

Pushbutton Set

ebook

Pushbutton Set



Areas of application

The products are intended for the support and assembly of electronic components and circuits.

Required knowledge and skills

The use of these products requires basic knowledge of electrical engineering and the handling of electronic components. Users should be able to install the products correctly and take the necessary safety precautions.

Environmental conditions

The products should be used in an environment free from moisture, dust and direct sunlight. They should not be operated near heat sources or in chemically aggressive environments to avoid damage and safety risks.

Intended Use

Electronic products should be operated in environments that meet the specified temperature and voltage ranges of each product. These components are typically designed for indoor use.

Improper foreseeable use

Improper but foreseeable uses include use in humid or extremely hot environments or operation by untrained or disabled persons. The product must be kept away from children and pets.

disposal

Do not discard with household waste! Your product is according to the European one Directive on waste electrical and electronic equipment to be disposed of in an environmentally friendly manner. The valuable raw materials contained therein can be recycled become. The application of this directive contributes to environmental and health protection. Use the collection point set up by your municipality to return and Recycling of old electrical and electronic devices. WEEE Reg. No.: DE 62624346

safety instructions

Attention: Improper disposal of electronic components can endanger the environment and health. Note: Dispose of electronic components in accordance with local regulations and use appropriate recycling options. Attention: Chemically aggressive media can damage the materials of the products. Note: Do not use the products in corrosive or chemically aggressive environments. Attention: Improper disposal of electronic components can endanger the environment and health. Note: Dispose of electronic components in accordance with local regulations and use appropriate recycling options. Attention: Chemically aggressive media can damage the materials of the products. Note: Do not use the products in corrosive or chemically aggressive environments. Caution: Mechanical shock or bending can damage the products and connected components. Note: Avoid mechanical stress and protect the products from physical influences. Attention: Inadequate fastening can lead to malfunctions and damage. Note: Make sure all products are securely and firmly assembled. Caution: Damaged products may pose safety risks. Note: Check products regularly for visible damage and replace defective parts immediately. Attention: Overloading can lead to overheating and failure of the products. Note: Use the products only within the specified load limits. Attention: Overheating can cause damage to the products and the connected electronic components. Note: Make sure that, for example, heat sinks or components that heat up are adequately ventilated and that the specified temperature ranges are not exceeded.

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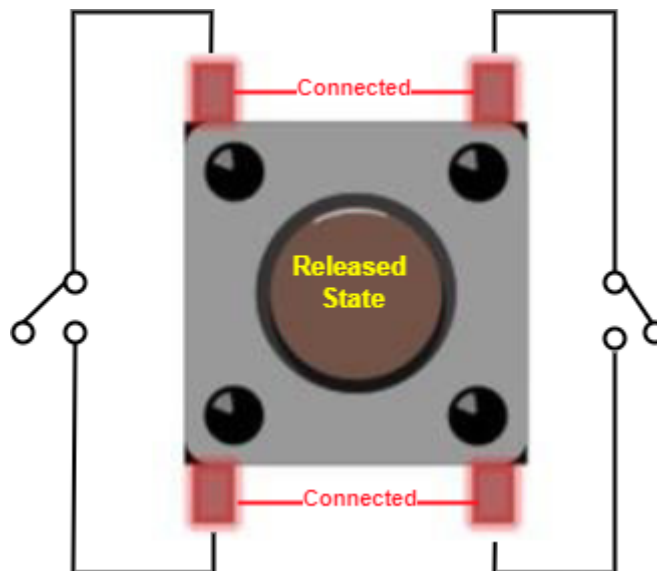
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Scope of delivery

PCS	Button
10	7x7x14 locking
15	6x6x13 tactile
15	6x6x12 tactile
20	6x6x11 tactile
20	6x6x9.5 tactile
20	6x6x8 tactile
20	6x6x7 tactile
20	6x6x6 tactile
20	6x6x5 tactile
20	6x6x4.3 tactile

