

# Sensors and Effectors

Last update: 1/7/23

Arduino Uno -microcontroller board based on the ATmega328P



Display - LCD 1602 Module:

<https://lastminuteengineers.com/arduino-1602-character-lcd-tutorial/>



RFID - Rc522 RFID Module:

<https://lastminuteengineers.com/how-rfid-works-rc522-arduino-tutorial/>



Motor - Servo Motor (SG90):

<https://www.electronics-lab.com/project/using-sg90-servo-motor-arduino/>



Motor - DC motor (higher PWM drives it faster)



Gyroscope - GY 521 (3-axis gyroscope) Module:

<https://mschoeffler.com/2017/10/05/tutorial-how-to-use-the-gy-521-module-mpu-6050-breakout-board-with-the-arduino-uno/>



Motor - Stepper Motor and ULN2003 Stepper Motor Driver Board:

<https://arduinogetstarted.com/tutorials/arduino-controls-28byj-48-stepper-motor-using-uln2003-driver>



Microphone - Sound Sensor Module (KY-038):

<https://randomnerdtutorials.com/guide-for-microphone-sound-sensor-with-arduino/>



Microphone - Electret Microphone, Model EM 6050:

<https://www.cuidevices.com/product/resource/cmc-6050-401100.pdf>



Distance - Ultrasonic Sensor (HC-SR04):

<https://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/>



Water Level Detection (HW038):

<https://arduinogetstarted.com/tutorials/arduino-water-sensor>



Temperature and Humidity - DHT11 Temperature and Humidity Module:

<https://lastminuteengineers.com/dht11-dht22-arduino-tutorial/>



Infrared - IR Receiver and IR Transmitter (Remote):

<https://www.circuitbasics.com/arduino-ir-remote-receiver-tutorial/>



Keyboard - Membrane Switch Module:

<https://randomnerdtutorials.com/arduino-membrane-keypad-tutorial/>



JoyStick – X,y Control

[https://exploreembedded.com/wiki/Analog\\_JoyStick\\_with\\_Arduino](https://exploreembedded.com/wiki/Analog_JoyStick_with_Arduino)



Speaker - Piezo Electric Tone Buzzer (square input at desired frequency)



Relay – 5 V dc control, maximum load < AC 250V/10A, < DC 30V/10A

Input: DC+ 5V, DC- GND, IN: control Signal

Output: NO: Relay normally open, COM: Relay Common Pin, NC: Relay normally closed.



Gas Detection - MQ135 Quality Sensor Hazardous Gas Detection

\* Input: +5V & GND, output: Analog and Digital output corresponding to presence of gases



Pressure Sensor - Thin Film Pressure Sensor High Precise Force Sensitive Resistor, Model: RP-C10-ST  
Resistance change starting at 200k $\Omega$  at 20g and with additional pressure (Mac 20 kg) the resistance decreases.



Wifi Module - ESP8266 ESP-01 Serial WiFi Wireless Transceiver Wireless Module  
<https://www.taydaelectronics.com/datasheets/files/ESP-01S.pdf>

