

Artec Intelligence

Instruction Manual

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Version History

Date	Content
2026/06/30	First version

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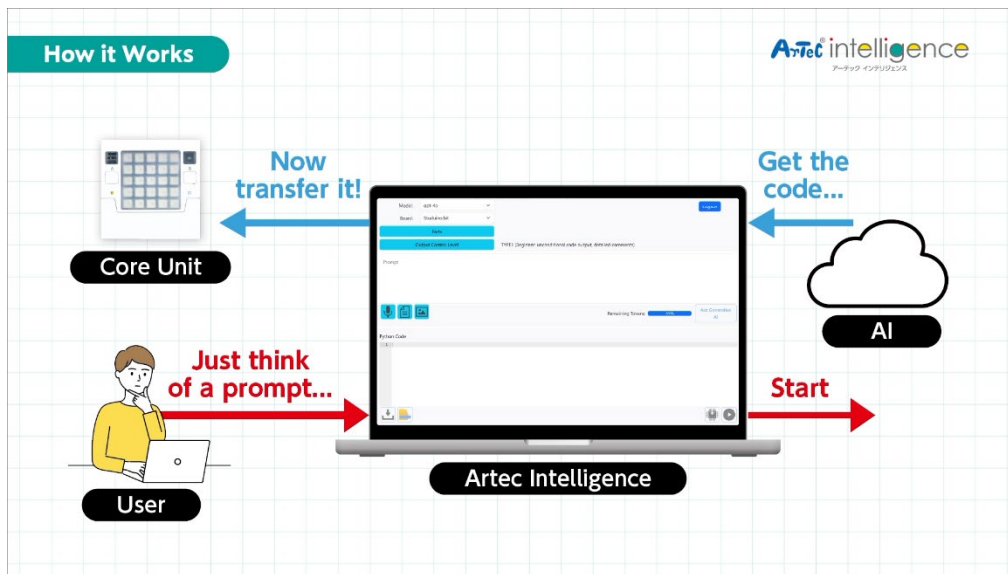
1. Getting Started

This instruction details how to use the Artec Intelligence AI programming platform.

The contents of this manual are subject to revision at any time.

1.1. What is Artec Intelligence?

Artec Intelligence is a programming platform which lets you use generative AI to control robots and systems. Describe what you want your robot to do using natural language and the AI will make the program. Once done, just transfer the program to make your robot or system work.

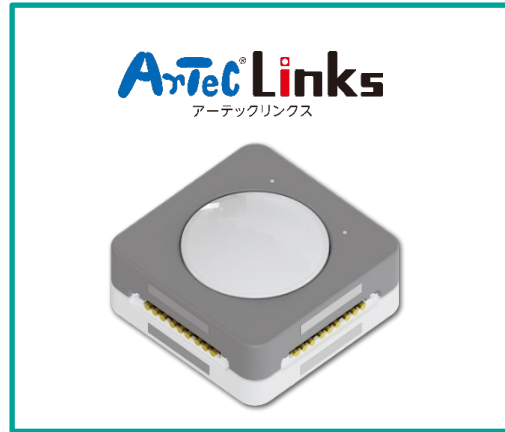


Programs are generated using the Python language. These programs can be edited by hand or even converted into Scratch, making it a flexible platform for learners of all levels.

1.2. Supported Hardware

Artec Intelligence is supported on the following hardware.

★ Support for the BBC micro:bit is in the works.



★ Visit the pages below for details on each platform.

ArtecRobo 2.0

<https://www.artec-kk.co.jp/artecrobo2/en>

Artec Links

<https://www.artec-kk.co.jp/en/arteclinks>

1.3. Software Downloads

You have a choice of different versions of the software depending on your device and operating system. Click the URL which corresponds to your device.

- ★ Active Internet connection required.
- ★ Latest OS version recommended.
- ★ Device compatibility may vary.

Windows / Chrome OS / Android

USB

<https://app.artec-kk.co.jp/artecintelligence/usb/>

Bluetooth

<https://app.artec-kk.co.jp/artecintelligence/bt/>

- ★ Software can be used in a web browser without installation.
- ★ Chrome is recommended for use with this software. Software can't connect to robots

iPad

Bluetooth

<https://apps.apple.com/us/app/artec-intelligence/id6755988678>

- ★ Software must be downloaded to each device.

1.4. Logging In

You'll need a username and password to login to the software. You can type these in on the startup screen.

Artec Intelligence Login

User ID

User ID

Password

Password

Login

1.5. The Software

You'll see the following screen once the software starts.



2. Software Settings

You'll need to make settings for your specific environment before generating a program.

2.1. Model

First choose the model you wish to use with the software. Pick an option under Model.

★ We recommend using the most up-to-date model.

Model: gpt-4o

Board: Studuino:bit

Parts

Output Control Level

2.2. Board

Choose a microcontroller★1 here. Be sure to pick the one which corresponds to your robot or system.

Model: gpt-4o

Board: Studuino:bit

Parts

Output Control Level

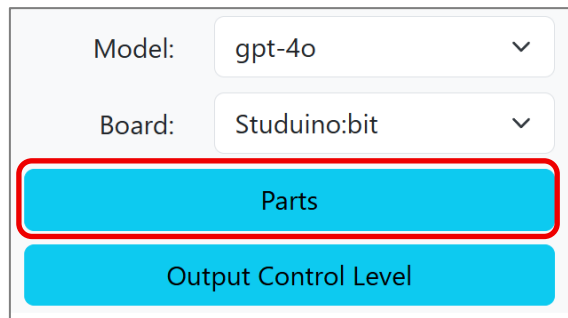
★1 A microcontroller is the tiny computer found inside of robots and systems.

Robot	Board
ArtecRobo 2.0	Studuino:bit Core Unit
Artec Links	Artec Links

2.3. Parts

Set the parts you'll use, like motors and sensors, here. Use Parts to choose the corresponding parts.

