	signal
<b>G</b>	Ground
<b>+</b>	Power
<b>D0</b>	Digital signal pin

### 3.Example

In this example, If no magnetic field is present, the signal line of the sensor is HIGH (3.5 V). If a magnetic field is presented to the sensor, the signal line goes LOW, at the same time the LED on the sensor lights up.

The connection as below:



Example Code:

\*\*\*\*\*Code begin\*\*\*\*\*

```
int Led = 13 ; // define LED Interface
int SENSOR = 10 ; // define the Hall magnetic sensor interface
int val ; // define numeric variables val
void setup ()
{
    pinMode (Led, OUTPUT) ; // define LED as output interface
    pinMode (SENSOR, INPUT) ; // define the Hall magnetic sensor line as
input
}
void loop ()
```

```
{
  val = digitalRead (SENSOR) ; // read sensor line
  if (val == LOW) // when the Hall sensor detects a magnetic field, Arduino
LED lights up
  {
    digitalWrite (Led, HIGH);
  }
  {
    digitalWrite (Led, LOW);
  }
}
*****Code End*****
```

## Module 9: Touch Sensor



### 1 Introduction

This module is a metal touch sensor, it looks like module7(flame sensor module), has 4 pin, including one analog pin and digital pin, but usually we just use the digital pin. Which can be used to detect whether a human body is touching the metal detector.

### Specification

- Operation voltage: 5V
- Both digital and analog output pin
- Adjustable sensitive
- Size: 45\*15mm



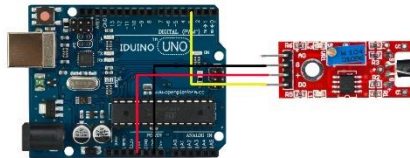
- Weight: 3g

## 2 Pinout

Pin	Description
<b>A0</b>	Analog output pin, real-time output voltage signal(usually useless)
<b>D0</b>	Digital output pin, output Low or High signal when the human body touch it
<b>+</b>	Power(5V for analog, 3.3V for digital)
<b>G</b>	Ground

### 1.Example

Here is an example show you how to use this module, connection as below. When you touch the metal detector via your finger, the LED13 turns on.



\*\*\*\*\*Code begin\*\*\*\*\*

```
int Led = 13;// define LED Interface
int buttonpin = 3;
int val;// define numeric variables val
void setup ()
{
pinMode (Led, OUTPUT) ;//define LED as output interface
pinMode (buttonpin, INPUT) ;// define metal touch sensor output interface
}
```

```

void loop ()
{
val = digitalRead (buttonpin) ;//digital interface will be assigned a value
of 3 to read val
if (val == HIGH) //When the metal touch sensor detects a signal, LED flashes
{
digitalWrite (Led, HIGH);
}
else
{
digitalWrite (Led, LOW);
}
}
*****Code End*****

```

## Module10: Digital Temperature Sensor(SE017)



### 1. Introduction

This module has both analog signal output pin and digital signal output pin, which is different from analog temperature sensor(module33) and other temperature sensor module.

A thermistor is a type of resistor whose resistance is dependent on temperature, more so than in standard resistors. The word is a portmanteau of thermal and resistor. Thermistors are widely used as inrush current limiter, temperature sensors (NTC type

typically), self-resetting overcurrent protectors, and self-regulating heating elements.

The Module's feature as below:

Feature	Value
<b>Model No.</b>	NTC-MF52 3950
<b>Temperature Range</b>	-55°C~+125°C
<b>Accuracy</b>	+/- 0.5°C

## 2.Pinout

Pin	Description
<b>A0</b>	Analog signal output pin
<b>D0</b>	Digital signal output pin
<b>G</b>	Gnd
<b>“+”</b>	Vcc(reference voltage:5V DC)

## Temperature convert Formula

Here we use Steinhart–Hart equation to calculate the corresponding temperature. The equation is

$$\frac{1}{T} = A + B \ln(R) + C[\ln(R)]^3,$$

where:

$T$  is the temperature (in Kelvins)

$R$  is the resistance at T (in ohms)

$A$ ,  $B$ , and  $C$  are the Steinhart–Hart coefficients which vary depending on the type and model of thermistor and the temperature range of interest. (The most general form of the applied equation contains a  $[\ln(R)]^2$  term, but this is frequently neglected because it is typically much smaller than the other coefficients).

**Note:** For this module, the recommended coefficients of A,B,C are

A equals 0.001129148;

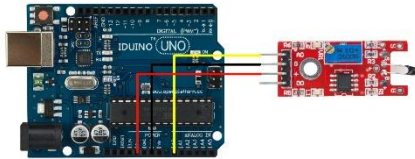
B equals 0.000234125;

C equals 0.0000000876741;

More, the same item products has a little bit different A,B,C coefficients , which depends your environmental temperature. If the recommended coefficients are not accurate enough, you'd better amend the A,B,C coefficients by Thermistor Calculator tool.

### 3 Example

This is a simple code for the NTC thermistor module, Connection as below:



Example code :

\*\*\*\*\*Code begin\*\*\*\*\*

```
#include <math.h>
double Thermister(int RawADC) {
double Temp;
Temp = log(((1024000/RawADC) - 10000));
Temp = 1 / (0.001129148 + (0.000234125 + (0.0000000876741 * Temp * Temp ))*
Temp );
Temp = Temp - 273.15;
return Temp;
}
void setup() {
Serial.begin(9600);
}
void loop()
{ Serial.print(Thermister(analogRead(0)));
```

```
Serial.println("c");
delay(1000); }
*****Code End*****
```

## Module 11: Buzzer module



### 1.Introduction

It's a basic sound component. Comparing with the passive buzzer, it can be driven by both DC signal and square wave signal.

### Specification

Operation voltage: 3.3V/5V

Size: 25\*15\*12mm

Weight: 2g

### 2 pinout

Pin	Description
S	Signal input pin, which can be driven by DC signal and square wave signal
+	Power(3.3V/5V), you may not see this mark on the board, it's the middle pin
-	Ground

### 3 Example

Here is a example that driven the active buzzer sound. The connection as below:



\*\*\*\*\*Code begin\*\*\*\*\*

```
int speakerPin = 8;
void setup () {
  pinMode (speakerPin, OUTPUT);
}
void loop () {
  analogWrite (speakerPin, 255);
  delay (50);
  analogWrite (speakerPin, 0);
  delay (10);
}
```

\*\*\*\*\*Code End\*\*\*\*\*

## Module 12: Passive Buzzer



### 1 Introduction

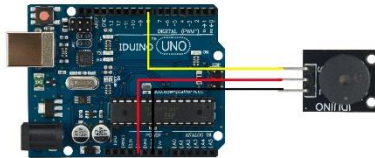
This module is similar with the Active Buzzer(Module 11), the only difference is that this module only can be driven square wave signal, not DC signal.

