

# Sound Sensor Module

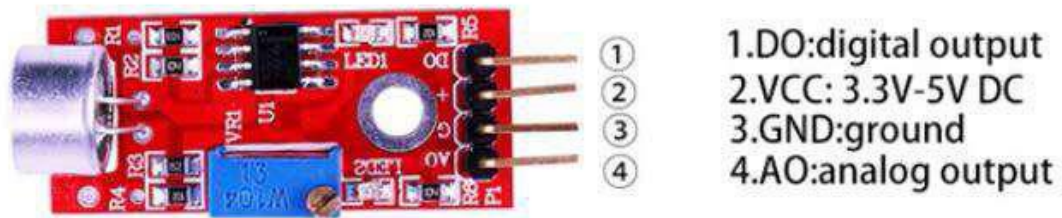
## Overview

In this lesson, you will learn how to use a sound sensor module. This module has two outputs:

AO: analog output, real-time output voltage signal of microphone

DO: when the intensity of the sound reaches a certain threshold, the output is a high or low level signal. The threshold sensitivity can be achieved by adjusting the potentiometer.

To make sure the microphone can detect your voice normally, please try to change its sensitivity by turning the blue precise potentiometer on the module. Given to its preciseness, it takes at least 10 circles for you to get some response.



## Component Required:

1 x Mega2560 R3

1 x Sound sensor module

4 x F-M wires (Female to Male DuPont wires)

## Component Introduction

### Microphone

Transducers are devices which convert energy from one form to other. A microphone is a transducer which converts sound energy to electrical signals. It works opposite to a speaker. Microphones are available in different shapes and sizes. Depending on the application, a microphone may use different technologies to convert sound to electrical signals. Here, we are going to discuss about the electret condenser microphone which is widely used in mobile phones, laptops, etc.

As the name suggests, the electret condenser microphone is a parallel plate capacitor and works on the principle of a variable capacitance. It consists of two plates, one fixed (called the back plate) and the other moveable (called the diaphragm) with a small gap between them. An electric potential charges the plate. When sound

strikes the diaphragm it starts moving, thereby changing the capacitance between the plates which in turn results in a variable electric current to flow.

