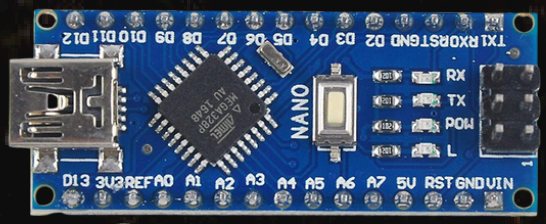

AUTOMATON
STUDY GUIDE

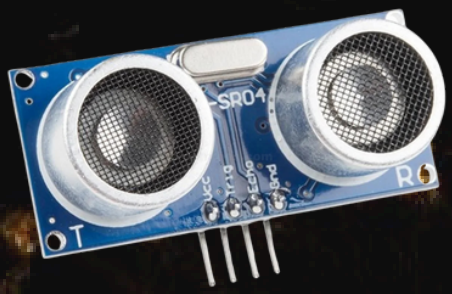
Arduino Nano

The Arduino Nano is a compact microcontroller board based on the ATmega328P, designed for breadboard friendly projects and space constrained applications. It offers the same core functionality as larger Arduino boards, including digital and analog pins, while being easy to power and program via USB. Image for reference:



Ultrasonic Sensors

Ultrasonic sensors measure distance by emitting high frequency sound waves and calculating the time taken for the echo to return. They are commonly used for obstacle detection, distance measurement, and basic navigation in robotics. Image for reference:

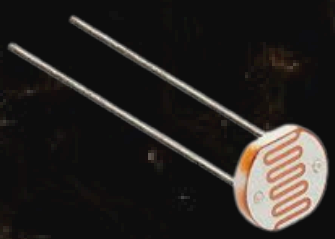


Servo Motors

Servo motors provide precise control of angular position through a control signal. This makes them suitable for robotic arms, steering systems, and mechanisms that require accurate movement. Image for reference:

LDR

An LDR is a light dependent resistor whose resistance changes with light intensity. It is commonly used in light sensing applications like automatic lighting and brightness detection. Image for reference:



NRF Modules

NRF modules are wireless transceivers that allow microcontrollers to communicate using radio signals. They are widely used for remote controls, wireless data transfer, and simple networking between devices.Image for referenc

OLED Displays

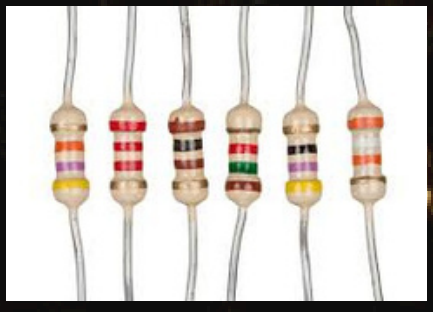
OLED displays are small, low power screens that can display text and graphics with high contrast. They are ideal for showing sensor data, system status, and menus in embedded systems. Image for reference:

Motor Drivers

Motor drivers interface between microcontrollers and motors by supplying higher current and controlling direction and speed. They protect the microcontroller while enabling effective motor control. Image for reference:

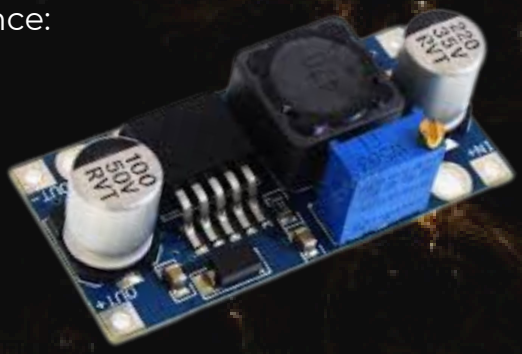
Resistors and Basic Circuits

Resistors are used to limit current, divide voltage, and protect components. Basic resistor circuits form the foundation of electronics, such as voltage dividers and current limiting for LEDs. Image for reference:



Boost Converters

Boost converters are DC to DC circuits that increase a lower input voltage to a higher output voltage. They are useful when powering components that require more voltage than the source provides.Image for reference:



Buck Converters

Buck converters are DC to DC circuits that reduce a higher input voltage to a lower, stable output voltage. They are commonly used for efficient power regulation in electronic systems.Image for reference:

Capacitors

Capacitors are electronic components that store and release electrical energy in the form of an electric field. They are commonly used for smoothing voltage, filtering noise, timing circuits, and providing short bursts of power in electronic systems.Image for reference: