



CENTRAL ASIAN JOURNAL OF THEORETICAL AND APPLIED SCIENCES

Volume: 03 Issue: 10 | Oct 2022 ISSN: 2660-5317
<https://cajotas.centralasianstudies.org>

Arduino Platform for Teaching the Subjects of Inductance, Electrical Resistance, Capacitors in Physics

Maraimova Muqaddas Gofirovna

2st year master degree student of Fergana State University Faculty of Physics and Technology

Received 18th Aug 2022, Accepted 19th Sep 2022, Online 30th Oct 2022

Abstract: *Arduino is a convenient platform for electronic design and rapid creation of electronic devices . The reason for the widespread use of this platform in the world is the ease and simplicity of the programming language, as well as the openness of its architecture and programming codes. The Arduino board consists of an AtmelAVR microcontroller and elements for programming and connecting to other circuits. Many boards have a +5 V or +3.3 V linear voltage stabilizer.*

Keywords: *Arduinio, physics, platform, program, calculation, electrical resistance, capacitor.*

INTRODUCTION

There are several versions of the **Arduino platform** . The Leonardo version is based on the ATmega32u4 microcontroller. Uno, Nano, Duemilanove versions are based on A **tmelATmega328** microcontroller. Older versions of Diecimila platform and Duemilanoves first working version were designed based on AtmelATmegal68. In turn, the ArduinoMega2560 version is built on the **ATmega2560** microcontroller. The latest version of **ArduinoDue** is based on the Cortex microprocessor.

RESEARCH METHODOLOGY AND EMPIRICAL ANALYSIS

Each of the 14 digital pins of the chip can serve as an input or output. The amount of voltage on the pins of the microcircuit is limited to 5 V. A single leg has a maximum current supply or consumption of 40 mA . All pins are connected with an internal pull-up resistor (disabled by default) and its value is 20-50 kOhm . In addition, some Arduino pins can perform additional tasks:

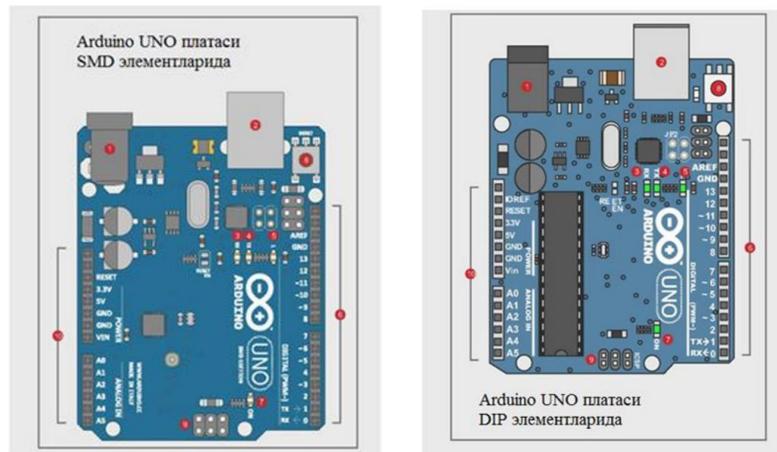
- Ø serial interface: 0 (RX) and 1 (TX);
- Ø external disconnection: 2 and 3 legs;
- Ø KIM: pins 3, 5, 6, 9, 10 and 11 can output an 8-bit analog value in the form of a KIM signal;
- Ø SPI interface: 10 (SS), 11 (MOSI), 12 (MISO), 13 (SCK) pins;
- Ø LED: 13. Placed LED connected to pin 13.

*ArduinoUno has 6 analog inputs (A0-A5), each of which can represent a 10-bit number (1024 different values) as an analog voltage. By **default**, the voltage measurement is carried out in the range from 0 to 5 V.*

However, the upper limit of this range can be changed using the AREF pin and the analog Reference function . Some of the analog inputs have additional functions:

TWI: A4 with SDA output and A5 or SCL output.

The ArduinoUno has a built-in protection device that protects the computer 's USB port from short circuit and overload. Although most computers have their own protection, such protection provides an additional level of protection. If more than 500mA of current is drawn from the USB port, the protection device will automatically disconnect until the cause of the short circuit or overload is removed. Figures 2 and 3 show the construction of the ArduinoUno.



There are many types of Arduino, for example: Arduino Yun, Arduino Uno, Arduino Duemilanove, Arduino Diecimila, Arduino Nano, Arduino Mega, Mega 2560, Mega ADK, Arduino Leonardo, Arduino Micro, etc. Arduino is very useful for young people who are interested in robotics and electronics, because it is possible to create small and large programs, algorithms, various devices, robots and other interesting practices with this device. In other words, Arduino is a device that combines software and hardware. As we have mentioned above, there are many types of Arduino, beginners to learn Arduino mostly start with Uno or Nano type of Arduino. Young people who have thoroughly studied the Uno and Nano type of Arduino are now not satisfied with this type of Arduino and rush to buy the Mega or Mega 2560 type of Arduino. Because, now the Arduino Uno, Nano type characteristics (technical indicators) are low for our robotics! Some roboticists, after getting acquainted with the Arduino Uno and using its capabilities, try to make and prepare it themselves without buying the Mega type of Arduino. That's right, because now a programmer, a roboticist can easily write a program on a microcontroller and upload it to the microcontroller. Arduino Uno differs from other types in its processor, microcontroller, more or less digital and analog outputs.

LIST OF REFERENCES

1. <https://www.technoman.uz/>
2. www.ziyonet.uz
3. Robototechnika.uz
4. Lib.uz
5. <https://uzhackersw.uz/>