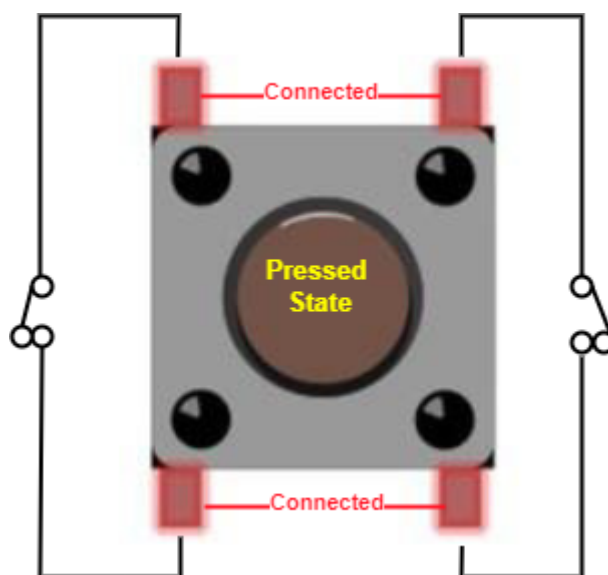
PushButton Overview

Released State :



Pressed State :

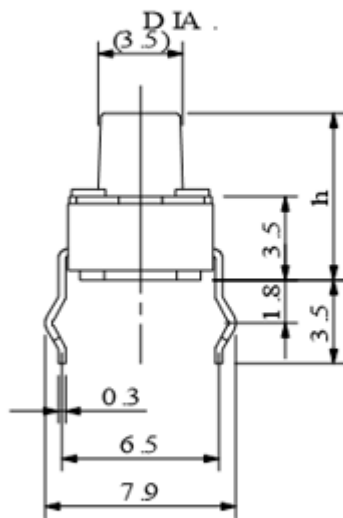
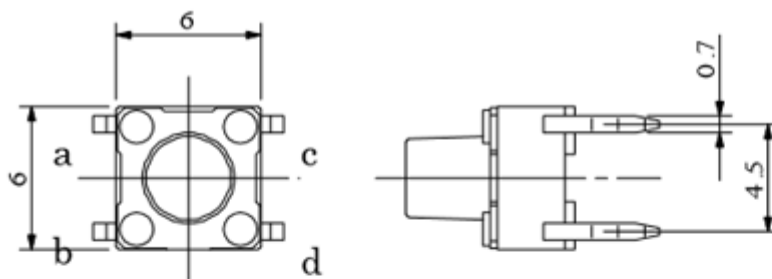
When pressed, it activates the switch's 4 pins, providing quick and responsive feedback for seamless operation in your electronic projects.



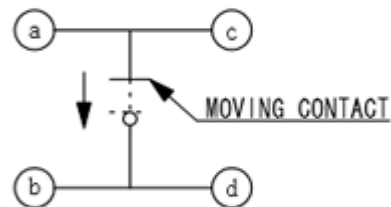
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How Does a Switch Work?

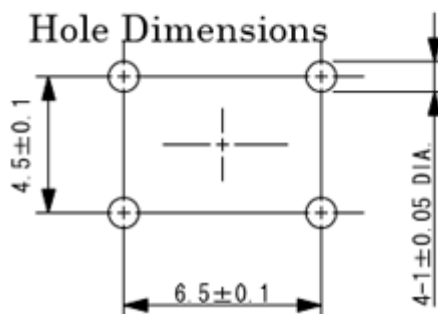
A tactile push button switch works by completing an electrical circuit when pressure is applied to its button, allowing current to flow through and triggering a response in the connected device or circuit. Once the pressure is released, the switch returns to its original state, breaking the circuit and stopping the flow of current.



■ Circuit Diagram



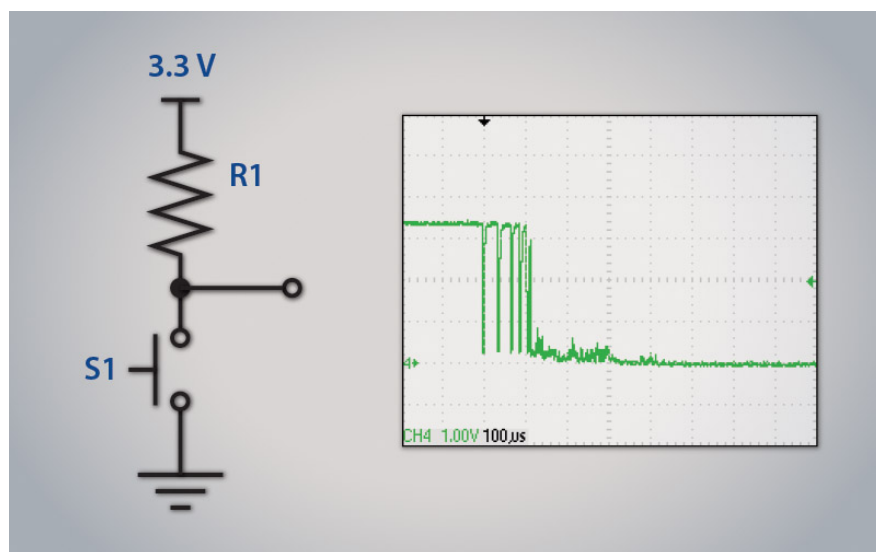
■ Recommended Mounting



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Debouncing - Ensuring Reliable Tactile Input