1. Click  .



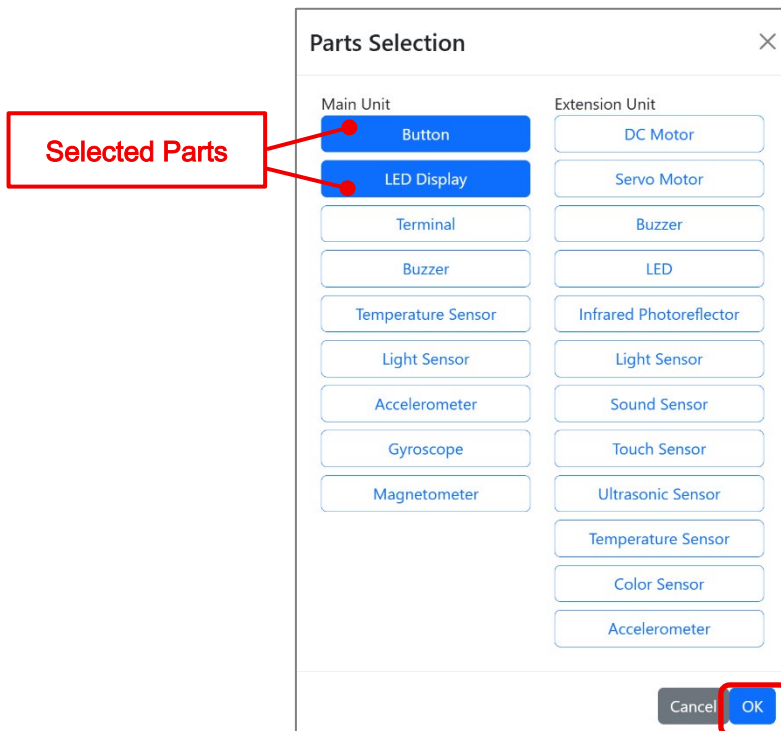
Model: gpt-4o

Board: Studuino:bit

Parts

Output Control Level

2. Choose your parts in the window that opens, then click OK.



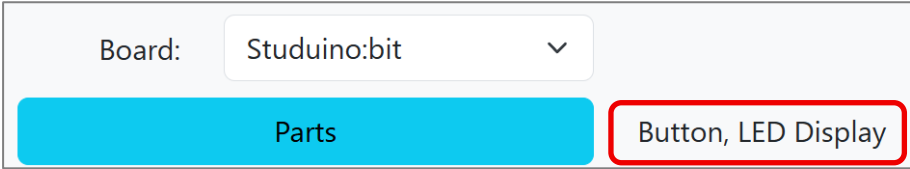
Parts Selection

Main Unit	Extension Unit
Button	DC Motor
LED Display	Servo Motor
Terminal	Buzzer
Buzzer	LED
Temperature Sensor	Infrared Photoreflector
Light Sensor	Light Sensor
Accelerometer	Sound Sensor
Gyroscope	Touch Sensor
Magnetometer	Ultrasonic Sensor
	Temperature Sensor
	Color Sensor
	Accelerometer

Cancel OK

Selected Parts

3. Select a part and it will appear next to .



Board: Studuino:bit

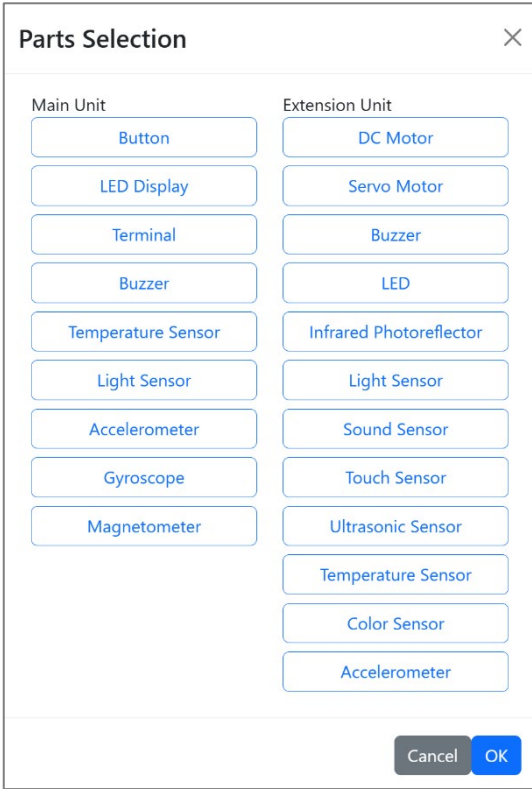
Parts

Button, LED Display

2.3.1. Available Parts

The parts you can choose depend on your microcontroller.

Studuino:bit Core Unit



Parts Selection

Main Unit

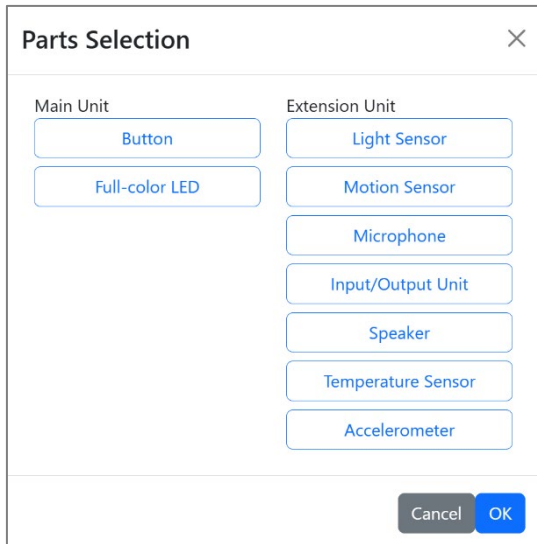
- Button
- LED Display
- Terminal
- Buzzer
- Temperature Sensor
- Light Sensor
- Accelerometer
- Gyroscope
- Magnetometer

Extension Unit

- DC Motor
- Servo Motor
- Buzzer
- LED
- Infrared Photoreflexor
- Light Sensor
- Sound Sensor
- Touch Sensor
- Ultrasonic Sensor
- Temperature Sensor
- Color Sensor
- Accelerometer

Cancel OK

Artec Links



Parts Selection

Main Unit

- Button
- Full-color LED

Extension Unit

- Light Sensor
- Motion Sensor
- Microphone
- Input/Output Unit
- Speaker
- Temperature Sensor
- Accelerometer

Cancel OK

★ See the instruction manual for each platform for details on how to physically connect parts.

