

Studuino for Android

Instruction Manual

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1. Getting Started

This manual explains how to use the application for the Block Programming Environment on Android (called Studuino for Android here). To learn the basics of using and programming with this software, read the [Instruction Manual](#) and Guide (Part [01](#) and [02](#)) for the PC version of the Block Programming Environment.

This manual will teach you about some of the differences in functionality and usage compared to the PC version of this software.

The information in this manual is subject to revision at any time.

2. Application System Requirements

System Requirements

● OS	Android 5.0 or later ★ This doesn't include devices updated from Android 4.0 or earlier.
● Bluetooth	Bluetooth 4.0 or later
● Memory	2 GB (recommended)
● Display	5-Inch or larger (10-Inch recommended)
● Resolution	1920 x 1080 (recommended)

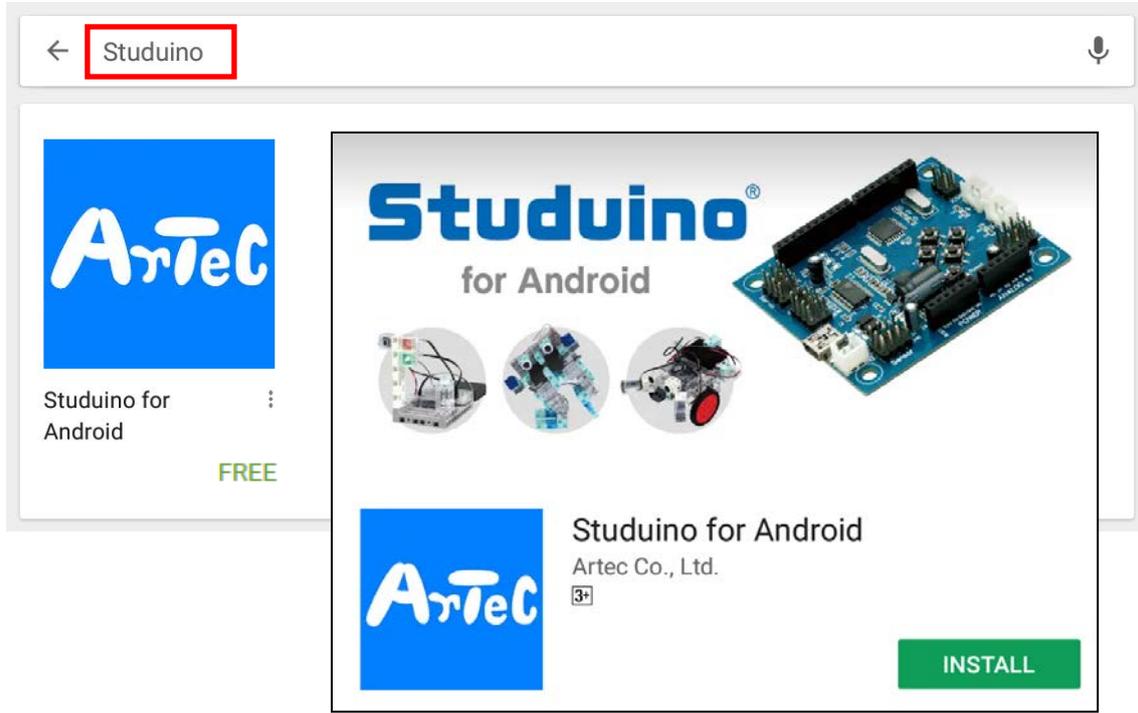
★ Compatibility can't be guaranteed for all devices.

Even with the required OS version, the software may not run on some devices.

★ Requirements may change based on future updates.

3. Installation

Open the Google Play Store application and search for **Studuino**.



You'll see the icon below once the installation finishes.



4. Getting Ready

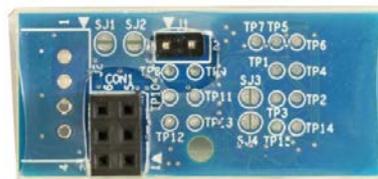
In order to use your Studuino with this application, you'll need to connect a Bluetooth Module (product #151094, Bluetooth 4.0 Module for Robots). This module is sold separately.

Your Bluetooth Module uses the following connectors:

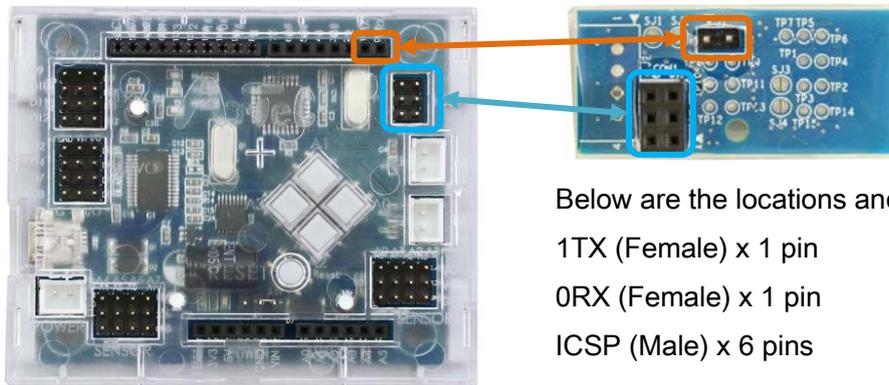
Bluetooth 4.0 Module for Robots



Front



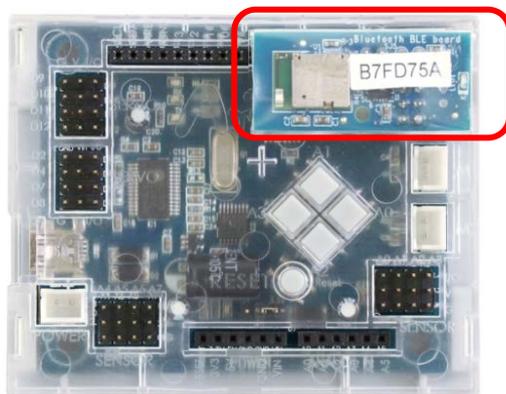
Back



Below are the locations and types of pins:

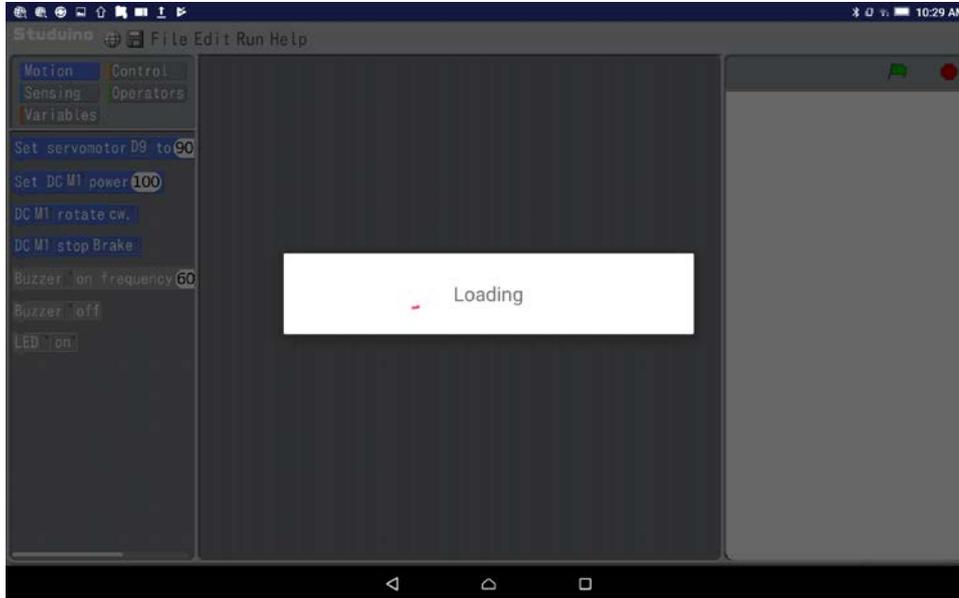
- 1TX (Female) x 1 pin
- 0RX (Female) x 1 pin
- ICSP (Male) x 6 pins

And when the Module is connected...



5. Opening the Application

Tap the application icon and you'll see the startup screen below.



The screen will change and you'll be able to use the software once the startup finishes.



6. Connecting to Studuino with Bluetooth

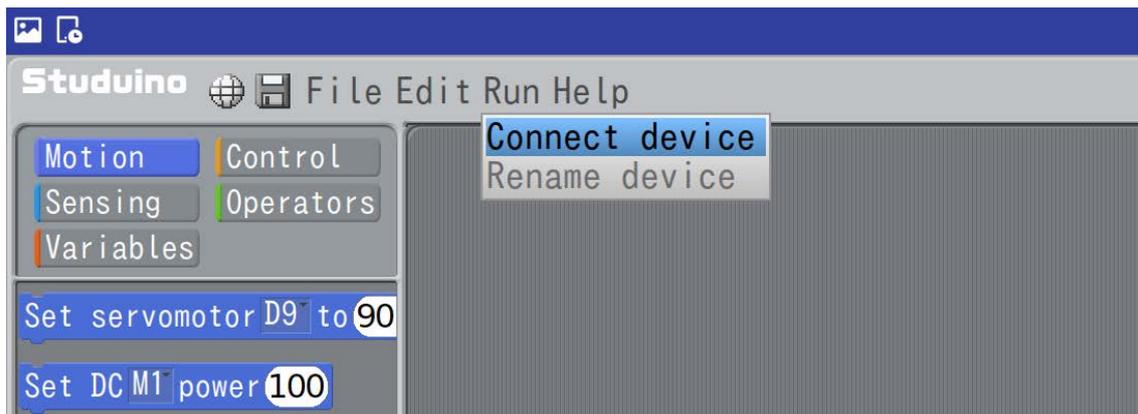
This application allows you to control your Studuino using your Android device via a Bluetooth connection.

An active Bluetooth connection between your Studuino and the application on your device is required in order to run the programs you make. Follow the steps below to do this.

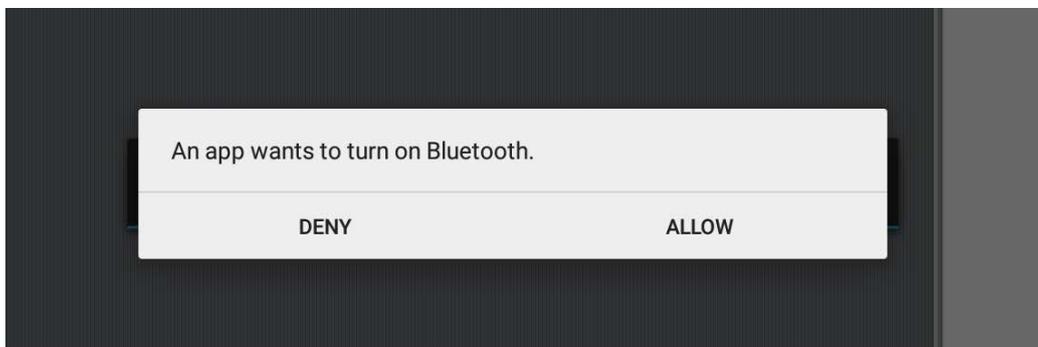
★ This application doesn't contain a feature similar to the Block Programming Environment's Transfer feature.

6.1. Connecting to Studuino

- ① Turn your Studuino on.
- ② Tap the **Run** menu and choose **Connect device**. The application will search for any available Studuino units.

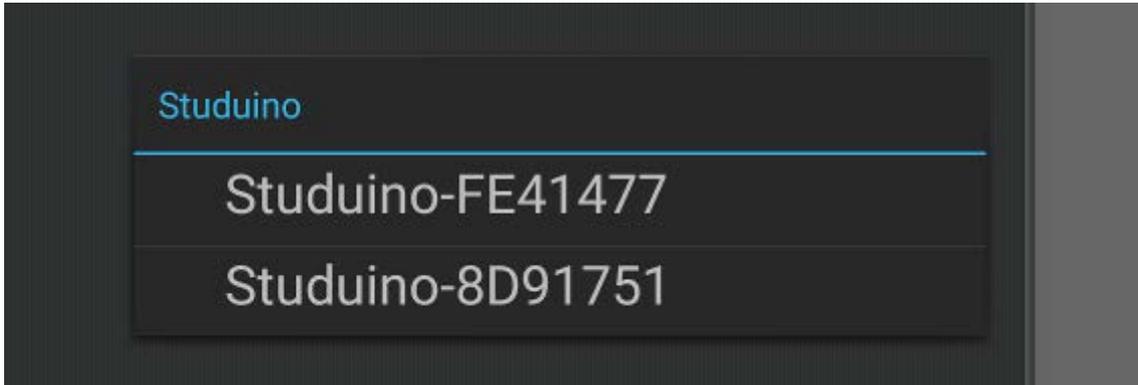


- ③ You'll see the following message if your device's Bluetooth is turned off. Tap **Allow** to turn Bluetooth on.



- ④ You'll see the name(★) of any Studuino units which are turned on and not connected to another device. Multiple available devices will be shown in a list. Tap the name of the unit you wish to connect to.

This screen will close automatically after 20 seconds of inactivity. If this happens, start again from the beginning.



Choose the unit that shares same seven-character serial number as the label on your Bluetooth Module.

★ Studuino (Bluetooth Module) Name

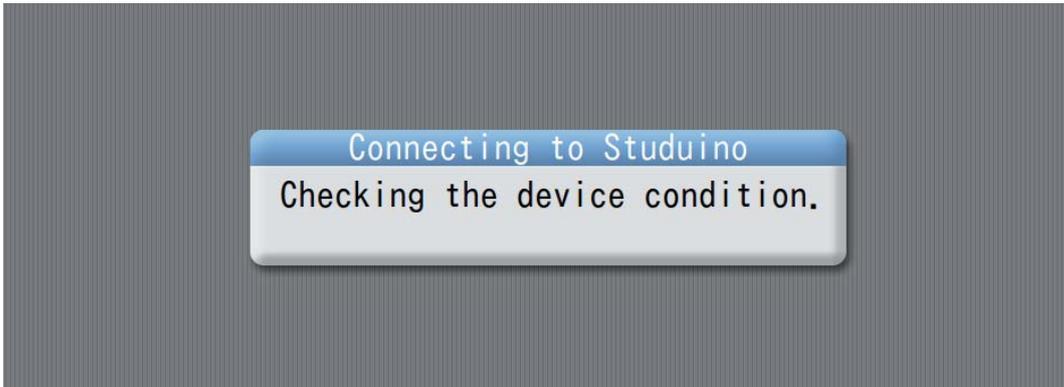


Factory Serial Number:
Studuino-B7FD75A

The factory serial number starts with **Studuino-** and is followed by a combination of seven numbers and letters. Each Bluetooth Module has its own unique number, meaning that connecting a new module will display a new name.

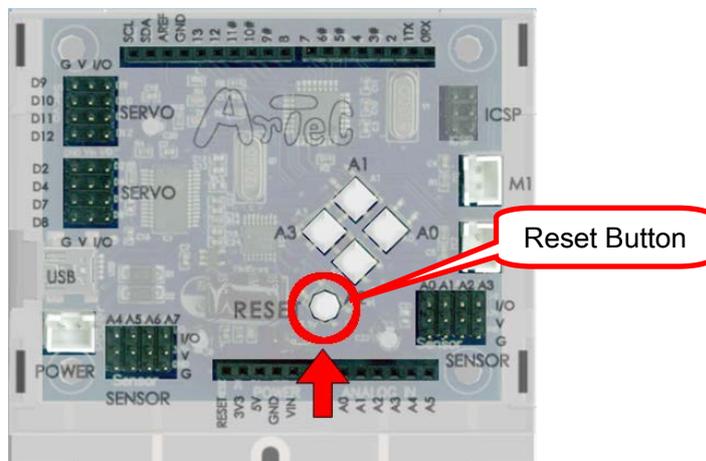
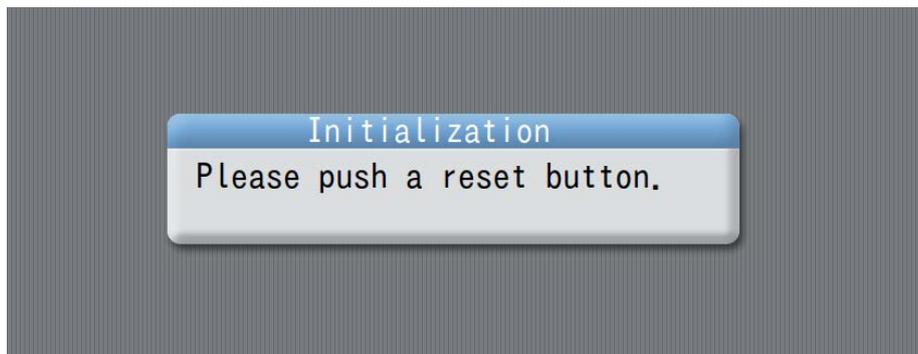
This serial number can also be edited. See **6.3. Renaming a Unit** to learn how to change a unit's name.

- ⑤ Once connected the software will check whether the Studuino has been initialized.

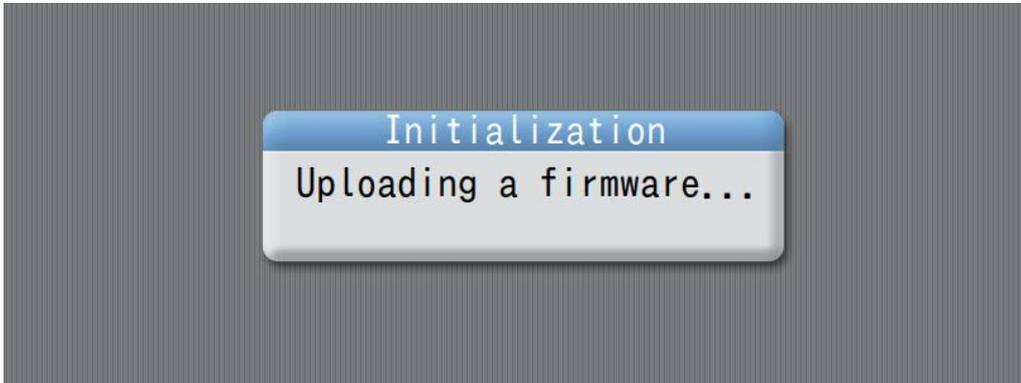


Follow the steps below to initialize a new Studuino unit. This initialization is a one-time process. You'll only have to follow this process for your Studuino again if you use it outside of the application.

- I. You'll see the message shown below. Press your Studuino's Reset button within 10 seconds.



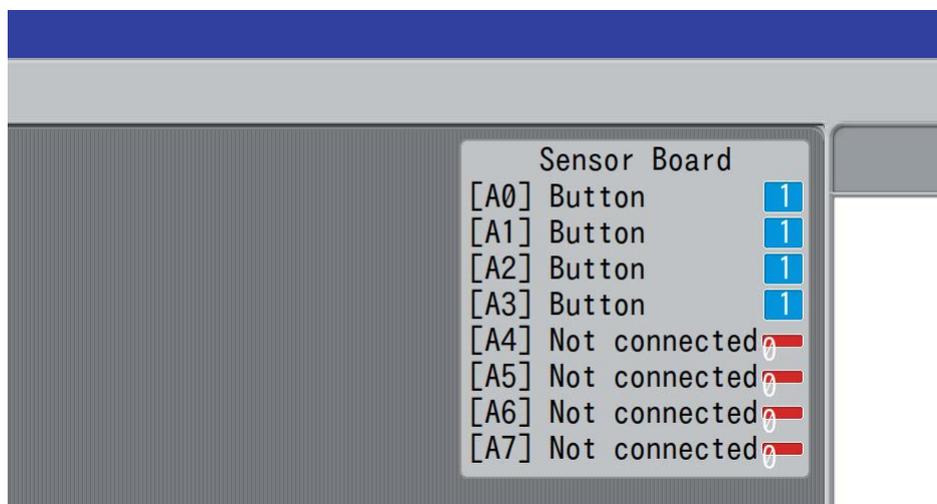
- II. The message will change and start sending the program to your Studuino. The initialization is finished once this message disappears (the transfer should take about 30 seconds).



- III. Your device will be connected once initialization is complete and the message disappears. If you fail to press the Reset button your unit will disconnect without having initialized. You'll also see the message below. If this happens, go back to step ② and try again.

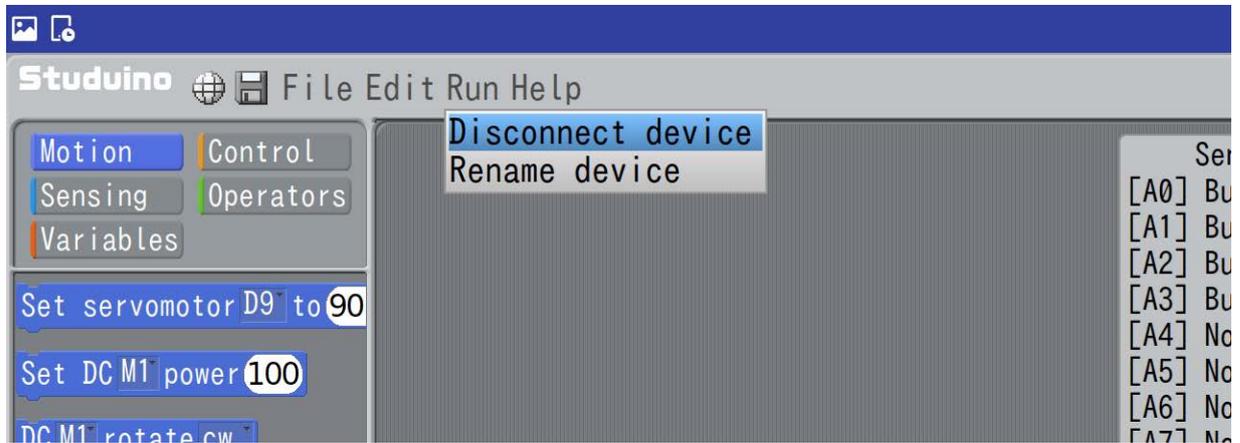


- ⑥ Your device is connected once you see the Sensor Board to the right side of your screen.



6.2. Disconnecting

When you wish to close your Bluetooth connection, tap the **Run** menu and choose **Disconnect device**.



★ Your device will disconnect automatically in the event of the following:

- Turning off your Studuino.
- Your device goes to sleep.
- You go back to the Home screen.
- You switch to another application.

6.3. Renaming a Unit

You can also change the seven-character serial number of any Bluetooth Module.

This serial number is a mixture of letters and numbers that can be found on the label of any module.

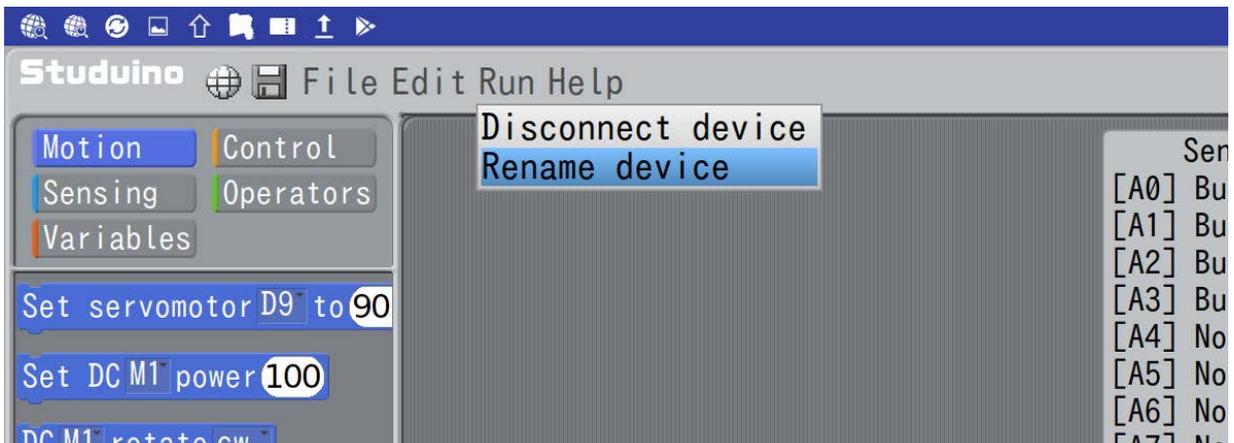


Factory Serial Number:
Studuino-B7FD75A

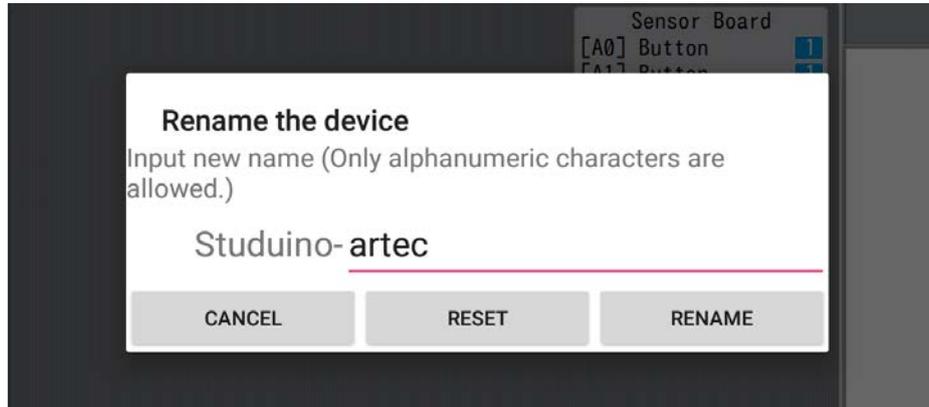
★ This serial number is unique to each module.