When a tactile switch is pressed or released, its contacts may not make or break the connection cleanly. Instead, they can momentarily make and break contact rapidly, resulting in a series of electrical pulses, also known as switch bouncing. These bounces can last for a few milliseconds, and they are often too fast for the human eye to detect. However, electronic circuits and microcontrollers can perceive these bounces as multiple button presses or releases, causing undesired behavior in the system.



Debouncing Techniques:

Debouncing is the process of ensuring that only one clean and stable signal is registered from a tactile switch, regardless of the bounces that occur during pressing or releasing. There are various debouncing techniques, Here are some common methods:

a. Hardware Debouncing:

Hardware debouncing involves adding additional components, such as resistors, capacitors, and Schmitt triggers, to the circuit to filter out the switch bounces. The use of RC (Resistor-Capacitor) circuits or Schmitt triggers can help smoothen the switch's electrical response and stabilize the output signal.

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b. Software Debouncing:

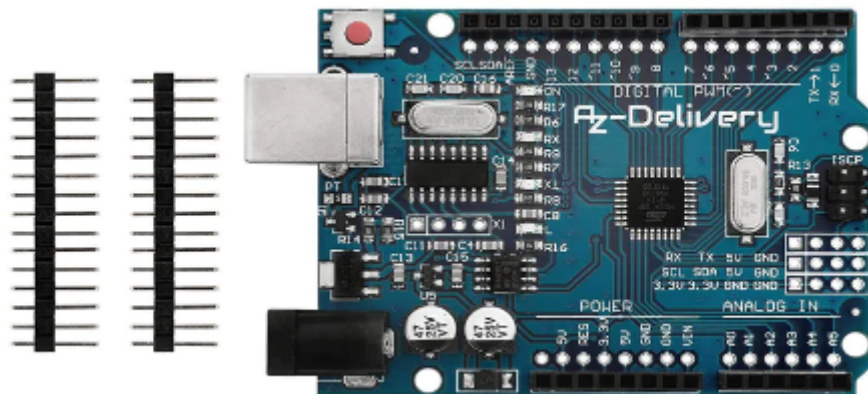
Software debouncing is achieved through programming in the microcontroller or digital circuitry. By monitoring the switch's input and applying a delay or utilizing algorithms, software debouncing filters out multiple rapid changes in the switch state, allowing only a single clean signal to be recognized.

How to Use a Pushbutton Switch

The uses of this sensor are very simple. In this section of this article, we will discuss how we can hook up a module and work with it, so first of all we need a setup which described below:

Setup for Development environment, we need :

-Microcontroller Board



-Push Button:

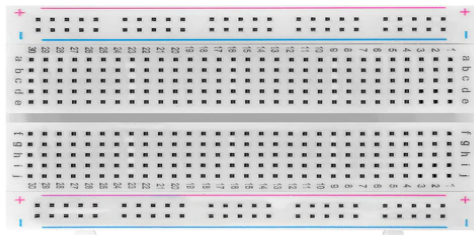


-Jumper

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-Mini Breadboard



-Led



-resistor

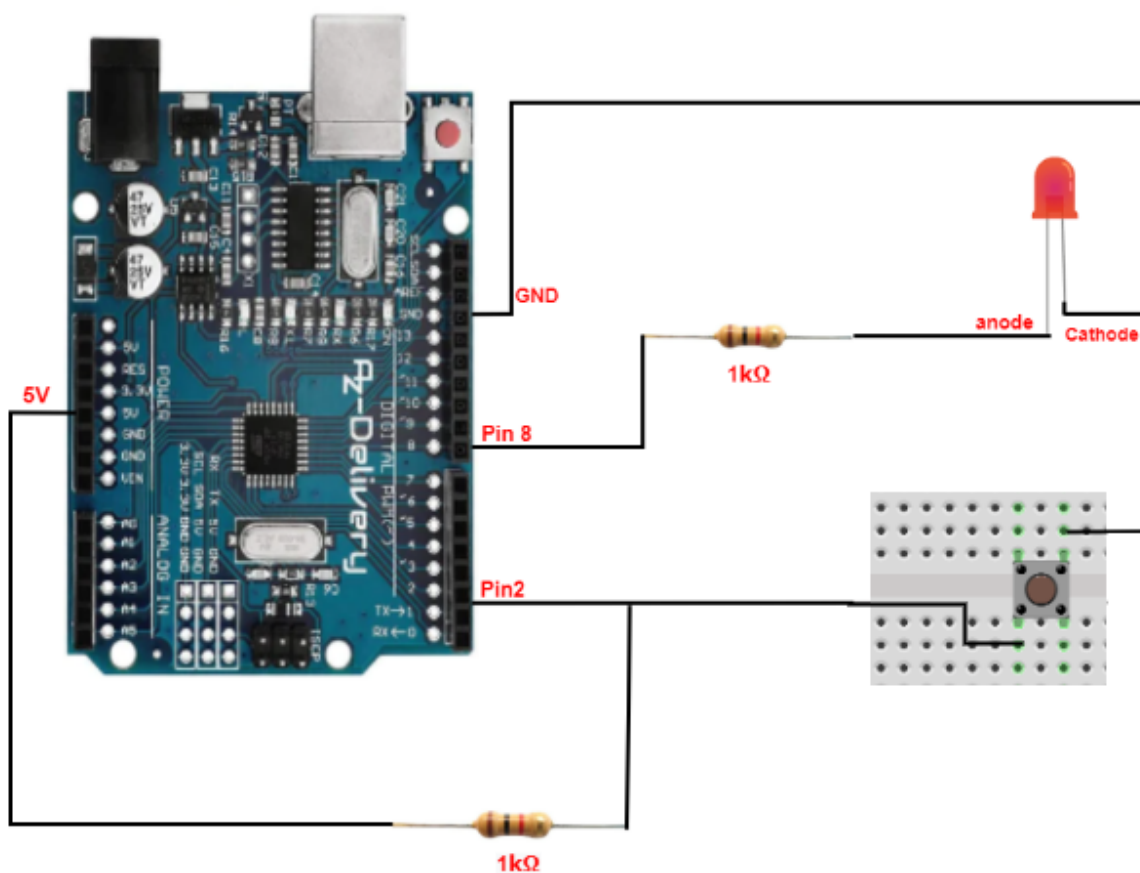


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Circuit Connection

Connecting the push Button switch is simple, connecting one end to the microcontroller board as input (which is pulled HIGH) and the other end to the GND.

The Microcontroller will always read the input as high until pressed . an LED is connected to reflect the switch state.



Software installation

Download the latest version of Arduino IDE here:

<https://www.arduino.cc/en/software>

Downloads



Arduino IDE 2.0.0

The new major release of the Arduino IDE is faster and even more powerful! In addition to a more modern editor and a more responsive interface it features autocompletion, code navigation, and even a live debugger.

For more details, please refer to the [Arduino IDE 2.0 documentation](#).

Nightly builds with the latest bugfixes are available through the section below.

SOURCE CODE

The Arduino IDE 2.0 is open source and its source code is hosted on [GitHub](#).

DOWNLOAD OPTIONS

Windows Win 10 and newer, 64 bits

Windows MSI installer

Windows ZIP file

Linux AppImage 64 bits (X86-64)

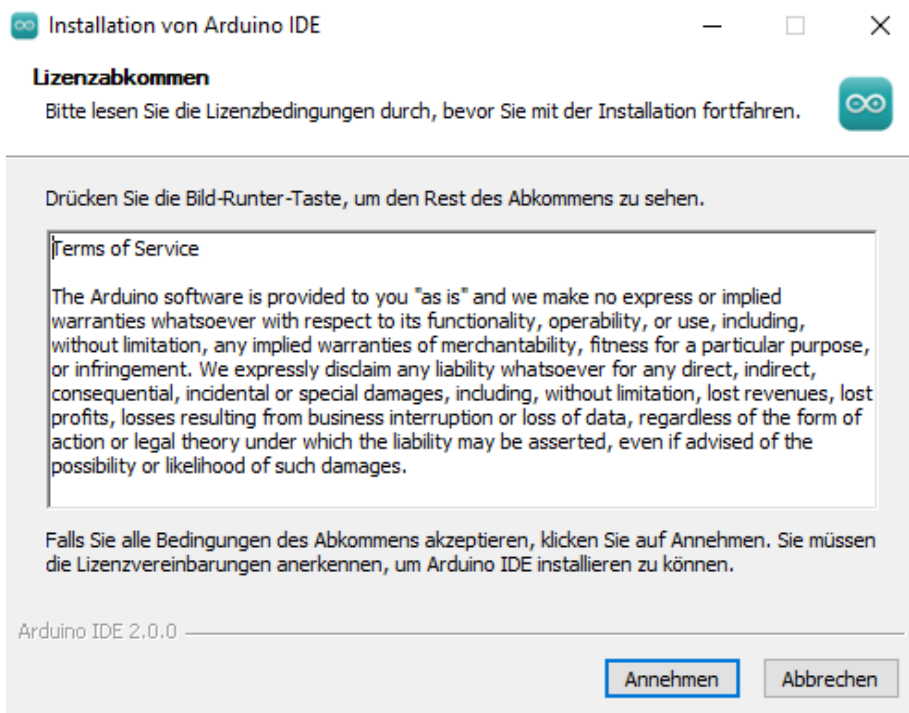
Linux ZIP file 64 bits (X86-64)