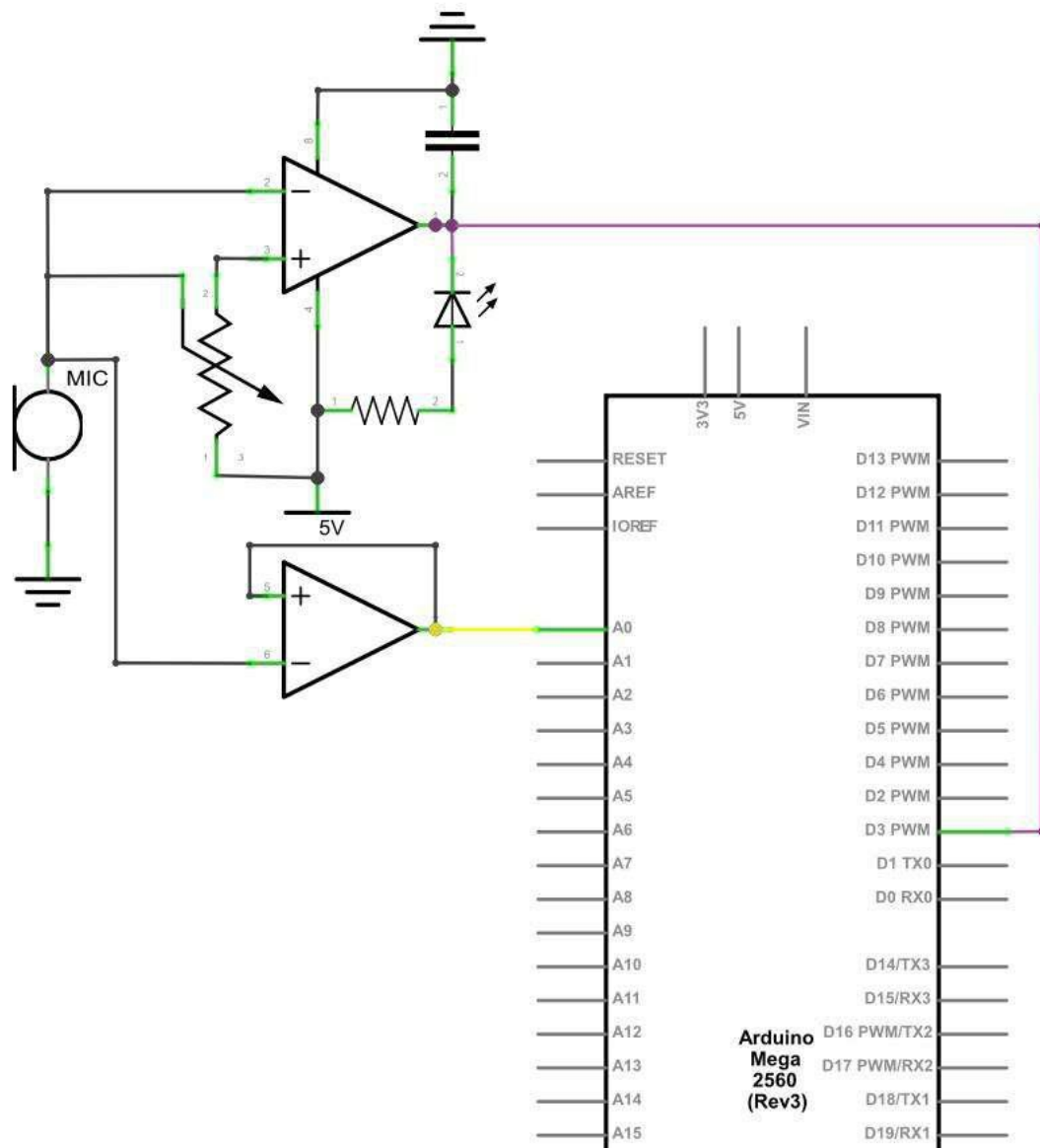


These microphones are widely used in electronic circuits to detect minor sounds or air vibrations which in turn are converted to electrical signals for further use. The two legs as shown in the image above are used to make electrical connection with the circuit.

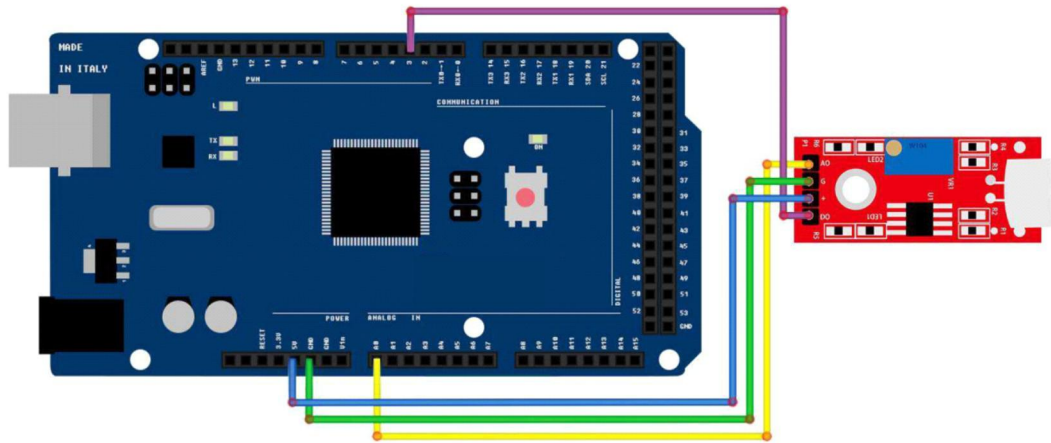


A solid conducting metal body encapsulates the various parts of the microphone. The top face is covered with a porous material with the help of glue. It acts as a filter for the dust particles. The sound signals/air vibrations passes through the porous material and falls on the diaphragm through the hole shown in the image above.

### Schematic



## Wiring diagram



## The code

After wiring, please open the program in the code folder- "[Sound Sensor Module](#)" and click **UPLOAD** to upload the program. See "[Blink](#)" for details about program uploading if there are any errors.

This module provides two signal output modes, for which we wrote two codes: [digital\\_signal\\_output](#) and [analog\\_signal\\_output](#). The code of [digital\\_signal\\_output](#) works when the voice reaches a certain value, it will trigger a digital signal and the dig #11 pin on Arduino will output a high level and the indicator L will be lit up at the same time. This triggering value may be changed according to the sensitivity adjustment method mentioned above. The code of [analog\\_signal\\_output](#) will read the analog value of the module and directly display it on the serial monitor, likewise, this value can also be changed according to the sensitivity adjustment method mentioned above.

Open the monitor then you can see the data as below:

Click the Serial Monitor button to turn on the serial monitor. The basics about the serial monitor are introduced in details in "[Arduino IDE useful manual.pdf](#)".