ArtecRobo 2.0

<https://www.artec-kk.co.jp/artecrobo2/en>

Artec Links

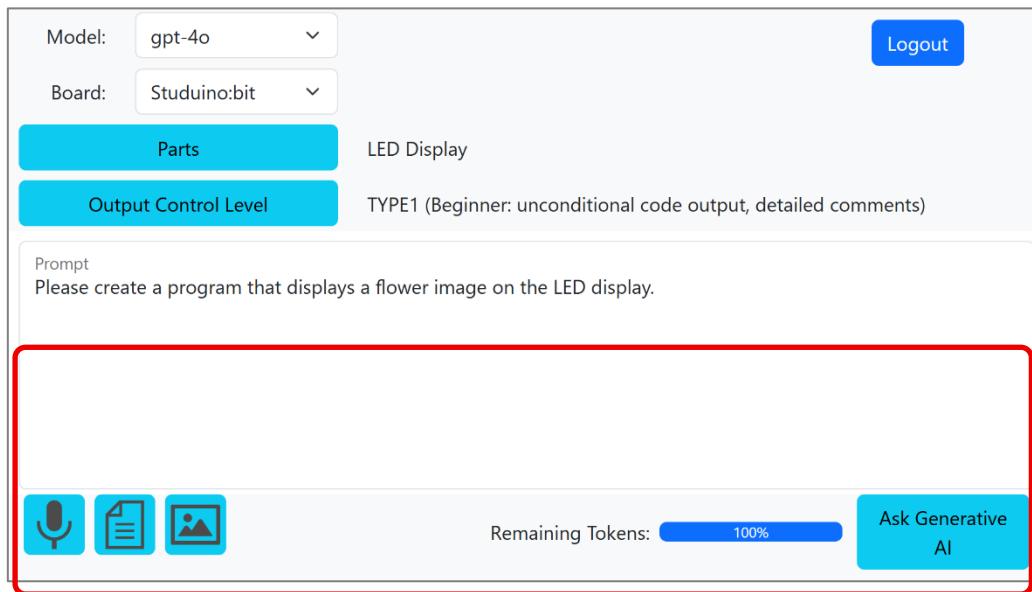
<https://www.artec-kk.co.jp/en/arteclinks>

3. Generating Programs

Write instructions in natural language and the AI will automatically generate a program based on them.

3.1. Typing Prompts

The instructions you pass to the AI are known as prompts. Type the prompt for your instructions in the prompt window at the center of the screen.



The screenshot shows a web interface for an AI model. At the top, there are dropdown menus for 'Model' (set to 'gpt-4o') and 'Board' (set to 'Studuino:bit'). A 'Logout' button is in the top right. Below these are two blue buttons: 'Parts' and 'Output Control Level'. To the right of 'Parts' is the text 'LED Display', and to the right of 'Output Control Level' is 'TYPE1 (Beginner: unconditional code output, detailed comments)'. A 'Prompt' section contains the text 'Please create a program that displays a flower image on the LED display.' Below the prompt is a large, empty text input area, which is highlighted with a red rectangle. At the bottom of the interface, there are three icons: a microphone, a document, and a picture. To the right of these icons is a 'Remaining Tokens' indicator showing '100%'. On the far right is a blue button labeled 'Ask Generative AI'.

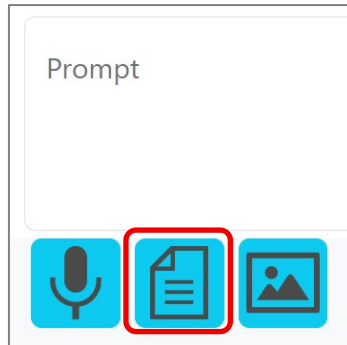
CAUTION

Prompts may be used as training data for generative AI models. Make sure that your prompts don't contain personal or confidential data before sending them.

3.1.1. Using Text Files

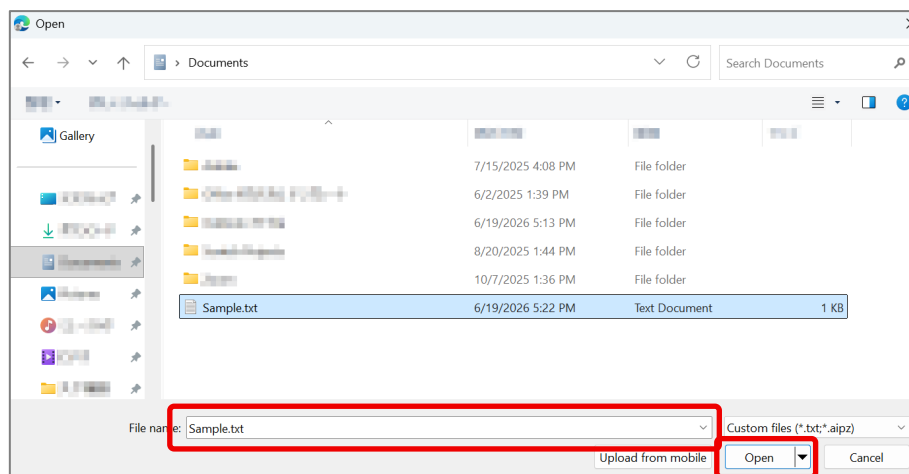
In addition to typing prompts directly into the software, you can also upload text files written in Notepad or other applications.

1. Click  below the prompt window.

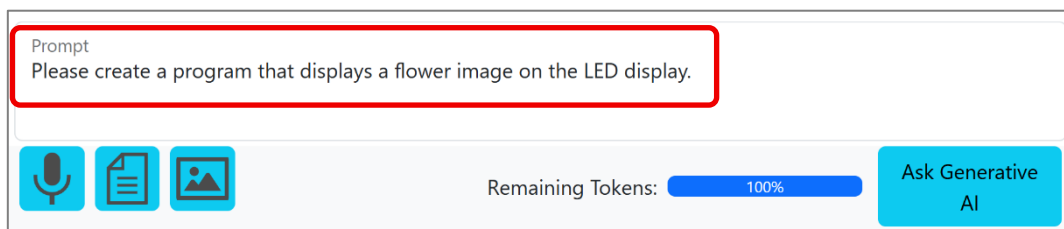


2. Choose your text file in the window that opens and click Open.

★ Only files with .txt extensions will appear.



3. The text inside the file will appear in the prompt window.

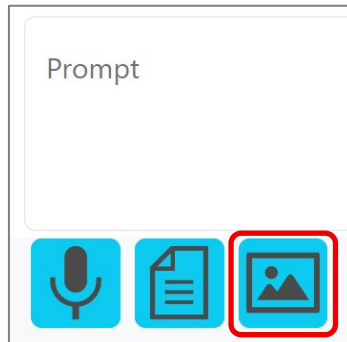


3.1.2. Using Images

You can also upload images to be used along with text prompts.

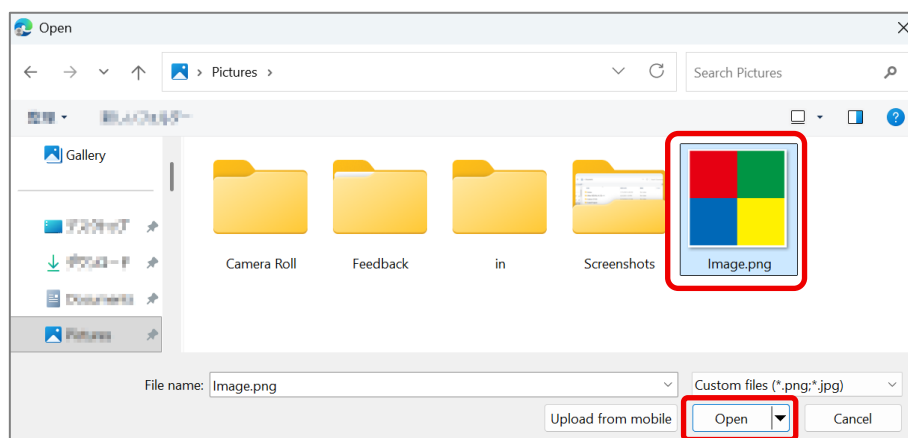
★ Artec Intelligence won't work with images alone. Always type out a prompt along with the image.