macOS 10.14: "Mojave" or newer, 64 bits

After starting the Arduino IDE installation file

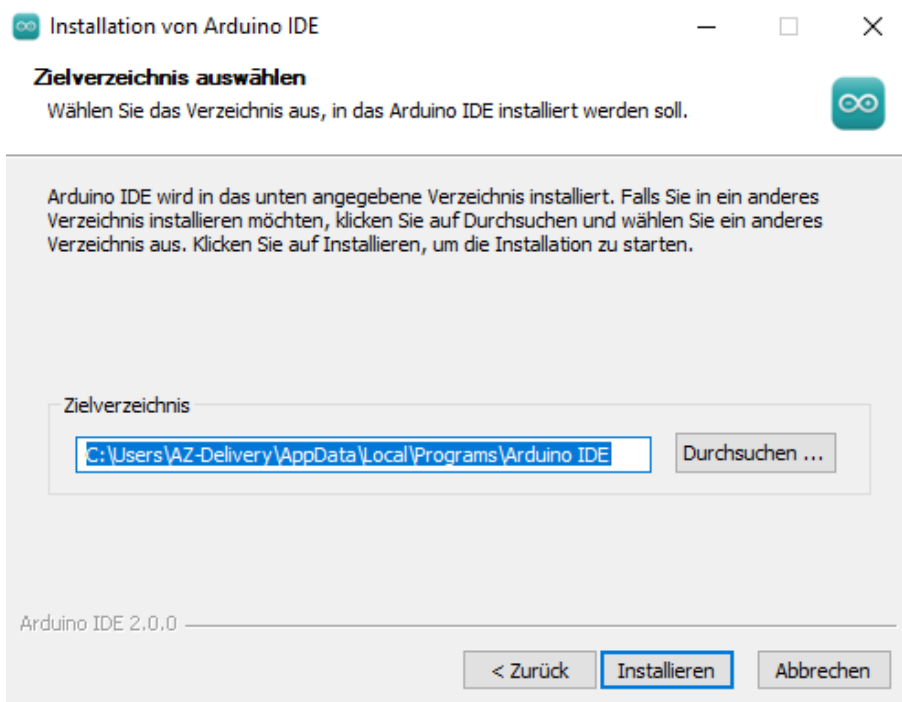
"arduino-ide_2.0.0_Windows_64bit.exe" the license conditions of the software must be read and accepted.