### 2 pinout

Pin	Description
S	Signal input pin, which can be driven by square wave signal
+	Power(3.3V/5V), you may not see this mark on the board, it's the middle pin
-	Ground

### 3 Example

Here is a example that driven the Passive buzzer sound. The connection as below:



\*\*\*\*\*Code begin\*\*\*\*\*

```
int buzzer = 8 ;// setting controls the digital IO foot buzzer
void setup ()
{
  pinMode (buzzer, OUTPUT) ;// set the digital IO pin mode, OUTPUT out of
  Wen
}
void loop ()
{
  unsigned char i, j ;// define variables
```

```

while (1)
{
  for (i = 0; i <80; i++) // Wen a frequency sound
  {
    digitalWrite (buzzer, HIGH) ;// send voice
    delay (1) ;// Delay 1ms
    digitalWrite (buzzer, LOW) ;// do not send voice
    delay (1) ;// delay ms
  }
  for (i = 0; i <100; i++) // Wen Qie out another frequency sound
  {
    digitalWrite (buzzer, HIGH) ;// send voice
    delay (2) ;// delay 2ms
    digitalWrite (buzzer, LOW) ;// do not send voice
    delay (2) ;// delay 2ms
  }
}
}
}
}
*****Code End*****

```

## Module13 : RGB LED Module



### 1. Introduction

RGB LED module consists of a full-color LED made by R, G, B three pin PWM voltage input



can be adjusted. Primary colors (red / blue / green) strength in order to achieve full color mixing effect. Control of the module with the Arduino can be achieved Cool lighting effects. And three resistor has been soldered on this board, so needn't worry to burn out the LED light under the long time work.

### Specification

- Red Vf: 1.8 to 2.1V
- Green Vf: 3.0 to 3.2V
- Blue Vf: 3.0 to 3.2V
- Red color: 620-625 nm
- Green color: 520-525 nm
- Blue color: 465-470 nm
- Red brightness @ ~20mA: 600-800 mcd
- Blue brightness @ ~20mA: 800-1000 mcd
- Green brightness @ ~20mA: 1500-2000mcd

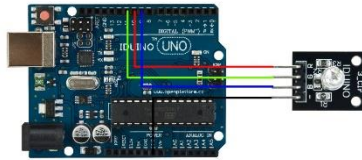
### 2. Pinout

Pin Name	Description
“R”	Red light
“G”	Green light
“B”	Blue light
“_”	Ground

### 3. Example

In this example, we blink an LED and using an RGB LED we can generate any color we want.

Here is the physical connection:



\*\*\*\*\*Code begin\*\*\*\*\*

```
//RGB LED pins
int ledDigitalOne[] = {10, 11, 9}; //the three digital pins of the digital
LED
//10 = redPin, 11 = greenPin, 9 = bluePin
const boolean ON = HIGH; //Define on as LOW (this is because we use a
//common
//Anode RGB LED (common pin is connected to +5
//volts)
const boolean OFF = LOW; //Define off as HIGH
//Predefined Colors
const boolean RED[] = {ON, OFF, OFF};
const boolean GREEN[] = {OFF, ON, OFF};
const boolean BLUE[] = {OFF, OFF, ON};
const boolean YELLOW[] = {ON, ON, OFF};
const boolean CYAN[] = {OFF, ON, ON};
const boolean MAGENTA[] = {ON, OFF, ON};
const boolean WHITE[] = {ON, ON, ON};
const boolean BLACK[] = {OFF, OFF, OFF};
//An Array that stores the predefined colors (allows us to later randomly
display a color)
```

```
const boolean* COLORS[] = {RED, GREEN, BLUE, YELLOW, CYAN, MAGENTA, WHITE,
BLACK};
void setup(){
  for(int i = 0; i < 3; i++){
    pinMode(ledDigitalOne[i], OUTPUT); //Set the three LED pins as outputs
  }
}
void loop(){
/* Example - 1 Set a color
  Set the three LEDs to any predefined color
*/
  setColor(ledDigitalOne, YELLOW); //Set the color of LED one

/* Example - 2 Go through Random Colors
  Set the LEDs to a random color
*/
  //randomColor();
}
void randomColor(){
  int rand = random(0, sizeof(COLORS) / 2); //get a random number within
the range of colors
  setColor(ledDigitalOne, COLORS[rand]); //Set the color of led one to a
random color
  delay(1000);
}
/* Sets an led to any color
  led - a three element array defining the three color pins (led[0] =
redPin, led[1] = greenPin, led[2] = bluePin)
  color - a three element boolean array (color[0] = red value (LOW = on,
```

```
HIGH = off), color[1] = green value, color[2] =blue value)
*/
void setColor(int* led, boolean* color){
  for(int i = 0; i < 3; i++){
    digitalWrite(led[i], color[i]);
  }
}
void setColor(int* led, const boolean* color){
  boolean tempColor[] = {color[0], color[1], color[2]};
  setColor(led, tempColor);
}
*****Code End*****
```

## Module14 : SMD RGB LED Module



### 1. Introduction

RGB LED module consists of a full-color LED made by R, G, B three pin PWM voltage input can be adjusted. Primary colors (red / blue / green) strength in order to achieve full color mixing effect. Control of the module with the Arduino can be achieved Cool lighting effects.

### Specification

- Red Vf: 1.8 to 2.1V
- Green Vf: 3.0 to 3.2V
- Blue Vf: 3.0 to 3.2V
- Red color: 620-625 nm
- Green color: 520-525 nm
- Blue color: 465-470 nm

- Red brightness @ ~20mA: 600-800 mcd
- Blue brightness @ ~20mA: 800-1000 mcd
- Green brightness @ ~20mA: 1500-2000mcd

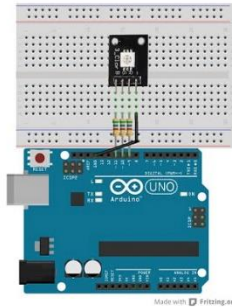
## 2. Pinout

Pin Name	Description
“R”	Red light
“G”	Green light
“B”	Blue light
“_”	Ground

## 3. Example

In this example, we blink an LED and using an RGB LED we can generate any color we want.

Here is the physical connection:



\*\*\*\*\*Code begin\*\*\*\*\*

```
int ledDigitalOne[] = {10, 11, 9}; //the three digital pins of the digital
LED

//10 = redPin, 11 = greenPin, 9 = bluePin
const boolean ON = HIGH; //Define on as LOW (this is because we use a
//common

//Anode RGB LED (common pin is connected to +5
//volts)
```

```
const boolean OFF = LOW; //Define off as HIGH
//Predefined Colors
const boolean RED[] = {ON, OFF, OFF};
const boolean GREEN[] = {OFF, ON, OFF};
const boolean BLUE[] = {OFF, OFF, ON};
const boolean YELLOW[] = {ON, ON, OFF};
const boolean CYAN[] = {OFF, ON, ON};
const boolean MAGENTA[] = {ON, OFF, ON};
const boolean WHITE[] = {ON, ON, ON};
const boolean BLACK[] = {OFF, OFF, OFF};
//An Array that stores the predefined colors (allows us to later randomly
display a color)
const boolean* COLORS[] = {RED, GREEN, BLUE, YELLOW, CYAN, MAGENTA, WHITE,
BLACK};
void setup(){
  for(int i = 0; i < 3; i++){
    pinMode(ledDigitalOne[i], OUTPUT); //Set the three LED pins as outputs
  }
}
void loop(){
/* Example - 1 Set a color
  Set the three LEDs to any predefined color
*/
  setColor(ledDigitalOne, YELLOW); //Set the color of LED one
/* Example - 2 Go through Random Colors
  Set the LEDs to a random color
*/
  //randomColor();
}
```

```
void randomColor(){
    int rand = random(0, sizeof(COLORS) / 2); //get a random number within
the range of colors
    setColor(ledDigitalOne, COLORS[rand]); //Set the color of led one to a
random color
    delay(1000);
}
/* Sets an led to any color
    led - a three element array defining the three color pins (led[0] =
redPin, led[1] = greenPin, led[2] = bluePin)
    color - a three element boolean array (color[0] = red value (LOW = on,
HIGH = off), color[1] = green value, color[2] =blue value)
*/
void setColor(int* led, boolean* color){
    for(int i = 0; i < 3; i++){
        digitalWrite(led[i], color[i]);
    }
}
/* A version of setColor that allows for using const boolean colors
*/
void setColor(int* led, const boolean* color){
    boolean tempColor[] = {color[0], color[1], color[2]};
    setColor(led, tempColor);
}
*****Code End*****
```

# Module 15: Two Color LED Module(5mm)



## 1 Introduction

This module can gradually generate two kinds color, Red and Green, from the one color to the other one. The “s” pin represents Red color and the middle pin means Green color.

