

HC-SR501 Bewegingssensor

[HC-SR501-front.jpg](#)

[HC-SR501-back.jpg](#)

Pin Configuration

Pin Number	Pin Name	Description
1	Vcc	Input voltage is +5V for typical applications. Can range from 4.5V- 12V
2	High/Low Output (Dout)	Digital pulse high (3.3V) when triggered (motion detected) digital low(0V) when idle(no motion detected)
3	Ground	Connected to ground of circuit

[HC-SR501-pinout.jpg](#)

PIR Sensor Features

- Wide range on input voltage varying from 4.V to 12V (+5V recommended)
- Output voltage is High/Low (3.3V TTL)
- Can distinguish between object movement and human movement
- Has two operating modes – Repeatable(H) and Non- Repeatable(H)
- Cover distance of about 120° and 7 meters
- Low power consumption of 65mA
- Operating temperature from -20° to +80° Celsius

How to use PIR Motion Sensor

The PIR sensor stands for Passive Infrared sensor. It is a low cost sensor which can detect the presence of Human beings or animals. This sensor has three output pins Vcc, Output and Ground as shown in the pin diagram above. Since the output pin is 3.3V TTL logic it can be used with any platforms like Arduino, Raspberry, [PIC](#), ARM, 8051 etc..

The module can be powered from voltage 4.5V to 20V but, typically 5V is used. Once the module is powered allow the module to calibrate itself for few minutes, 2 minutes is a well settled time. Then observe the output on the output pin. Before we analyse the output we need to know that there are two operating modes in this sensor such as Repeatable(H) and Non- Repeatable(L) and mode. The Repeatable mode is the default mode.

The output of the sensor can be set by shorting any two pins on the left of the module as shown below. You can also notice two orange colour potentiometers that can be used to set the sensitivity and time which will be explained further below.

Repeatable(H) mode

In Repeatable(H) mode the output pin Dout will go high (3.3V) when a person is detected within range and goes low after a particular time (time is set by “Off time control” potentiometer). In this mode the output pin will go high irrespective of whether the person is still present inside the range or has left the area. The sensitivity can be set using the “sensitivity control” potentiometer

Non- Repeatable(L) mode

In “l” mode the output pin Dout will go high (3.3V) when a person is detected within range and will stay high as long as he/she stays within the limit of the Sensors range. Once the person has left the area the pin will go low after the particular time which can be set using the potentiometer. The sensitivity can be set using the “sensitivity control” potentiometer

There are two important materials present in the sensor one is the pyroelectric crystal which can detect the heat signatures from a living organism (humans/animals) and the other is a Fresnel lenses which can widen the range of the sensor. Yes the white colour things is just a lense that is used to widen the range of the sensor, if you remove the lense you can find the Pyroelectric sensor inside it covered inside a protective metal casing as shown above.

BRON:

[Components101](#)

Revision #2

Created 10 September 2023 15:38:45 by Alex

Updated 10 September 2023 16:01:11 by Alex