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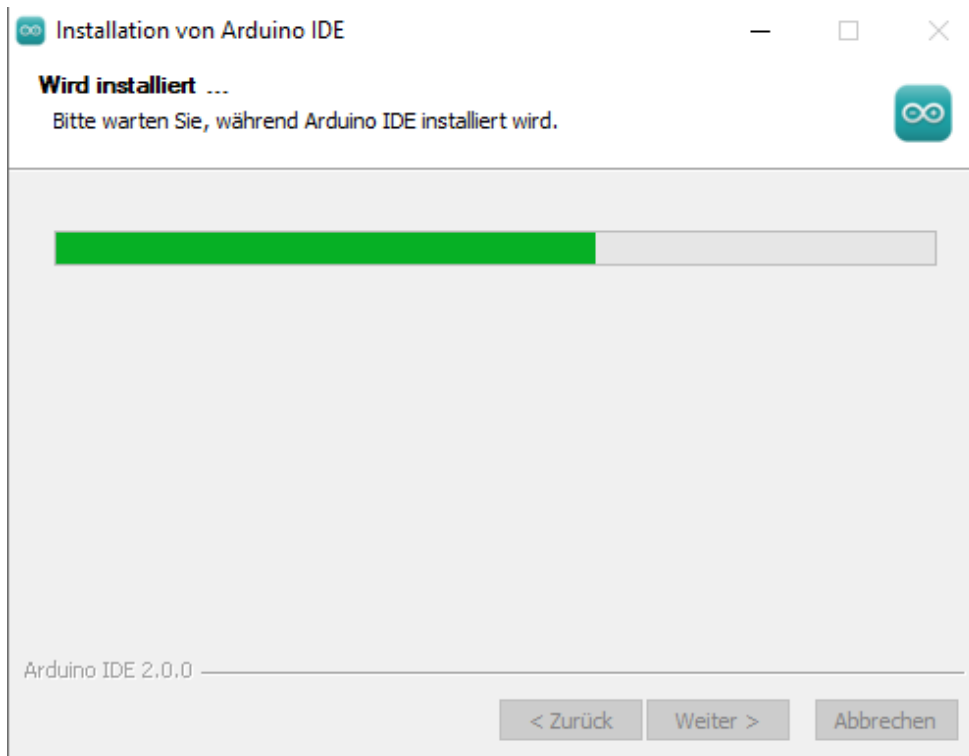
In the next step, different options can be selected for installation.

Finally, the destination folder must be specified. The installation requires approx. 500MB of free disk space.

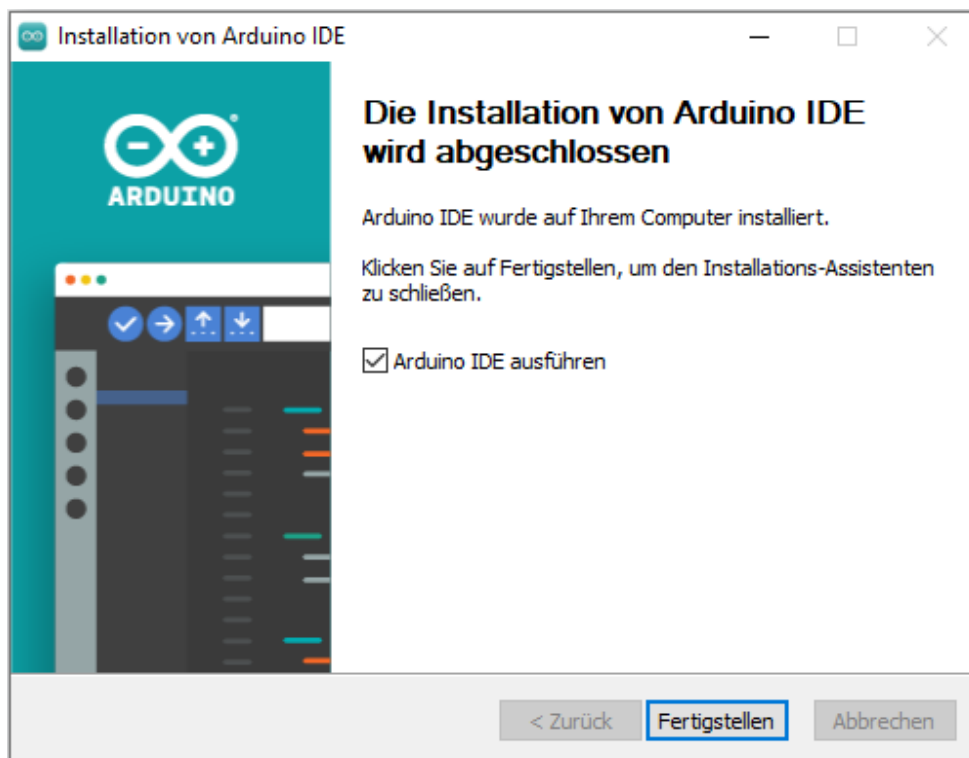


Click on "Install" to start the installation.

