CoDrone Mini
Rokit Brick

ENG

ROKIT **BRICK** for **codrone** MINI

Controlling CoDrone Mini with Rokit Brick

Introduction

1. Enter coding mode from PC
Drone Simulator & Rokit Brick

1

Connect the USB cable to your PC

2

Connect the cable (micro 5 pin) to the controller port

3

> ∨ 🖥 포트(COM & LPT)
>   🖥 **USB serial device(COM 13)**
>   🖥 통신 포트(COM1)
>   🖥 표준 Bluetooth에서 직렬 링크(COM14)
>   🖥 표준 Bluetooth에서 직렬 링크(COM7)
> › 🔲 프로세서
> › 🖨 프린터
> › 🎮 휴먼 인터페이스 장치

Check the COM PORT number in Device Manager - Port
(COM PORT numbers may vary from PC to PC)

4

Occasionally, a bad 'Micro 5 pin' may prevent 'COM PORT number' from appearing.
(In this case, please replace Cable.)

!
- Windows 10 : The UBB driver will be installed automatically
- Windows 7,8 : UBB drivers must be installed manually
※ The name of the device manager may be marked 'STM32 virtual COMport'

5

Put a battery in the drone, turn on the power, and connect the controller to the drone.

6

With Rokit brick coding, you can get the drone flying as much as you want.

2. What's the 'Rokit Brick'

Rokit Brick is based on "Snap" and has existing Scratch programs such as robots, drones and others.
Scratched SW developed by combining various control functions. The method used is almost the same as Scratch.

HWs such as 'Rokit Smart Series' and 'CoDrone' can be controlled in Scratch format.
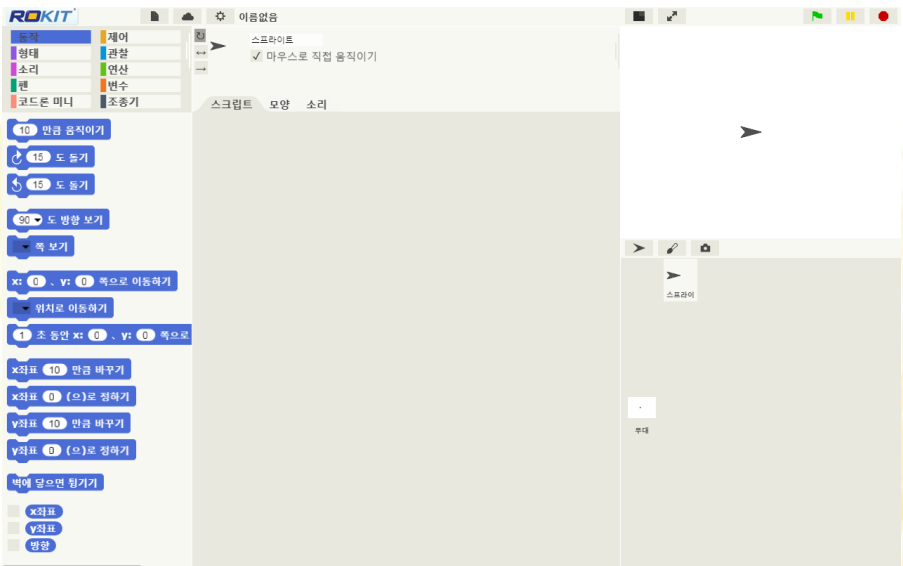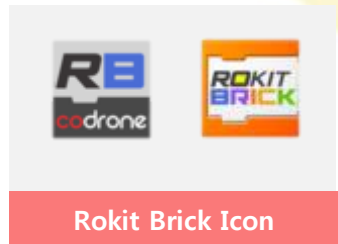
Rokit Brick Icon

