

# CAMBOT 1.0

*CamBot 1.0 is an innovative robot that is designed to be both functional and aesthetically pleasing. This project brings together elements of mechanical engineering, electrical engineering, and computer programming to create a sophisticated and versatile machine that can perform a wide range of tasks.*

*One of the key features of CamBot 1.0 is its ability to navigate its surroundings. The robot is equipped with a range of sensors, including a direction sensor, an ultrasound sensor, an IR sensor, and many more. These sensors allow the robot to identify its location, detect obstacles in its path, and record the distance it has traveled. This enables the robot to move around autonomously and avoid collisions with other objects.*

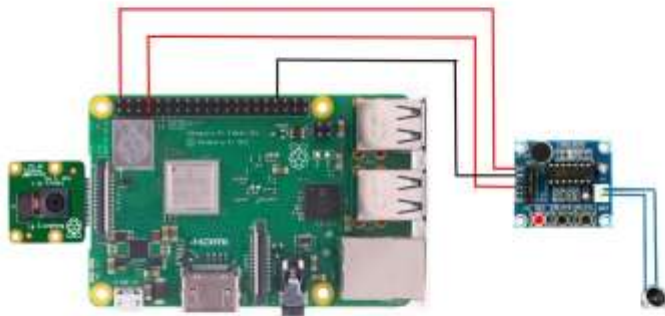
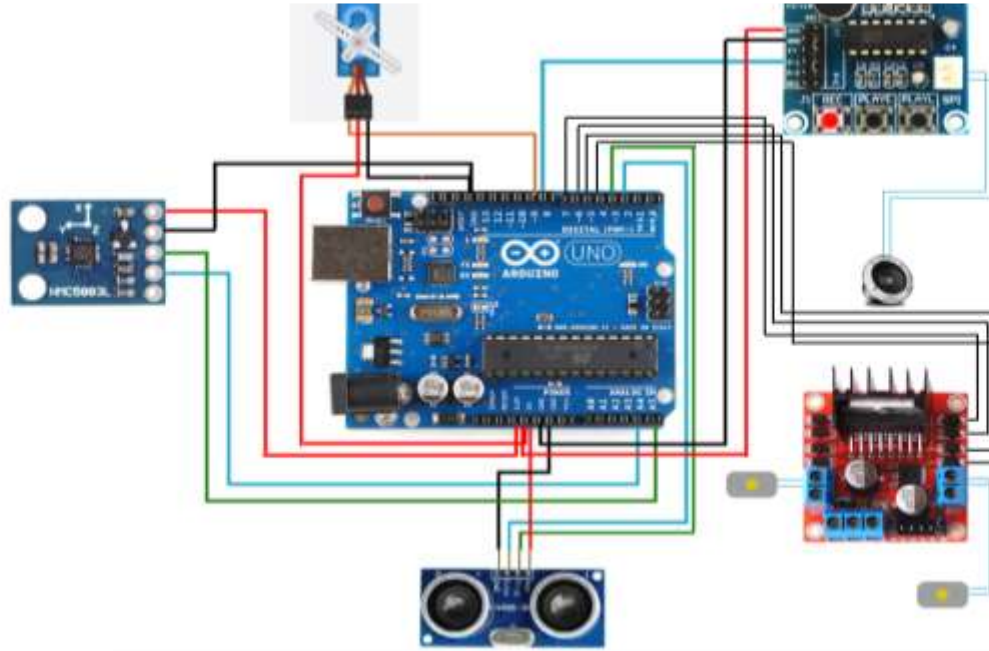
*In addition to its navigation capabilities, CamBot 1.0 is also able to recognize objects and respond to commands. The robot is equipped with a 5 megapixel HD camera that is capable of performing extensive AI-ML computations and computer vision and image processing algorithms. This allows the robot to identify and track objects in its environment, and to respond to commands from its human operator or from other electronic devices.*

*CamBot 1.0 is powered by a Raspberry Pi Module, which provides a powerful 64-bit quad-core Cortex-A72 processor and 2GB RAM. This enables the robot to perform complex computations quickly and efficiently. The robot is also equipped with wireless connectivity options such as WIFI & Bluetooth, which allow it to interface with other electronic devices wirelessly.*