1. Click  below the prompt window.

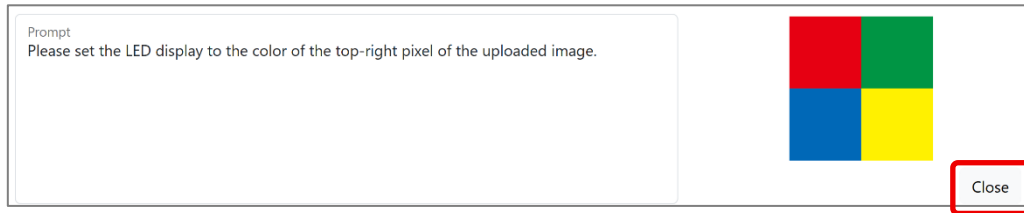


2. Choose your image in the window that opens and click Open.

★ Only files with .jpg or .png or extensions will appear.



3. The image will appear to the right of the prompt.



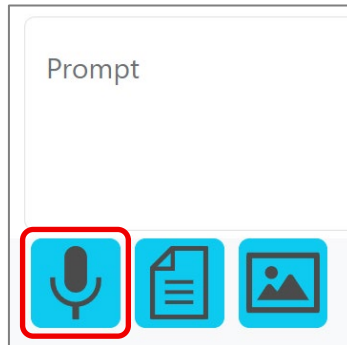
★ If you choose the wrong image, click the close button at the bottom right to remove the image.

Uploading images like flowcharts and graphs will let you make programs with them. See 3-2. Working with Flowcharts in the Artec Intelligence [Measurement and Control](#) textbook for details.

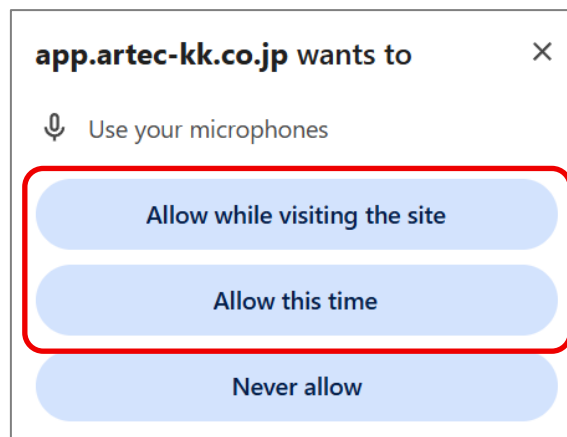
3.1.3. Using Sound

You can also use your device's microphone to enter prompts.

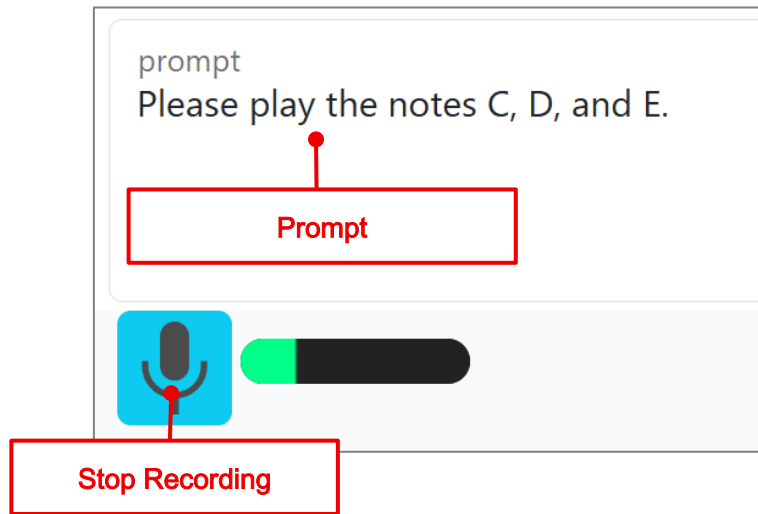
1. Click  below the prompt window.



★ You'll need to allow the software access to your microphone.



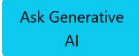
2. Speak into the microphone to enter your prompt.



Once you're done speaking, the recording will stop automatically and your prompt will appear in the window. You can also click  to stop recording.

- ★ Use Chrome version 139 or later for sound input.
- ★ Sound input is not available on iOS or iPadOS.

3.2. Generating Programs

Clicking  with a prompt in the box will generate a program in Python.

★ The program won't be generated if you click  without setting parts beforehand.

★ A unique program is generated each time, even with the same prompt.

Model: gpt-4o

Board: Studuino:bit

Logout

Parts

LED Display

Output Control Level

TYPE1 (Beginner: unconditional code output, detailed comments)

Prompt

Please create a program that displays a flower image on the LED display.



Remaining Tokens: 100%



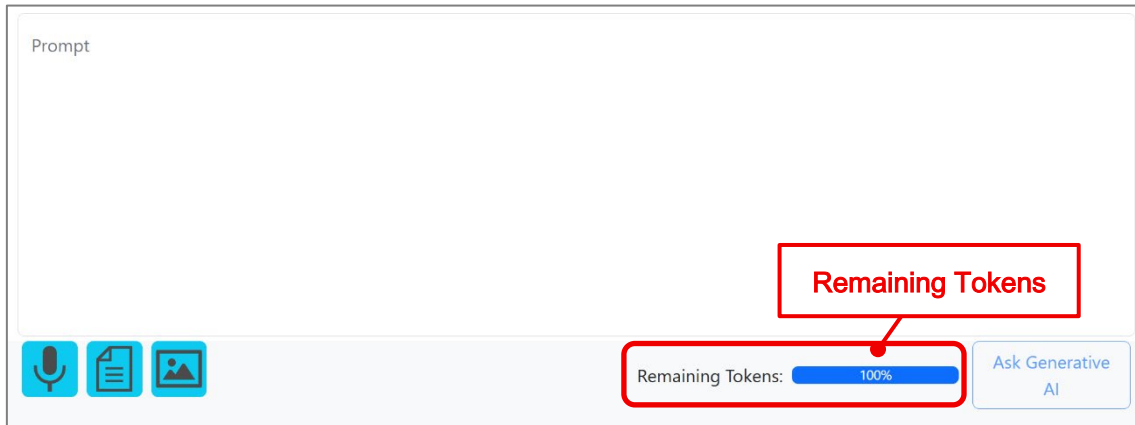
Python Code

```
1 from sbblocks import *
2
3 # Define the flower pattern using RGB values
4 flower_pattern = [
5     [(0, 0, 0), (31, 0, 31), (0, 31, 0), (31, 0, 31), (0, 0, 0)],
6     [(31, 0, 31), (31, 0, 31), (31, 0, 31), (31, 0, 31), (31, 0, 31)],
7     [(0, 31, 0), (31, 0, 31), (31, 31, 31), (31, 0, 31), (0, 31, 0)],
8     [(31, 0, 31), (31, 0, 31), (31, 0, 31), (31, 0, 31), (31, 0, 31)],
9     [(0, 0, 0), (31, 0, 31), (0, 31, 0), (31, 0, 31), (0, 0, 0)]
10 ]
11
12 # Clear the display
13 display.clear()
14
15 # Set the pixels according to the flower pattern
16 for y in range(5):
```