3. Run the 'Rokit Brick for CoDrone'

(1) Run 'RBCodrone.exe' in the installation path of 'Rokit Brick for CoDrone'
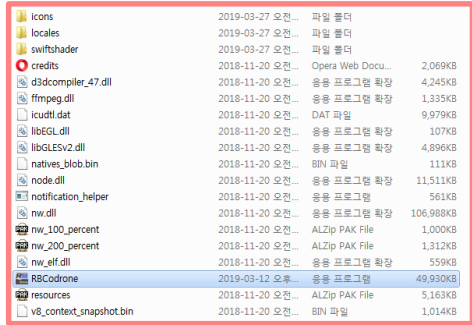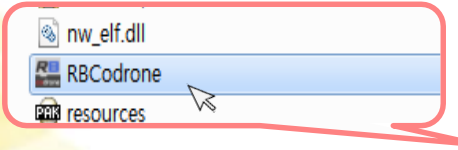
(2) When the program is running, Run '**Rokit Brick' with the '<   >'** Button on the left screen

(3) '**Rokit Brick'** runs normally, as shown in the image on the right

4. Connection between Rokit Brick and CoDrone

If you have connected your PC and remote control, please make sure your **USB drive** is installed successfully.
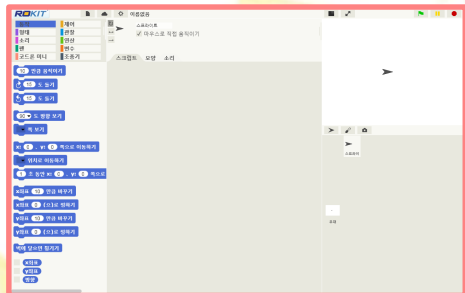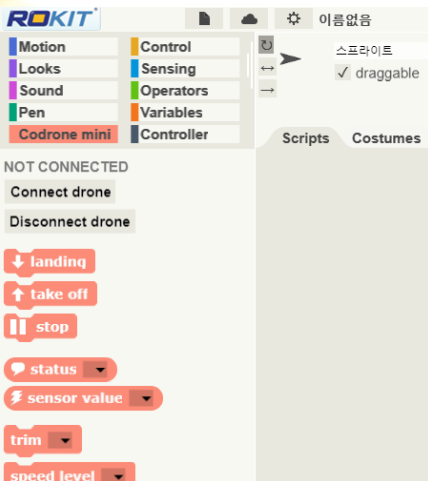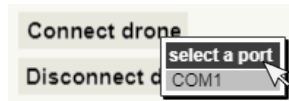
After installing the drive and verifying the **COM number**, run **Rokit Brick for Codrone** (RBCodrone, Rokit Brick CoDrone).

Click Codrone mini on the bottom left palette to see the drone control blocks and check the two buttons

Connect the controller to the PC, then press the 'Connect to drone' button to connect the PC and the drone.

Even if the drone is turned off by removing the battery during use, there is no need to disconnect the drone, and it is automatically connected when the drone is switched back on.

CAUTION !

• **Before pressing the Connect to Drone button, the drones and controllers must be paired!**
• **If you have too many ports to connect to, check Device Manager.**

