Ultra sonic sensor:

An ultrasonic sensor is an instrument that measures the distance to an object using ultrasonic sound waves.

An ultrasonic sensor uses a transducer to send and receive ultrasonic pulses that relay back information about an object’s proximity.

High-frequency sound waves reflect from boundaries to produce distinct echo patterns.

Woking principle:

The working principle of this module is simple.  It sends an ultrasonic pulse out at 40kHz which travels through the air and if there is an obstacle or object, it will bounce back to the sensor.  By calculating the travel time and the speed of sound, the distance can be calculated.

ultrasonic sensors work by sending out a sound wave at a frequency above the range of human hearing.  The transducer of the sensor acts as a microphone to receive and send the ultrasonic sound. Our [ultrasonic sensors](https://www.maxbotix.com/SelectionGuide/Selection-Guide.htm), like many others, use a single transducer to send a pulse and to receive the echo.  The sensor determines the distance to a target by measuring time lapses between the sending and receiving of the ultrasonic pulse.

Arduino Uno:

The **Arduino Uno** is an [open-source](https://en.wikipedia.org/wiki/Open-source) [microcontroller board](https://en.wikipedia.org/wiki/Microcontroller_board) based on the [Microchip](https://en.wikipedia.org/wiki/Microchip_Technology) [ATmega328P](https://en.wikipedia.org/wiki/ATmega328P) microcontroller and developed by [Arduino.cc](https://en.wikipedia.org/wiki/Arduino).[[2]](https://en.wikipedia.org/wiki/Arduino_Uno#cite_note-2)[[3]](https://en.wikipedia.org/wiki/Arduino_Uno#cite_note-What_is_Arduino?-3) The board is equipped with sets of digital and analog [input/output](https://en.wikipedia.org/wiki/Input/output) (I/O) pins that may be interfaced to various [expansion boards](https://en.wikipedia.org/wiki/Expansion_board) (shields) and other circuits.[[1]](https://en.wikipedia.org/wiki/Arduino_Uno#cite_note-Makerspace-1) The board has 14 digital I/O pins (six capable of [PWM](https://en.wikipedia.org/wiki/Pulse-width_modulation) output), 6 analog I/O pins, and is programmable with the [Arduino IDE](https://en.wikipedia.org/wiki/Arduino#Software) (Integrated Development Environment), via a type B [USB cable](https://en.wikipedia.org/wiki/USB_cable).[[4]](https://en.wikipedia.org/wiki/Arduino_Uno#cite_note-priceton-4) It can be powered by the USB cable or by an external [9-volt battery](https://en.wikipedia.org/wiki/9-volt_battery), though it accepts voltages between 7 and 20 volts. It is also similar to the [Arduino Nano](https://en.wikipedia.org/wiki/Arduino_Nano) and Leonardo.[[5]](https://en.wikipedia.org/wiki/Arduino_Uno#cite_note-5)[[6]](https://en.wikipedia.org/wiki/Arduino_Uno#cite_note-6) The hardware reference design is distributed under a [Creative Commons](https://en.wikipedia.org/wiki/Creative_Commons) Attribution Share-Alike 2.5 license and is available on the Arduino website. Layout and production files for some versions of the hardware are also available.

The word "[uno](https://en.wiktionary.org/wiki/uno)" means "one" in [Italian](https://en.wikipedia.org/wiki/Italian_language) and was chosen to mark the initial release of [Arduino Software](https://en.wikipedia.org/wiki/Arduino_Software).[[1]](https://en.wikipedia.org/wiki/Arduino_Uno#cite_note-Makerspace-1) The Uno board is the first in a series of USB-based Arduino boards;[[3]](https://en.wikipedia.org/wiki/Arduino_Uno#cite_note-What_is_Arduino?-3) it and version 1.0 of the Arduino [IDE](https://en.wikipedia.org/wiki/Integrated_development_environment) were the reference versions of Arduino, which have now evolved to newer releases.[[4]](https://en.wikipedia.org/wiki/Arduino_Uno#cite_note-priceton-4) The ATmega328 on the board comes preprogrammed with a [bootloader](https://en.wikipedia.org/wiki/Bootloader) that allows uploading new code to it without the use of an external hardware programmer.[[3]](https://en.wikipedia.org/wiki/Arduino_Uno#cite_note-What_is_Arduino?-3)

While the Uno communicates using the original STK500 protocol,[[1]](https://en.wikipedia.org/wiki/Arduino_Uno#cite_note-Makerspace-1) it differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it uses the Atmega16U2 (Atmega8U2 up to version R2) programmed as a [USB-to-serial converter](https://en.wikipedia.org/wiki/Usb_to_serial_adapter).

Technical specifications:

* [Microcontroller](https://en.wikipedia.org/wiki/Microcontroller): [Microchip](https://en.wikipedia.org/wiki/Microchip_Technology) [ATmega328P](https://en.wikipedia.org/wiki/ATmega328P)
* Operating Voltage: 5 Volts
* Input Voltage: 7 to 20 Volts
* Digital I/O Pins: 14 (of which 6 can 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](https://en.wikipedia.org/wiki/Flash_Memory): 32 KB of which 0.5 KB used by [bootloader](https://en.wikipedia.org/wiki/Booting#BOOT-LOADER)
* [SRAM](https://en.wikipedia.org/wiki/Static_random-access_memory): 2 KB
* [EEPROM](https://en.wikipedia.org/wiki/EEPROM): 1 KB
* Clock Speed: 16 MHz
* Length: 68.6 mm
* Width: 53.4 mm
* Weight: 25 g

L298D motor driver:

The L298 Driver is a high voltage, high current dual ful bridge driver designed to accept standard TTL logic levels and drive inductive loads such relays, solenoids, DC and stepping motors. Two enable inputs are provided to enable or disable the device independently of the input signals. The emitters of the lower transistors of each bridge are connected together the corresponding external terminal can be used for the connection of an external sensing resistor. FEATURES

• Operating supply voltage up to 46 V

• .Total DC current up to 4 A

• .Low saturation voltage

• .Over temperature protection.

• .Logical "0" input voltage upto1.5 V (HIGH NOISE IMMUNITY)

• Two motor direction indicator LEDs

• An onboard user-accessible 5V low-dropout regulator

• Schottky EMF-protection diodes

• Screw-terminals for power and motor connections.

• High quality PCB FR4 Grade with FPT Certified.

 APPLICATION 1. MCU controlled vehicle

. 2. Wheel robots.