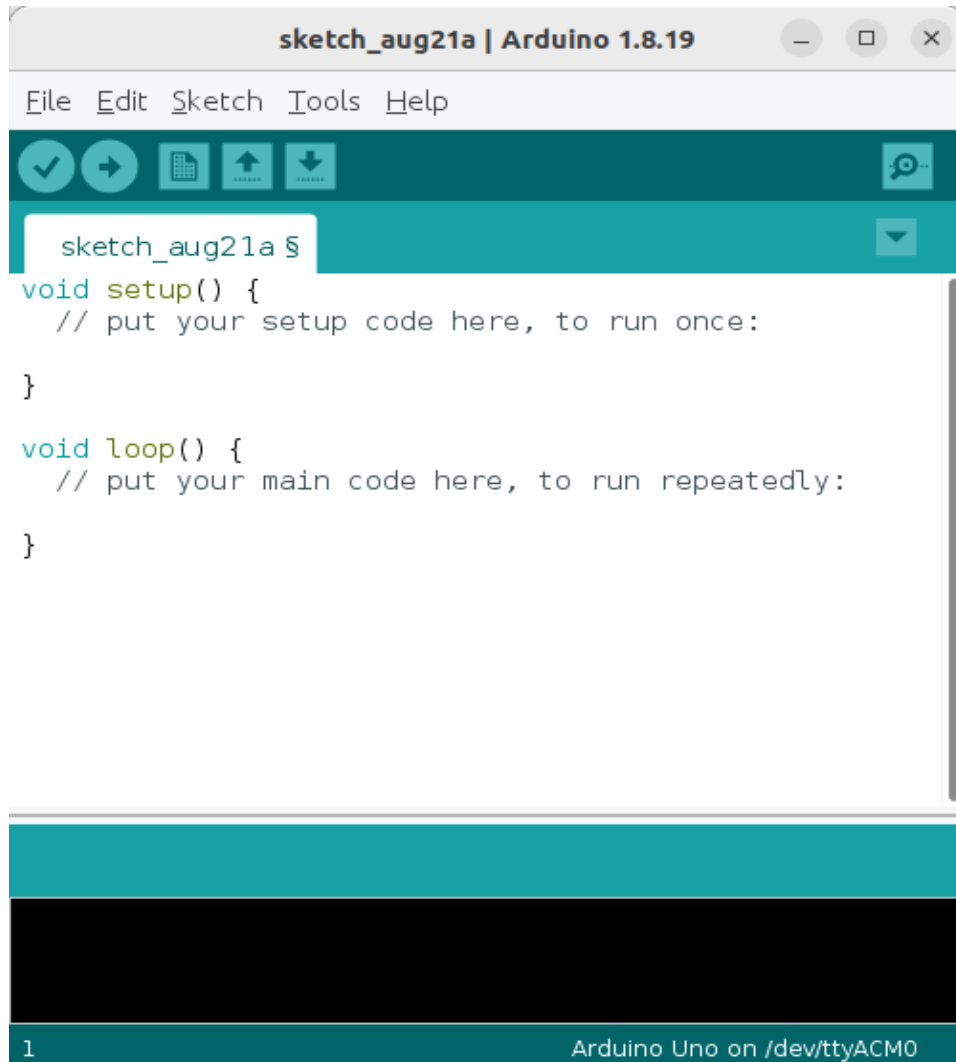
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After successful installation, the installation programme can be terminated via the "**Finish**" button.



