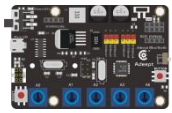
Lesson 2 How to use the potentiometer

In this lesson, we will learn how to use the potentiometer.

2.1 Components used in this course

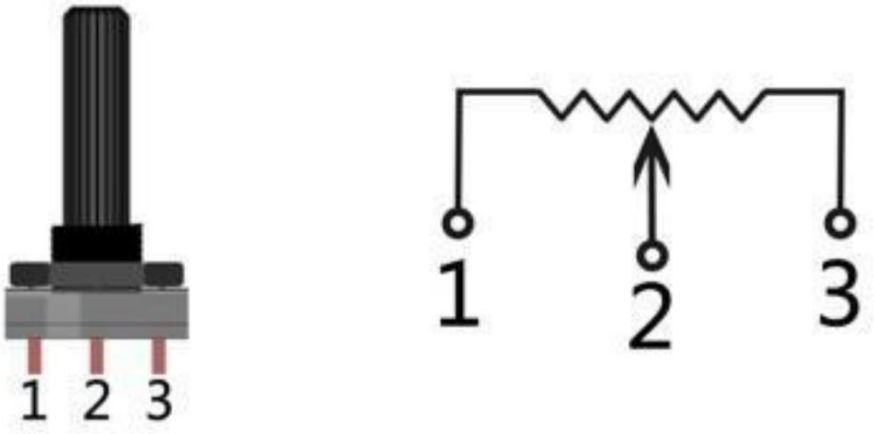
Components	Quantity	Picture
Adeept Arm Drive Board	1	
Micro USB Cable	1	

2.2 Introduction of Potentiometer

The potentiometer is a resistance element with three terminals and the resistance value can be adjusted according to a certain change law, which is equivalent to a variable resistor. Because its role in the circuit is to obtain a certain relationship with the input voltage (external voltage) to output Voltage, so called potentiometer. Potentiometers can be divided into rotary potentiometers, push-pull potentiometers, straight slide potentiometers, etc. according to the adjustment method. Our course experiment uses a rotary potentiometer. It's three pins are showed as below:

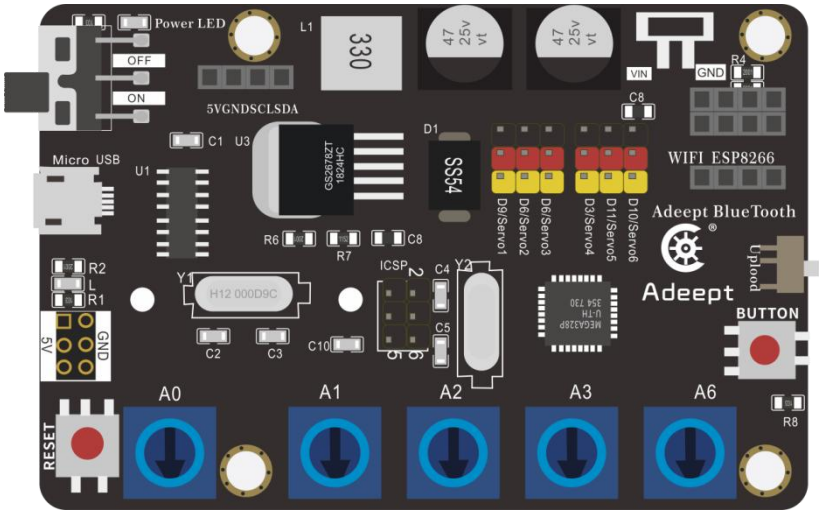
The rotary potentiometer is an adjustable resistance element. It is composed of a resistor and a rotating system. When a voltage is applied between the two fixed contacts of the resistive body, the position of the contact on the resistive body is changed by the rotating system, and a voltage that has a certain relationship with the position of the moving contact can be achieved between the moving contact and the fixed contact. Potentiometer can be used to adjust the voltage and current.

Our course uses a rotary potentiometer. Its structure is as shown in the figure below. By rotating the knob, the position of pin 2 is changed, thereby changing the resistance value from pin 2 to both ends. In the experiment. Connect pin 1 and pin 3 to the GND and 5V of the development board respectively. And then read the voltage divided by the pin 2 of the potentiometer through the analog input pin A0, the range is between 0V and 5V. The analog input function of Arduino has 10-bit precision, that is, it can convert the voltage signal of 0 to 5V into an integer form of 0 to 1024.



2.3 Wiring diagram (Circuit diagram)

Figure as below:



2.4 How to use the potentiometer

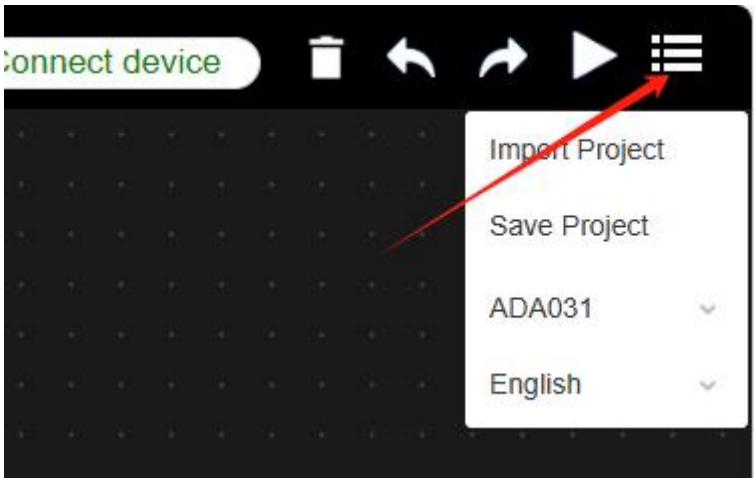
1. Before performing the following steps, make sure that the "block_py.ino" program has been uploaded. (If not, please upload the "block_py.ino" program)

2. Connecting GwBlock graphical editor. (See" 1 Building the GwBlock Graphical Programming Development Environment")

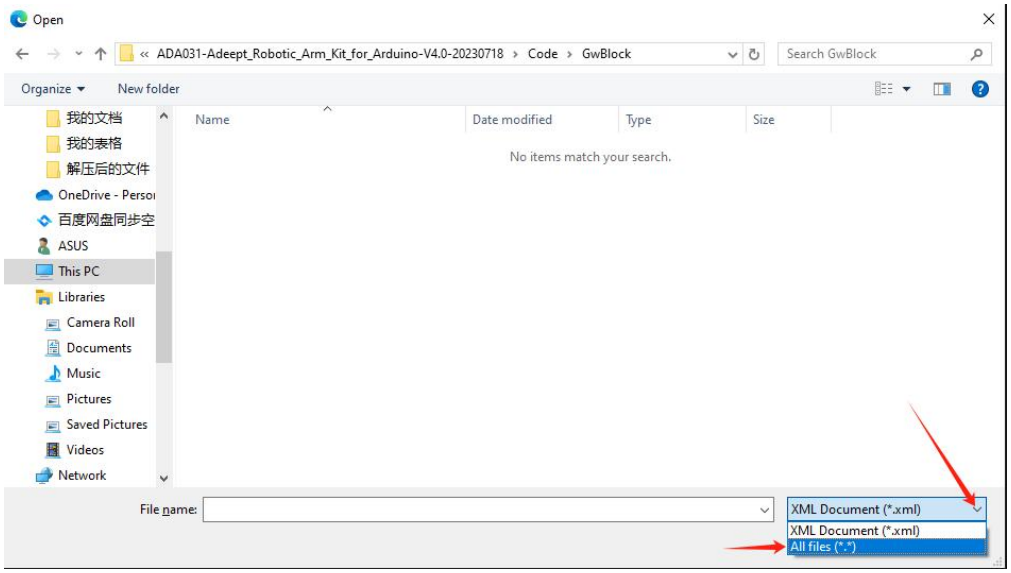
http://www.adeept.com/gwblock/?hd_mo=ADA031

3. Import the program in GwBlock

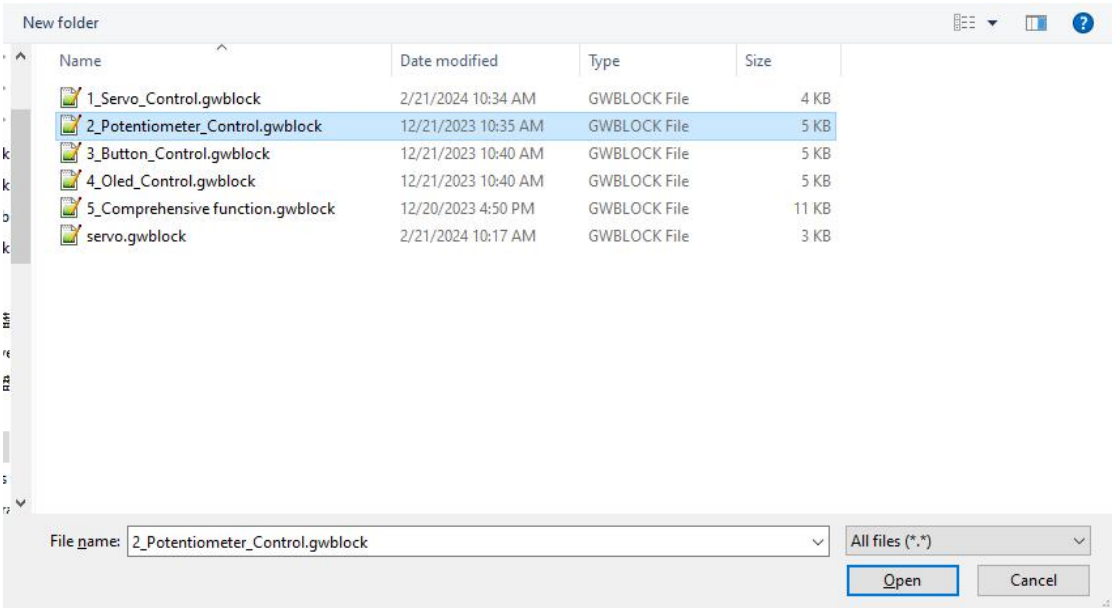
3.1 After successfully connecting to the GwBlock graphical editor, you need to click the drop-down button in the upper right corner, as shown bellow:



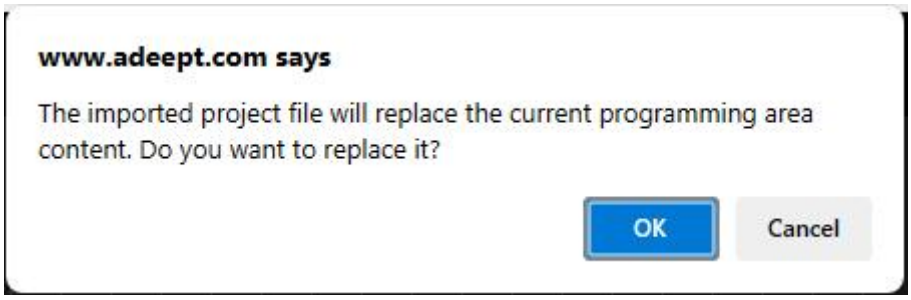
3.2 Then click Import project file to import the external project file. After opening it, a blank page will appear. You need to make a modification in the lower right corner and select All Files, as shown below:



3.3 Then the folder will be displayed and find the user folder "Adeept_Robotic_Arm_Kit_for_Arduino-V4.0\Code\GwBlock". Open the GwBlock folder and select the "2_Potentiometer_Control.gwblock" file. This file is our graphical code program for this lesson. Click "Open" in the lower right corner.



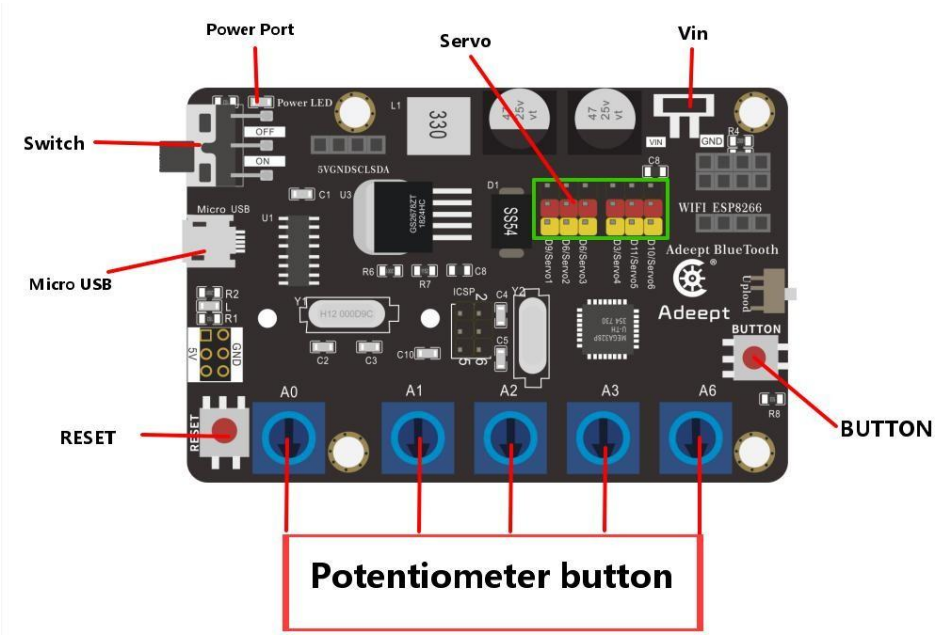
3.4 Click OK.


www.adeept.com says
The imported project file will replace the current programming area content. Do you want to replace it?
OK
Cancel

Setup
Initialize Servo Motor : ID 0 , PIN 9
Initialize Servo Motor : ID 1 , PIN 6
Initialize Servo Motor : ID 2 , PIN 5
Initialize Servo Motor : ID 3 , PIN 3
Initialize Servo Motor : ID 4 , PIN 11
Delay 1 Second (s)
Servo Motor Control : ID 0 , Angle 0
Servo Motor Control : ID 1 , Angle 40
Servo Motor Control : ID 2 , Angle 180
Servo Motor Control : ID 3 , Angle 90
Servo Motor Control : ID 4 , Angle 70
repeat while True
do
set A0 to Read Analog Value : PIN 0
set A0 to A0 × 180 ÷ 1024
Servo Motor Control : ID 0 , Angle A0

2.5 Run

Click the button in the upper right corner, after successfully running the program, you can see that the servo angles are a grasping action, and then you can rotate the direction by rotating the potentiometer A0.



【Note】:

1. Potentiometer control mode is not very precise, there will be some delay, so it is best to turn the potentiometer button slowly when using.

2. The torque of the servo is small, and can only clamp and carry relatively light objects.

3. The Robotic Arm works better with a fully charged battery.