5. Screen configuration for Rokit Brick

The basic menu and screen layout is similar to 'Scratches in MIT'
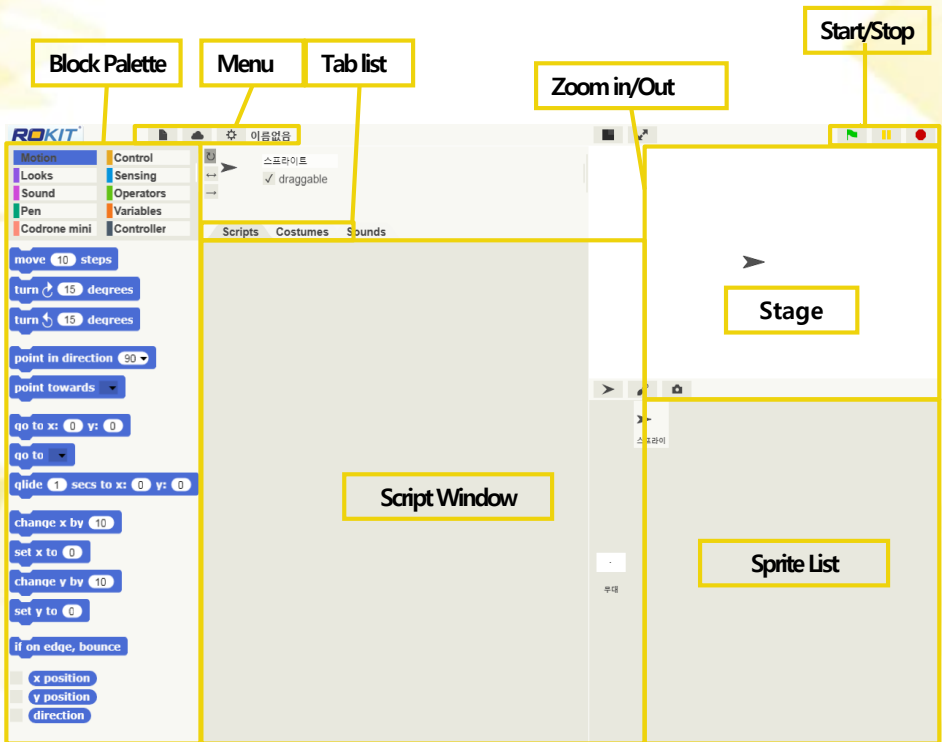
Control CoDrone with motion block

CoDrone Block Description

1. Import Image

From the menu, you can get the desired image using the 'look tab'
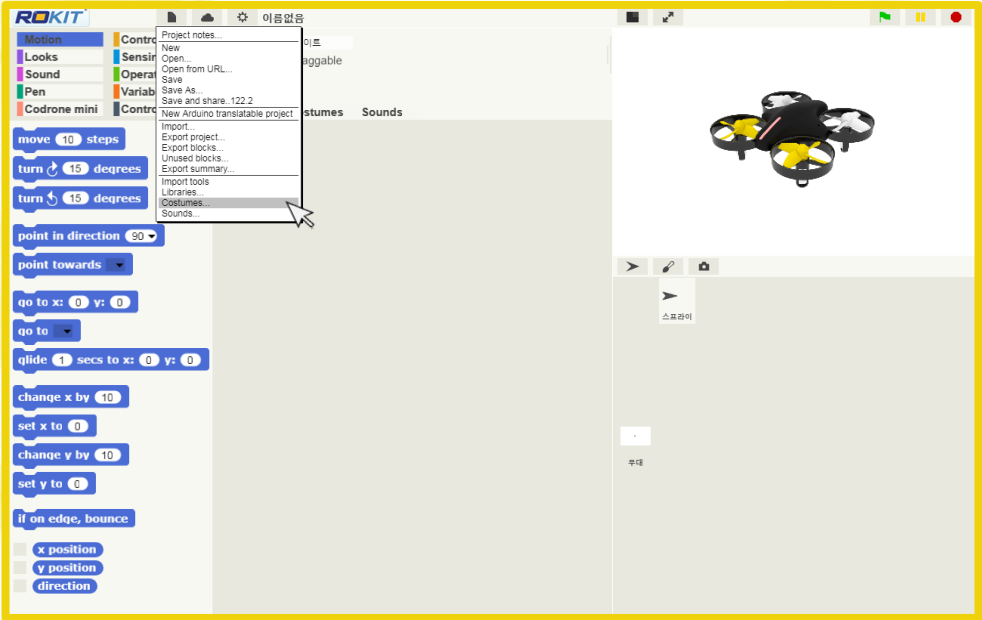
You can resize the stage by dragging the "boundary line" with the mouse.