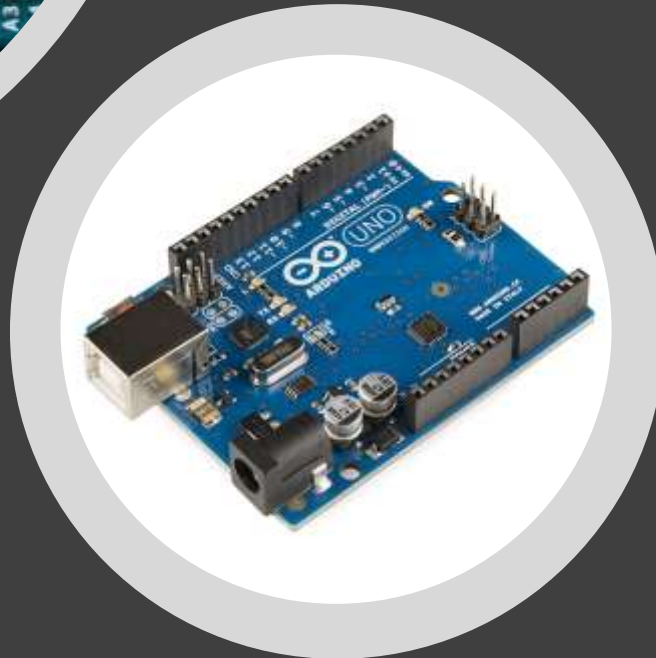
*Overall, CamBot 1.0 is a sophisticated and versatile robot that is well-suited for a wide range of applications. Whether it is used for research, education, or entertainment, CamBot 1.0 is sure to impress with its innovative design and cutting-edge technology.*



## Arduino Connection



## Raspberry Pi Connection



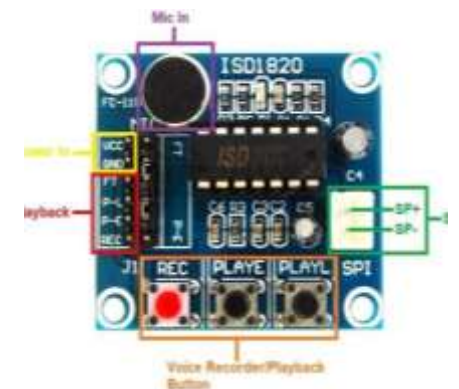
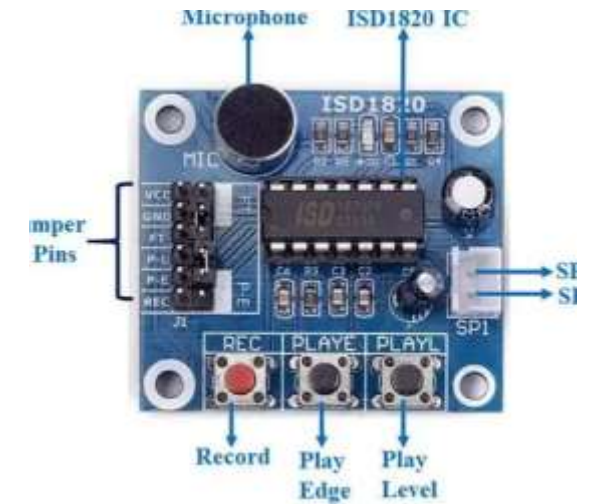
- *Arduino Uno is a popular microcontroller board based on the ATmega328P microcontroller. It is designed to make it easy for beginners to learn and experiment with electronics and programming. The board features digital and analog inputs and outputs, as well as a USB interface for programming and communication.*

- MICROCONTROLLER: ATMEGA328P
- OPERATING VOLTAGE: 5V
- INPUT VOLTAGE (RECOMMENDED): 7-12V
- DIGITAL I/O PINS: 14 (OF WHICH 6 PROVIDE PWM OUTPUT)
- ANALOG INPUT PINS: 6
- DC CURRENT PER I/O PIN: 20 MA
- DC CURRENT FOR 3.3V PIN: 50 MA
- FLASH MEMORY: 32 KB (ATMEGA328P) OF WHICH 0.5 KB USED BY BOOTLOADER
- SRAM: 2 KB (ATMEGA328P)
- EEPROM: 1 KB (ATMEGA328P)
- CLOCK SPEED: 16 MHZ

## ISD1820 Voice Recording Module

The ISD1820 is a Voice Recorder Module that provides outstanding quality, natural audio from the recorded audio by a Microphone driven through Microcontroller. The module has dual operation modes; Standalone and Microcontroller are driven.

