

**GETTING TO KNOW THE ARDUINO UNO BOARD AND
LEARNING HOW TO PROGRAM IT.**

***Abstract:** Nowadays, the field of automation is developing very quickly with pictures, and it is very convenient and cheap to do it with Arduino. The most convenient of Arduino devices is Arduino UNO, so let's get acquainted with this device.*

***Keywords:** Arduino Uno, LED, resistor, breadboard, and source.*

Arduino UNO is a small board with its own processor (microcontroller) and memory.

Arduino Uno is a collection of software and hardware for non-professional robotics enthusiasts. Arduino is a completely open architecture. All parts of the projects in it (mainly software) are freely distributed. It has its own board and IDE-programming environment. Arduino was discovered in 2003 by Italian scientists Massimo Banzi, David Mellis and David Quartiller [1].

The word "Uno" means one in Italian. It is not for nothing that the creators of the Arduino Uno tried to create a new twist and a new flagship in the Arduino controller family with this new controller, and they succeeded. The reason is that Arduino Uno is more compact, convenient, fast, simple and certainly cheaper than other "brothers" in the family of Arduino controllers [1].

Arduino can be used in all areas of our life, for example: lights, sensors, relay modules, networks (Wi-Fi, Bluetooth, Internet), sensors, motors, magnetic door locks and everything that works with electricity.

-Using Arduino we can work with digital and analog signals [2,3].

- Control of DC motors, servo motors and displays and various actuators. - Implementation of data exchange between wireless Arduino platforms using radio modules[2].

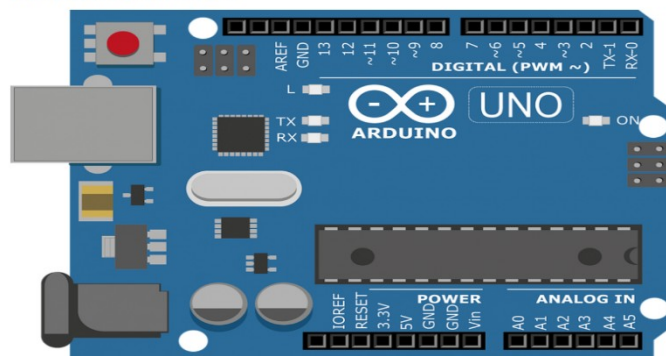
Technical indicators of the Arduino Uno platform

- Microcontroller: ATmega328;
- Operating voltage: 5 V;
- Input voltage (recommended): 7-12 V;
- Input voltage (highest): 6-20 V;
- Digital I/O: 14
- Analog input: 6;
- Constant current through input/output: 40 mA;
- Constant current for 3.3 V input: 50 mA;

Flash
KB
of which 0.5
bootloader;

Fast
(ATmega328);

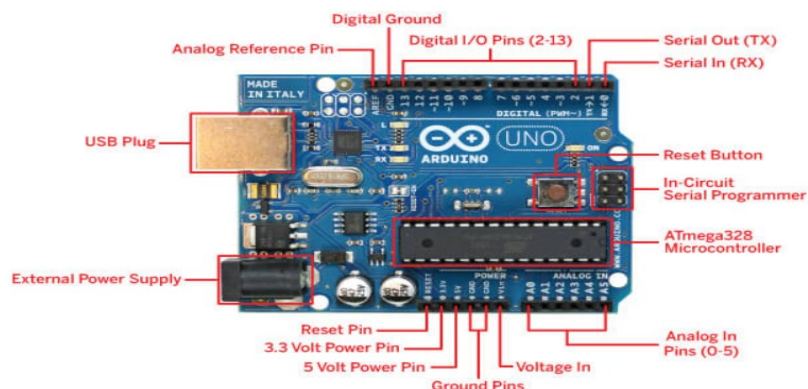
- EEPROM: 1 KB (ATmega328);
- Frequency: 16 MHz; [4]



memory: 32
(ATmega328)
KB is used as a

memory: 2 KB

In addition, the Arduino Uno can receive power from a USB or external source connected to it. In this case, if there are several sources, one of them will be selected automatically.



It uses `pinMode()`, `digitalWrite()` and `digitalRead()` functions. Each output can pass 20-50 kOhm resistance and up to 40 mA current [5,6].

Arduino Uno controller is programmed using Arduino software. To do this, in the Arduino program, in the menu Tools>Board and from there select "Arduino Uno".

As mentioned above, this controller has very compact dimensions, its sides are 6.9 and 5.3 cm. This in turn makes it more interesting[7].

Arduino software includes two main functions:

- `void setup()`
- `void loop()`

You can use the `void setup()` function to start the program. This function is executed only once when the program is launched.

The `void loop()` function is executed after the `void setup()` function completes, and unlike the `void setup()` function, it runs continuously.

To install the Arduino IDE on your computer, you must first download it from <https://www.arduino.cc/en/software> [8].

Program keywords:

Below is a list of the most commonly used functions in Arduino programming:

- `pinMode` - sets the pin to enter or exit the mode;
- `digitalRead` - reads the digital input pin value;
- `digitalWrite` - sets the value of a digital output pin high or low;

- analogRead - reads the analog voltage on the analog input pin;
- analogWrite - writes the analog voltage to the analog output pin;
- delay- hold, hold (wait)
- Serial.print - writes data to the serial port as human-readable ASCII text.

Arduino libraries are a collection of functions that allow you to control these devices. Some of the most common libraries are [9]:

- EEPROM - read and write "permanent" storage;
- Ethernet - to connect to the Internet using the Arduino Ethernet Shield board;
- Firmata - to communicate with applications on a computer using a standard serial protocol;
- GSM - to connect to the GSM / GRPS network using a GSM board;
- Liquid Crystal - for controlling liquid crystal displays (LCD);
- SD - for reading and writing SD cards;
- Servo - for controlling servo drives;
- SPI - for communication with devices using the SPI bus;
- SoftwareSerial - for serial communication through any digital pins;
- Stepper - for controlling stepper motors;
- TFT - for drawing text, images and shapes on Arduino TFT screens;
- WiFi - to connect to the Internet using Arduino Wi-Fi;
- Wire is a two-wire interface (TWI / I2C)[5] for transmitting and receiving data through a network of devices or sensors [10].

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