You'll need to connect the module to your Studuino in order to rename it.

① Once it's connected to your Studuino, tap the **Run** menu and choose **Rename device**.

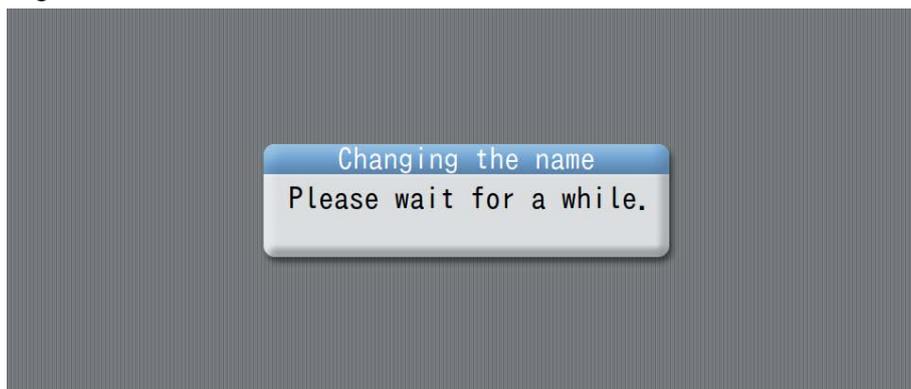


- ② You'll see the dialog box shown below.



- **Cancel**
Closes the box without renaming the unit.
- **Reset**
Resets the unit's name to the default serial number.
- **Rename**
Sets the unit's name to **Studuino-** followed by the text in the text box. Names can contain a maximum of seven alphanumeric characters.
Ex) Studuino-Artec01

- ③ Tap **Reset** or **Rename** to change your unit's name and you'll see the following message:

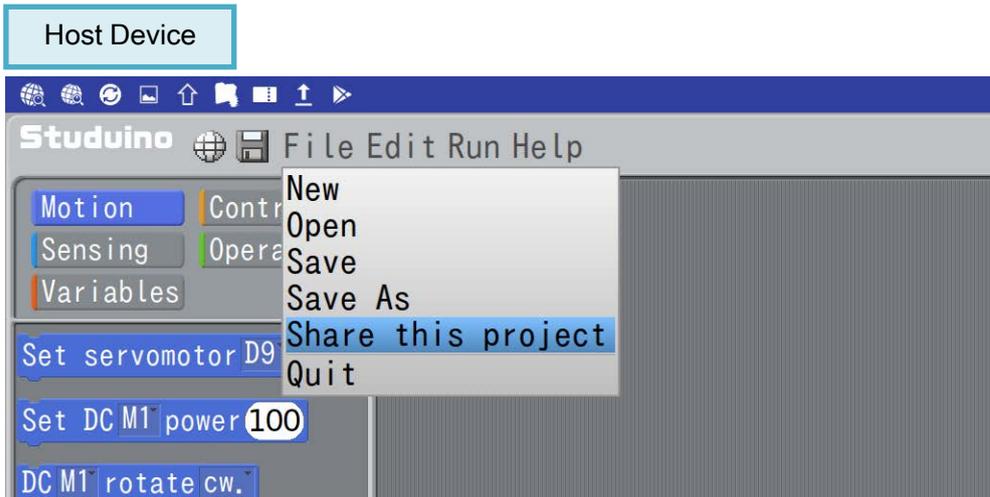


- ④ The message will disappear once the change is complete.

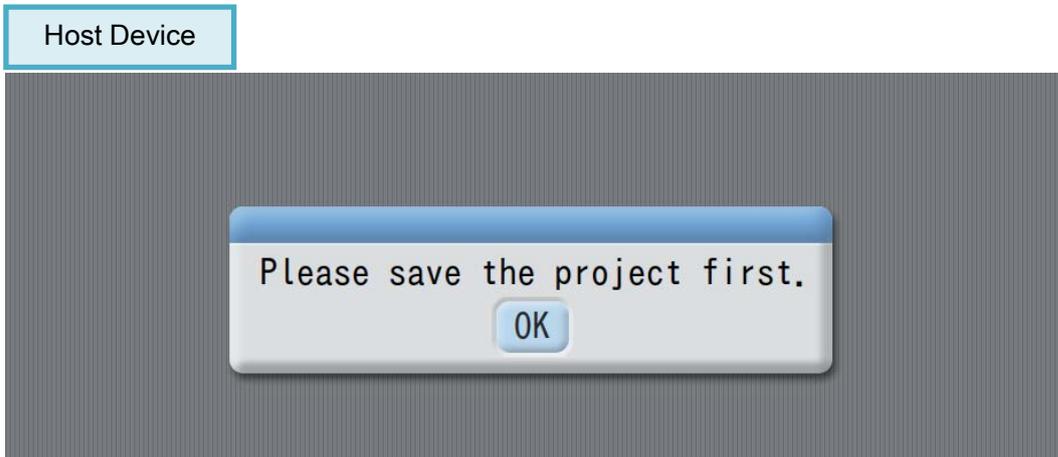
7. Sharing a Project

Use this feature to share a work in progress by uploading it to cloud storage or sending it to a device via e-mail or another application.

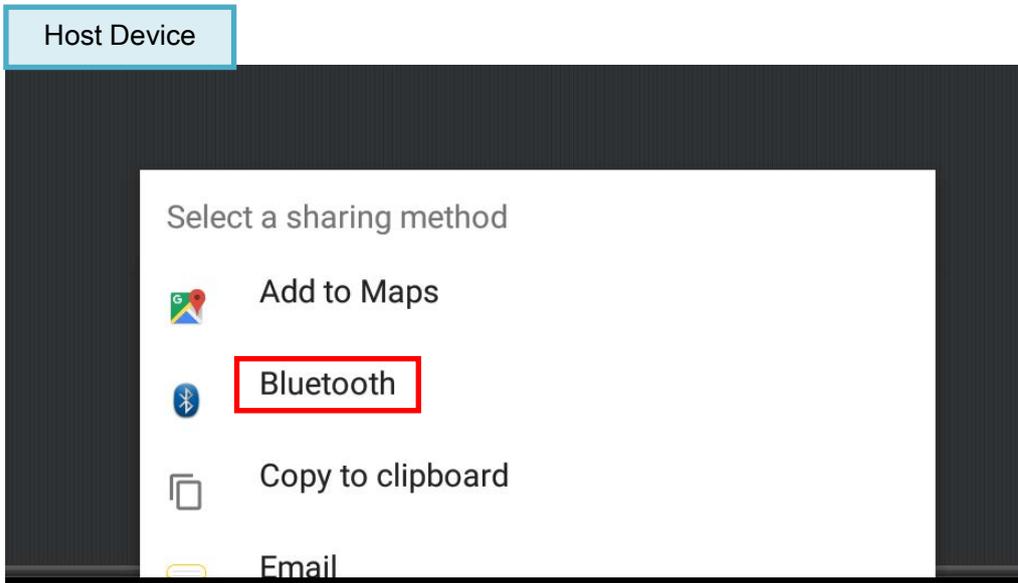
- ① Tap **File** and choose **Share this project**.