3.2.1. Tokens

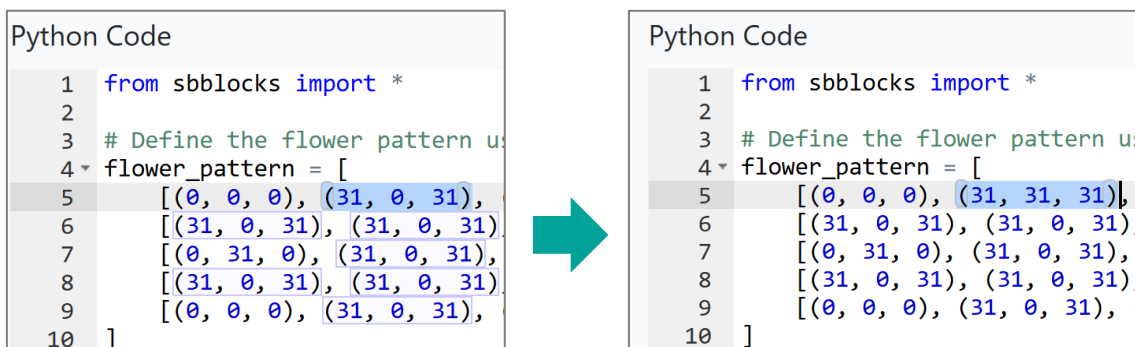
Tokens are a unit which represent how much processing power the generative AI uses. Each account can use a set number of tokens. Generating a program uses tokens, and running out of tokens means you can no longer make requests.



Longer prompts require more tokens. Images also require more tokens than text.

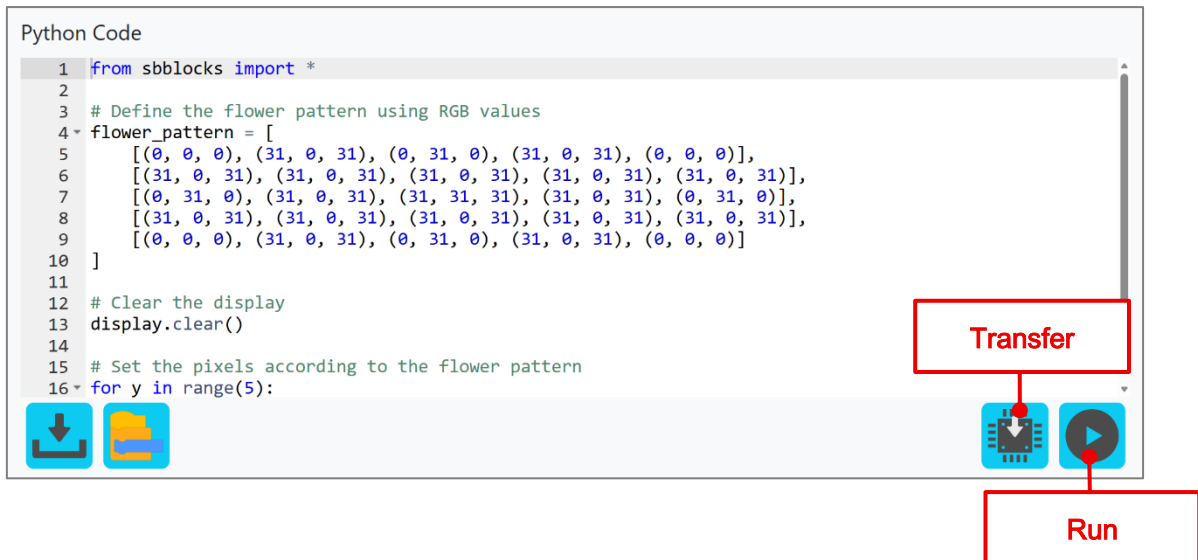
3.2.2. Editing Python code

You can also edit generated programs yourself. Do this by clicking the program under Python Code and typing with your keyboard.



4. Running Programs

You can use your Python program to run a robot or system while connected to it. To do this, click the Transfer or Run buttons at the bottom right of Python Code.



The screenshot shows a Python Code editor window. The code defines a 5x5 flower pattern using RGB values (0, 31, 0) for petals and (31, 0, 31) for the center. It includes comments and a loop to set the pixels. At the bottom right, there are two buttons: 'Transfer' (represented by a download icon) and 'Run' (represented by a play icon). Both buttons are highlighted with red boxes and red arrows pointing to them from the text below.

```
Python Code
1 from sbblocks import *
2
3 # Define the flower pattern using RGB values
4 flower_pattern = [
5     [(0, 0, 0), (31, 0, 31), (0, 31, 0), (31, 0, 31), (0, 0, 0)],
6     [(31, 0, 31), (31, 0, 31), (31, 0, 31), (31, 0, 31), (31, 0, 31)],
7     [(0, 31, 0), (31, 0, 31), (31, 31, 31), (31, 0, 31), (0, 31, 0)],
8     [(31, 0, 31), (31, 0, 31), (31, 0, 31), (31, 0, 31), (31, 0, 31)],
9     [(0, 0, 0), (31, 0, 31), (0, 31, 0), (31, 0, 31), (0, 0, 0)]
10 ]
11
12 # Clear the display
13 display.clear()
14
15 # Set the pixels according to the flower pattern
16 for y in range(5):
```

■ Transfer

This uploads the program to your microcontroller before running it. Programs are stored on the microcontroller itself, letting you run them repeatedly by using the Reset button. Unplugging the microcontroller from the computer after transferring will let it run the program on battery power.