- REC Button: The REC input is an active high-record signal. We should press this button while recording.
- Play-E Button: Playback, Edge activated. When a high transition is detected continues until it reached the end of the memory space.
- Play-L Button: Playback, Level activated button. When this it pressed, it starts a playback cycle.
- Microphone In: To get the voice signal, the microphone input transfers its signals to the chip pre-amplifier present on the board.



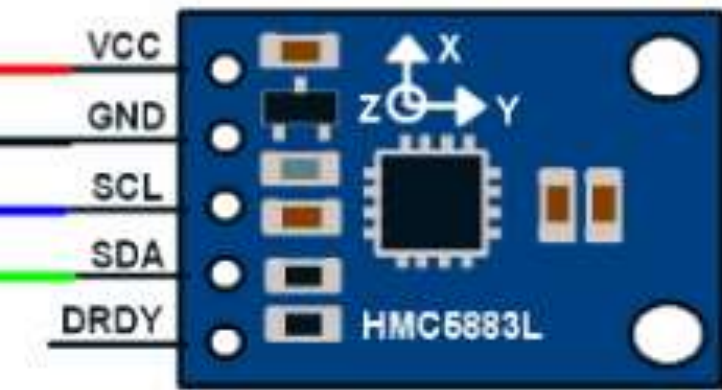




## **THE HC-SR04 SENSOR WORKS ON THE PRINCIPLE OF ULTRASONIC WAVES.**

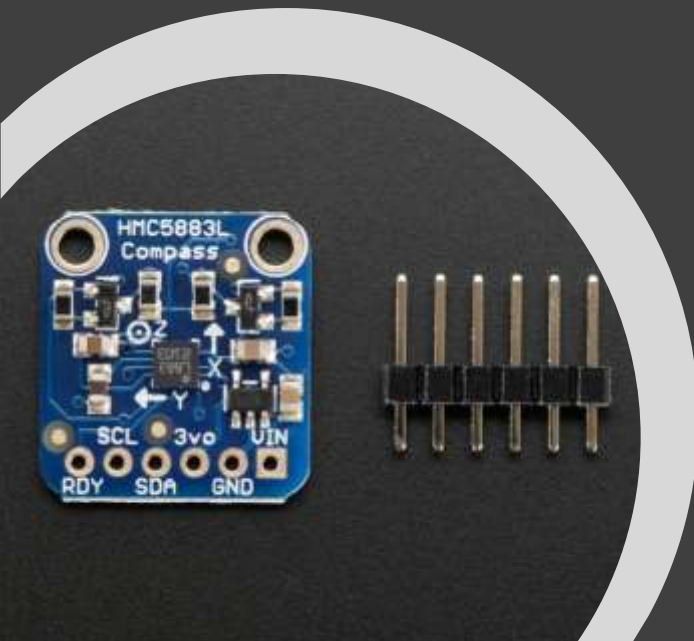
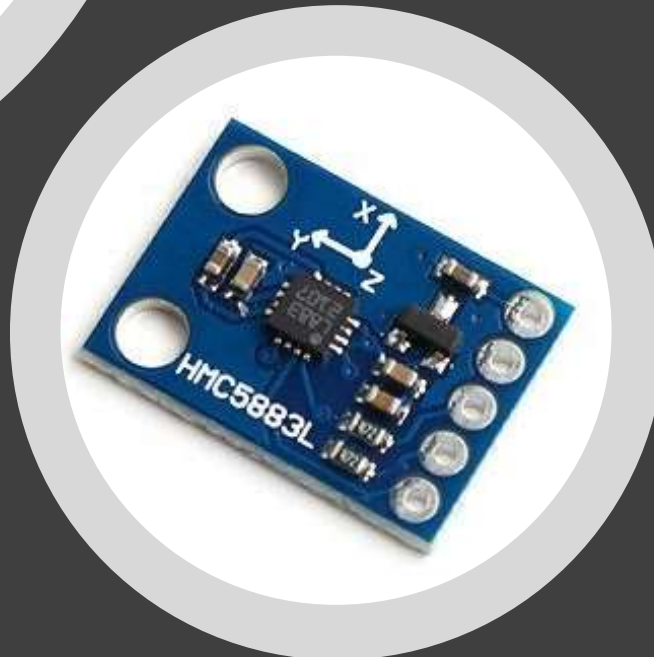
- IT CONSISTS OF A TRANSMITTER AND A RECEIVER.
- THE TRANSMITTER SENDS OUT ULTRASONIC WAVES THAT BOUNCE OFF AN OBJECT AND RETURN TO THE RECEIVER.
- THE TIME IT TAKES FOR THE WAVES TO BOUNCE BACK IS USED TO CALCULATE THE DISTANCE BETWEEN THE SENSOR AND THE OBJECT.
- THE SENSOR IS ACTIVATED BY SENDING A TRIGGER SIGNAL TO THE TRANSMITTER AND RECEIVING AN ECHO SIGNAL BACK FROM THE RECEIVER.
- THE SENSOR CAN MEASURE DISTANCES FROM 2CM TO 400CM WITH AN ACCURACY OF 3MM.
- THE SENSOR IS COMMONLY USED IN ROBOTICS, AUTOMATION, AND DISTANCE MEASUREMENT APPLICATIONS.





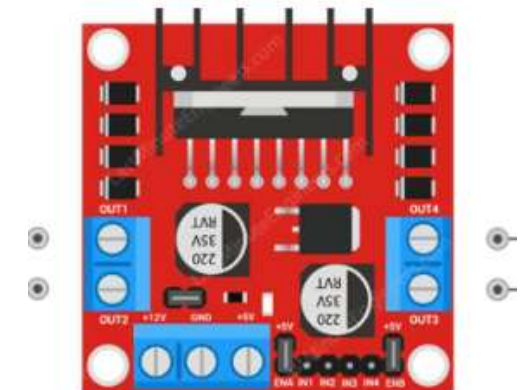
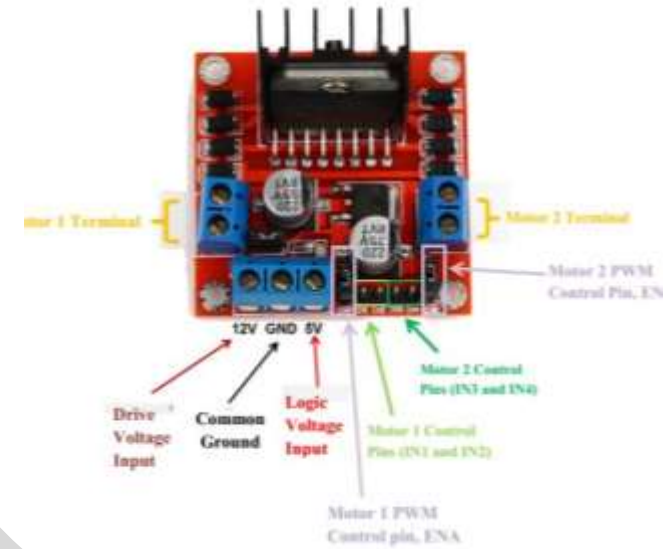
## •**HMC5883L 3-AXIS DIGITAL COMPASS SENSOR**

- THE HMC5883L IS A 3-AXIS DIGITAL COMPASS SENSOR THAT CAN MEASURE MAGNETIC FIELDS IN THREE DIMENSIONS.
- THE SENSOR IS DESIGNED TO BE USED IN A VARIETY OF APPLICATIONS, INCLUDING NAVIGATION, ROBOTICS, AND LOCATION-BASED SERVICES.
- THE SENSOR OPERATES BASED ON THE PRINCIPLE OF MAGNETORESISTANCE, WHICH MEASURES CHANGES IN RESISTANCE IN RESPONSE TO MAGNETIC FIELDS.
- THE SENSOR HAS THREE PINS: VCC (POWER SUPPLY), GND (GROUND), AND SDA/SCL (DATA AND CLOCK LINES FOR I2C COMMUNICATION).
- THE SENSOR PROVIDES ACCURATE AND STABLE READINGS WITH A RESOLUTION OF UP TO 1 MILLI-GAUSS.
- THE SENSOR HAS A WIDE OPERATING RANGE, FROM  $-40^{\circ}\text{C}$  TO  $85^{\circ}\text{C}$ .
- THE SENSOR CAN BE INTERFACED WITH POPULAR MICROCONTROLLERS LIKE ARDUINO AND RASPBERRY PI USING I2C COMMUNICATION PROTOCOL.
- THE SENSOR IS EASY TO USE, LOW POWER CONSUMPTION AND COST-EFFECTIVE.