### Specification:

- Color: Green + Red
- Diameter: 5mm
- Case Color: None
- Package Type: Diffusion
- Voltage (V): G :2.3-2 .6 V; R :1.9-2 .2 V
- Using a current (MA): 20
- Viewing angle: Wavelength (NM): 571 +625
- Luminous intensity (MCD) :20-40; 60-80
- Stent type: long-legged

## 2 pinout

Pin	Description
S	Red color pin
Middle pin	Green color pin
-	Ground

## 3. Example

Here is a example show that the color of the LED gradually change to Green from Red. The connection as below:



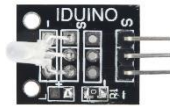


\*\*\*\*\*Code Begin\*\*\*\*\*

```
int redpin = 11; // select the pin for the red LED
int greenpin = 10; // select the pin for the greenLED
int val;
void setup () {
  pinMode (redpin, OUTPUT);
  pinMode (bluepin, OUTPUT);
  Serial.begin (9600);
}
void loop ()
{
  for (val = 255; val > 0; val --)
  {
    analogWrite (11, val);
    analogWrite (10, 255-val);
    delay (15);
  }
  for (val = 0; val < 255; val ++ )
  {
    analogWrite (11, val);
    analogWrite (10, 255-val);
```

```
delay (15);  
}  
Serial.println (val, DEC);  
}  
*****Code End*****
```

## Module 16: Two Color LED Module(3mm)



### 1 Introduction

This module is similar with the module 15, it also can gradually generate two kinds color, Red and Green, from the one color to the other one. The difference is the diameter of the LED is 3mm. The “s” pin represents Red color and the middle pin means Green color.

### Specification:

- Color: Green + Red
- Diameter: 3mm
- Case Color: None
- Package Type: Diffusion
- Voltage (V) :2.0-2 .5
- Using a current (MA): 10
- Viewing angle: 150
- Wavelength (NM): 571 +644
- Luminous intensity (MCD) :20-40; 40-80
- Stent type: long-legged

### 2 pinout

Pin	Description
S	Red color pin
Middle pin	Green color pin
-	Ground

### 3. Example

Here is an example show that the color of the LED gradually change to Green from Red. The connection as below:



\*\*\*\*\*Code Begin\*\*\*\*\*

```
int redpin = 11; // select the pin for the red LED
int greenpin = 10; // select the pin for the greenLED
int val;
void setup () {
  pinMode (redpin, OUTPUT);
  pinMode (bluepin, OUTPUT);
  Serial.begin (9600);
}
void loop ()
{
  for (val = 255; val > 0; val --)
  {
    analogWrite (11, val);
```

```
analogWrite (10, 255-val);
delay (15);
}
for (val = 0; val <255; val ++)
{
analogWrite (11, val);
analogWrite (10, 255-val);
delay (15);
}
Serial.println (val, DEC);
}
*****Code End*****
```

## Module 17: Reed Switch Module



### 1 Introduction

It is a simple magnetic read module, you can sense whether there is a current or magnetic field.

### Specification

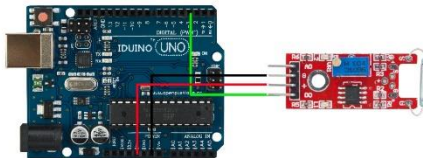
- Operation voltage: 5V
- Both digital and analog output pin
- Adjustable sensitive
- Size: 45\*15mm
- Weight: 3g

## 2 Pinout

Pin	Description
A0	Analog output pin, real-time output voltage signal
D0	Digital output pin, output Low or High signal when there current or magnetic exists
+	Power
G	Ground

## 3.example

The example show that Reed module and the interface comes with digital 13 LED build a simple circuit to produce a Reed warning lamp 13 comes with digital interfaces of the LED, the Reed sensor access number 3 interface, when Reed sensors Sensed a key signal, LED lights, otherwise off.



\*\*\*\*\*Code Begin\*\*\*\*\*

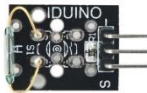
```
int Led = 13 ; // define LED Interface
int buttonpin = 3; // define the Reed sensor interfaces
int val ; // define numeric variables val
void setup ()
```

```
{
```

```
52
```

```
pinMode (Led, OUTPUT) ; // define LED as output interface
pinMode (buttonpin, INPUT) ; // output interface as defined Reed sensor
}
void loop ()
SunFounder{
    val = digitalRead (buttonpin) ; // digital interface will be assigned a
value of 3 to read val
    if (val == HIGH) // When the Reed sensor detects a signal, LED flashes
    {
        digitalWrite (Led, HIGH);
    }
    else
    {
        digitalWrite (Led, LOW);
    }
}
}
*****Code End*****
```

## Module 18: Mini Reed Switch Module



### 1 Introduction

This module is a simple reed switch module, it's similar with the module17(Reed switch module), but it has no analog pin, no adjustable resistor, just soldering one 10K ohm resistor.

### Specification

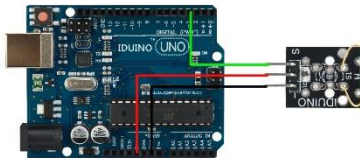
- Operation voltage: 5V
- 3Pin
- Size:25\*15mm
- Weight: 2g

### 2 Pinout

Pin	Description
D0	Digital output pin, output Low or High signal when there current or magnetic exists
+(middle pin)	Power
-	Ground

### 3.example

The example show that Reed module and the interface comes with digital 13 LED build a simple circuit to produce a Reed warning lamp 13 comes with digital interfaces of the LED, the Reed sensor access number 3 interface, when Reed sensors Sensed a key signal, LED lights, otherwise off.



\*\*\*\*\*Code Begin\*\*\*\*\*

```
int Led = 13 ; // define LED Interface
int buttonpin = 3; // define the Reed sensor interfaces
int val ; // define numeric variables val
```

```
void setup ()
{
  pinMode (Led, OUTPUT) ; // define LED as output interface
  pinMode (buttonpin, INPUT) ; // output interface as defined Reed sensor
}
void loop ()
SunFounder{
  val = digitalRead (buttonpin) ; // digital interface will be assigned a
value of 3 to read val
  if (val == HIGH) // When the Reed sensor detects a signal, LED flashes
  {
    digitalWrite (Led, HIGH);
  }
  else
  {
    digitalWrite (Led, LOW);
  }
}
}
*****Code End*****
```

## Module 19: Heartbeat Sensor



### 1 Introduction

This project uses bright infrared (IR) LED and a phototransistor to detect the pulse of the



finger, a red LED flashes with each pulse. Pulse monitor works as follows: The LED is the light side of the finger, and phototransistor on the other side of the finger, phototransistor used to obtain the flux emitted, when the blood pressure pulse by the finger when the resistance of the photo transistor will be slightly changed.