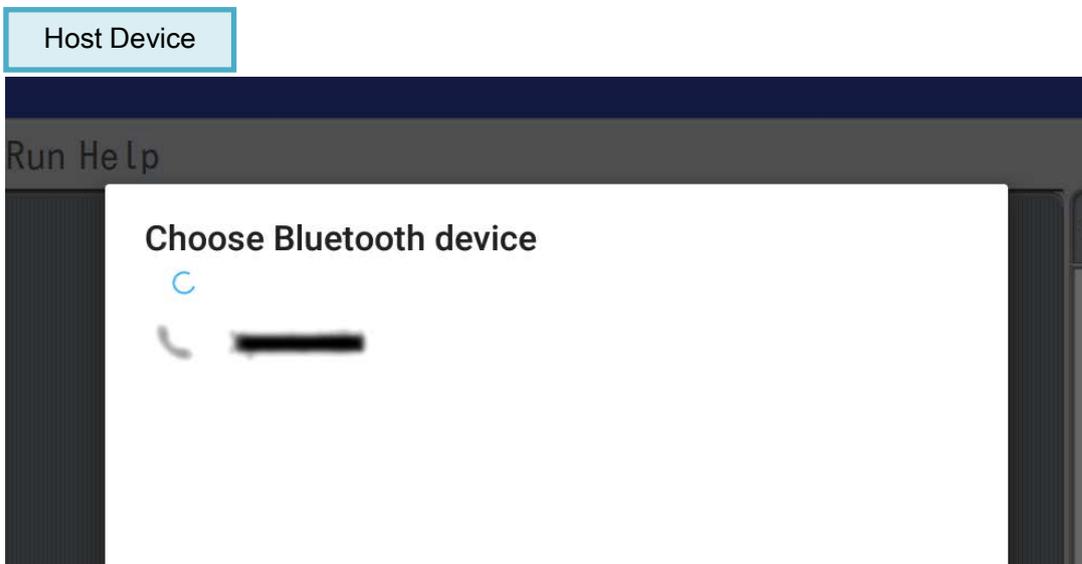
- ② You'll see the message below. Tap **OK** to save the project.



- ③ Once it's saved, you'll see a list of compatible applications. This section covers sharing via Bluetooth. See the **Bluetooth Application Guide** for details on using other applications. Tap **Bluetooth**.



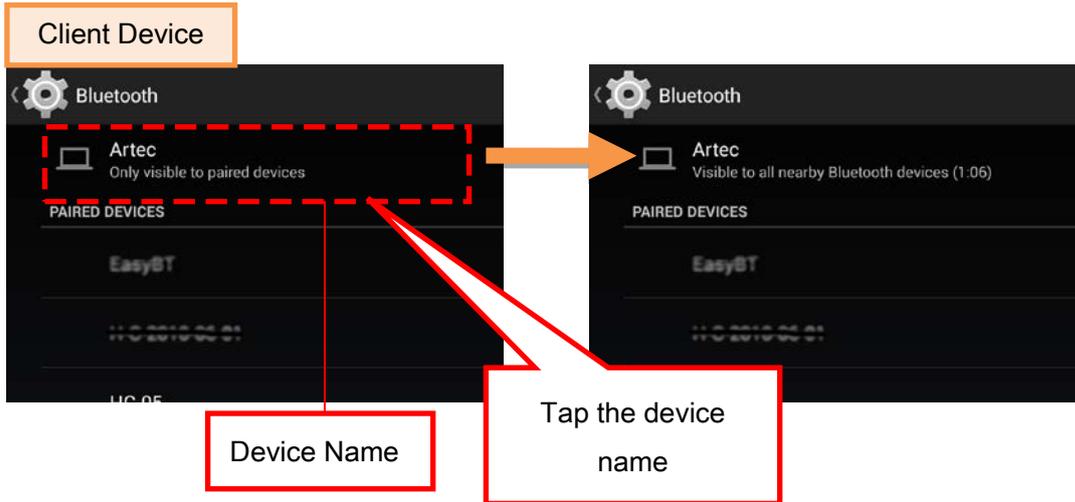
- ④ You'll see a list of available Bluetooth-enabled devices. If you don't see any available devices, go to the next page and follow the steps for your client device.



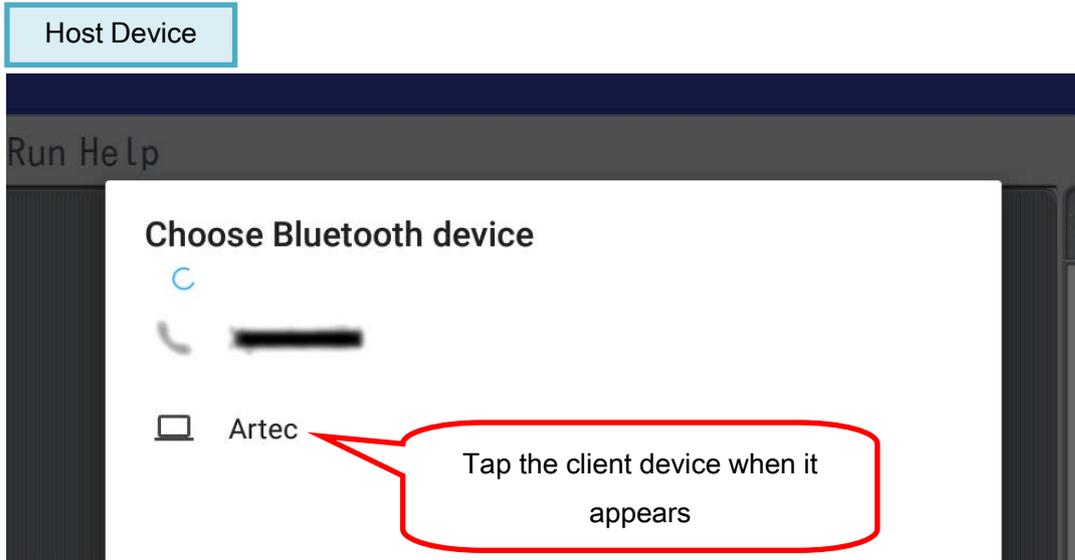
★ This will also show non-Android devices.