★ Clicking Transfer again will overwrite any program currently stored on the microcontroller.

◇ Use for...

- Testing a finished program.
- Running a program without being connected to a device.
- Running a program over and over again.

■ Run

This temporarily stores a program on the microcontroller before running it. It doesn't write the program to the memory of the microcontroller. While you have to keep the microcontroller connected to your device, the fast response makes it good for testing programs. It will also show you any errors which occur as the program runs.

You can use this feature to investigate errors which occur after you transfer a program. The example below shows 31 typed in full-width (3 1) instead of half-width characters, which causes an error.

Python Code

```
1 from sbblocks import *
2
3 # Define the flower pattern using RGB values
4 flower_pattern = [
5     [(0, 0, 0), (31, 31, 31), (0, 31, 0), (31, 0, 31), (0, 0, 0)],
6     [(31, 0, 31), (31, 0, 31), (31, 0, 31), (31, 0, 31), (31, 0, 31)],
7     [(0, 31, 0), (31, 0, 31), (31, 31, 31), (31, 0, 31), (0, 31, 0)],
8     [(31, 0, 31), (31, 0, 31), (31, 0, 31), (31, 0, 31), (31, 0, 31)],
9     [(0, 0, 0), (31, 0, 3 1), (0, 31, 0), (31, 0, 31), (0, 0, 0)]
10 ]
```

This error will result in a message like the one shown below. It will tell you exactly where the error occurred, letting you see that it was the 3 1 on line 9.

```
Traceback (most recent call last):
  File "<stdin>", line 9, in <module>
    NameError: name '3 1' isn't defined
```

Cancel

★ Run button is not available on iOS or iPadOS.

★ This version of the software doesn't support Bluetooth in the online version.

◇ Use for...

- Testing how your robot or system works.
- Testing a program in real time.
- Making adjustments as you work.

The following section describes how to connect to your microcontroller:

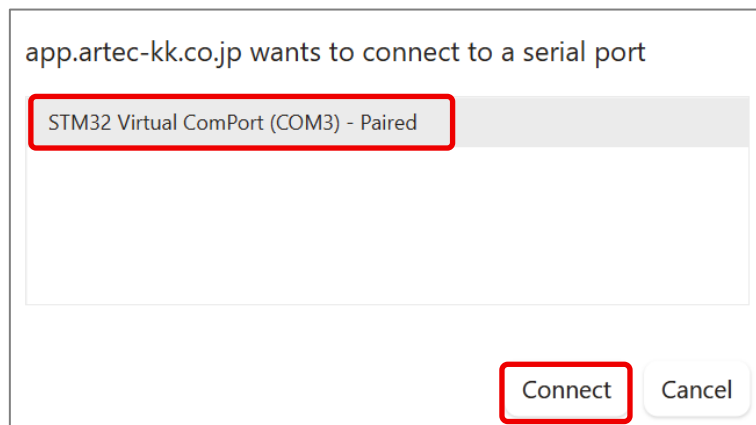
4.1. USB

You can use the same method to connect to any microcontroller over USB.

1. Use a USB cable to connect your microcontroller to your device.



2. Click  and the following menu will appear.
Choose your microcontroller, then click Connect.



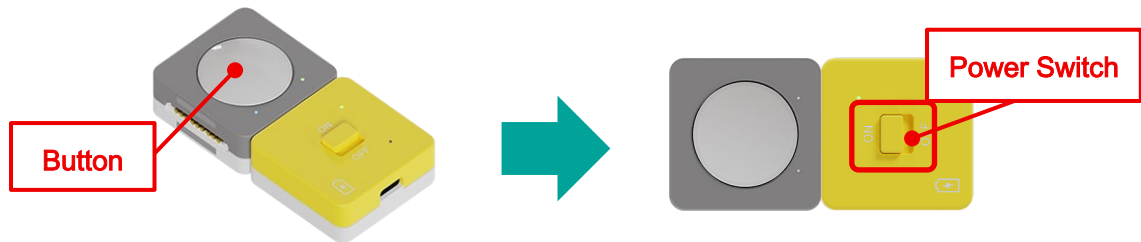
4.2. Bluetooth

Each microcontroller has a different way of connecting over Bluetooth.

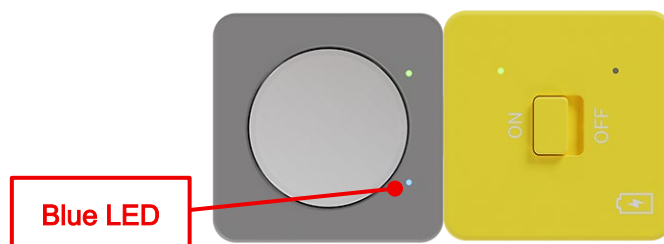
This method also depends on your operating system.

4.2.1. Artec Links

1. Hold down the button on the Main Unit as you turn it on.



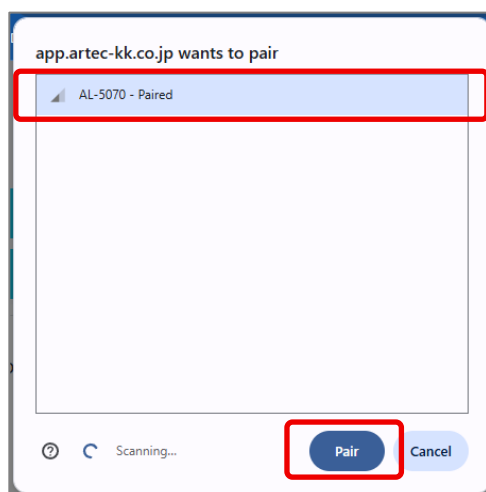
2. Release the button once the blue LED starts to blink.



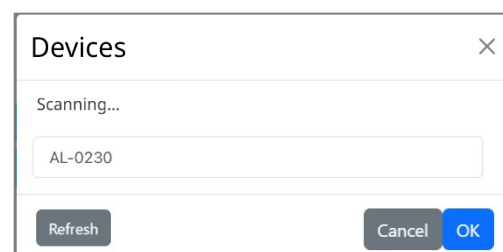
3. Turn your device Bluetooth on.