### Specification

- Operation voltage: 5V
- 3 pin
- Size: 30\*18mm
- Weight: 2g

### 2 Pinout

Pin	Description
A0	Analog output pin, real-time output voltage signal
+(middle pin)	Power
-	Ground

### 3.example

In this example, put your finger between the IR LED and the phototransistor, then open the Serial Monitor, you will see the voltage value changing. With one camera in the dark, you can see the IR LED is blinding.



\*\*\*\*\*Code Begin\*\*\*\*\*

```
int sensorPin = 0;
```

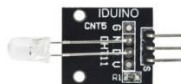
```

double alpha = 0.75;
int period = 100;
double change = 0.0;
double minval = 0.0;
void setup ()
{
  Serial.begin (9600);
}
void loop ()
{
  static double oldValue = 0;
  static double oldChange = 0;
  int rawValue = analogRead (sensorPin);
  double value = alpha * oldValue + (1 - alpha) * rawValue;
  Serial.print (rawValue);
  Serial.print (",");
  Serial.println (value);
  oldValue = value;
  delay (period);
}

```

\*\*\*\*\*Code End\*\*\*\*\*

## Module 20: Seven-Color flash Module



### 1 Introduction

This module can make colorful light from one led, just like a rainbow light. Maybe you not understand the meaning of seven-color flash, just try the example trail, it brings you amazing experience.

### Specification:

- Color: colorful
- Diameter: 3mm
- Shape: Round LED 5mm DIP type
- Lens type: white mist
- Standard Forward Voltage :3.0-4 .5 V

### 2 pinout

Pin	Description
S	color pin
Middle pin	color pin
-	Ground

### 3. Example

Here is an example show that the color of the LED blinking. The connection as below:

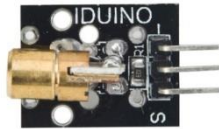


\*\*\*\*\*Code Begin\*\*\*\*\*

```
void setup() {  
  // initialize digital pin 13 as an output.  
  pinMode(13, OUTPUT);  
}
```

```
// the loop function runs over and over again forever
void loop() {
  digitalWrite(13, HIGH);    // turn the LED on (HIGH is the
  voltage level)
  delay(1000);              // wait for a second
  digitalWrite(13, LOW);    // turn the LED off by making the
  voltage LOW
  delay(1000);              // wait for a second
}
*****Code End*****
```

## Module 21: Laser Module(ST1172)



### 1. Introduction

Laser transmitter module, 650 nm (red), gives a small intense beam. Even this module is safety for your project, do not look direct into the beam.

**Warning :** *This Class 3B laser can cause eye injury, please avoid exposure the beam.*



### Specification:

- Operation voltage: 5V

- Wavelength:650nm      Light color: Red
- Size:27\*15mm          Type:Class 3B

## 2. Pinout

Pin Name	Description
“_”	Gnd
“S”	Signal pin(input)
“+”	Power(5V DC)

## 3. Example

This module can be used simply, example code as below, which control the laser diode to turn on and turn off alternately.



\*\*\*\*\*Code begin\*\*\*\*\*

```
void setup ()
{
  pinMode (13, OUTPUT); // define the digital output interface 13 feet
}
void loop () {
  digitalWrite (13, HIGH); // open the laser head
  delay (1000); // delay one second
  digitalWrite (13, LOW); // turn off the laser head
  delay (1000); // delay one second
```

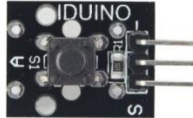
```
}

```

```
*****Code begin*****

```

## Module 22: Button switch Module



### 1 Introduction

This is a simple button switch module, like a key switch. When you press on the key, this module output a high level signal.

### Specification:

- Color: black
- Voltage:5V DC
- 3 Pins

### 2 pinout

Pin	Description
S	Output pin
Middle pin	Power (5V DC)
-	Ground

### 3. Example

Here is an example show that the color of the LED blinking. When you press the key, the LED13 turns on. The connection as below:



\*\*\*\*\*Code Begin\*\*\*\*\*

```
int Led = 13 ;// define LED Interface
int buttonpin = 7; // define the key switch sensor interface
int val ;// define numeric variables val
void setup ()
{
  pinMode (Led, OUTPUT); // define LED as output interface
  pinMode (buttonpin, INPUT); // define the key switch sensor
  output interface
}
void loop ()
{
  val = digitalRead (buttonpin); // digital interface will be
  assigned a value of 3 to read val
  if (val == HIGH) // When the key switch when the sensor
  detects a signal, LED flashes
  {
    digitalWrite (Led, LOW);
  }
  else
  {
```

```
digitalWrite (Led, HIGH);
}
}
*****Code End*****
```

## Module23: Vibration Shock module(SE053)



### 1 Introduction

This module is a shock switch module, and if it can detect a jolt, it output one low level signal. Be similar with our most sensor, It has three pin: Power pin, Ground pin and signal switch pin. That's an interesting function to your Arduino project.

### Specification

- Operation voltage: 5V
- 3Pin
- Size:28\*15mm
- Weight: 2g

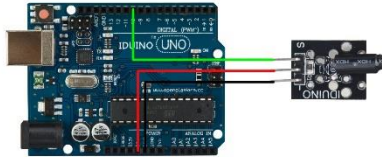
### 2 Pinout

Pin	Description
S	If the sensor detect a jolt, this pin output low level signal
+(middle pin)	Power
-	Ground



## 3.Example

This example show you how to use this module, connection as below, and upload the sketch, open the serial monitor session, see how it will go~



Example code :

\*\*\*\*\*Code begin\*\*\*\*\*

```
int shockPin = 10; // Use Pin 10 as our Input
int shockVal = HIGH; // This is where we record our shock measurement
boolean bAlarm = false;
unsigned long lastShockTime; // Record the time that we measured a shock
int shockAlarmTime = 250; // Number of milli seconds to keep the shock
alarm high
void setup ()
{
  Serial.begin(9600);
  pinMode (shockPin, INPUT) ; // input from the KY-002
}
void loop ()
{
  shockVal = digitalRead (shockPin) ; // read the value from our sensor
  if (shockVal == LOW) // If we're in an alarm state
  {
```



## Specification

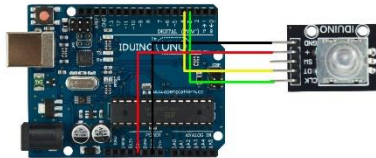
- Operation voltage: 5V
- 5Pinout
- Size:32\*20\*30mm
- Weight: 20g

## 2 Pinout

Pin	Description
CLK	Encoder A
DT	Encoder B
SW	Switch button
+	Power(5V DC)
Gnd	Ground

## 3.Example

This is a simple sketch that shows how to count the encoder position and how to determine direction of rotation. It has no switch debounce, nor does it use interrupts. A fully developed application might need to incorporate these in order to make it robust.