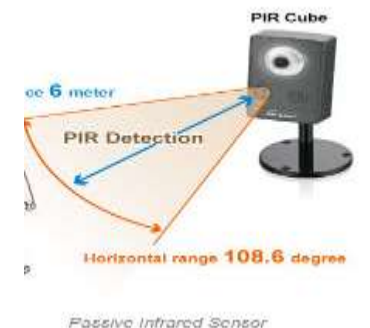
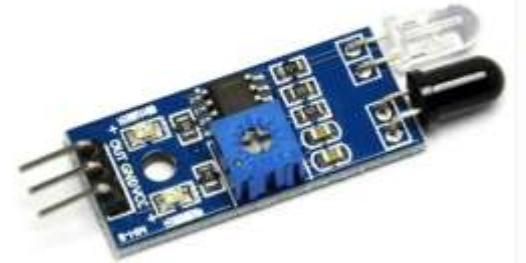
## L298N Motor Driver

- The L298N is a motor driver integrated circuit designed to drive two DC motors or a single stepper motor.
- The driver is capable of controlling motors with a voltage between 5V and 35V and a maximum current of 2A per channel.
- The L298N motor driver can be used with a variety of microcontrollers, including Arduino, Raspberry Pi, and other popular platforms.
- The motor driver features four input pins (IN1, IN2, IN3, and IN4) that can be used to control the direction and speed of the connected motors.
- The driver also features a built-in voltage regulator, allowing it to be powered using a single power supply.
- The L298N motor driver is ideal for use in projects that require precise control over motor movement, such as robotics, automation, and motorized vehicles.
- The motor driver can be easily integrated into a project using screw terminals or jumper wires.
- The L298N motor driver is a popular choice for hobbyists and educators due to its affordability, versatility, and ease of use.

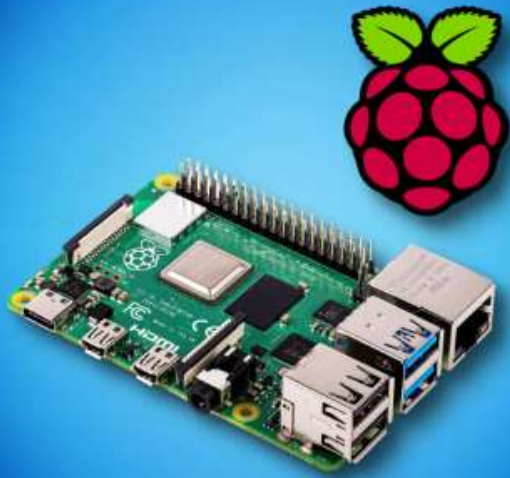


- **Infrared Sensor**

- Infrared sensors are electronic devices that can detect infrared radiation.
- They are commonly used in a variety of applications, including security systems, motion detectors, and temperature sensors.
- The sensor works by detecting changes in the infrared radiation emitted by objects in its field of view.
- The sensor has two components: the emitter and the receiver. The emitter sends out a beam of infrared radiation, and the receiver detects any reflected radiation.
- The sensor can be designed to detect specific wavelengths of infrared radiation, which can be used for different applications.
- The sensor can be interfaced with popular microcontrollers like Arduino and Raspberry Pi, and can be used with various communication protocols.
- The sensor can be designed for short-range or long-range detection, depending on the application.
- The sensor is widely available in the market and can be purchased at a relatively low cost.