4. Click  and the following window will appear.
Choose your microcontroller, then click Pair or OK.

Windows / Chrome OS / Android



iPadOS



4.2.2. ArtecRobo 2.0

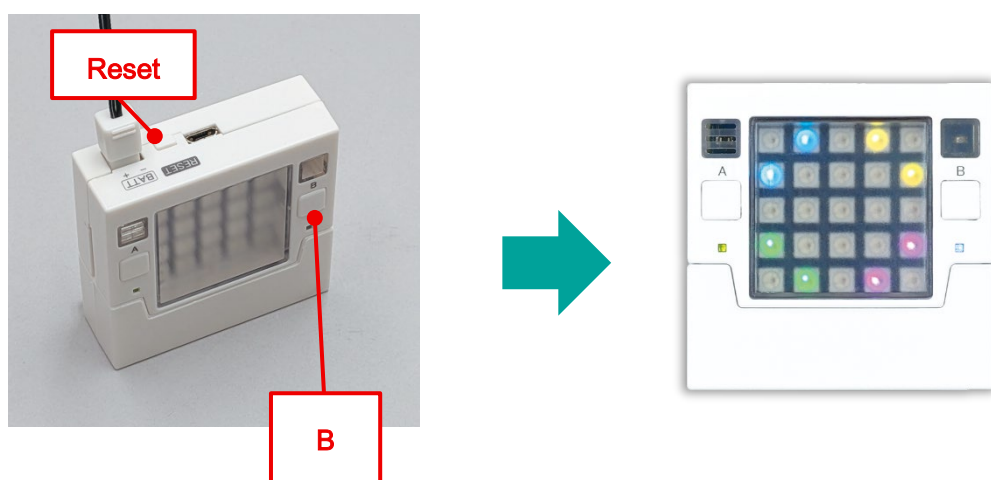
1. Plug in your Battery Box or Power Bank.



★ Using these requires a Robot Expansion Unit.



2. Hold down B, then press Reset, and a pattern will appear on the LED display.

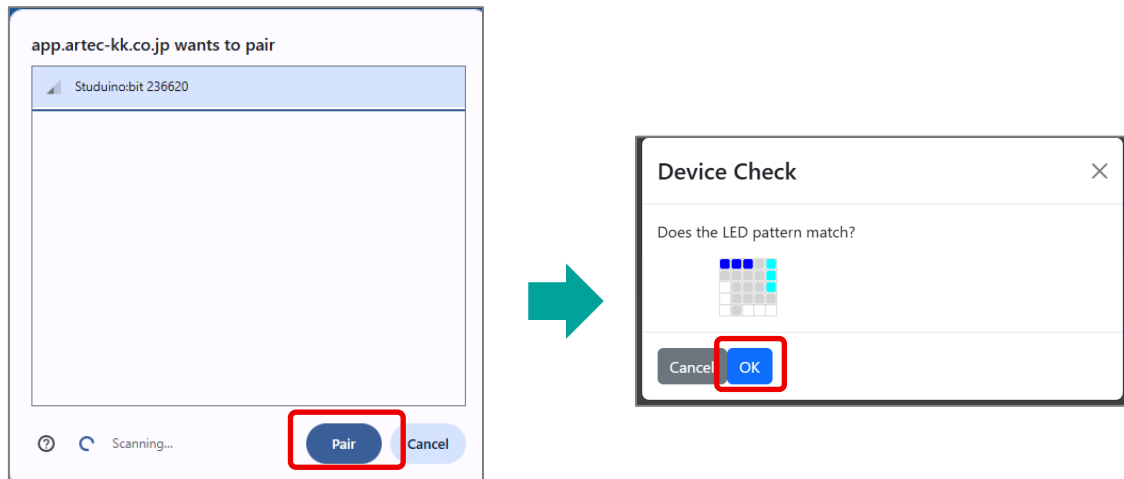


3. Turn your device Bluetooth on.

4. Click  and the following menu will appear.

Choose the same pattern as the one on the microcontroller, then click Pair or OK.

Windows / Chrome OS / Android



iPadOS



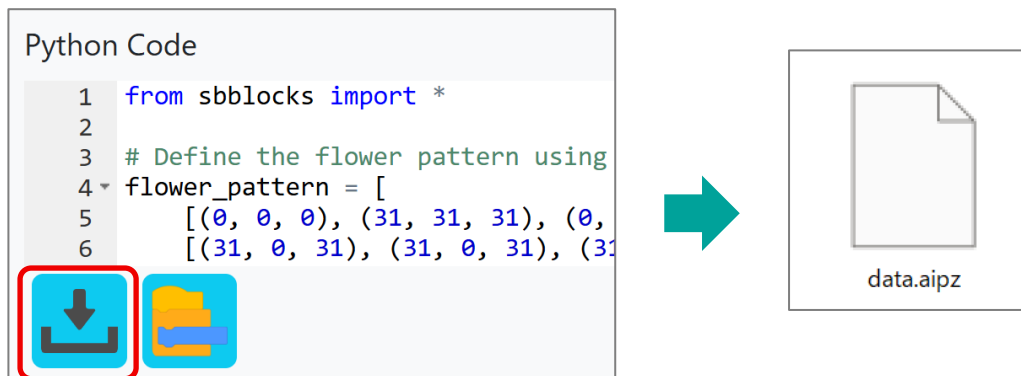
5. Using Generated Programs

You can save any generated program as a project file or convert it into Scratch.

5.1. Saving the Project

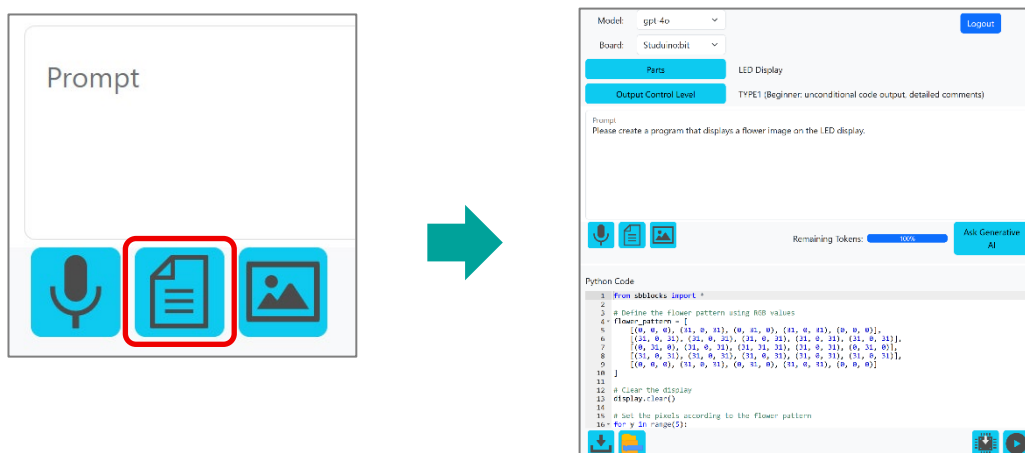
You can save programs as a single project file which includes software settings and the prompt you used. Loading a saved project file will open it in the exact state you saved it in.

1. Click  below Python Code to download an .aipz file which contains your software settings, prompt, and the generated Python code.