[For Client Devices]

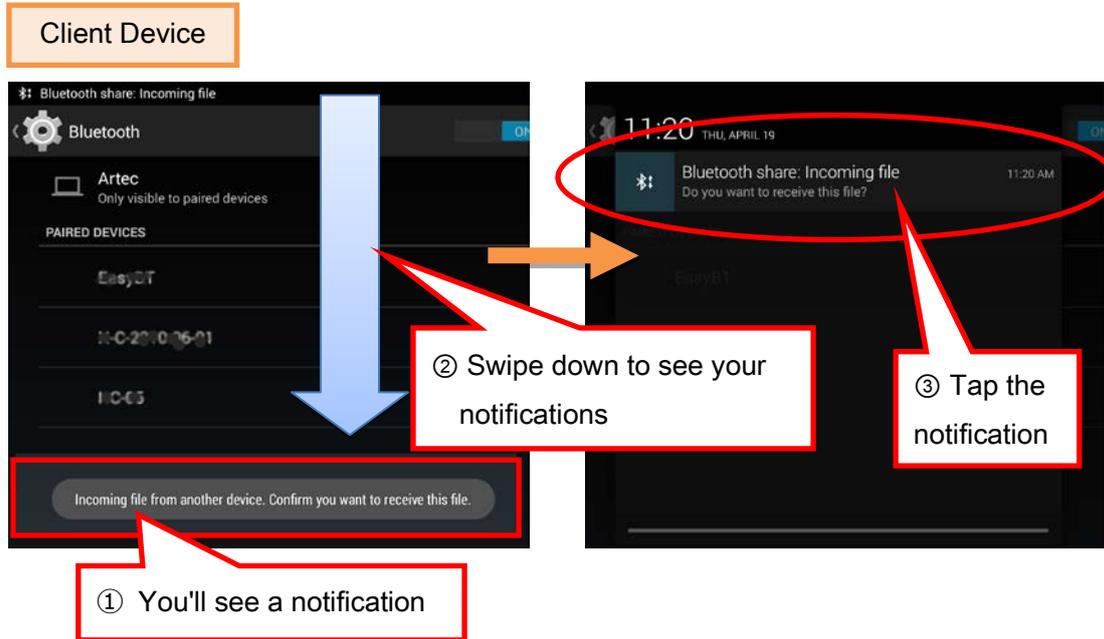
1. Go to Settings → Bluetooth to open the screen below.
2. Tap the device name to make it available for two minutes. Check that you can now see the client when searching on your host device.
 - ★ For some devices, simply opening the Bluetooth settings screen will make it appear to other devices.



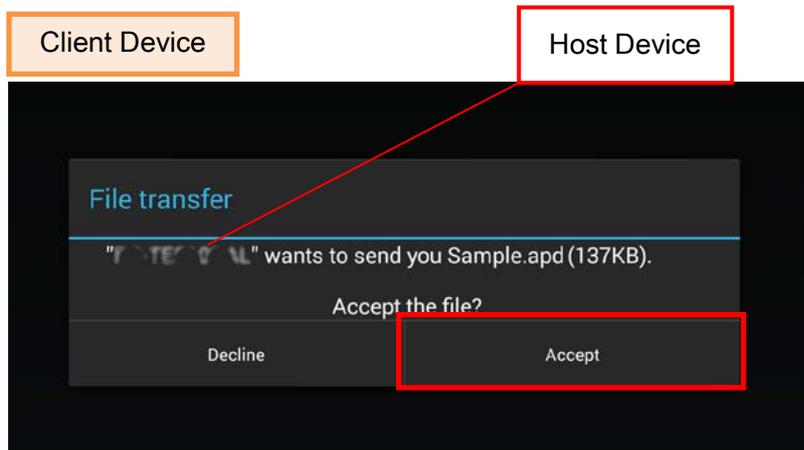
- ⑤ The client device will now appear in the list during step ④. Tap the device.



- ⑥ You'll see a file transfer notification like the one shown below on the client device. Swipe down from the top of your screen to see your notifications. Now tap the notification.



- ⑦ You'll see the dialog box shown below. Tap **Accept** to receive the project file.



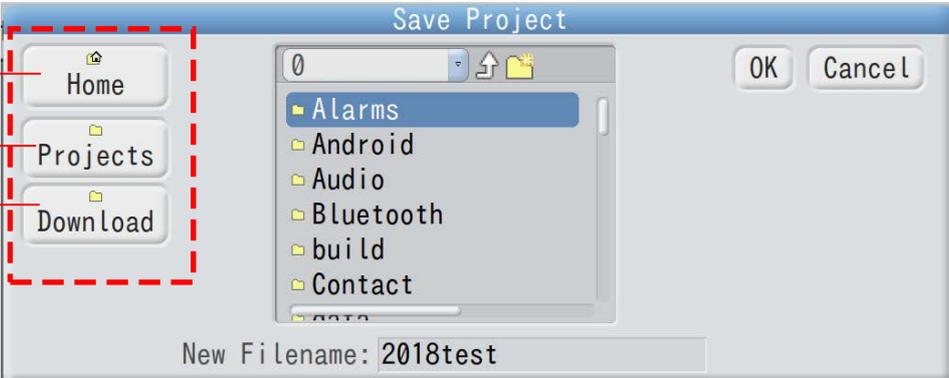
The project file you send will be saved in a folder named **Bluetooth**. See 8. **Android Folder Structure** to learn where to find this folder.

8. Android Folder Structure

Look below to learn more about the folder structure of your Android device. Tap **Open** or **Save** in the **File** menu and you'll see dialog boxes with buttons. Tapping each button will take you to a different folder.