## •Raspberry Pi

- RASPBerry PI IS A SERIES OF SMALL SINGLE-BOARD COMPUTERS DEVELOPED BY THE RASPBerry PI FOUNDATION.
- THE BOARDS ARE DESIGNED TO BE AFFORDABLE, ACCESSIBLE, AND EASY TO USE, MAKING THEM A POPULAR CHOICE FOR HOBBYISTS, EDUCATORS, AND PROFESSIONALS ALIKE.
- THE BOARDS ARE AVAILABLE IN SEVERAL MODELS, INCLUDING THE RASPBerry PI ZERO, RASPBerry PI 4, AND RASPBerry PI PICO.
- THE BOARDS ARE POWERED BY ARM PROCESSORS AND RUN ON LINUX-BASED OPERATING SYSTEMS LIKE RASPBerry PI OS, WHICH IS OPTIMIZED FOR THE RASPBerry PI.
- THE BOARDS CAN BE USED FOR A VARIETY OF PROJECTS, INCLUDING ROBOTICS, HOME AUTOMATION, MEDIA CENTERS, AND MORE.
- THE BOARDS HAVE A WIDE RANGE OF INPUTS AND OUTPUTS, INCLUDING GPIO (GENERAL PURPOSE INPUT/OUTPUT), HDMI, USB, AND ETHERNET.
- THE BOARDS CAN BE PROGRAMMED USING A VARIETY OF PROGRAMMING LANGUAGES, INCLUDING PYTHON, C/C++, AND SCRATCH.
- THE RASPBerry PI COMMUNITY IS LARGE AND ACTIVE, WITH MANY ONLINE RESOURCES, TUTORIALS, AND FORUMS AVAILABLE TO HELP USERS GET STARTED AND TROUBLESHOOT ISSUES.



## Raspberry Pi Camera 5MP

- The Raspberry Pi Camera 5MP is a small camera module designed to be used with Raspberry Pi boards.
- The camera module features a 5 megapixel image sensor and can capture still images and video at a resolution of up to 1080p.
- The camera module connects to the Raspberry Pi board using a ribbon cable and can be controlled using the Raspberry Pi Camera software.
- The camera module features a wide-angle lens with a 2592 x 1944 resolution and a 3.6 mm focal length.
- The camera module has several features, including automatic exposure control, white balance, and brightness control.
- The camera module is ideal for use in projects that require image or video capture, such as surveillance systems, home automation, and robotics.
- The camera module can be interfaced with popular programming languages like Python and C++ and can be controlled using the Raspberry Pi Camera software.
- The camera module is easy to use and is a cost-effective solution for image and video capture with Raspberry Pi.



## SG90 MICRO SERVO

- THE SG90 MICRO SERVO IS A SMALL AND AFFORDABLE MOTOR DESIGNED FOR USE IN HOBBYIST PROJECTS AND ROBOTICS.
- THE SERVO IS COMPACT IN SIZE, MEASURING JUST 23 X 12.2 X 29 MM AND WEIGHING ONLY 9G.
- THE SERVO IS CAPABLE OF ROTATING UP TO 180 DEGREES AND CAN BE CONTROLLED USING PWM SIGNALS FROM A MICROCONTROLLER OR OTHER SOURCE.
- THE SERVO FEATURES A 3-PIN INTERFACE (POWER, GROUND, AND SIGNAL) AND CAN BE POWERED BY A VOLTAGE BETWEEN 4.8V AND 6V DC.
- THE SERVO IS IDEAL FOR USE IN PROJECTS THAT REQUIRE PRECISE CONTROL OVER MOVEMENT OR POSITIONING, SUCH AS ROBOTIC ARMS OR CAMERA MOUNTS.
- THE SERVO CAN BE INTERFACED WITH POPULAR MICROCONTROLLERS LIKE ARDUINO AND RASPBERRY PI AND CAN BE CONTROLLED USING A VARIETY OF PROGRAMMING LANGUAGES, INCLUDING C/C++, PYTHON, AND JAVA.
- THE SG90 MICRO SERVO IS A POPULAR CHOICE FOR HOBBYISTS AND EDUCATORS DUE TO ITS AFFORDABILITY, VERSATILITY, AND EASE OF USE.
- THE SERVO CAN BE EASILY INTEGRATED INTO A PROJECT USING A VARIETY OF MOUNTING OPTIONS, INCLUDING SCREWS OR ADHESIVE TAPE.