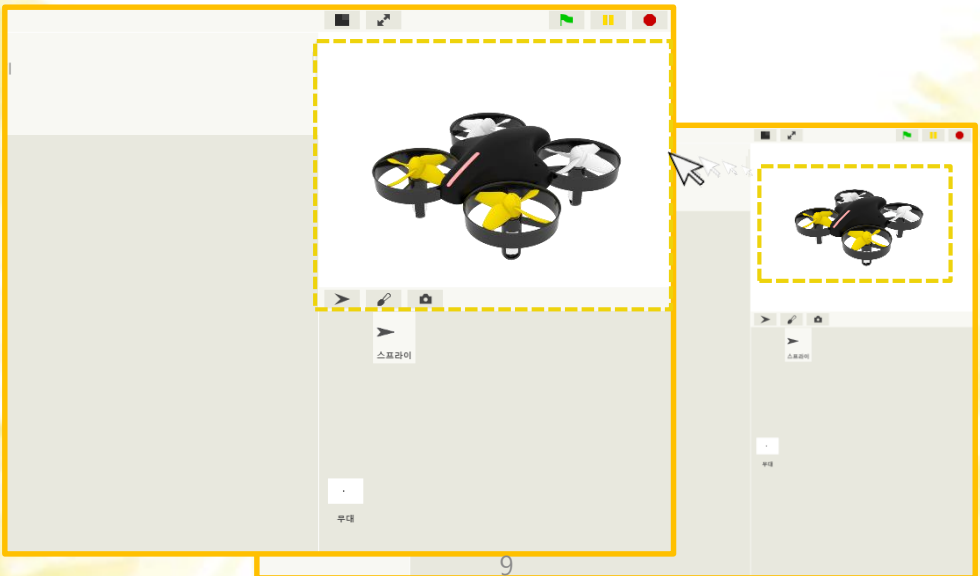# 2. Example of moving sprites

1) Move drone sprite (Go straight to CoDrone)