\*\*\*\*\*Code Begin\*\*\*\*\*

```
int pinA = 3; // Connected to CLK
int pinB = 4; // Connected to DT
int encoderPosCount = 0;
```

```

int pinALast;
int aVal;
boolean bCW;
void setup() {
  pinMode (pinA,INPUT);
  pinMode (pinB,INPUT);
  /* Read Pin A
  Whatever state it's in will reflect the last position
  */
  pinALast = digitalRead(pinA);
  Serial.begin (9600);
}

void loop() {
  aVal = digitalRead(pinA);
  if (aVal != pinALast){ // Means the knob is rotating
    // if the knob is rotating, we need to determine direction
    // We do that by reading pin B.
    if (digitalRead(pinB) != aVal) { // Means pin A Changed first - We're
Rotating Clockwise
      encoderPosCount ++;
      bCW = true;
    } else { // Otherwise B changed first and we're moving CCW
      bCW = false;
      encoderPosCount--;
    }
  }
  Serial.print ("Rotated: ");
  if (bCW){
    Serial.println ("clockwise");
  }
}

```

```

}else{
    Serial.println("counterclockwise");
}
Serial.print("Encoder Position: ");
Serial.println(encoderPosCount);
}
pinALast = aVal;
}
*****Code End*****

```

## Module25: Switch light module



### 1 Introduction

This module contains two function, one is ball switch, the other is red led. Basing on these two function, we can make a project like a magic

### Specification

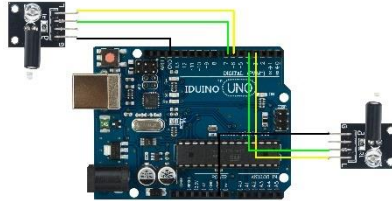
- Operation voltage: 5V
- 4Pin

### 2 Pinout

Pin	Description
S	Signal output pin, used for the mercury switch is active or not
L	Input pin for the red led
+(middle pin)	Power

### 3.Example

This example shows you how to use this module, connection as below, and upload the sketch, see how it will go~



Example code :

```
*****Code begin*****
```

```
int LedPinA = 3;
int LedPinB = 6;
int ButtonPinA = 4;
int ButtonPinB = 7;
int buttonStateA = 0;
int buttonStateB = 0;
int brightness = 0;
void setup ()
{
  pinMode (LedPinA, OUTPUT);
  pinMode (LedPinB, OUTPUT);
  pinMode (ButtonPinA, INPUT);
  pinMode (ButtonPinB, INPUT);
}
void loop ()
```

```

{
  buttonStateA = digitalRead (ButtonPinA);
  if (buttonStateA == LOW &&brightness!= 255)
  {
    brightness=brightness+5;
  }
  analogWrite (LedPinA, brightness); //
  analogWrite (LedPinB, 255-brightness);//
  delay (200);
  buttonStateB = digitalRead (ButtonPinB);
  if (buttonStateB == LOW &&brightness>= 255)
  {
    brightness=0;
    analogWrite (LedPinA, brightness); // A few Guan Yuan (ii) ?
    analogWrite (LedPinB, 255-brightness);// B Yuan (ii) a few
Bang ?
    delay (1000);
  }
  //brightness=brightness-5;
}

```

\*\*\*\*\*Code End\*\*\*\*\*

## Module26: Tilt Switch module



## 1 Introduction

This module is a tilt switch module, and if it is tilted towards right side ,it output one High level signal. Be similar with our most sensor, It has three pin: Power pin, Ground pin and signal switch pin. That's an interesting function to your Arduino project.

## Specification

- Operation voltage: 5V
- 3Pin
- Size:28\*15mm
- Weight: 2g

## 2 Pinout

Pin	Description
S	If the sensor is tilted, this pin output high level signal
+(middle pin)	Power
-	Ground

## 3.Example

This example show you how to use this module, connection as below, and upload the sketch, rotate this module, see what will be happen.



Example code :

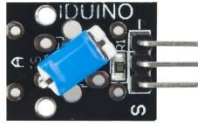
```
*****Code begin*****
```

```
int Led = 13 ;// define LED Interface
```



```
int buttonpin = 7; // define the mercury tilt switch sensor
interface
int val ;// define numeric variables val
void setup ()
{
  pinMode (Led, OUTPUT) ;// define LED as output interface
  pinMode (buttonpin, INPUT) ;// define the mercury tilt switch
sensor output interface
}
void loop ()
{
  val = digitalRead (buttonpin) ;// read the values assigned to
the digital interface 7 val
  if (val == HIGH) // When the mercury tilt switch sensor detects
a signal, LED flashes
  {
    digitalWrite (Led, HIGH);
  }
  else
  {
    digitalWrite (Led, LOW);
  }
}
}
*****Code End*****
```

## Module27: Ball Switch sensor(SE059)



### 1 Introduction

This module called Ball switch sensor, just like a ball tilt switch, similar with the tilt switch. When this module be tilted, it will output low or high signal for your control.

### Specification

- Operation voltage: 5V
- 3Pin
- Size:25\*15mm
- Weight: 2g

### 2 Pinout

Pin	Description
S	If the sensor detect a tilt, this pin output low or high level signal
+(middle pin)	Power
-	Ground

### 3.Example

In this example, you need connect a LED to pin13 to see when this module be rotated, what will happen.

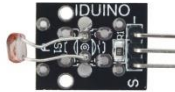


\*\*\*\*\*Code Begin\*\*\*\*\*

```
int Led = 13 ;// define LED Interface
int buttonpin = 3; // define the tilt switch sensor interfaces
int val ;// define numeric variables val
void setup ()
{
  pinMode (Led, OUTPUT) ;// define LED as output interface
  pinMode (buttonpin, INPUT) ;//define the output interface tilt switch
  sensor
}
void loop ()
{
  val = digitalRead (buttonpin) ;// digital interface will be assigned a
  value of 3 to read val
  if (val == HIGH) //When the tilt sensor detects a signal when the switch,
  LED flashes
  {
    digitalWrite (Led, HIGH);
  }
  else
  {
```

```
digitalWrite (Led, LOW);
}
}
*****Code Begin*****
```

## Module 28: Light Dependent Resistor Module(SE012)



### 1 Introduction

Light Dependent Resistor, also called photoresistor, are light sensitive devices most often used to indicate the presence or absence of light, or to measure the light intensity

### Specification

- Operation voltage: 5V
- 3Pin
- Size:28\*15mm
- Weight: 2g

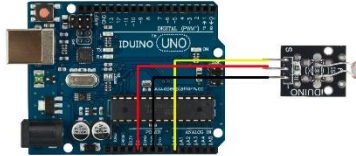
### 2 Pinout

Pin	Description
S	Analog output pin, real-time output voltage signal
+(middle pin)	Power
-	Ground

### 3.example

In this example, this module will read the value of resistor and print in the Serial Monitor. These value can be reflect the intensity of environment light.