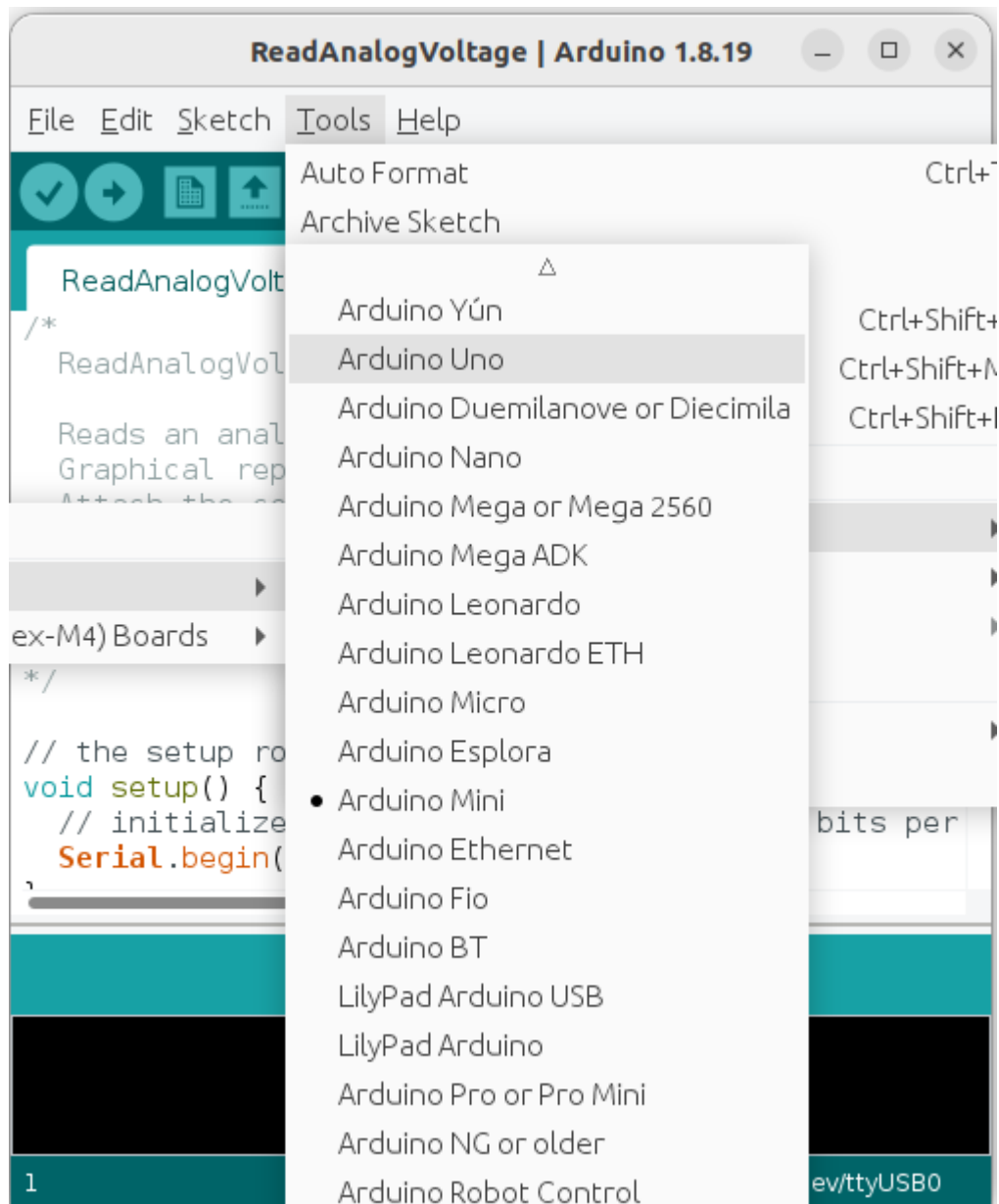
The starting window:



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Select the UNO Board:

Tools -> Board -> Arduino Uno



Example Sketch

```
#define pushButtonPin 2
#define ledPin 8

int Switch_State = HIGH;
int previous_State = HIGH;
unsigned long debounce_Time = 50; // Debounce time in
milliseconds

void setup() {
    pinMode(ledPin, OUTPUT);
    pinMode(pushButtonPin, INPUT);
    Serial.begin(9600);
}

void loop() {
    int current_State = digitalRead(pushButtonPin);

    if (current_State != previous_State) {
        // Reset the debounce timer
        unsigned long debounce_Timer = millis();

        // Wait for the debounce time to pass
        while (millis() - debounce_Timer < debounce_Time) {
            current_State = digitalRead(pushButtonPin);
        }
    }

    // Update the previous state with the current state
    previous_State = current_State;

    if (current_State == LOW) {
        Serial.println("pushButton is pressed");
    }
}
```

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```
        digitalWrite(ledPin, HIGH);  
    } else {  
        Serial.println("pushButton is released");  
        digitalWrite(ledPin, LOW);  
    }  
  
    delay(50); // A small delay for stability (optional)  
}
```

How the code Works

The provided code utilizes a tactile push button connected to pin 2 and an LED connected to pin 8 of the Microcontroller board. The push button employs an internal pull-up resistor, so when it is not pressed, the pin remains HIGH. Upon pressing the button, its contacts connect, and the pin switches to LOW. As a result, the Microcontroller detects this transition and activates the LED, turning it on. When the button is released, the pin returns to HIGH, turning off the LED. To ensure reliable button state detection, the code employs a software-based debouncing technique, preventing erratic behavior caused by switch bouncing and ensuring consistent and accurate responses to button presses and releases.

You've done it, you can now use your module for your projects :)

Now it is time to learn and make the Projects on your own. You can do that with the help of many example scripts and other tutorials, which you can find on the internet.

If you are looking for the high quality microelectronics and accessories, AZ-Delivery Vertriebs GmbH is the right company to get them from. You will be provided with numerous application examples, full installation guides, eBooks, libraries and assistance from our technical experts.

<https://az-delivery.de>

Have Fun!

Impressum

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