Import `move 10 steps` from the motion block group to the script screen.
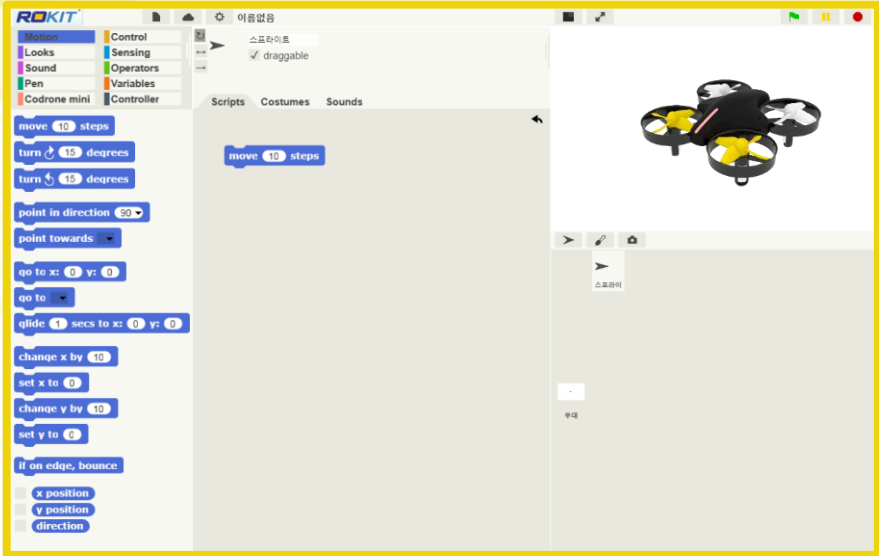
Each time the mouse clicks on the block on the script screen, the drone moves forward by as much as 10.
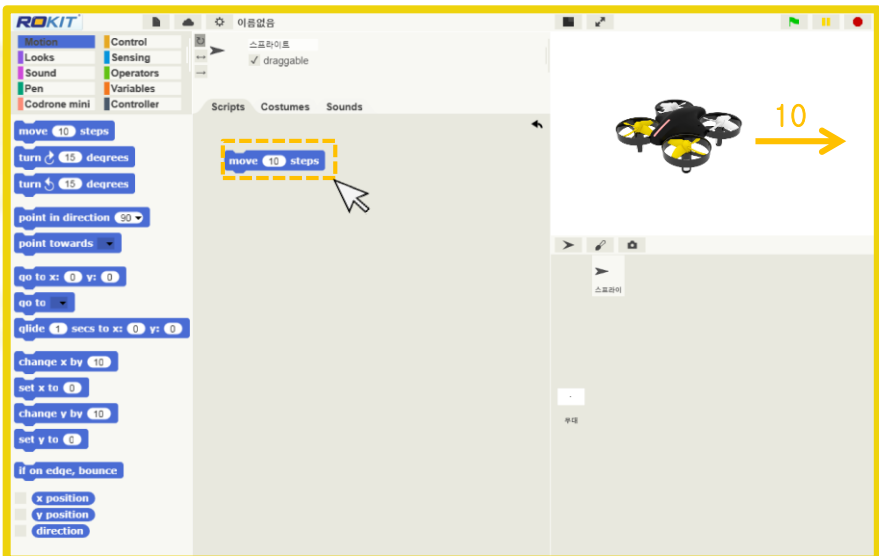
You can see it right away by clicking on the mouse, and it's usually in the control block group. You start driving using when clicked or when space key pressed
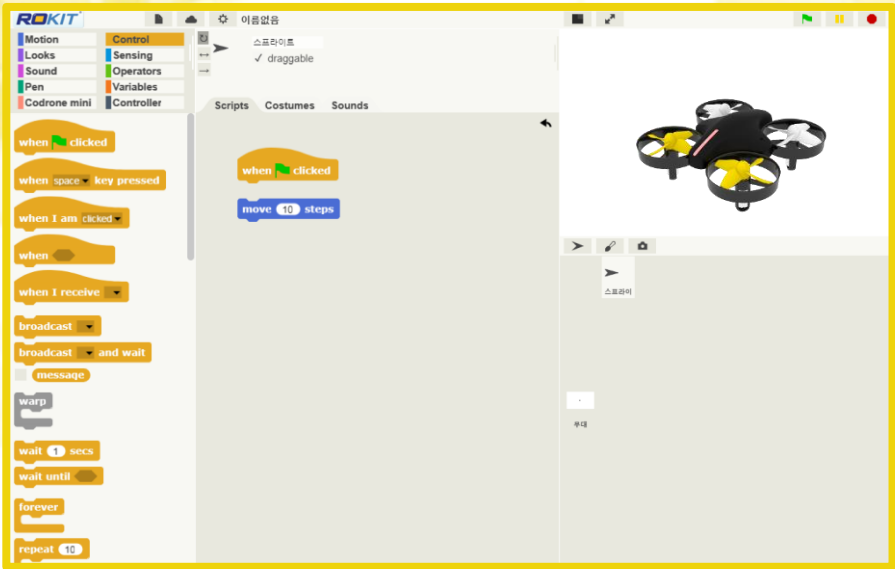
Connect Block when clicked to move 10 steps, and click on the green flag to move.
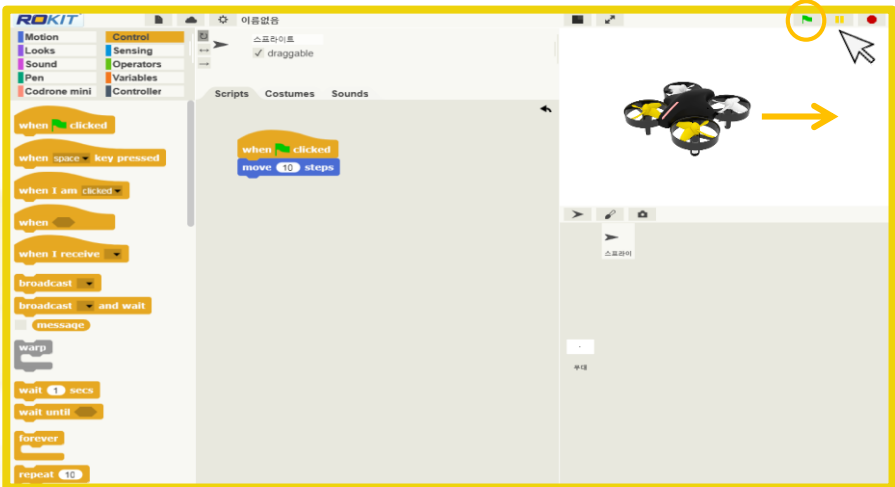
Drone Homeward Movement