The connection as below:

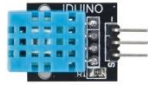


\*\*\*\*\*Code Begin\*\*\*\*\*

```
int sensorPin = A5; // select the input pin for the potentiometer
int ledPin = 13; // select the pin for the LED
int sensorValue = 0; // variable to store the value coming from the sensor
void setup() {
  pinMode(ledPin, OUTPUT);
  Serial.begin(9600);
}
void loop() {
  sensorValue = analogRead(sensorPin);
  digitalWrite(ledPin, HIGH);
  delay(sensorValue);
  digitalWrite(ledPin, LOW);
  delay(sensorValue);
  Serial.println(sensorValue, DEC);
}
```

\*\*\*\*\*Code End\*\*\*\*\*

# Module29: Temperature and Humidity Module(SE052)



## 1. Introduction

DHT11 digital temperature and humidity sensor is a composite Sensor contains a calibrated digital signal output of the temperature and humidity. Application of a dedicated digital modules collection technology and the temperature and humidity sensing technology, to ensure that the product has high reliability and excellent long-term stability. The sensor includes a resistive sense of wet components and an NTC temperature measurement devices, and connected with a high-performance 8-bit microcontroller.

The Module's feature as below:

Feature	Value
<b>Model No.</b>	DTH11
<b>Voltage</b>	5V DC
<b>Temperature Range</b>	0~50°C
<b>Humidity Range</b>	20~90%
<b>Accuracy</b>	+/- 0.2°C, +/- 5%

## 2.Pinout

Pin	Description
“S”	Analog output pin, real-time output voltage signal
“-”	Gnd
“+”	Vcc(reference voltage:5V DC)

### 3.example

Here is an example to show the real-time temperature and humidity of environment, if you have another LCD screen to be connected, that would be better fun.

The connection as below:



\*\*\*\*\*Code begin\*\*\*\*\*

```
int DHpin = 8;
byte dat [5];
byte read_data () {
    byte data;
    for (int i = 0; i < 8; i ++) {
        if (digitalRead (DHpin) == LOW) {
            while (digitalRead (DHpin) == LOW); // wait for 50us
            delayMicroseconds (30); // determine the duration of the high level
            to determine the data is '0 'or '1'
            if (digitalRead (DHpin) == HIGH)
                data |= (1 << (7-i)); // high front and low in the post
            while (digitalRead (DHpin) == HIGH); // data '1 ', wait for the next
            one receiver
        }
    }
    return data;
}
```

```

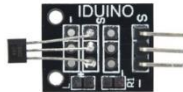
}
void start_test () {
    digitalWrite (DHpin, LOW); // bus down, send start signal
    delay (30); // delay greater than 18ms, so DHT11 start signal can be
detected
    digitalWrite (DHpin, HIGH);
    delayMicroseconds (40); // Wait for DHT11 response
    pinMode (DHpin, INPUT);
    while (digitalRead (DHpin) == HIGH);
    delayMicroseconds (80); // DHT11 response, pulled the bus 80us
    if (digitalRead (DHpin) == LOW);
    delayMicroseconds (80); // DHT11 80us after the bus pulled to start
sending data
    for (int i = 0; i < 4; i ++) // receive temperature and humidity data,
the parity bit is not considered
        dat[i] = read_data ();
    pinMode (DHpin, OUTPUT);
    digitalWrite (DHpin, HIGH); // send data once after releasing the bus,
wait for the host to open the next Start signal
}
void setup () {
    Serial.begin (9600);
    pinMode (DHpin, OUTPUT);
}
void loop () {
    start_test ();
    Serial.print ("Current humdity =");
    Serial.print (dat [0], DEC); // display the humidity-bit integer;
    Serial.print ('.');
}

```



```
Serial.print (dat [1], DEC); // display the humidity decimal places;
Serial.println ('%');
Serial.print ("Current temperature =");
Serial.print (dat [2], DEC); // display the temperature of integer bits;
Serial.print ('. ');
Serial.print (dat [3], DEC); // display the temperature of decimal places;
Serial.println ('C');
delay (700);
}
*****Code End*****
```

## Module 30: Hall Effect Sensor (SE022)



### 1 Introduction

This module is analog hall sensor module, it can output an analog voltage at the signal pin of this module. This module is different from hall magnetic sensor (Module 31), which just output digital signal, like a magnetic switch.

#### Specification

- Operation voltage: 5V
- 3Pin
- Size: 28\*15mm
- Weight: 2g

### 2 Pinout

---

Pin	Description
-----	-------------

---

<b>S</b>	Analog output pin, real-time output voltage signal
<b>+(middle pin)</b>	Power
<b>-</b>	Ground

### 3.example

In this example, this module will read the value of magnetic and print on the Serial Monitor. These value can be reflect the intensity of environment magnetic.



Example Code:

\*\*\*\*\*Code begin\*\*\*\*\*

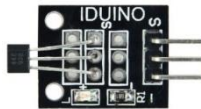
```
int sensorPin = A5;    // select the input pin
int ledPin = 13;      // select the pin for the LED
int sensorValue = 0;  // variable to store the value coming from the
sensor

void setup () {
  pinMode (ledPin, OUTPUT);
  Serial.begin (9600);
}

void loop () {
  sensorValue = analogRead (sensorPin);
  digitalWrite (ledPin, HIGH);
  delay (sensorValue);
}
```

```
digitalWrite (ledPin, LOW);
delay (sensorValue);
Serial.println (sensorValue, DEC);
}
*****Code End*****
```

## Module 31: Class Hall Magnetic Sensor(SE054)



### 1 Introduction

This module is Digital hall sensor module, it can output a digital voltage at the signal pin of this module. Just like a magnetic switch, is different from analogy hall magnetic sensor(Module 30).

#### Specification

- Operation voltage: 5V
- 3Pin
- Size:28\*15mm
- Weight: 2g

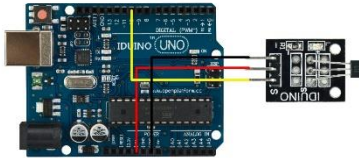
### 2 Pinout

Pin	Description
S	Digital signal output pin, real-time output voltage signal
+(middle pin)	Power
-	Ground

### 3.example

In this example, If no magnetic field is present, the signal line of the sensor is HIGH (3.5 V). If a magnetic field is presented to the sensor, the signal line goes LOW, at the same time the LED on the sensor lights up.

The connection as below:



Example Code:

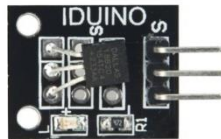
\*\*\*\*\*Code begin\*\*\*\*\*

```
int Led = 13 ; // define LED Interface
int SENSOR = 10 ; // define the Hall magnetic sensor interface
int val ; // define numeric variables val
void setup ()
{
    pinMode (Led, OUTPUT) ; // define LED as output interface
    pinMode (SENSOR, INPUT) ; // define the Hall magnetic sensor line as
input
}
void loop ()
{
    val = digitalRead (SENSOR) ; // read sensor line
    if (val == LOW) // when the Hall sensor detects a magnetic field, Arduino
LED lights up
```

```
{
  digitalWrite (Led, HIGH);
}
{
  digitalWrite (Led, LOW);
}
}
```

\*\*\*\*\*Code End\*\*\*\*\*

## Module 32:DS18B20 Temperature Sensor(SE029)



### 1. Introduction

This module is temperature sensor with chipDS18B20, It's different from other NTC-MF523950 temperature sensor(ST1147) or LM35 temperature sensor(SE039).