Folder Structure

- [HOME] Root folder
- ├─ ■ Bluetooth Find files shared via Bluetooth here
- ├─ ■ Documents
- ├─ ■ Studuino Projects This is the default folder for projects
- ├─ ...
- ├─ ■ Download This is where you can find files you've downloaded from the Internet
- ★ This list only shows the applicable folders



New Filename: 2018test

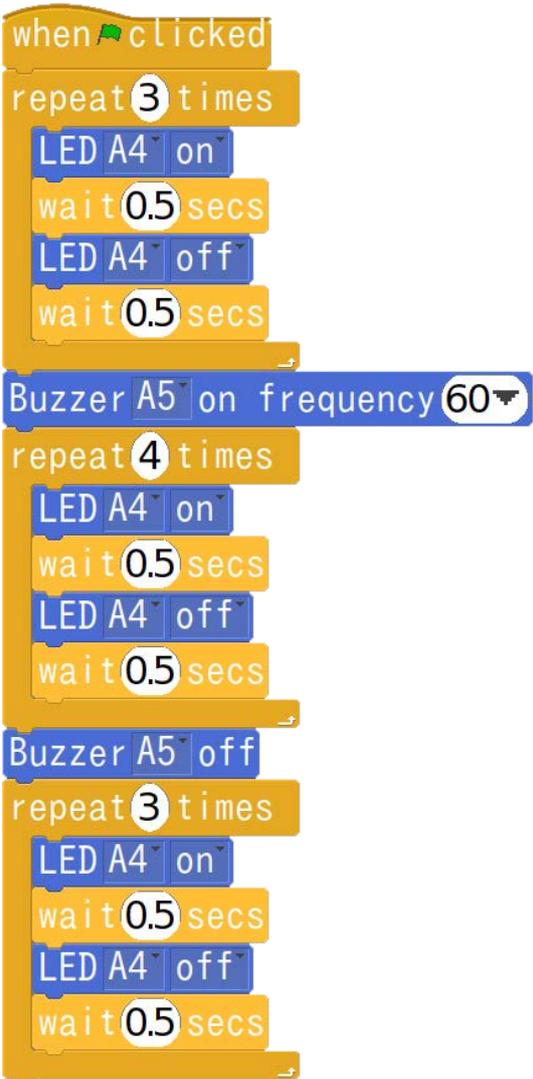
9. Programming Multiple Processes

You can use this application to run several different processes at the same time. This is called **parallel processing**, and you can use it to make your programs much simpler.

9.1. Different Parts at the Same Time

Here's an example of how to use multiple parts at the same time.

Let's say you wanted to make your LED blink 10 times in 0.5 second intervals, but three seconds into the program you want to play for Buzzer for four seconds. Make this program without parallel processing and it would look like this:



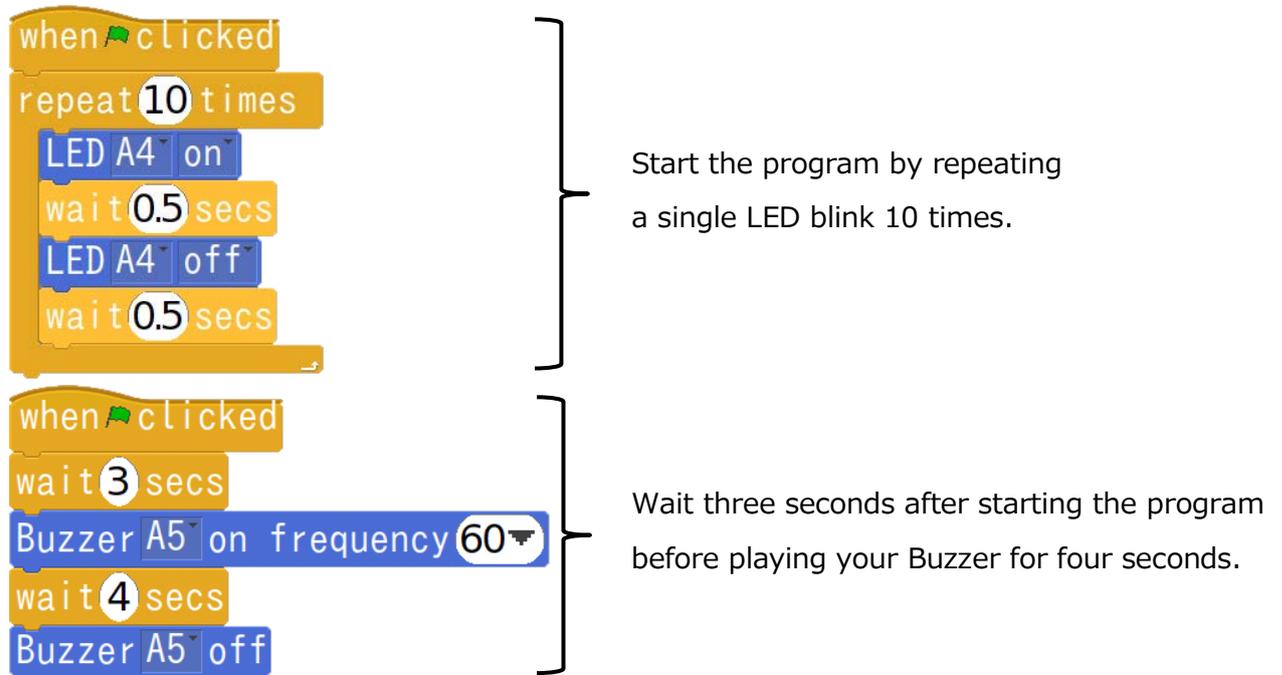
The image shows a Scratch script starting with a 'when clicked' event. It contains three main sections, each enclosed in a 'repeat' loop. The first loop repeats three times, with each iteration containing 'LED A4 on', 'wait 0.5 secs', and 'LED A4 off'. The second loop repeats four times, with each iteration containing 'LED A4 on', 'wait 0.5 secs', 'LED A4 off', and 'wait 0.5 secs'. The third loop repeats three times, with each iteration containing 'LED A4 on', 'wait 0.5 secs', 'LED A4 off', and 'wait 0.5 secs'. A 'Buzzer A5 on frequency 60' block is placed between the first and second loops. A 'Buzzer A5 off' block is placed between the second and third loops. Brackets on the right side of the script group these sections into three explanatory paragraphs.

Blink the LED three times in the three seconds it takes for the Buzzer to play.

Since it's been three seconds, play the Buzzer for four seconds and blink the LED four times.

Since it's been four seconds, stop the Buzzer and blink the LED three more times.
And now your LED's blinked 10 times!

But you can also try using two `when clicked` blocks to make separate programs for your Buzzer and LED and run them at the same time!



Separating your program into two different parts like this means you don't have to calculate all those different times. Plus it's easier to understand!

Another benefit of parallel processing is that if you want to change the amount of time for your LEDs or your Buzzer, you only need to change that specific part of the program!

10. Studuino for Android vs. the Block Programming Environment

There are several key differences between this application and the Block Programming Environment on PC. Follow the table below to see the major ones:

Function	PC	Android	Notes
Transfer	O	X	Any programs you make in this application can't be transferred and run on your Studuino. Your Studuino must be connected to device running this application in order for your program to run.
Running Multiple Processes (Parallel Processing)	X	O	You can use this application to run several different processes at the same time. See 9. Programming Multiple Processes in this manual for details.