If the drone disappears to the point where it cannot be seen, then it's on the Motion tab [Move to x:0, y:0] Click on block go to x: 0 y: 0 to start the home position return to

11

2) Move drones (move drones continuously)

Connect the infinite repeat block in the control block group to `10 만큼 움직이기`
A. To drive. To travel to where the drone is not seen as a click.
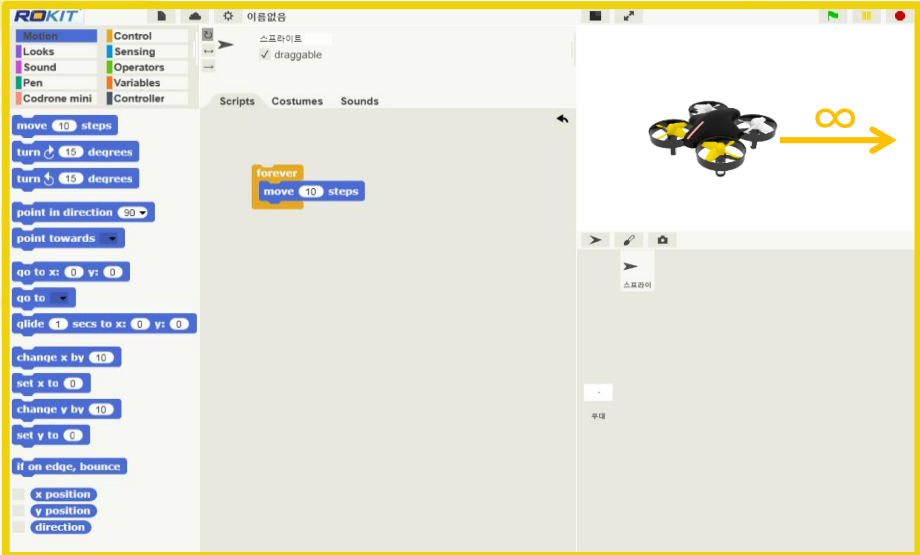
To have the drone repeat bouncing on the wall without disappearing out of the screen: Use Block `if on edge, bounce`

3) Move drones (take-off and landing)

If the drone is to move as shown in Figure 1, it can be coded using the coordinate values and `wait 1 secs` (Delay) as shown in Figure 2.

그림1

그림2

To change the distance of the drone shown in Figure 1, the blocks shown in Figure 3 are: Change the x, y coordinate values. Similarly, the amount of time to wait is entered for the desired time. can be changed into

그림3

4) Move Drones (Use variables)