The Module's feature as below:

Feature	Value
<b>Chip</b>	DS18B20
<b>Temperature Range</b>	-55°C~+125°C
<b>Accuracy</b>	+/- 0.5°C
<b>Supply voltage</b>	5V DC

### 2.Pinout

Pin	Description
-----	-------------

S	Signal pin
+(middle pin)	Power(reference voltage:5V DC)
-	Ground

### 3 Example

This is a simple code for the DS18B20temperature module, Wire as below:



Example code :

\*\*\*\*\*Code begin\*\*\*\*\*

```
#include <OneWire.h>
// DS18S20 Temperature chip i/o
OneWire ds(10); // on pin 10
void setup(void) {
    // initialize inputs/outputs
    // start serial port
    Serial.begin(9600);
}
void loop(void) {
    //For conversion of raw data to C
    int HighByte, LowByte, TReading, SignBit, Tc_100, Whole, Fract;
    byte i;
    byte present = 0;
    byte data[12];
```

```

byte addr[8];
if ( !ds.search(addr)) {
    Serial.print("No more addresses.\n");
    ds.reset_search();
    return;
}
Serial.print("R=");
for( i = 0; i < 8; i++) {
    Serial.print(addr[i], HEX);
    Serial.print(" ");
}
if ( OneWire::crc8( addr, 7) != addr[7]) {
    Serial.print("CRC is not valid!\n");
    return;
}
if ( addr[0] == 0x10) {
    Serial.print("Device is a DS18S20 family device.\n");
}
else if ( addr[0] == 0x28) {
    Serial.print("Device is a DS18B20 family device.\n");
}
else {
    Serial.print("Device family is not recognized: 0x");
    Serial.println(addr[0],HEX);
    return;
}
ds.reset();
ds.select(addr);
ds.write(0x44,1);           // start conversion, with parasite

```

power on at the end

```

delay(1000);    // maybe 750ms is enough, maybe not
// we might do a ds.depower() here, but the reset will take
care of it.

```

```

present = ds.reset();
ds.select(addr);
ds.write(0xBE);    // Read Scratchpad
Serial.print("P=");
Serial.print(present,HEX);
Serial.print(" ");
for ( i = 0; i < 9; i++) {    // we need 9 bytes
    data[i] = ds.read();
    Serial.print(data[i], HEX);
    Serial.print(" ");
}
Serial.print(" CRC=");
Serial.print( OneWire::crc8( data, 8), HEX);
Serial.println();
//Conversion of raw data to C
LowByte = data[0];
HighByte = data[1];
TReading = (HighByte << 8) + LowByte;
SignBit = TReading & 0x8000; // test most sig bit
if (SignBit) // negative
{
    TReading = (TReading ^ 0xffff) + 1; // 2's comp
}
Tc_100 = (6 * TReading) + TReading / 4;    // multiply by (100

```



```
* 0.0625) or 6.25
  Whole = Tc_100 / 100; // separate off the whole and fractional
portions
  Fract = Tc_100 % 100;
  if (SignBit) // If its negative
  {
    Serial.print("-");
  }
  Serial.print(Whole);
  Serial.print(".");
  if (Fract < 10)
  {
    Serial.print("0");
  }
  Serial.print(Fract);

  Serial.print("\n");
  //End conversion to C
}
*****Code End*****
```

## Module33: Analog Temperature Sensor(ST1147)



## 1. Introduction

A thermistor is a type of resistor whose resistance is dependent on temperature, more so than in standard resistors. The word is a portmanteau of thermal and resistor. Thermistors are widely used as inrush current limiter, temperature sensors (NTC type typically), self-resetting overcurrent protectors, and self-regulating heating elements.

The Module's feature as below:

Feature	Value
<b>Model No.</b>	NTC-MF52 3950
<b>Temperature Range</b>	-55°C~+125°C
<b>Accuracy</b>	+/- 0.5°C
<b>Pull-up resistor</b>	10KΩ

## 2.Pinout

Pin	Description
“S”	Singal pin
“-”	Gnd
“+”	Vcc(reference voltage:5V DC)

## Temperature convert Formula

Here we use Steinhart–Hart equation to calculate the corresponding temperature. The equation is

$$\frac{1}{T} = A + B \ln(R) + C[\ln(R)]^3,$$

where:

$T$  is the temperature (in Kelvins)

$R$  is the resistance at  $T$  (in ohms)

$A$ ,  $B$ , and  $C$  are the Steinhart–Hart coefficients which vary depending on the type and model of thermistor and the temperature range of interest. (The most general form of the applied equation contains a  $[\ln(R)]^2$  term, but this is frequently neglected because it is typically much smaller than the other coefficients).

**Note:** For this module, the recommended coefficients of A,B,C are

A equals 0.001129148;

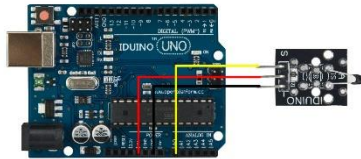
B equals 0.000234125;

C equals 0.0000000876741;

More, the same item products has a little bit different A,B,C coefficients , which depends your environmental temperature. If the recommended coefficients are not accurate enough, you'd better amend the A,B,C coefficients by Thermistor Calculator tool.

### 3 Example

This is a simple code for the NTC thermistor module, Wire as below:



Example code :

\*\*\*\*\*Code begin\*\*\*\*\*

```
#include <math.h>
```

```
double Thermister(int RawADC) {
```

```
double Temp;
```

```
Temp = log(((1024000/RawADC) - 10000));
```

```
Temp = 1 / (0.001129148 + (0.000234125 + (0.0000000876741 * Temp * Temp ))*
```

```
Temp );
```

```
Temp = Temp - 273.15;
```

```
return Temp;
```

```
}
```

```
void setup() {
```

```
Serial.begin(9600);
}
void loop()
{ Serial.print(Thermister(analogRead(0)));
  Serial.println("c");
  delay(1000); }
*****Code End*****
```

## Module 34: IR Transmitter Module



### 1. Introduction

This module usually used together with the IR Receiver Module(Module35), this module's application are very wide in our common life. This module just like a LED, but the color of light can't be seen by human' eye, you can see the light through your camera of your phone.

#### Specification

- Operation voltage: 5V
- 3Pin
- Size:30\*15mm
- Weight: 2g

#### 2 Pinout

Pin	Description
S	Digital signal input pin, if this pin detect a HIGH signal, this module transmit infrared

	light
<b>+(middle pin)</b>	Power
<b>-</b>	Ground

### 3.example

In this example, we use the basic sketch in the Arduino IDE, blinking this Infrared LED. You can't see the light through your light by your eye, but you can catch the infrared light by a infrared receive device, like module 35, or just a camera.

The connection as below:



Example code :

\*\*\*\*\*Code begin\*\*\*\*\*

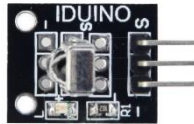
```
void setup() {
  // initialize digital pin 13 as an output.
  pinMode(13, OUTPUT);
}
// the loop function runs over and over again forever
void loop() {
  digitalWrite(13, HIGH); // turn the LED on (HIGH is the
  voltage level)
  delay(1000);           // wait for a second
  digitalWrite(13, LOW); // turn the LED off by making the
  voltage LOW
```

```

delay(1000);           // wait for a second
}
*****Code End*****

```

## Module 35: IR Receiver Module



### 1. Introduction

This module usually used together with the IR transmit Module(Module34), This module can read infrared light value and print in the Serial Monitor session.