2. Use  to load a project file and continue working on it.

★ See 3.1.1 for instructions on how to load files.



5.2. Converting to Blocks

You can convert any generated Python code into Scratch blocks. Load a converted program in the corresponding software to see how the AI's program would look in block format.

★ Not supported for Artec Links.

1. Click  to download a block.sbd file for the ArtecRobo 2.0 studuino:bit Software.

★ This button won't be available unless Python code has been generated.

Python Code

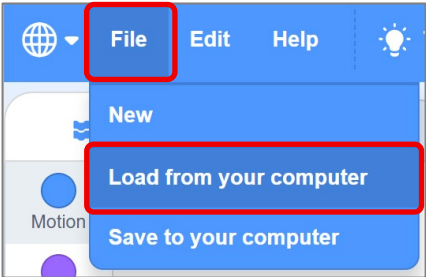
```
1 from sbblocks import *
2 import time
3
4 display.clear()
5
6 # Center of the flower
7 display.set_pixel(2,2,(31, 31, 0)) #yellow
8
9 # Petals
10 display.set_pixel(1,1,(31, 0, 0)) #red
11 display.set_pixel(1,2,(31, 0, 0)) #red
12 display.set_pixel(1,3,(31, 0, 0)) #red
13 display.set_pixel(2,1,(31, 0, 0)) #red
14 display.set_pixel(2,3,(31, 0, 0)) #red
```



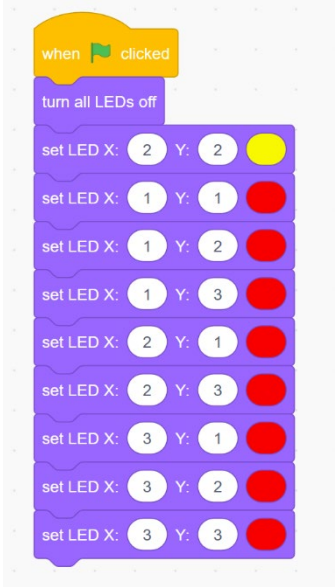


block.sbd

2. You can open the downloaded file in the studuino:bit Software. <https://www.artec-kk.co.jp/artecrobo2/en/software/>







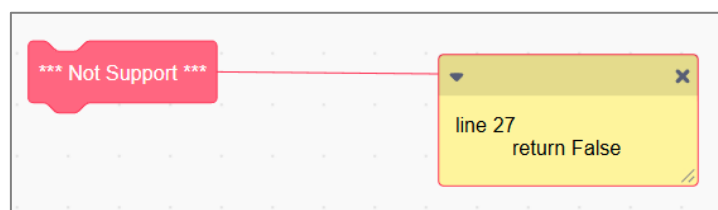
Unsupported Code

Python code like loop control statements, multi-dimensional lists, and function return values unsupported in Scratch will instead appear as blocks which say *****Not Support*****. You can find comments detailing the lines of the code attached to the block. You can find the different kinds of unsupported blocks below.

■ Original Functions

Blocks of unsupported code will appear as a function block.

The example shows that return False on line 27 couldn't be converted.



■ Booleans

The unsupported code will appear as a boolean block.

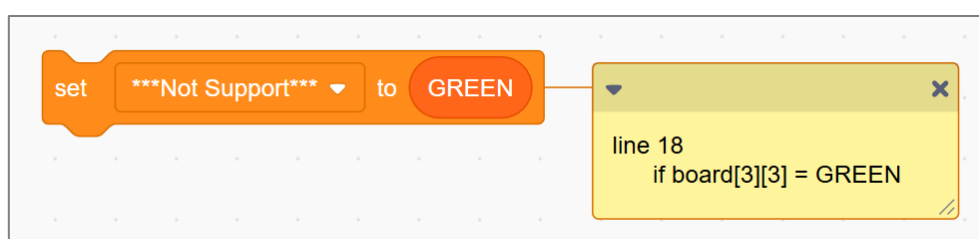
The example shows a two-dimensional list on the left side of a comparison operator on line 26 which couldn't be converted.



■ Variables

The unsupported code will appear as a variable block.

The example shows a two-dimensional list on the left side of a substitution on line 18 which couldn't be converted.



5.2.1. Supported Parts

You can find parts which support Scratch conversion below. Just like in 5.2.1, code for any unsupported blocks will be converted into ***Not Support*** blocks.

★ Support for these parts will be added as needed.

Studuino:bit Core Unit		Artec Links	
Part	Supported	Part	Supported
Button	○	Button	
LED Display	○	Full-color LED	
Terminal	○	Light Sensor	
Buzzer	○	Motion Sensor	
Temperature Sensor	○	Microphone	
Light Sensor	○	Input/Output Unit	
Accelerometer	○	Speaker	
Gyroscope	○	Temperature Sensor	
Magnetometer	○	Accelerometer	
DC Motor	○		
Servo Motor	○		
Buzzer			
LED (onboard)			
Infrared Photoreflector	○		
Light Sensor (onboard)			
Temperature Sensor (onboard)			
Sound Sensor			
Touch Sensor			
Ultrasonic Sensor			
Color Sensor			
Accelerometer (onboard)			

6. Troubleshooting

Troubleshooting	Cause	Solution
Nothing happens when I click the Ask Generative AI button.	This button won't become available until you set parts.	See 2.3 for instructions on how to add parts to your program.
No code appears in Python Code when I click the Ask Generative AI button.	You won't be able to generate a program without entering a prompt or selecting parts.	Review your prompt and software settings before trying again.
I get an error when I try to transfer a program.	Transfers will fail if the connection is interrupted by unplugging a USB cable or turning off Bluetooth.	Make sure that your microcontroller is connected before trying again.
I transfer the program but nothing happens.	① The transfer may have failed due to an interrupted connection. ② Your program may not work if you haven't selected the applicable parts. ③ Motors won't work correctly if you connect them to different ports than the ones you set in your program. ④ The program also won't work correctly if the motors aren't connected correctly.	① Try transferring the program again. ② Make sure that your parts are set correctly in the software. ③ Make sure that your prompt includes the correct ports (like P0) for your motors. ④ Make sure that your parts are actually connected. When converting programs from Python to Scratch, check the generated blocks and adjust your prompt as necessary.

★ See the instruction manual for each platform for details on how to troubleshoot issues with your project and electronic parts.

ArtecRobo 2.0

<https://www.artec-kk.co.jp/artecrobo2/en>

Artec Links

<https://www.artec-kk.co.jp/en/arteclinks>

If you encounter an issue which can't be found in this manual or solved with the described steps, contact us directly for support!

7. Contact Us

Artec Co., LTD. International Business Department

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