Let's create a program that only "repeats three times" the following movements, rather than "no uniform." Try to minimize the number of blocks used.
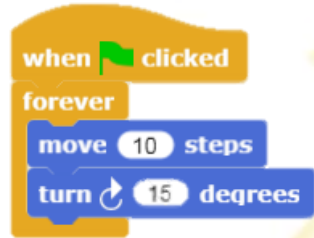
Create a variable to change the movement value of the block. Variable block group In , press the Create Variables button and create a variable named A.
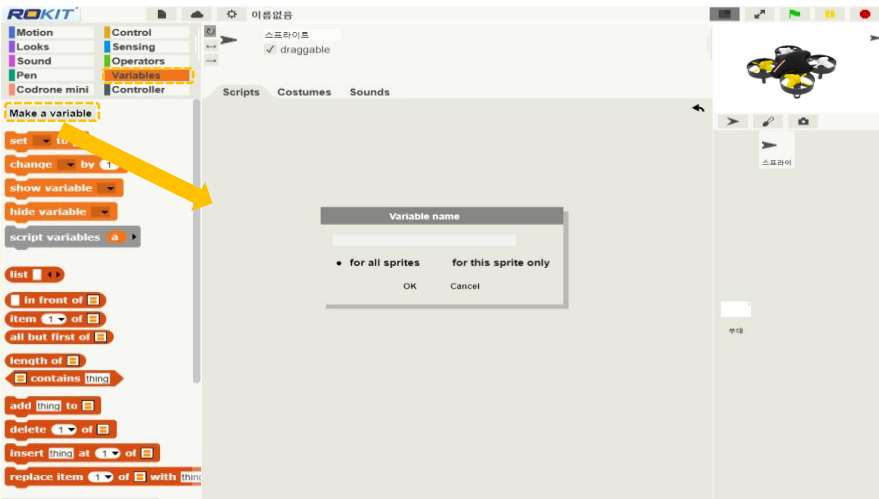
Variable?

A variable, especially one used a lot in a program, is a non-numeric character that creates space for storing numbers and allows you to put the desired number at any time.

e.g. A = 5, Value = 0

Creating a variable named A creates a variable block group as shown below and creates a variable on the stage.
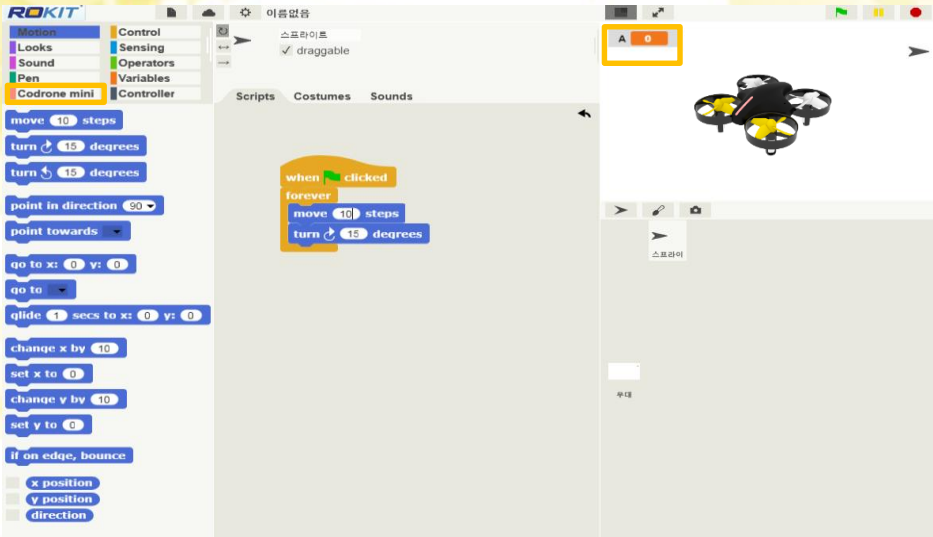
Drag the A-parameter block created on the left to the part where you want to change it.
Right-click the variable that appears on the stage to select the slider.
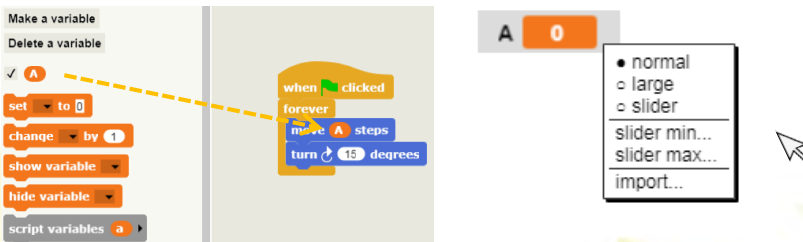
And after you've run the stage, you can move the A variable slider on the stage with your mouse, and you can change the variable in real time. You can see that the rotating radius of the drone has become larger and smaller as the value changes.