#### Specification

- Operation voltage: 5V
- 3Pin
- Size:25\*15mm
- Weight:2g

#### 2 Pinout

Pin	Description
S	Digital signal input pin, used to read the value of infrared light.
+(middle pin)	Power
-	Ground

### 3.Example

In this example, you need an Infrared transmit device, like module 34, or mini remote

controller, directly point the remoter to this module, which can read the hexadecimal value of the infrared light and print on the window.

The connection as below:



Example code :

\*\*\*\*\*Code begin\*\*\*\*\*

```
# Include <IRremote.h>
int RECV_PIN = 11; // define input pin on Arduino
IRrecv irrecv (RECV_PIN);
decode_results results;
void setup ()
{
  Serial.begin (9600);
  irrecv.enableIRIn (); // Start the receiver
}
void loop () {
  if (irrecv.decode (& results)) {
    Serial.println (results.value, HEX);
    irrecv.resume (); // Receive the next value
  }
}*****Code End*****
```

## Module 36: Optical Broken Module(SE056)



### 1. Introduction

Optical Broken Module , also called photo-interrupter, which is a device that is made up of an infrared led and a photo transistor with a gap between the two of them, When something is placed between the gap the light is cut and the current flow through the photo transistor is reduced or stopped.

#### Specification

- Operation voltage: 5V
- 3Pin
- Size:28\*15mm
- Weight: 2g

#### 2 Pinout

Pin	Description
S	Digital signal input pin, if it detect a shelter, it output High level.
+(middle pin)	Power
-	Ground

### 3.Example

In this example, connect the circuit as below, upload the sketch, then put something between this module, the LED13 will light on.





Example code :

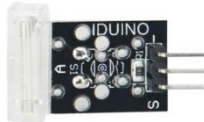
\*\*\*\*\*Code begin\*\*\*\*\*

```
int Led=13;
int buttonpin=3;
int val;
void setup()
{
  pinMode(Led,OUTPUT);
  pinMode(buttonpin,INPUT);
}
void loop()
{
  val=digitalRead(buttonpin);
  if(val==HIGH)
  {
    digitalWrite(Led,HIGH);
  }
  else
  {
    digitalWrite(Led,LOW);
  }
}
```

}

\*\*\*\*\*Code End\*\*\*\*\*

## Module 37: Hit Sensor Module(SE020)



### 1. Introduction

This module also called knock switch, if you hit this module, the signal pin would pinout High level signal.

#### Specification

- Operation voltage: 5V
- 3Pin
- Size:28\*15mm
- Weight: 3g

#### 2 Pinout

Pin	Description
S	Digital signal input pin, if it detect a knock, it output High level.
+(middle pin)	Power
-	Ground

### 3.Example

This example shows you how to use this module to catch a hit, which is different to the shock. If you hit this module, the LED13 will light on.

The connection as below:

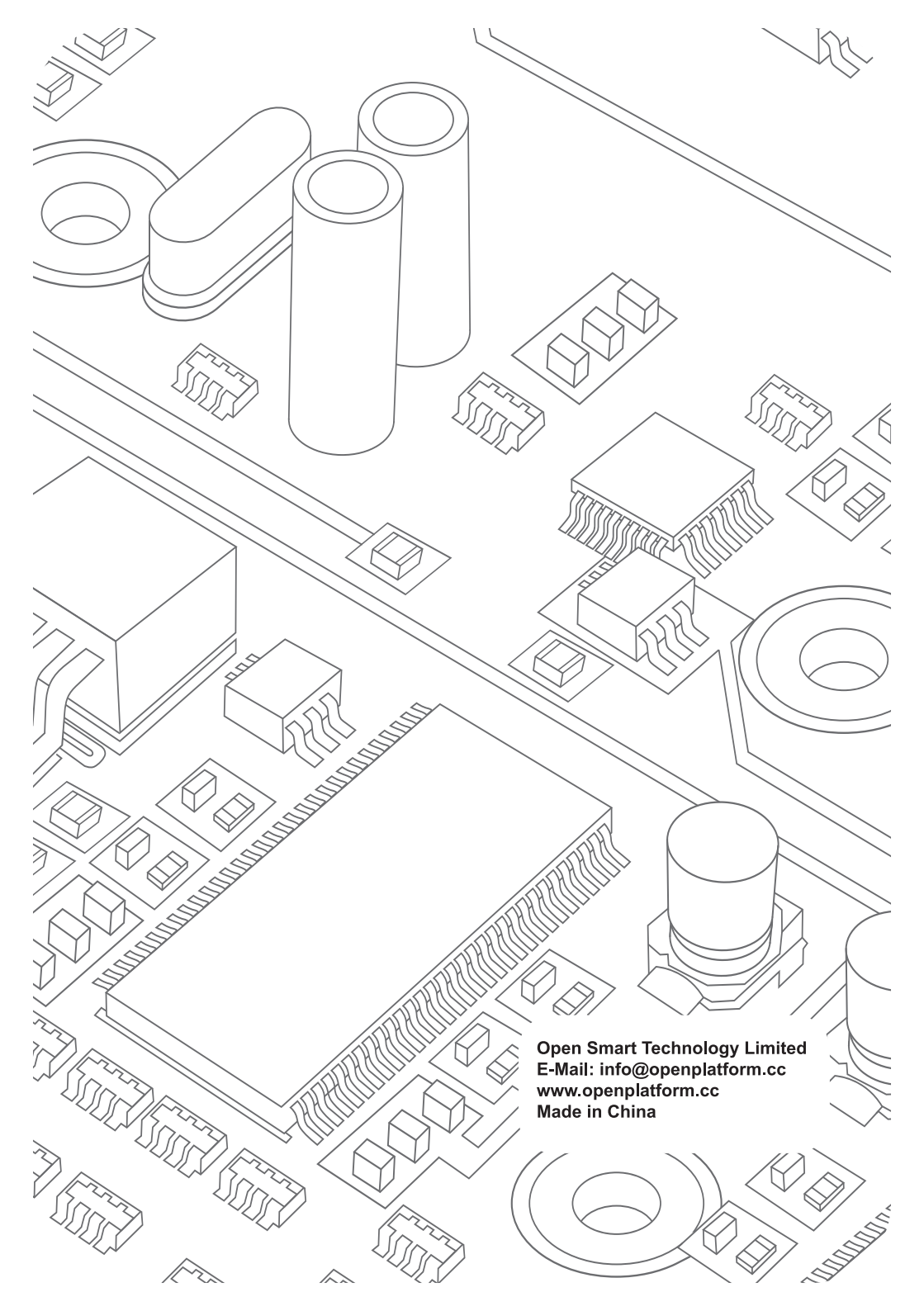


Example code :

\*\*\*\*\*Code begin\*\*\*\*\*

```
int Led=13;
int Shock=3;
int val;
void setup()
{
  pinMode(Led,OUTPUT);
  pinMode(Shock,INPUT);
}
void loop()
{val=digitalRead(Shock);
if(val==HIGH)
{
  digitalWrite(Led,LOW);
}
else
{digitalWrite(Led,HIGH);
}
}
```

\*\*\*\*\*Code End\*\*\*\*\*



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