3. Move drones (take-off and landing)

1) Create a "Drone moves back and forth motion reflecting the wall" and make a variable.
   Use to adjust the "moving speed."


2) Let's create a program that only "repeats three times" the following movements, rather than "no uniform." Try to minimize the number of blocks used.
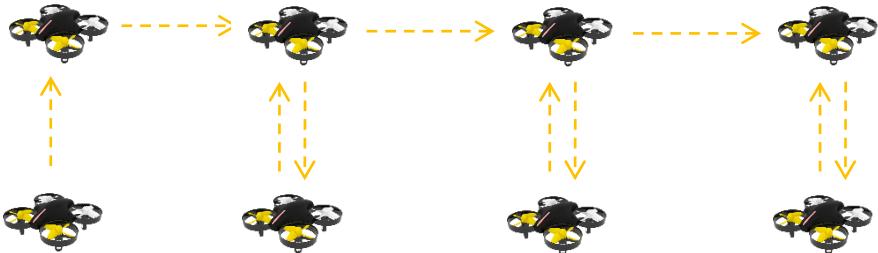
3) After creating a landing site through the addition of a new sprite, Implementing the drone landing at the landing site in a variety of ways
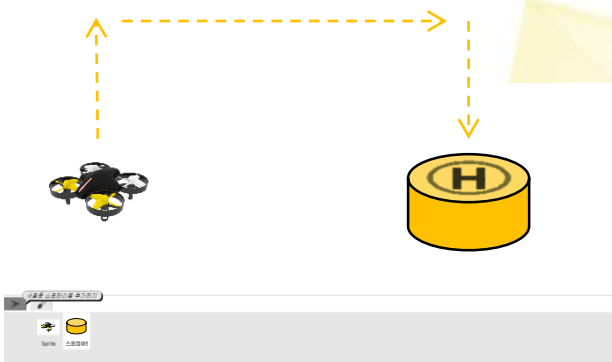
To control CoDrone with motion blocks

CoDrone Block Description

To control a CoDrone with an operating blocks of motion

1.CoDrone Mini Block Description:Motion Block

↑ take off	All flight movements of the drones start with this block.
↓ landing	Drone landings.
‖ stop	Drones Stop Motion

※ The control block value below has a value between -100 and 100 and the output (%)

set THROTTLE ▾ to ● %	Up/down (altitude) vertical movement
set YAW ▾ to ● %	Left turn, right turn
set PITCH ▾ to ● %	Forward and backward (forward/backward) movement
set ROLL ▾ to ● %	Left-hand, right-hand movement
롤 ● 피치 ● 요우 ● 쓰로틀 ●	Used to change multiple values at the same time

1.CoDrone Mini Block Description:Motion Block

Connecting a board from the CoDrone tab results in CoDrone blocks that can control the CoDrone.

If the drone doesn't stop at a strange direction, press the **stop** button at any time to stop the motion.
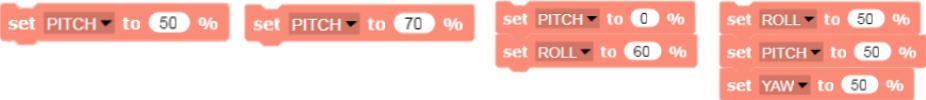
If multiple blocks are difficult to use over time, you can change several values at the same time to one block below. Values left blank without input are considered zero.

And when you add a waiting block (delay block), the specified control value is maintained for a specified period of time before the next block is operated.
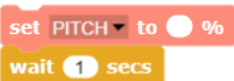
: With the pitch value set to 50%, it remains intact regardless of the wait block below (no trailing blocks)

: Set pitch to 50% and continue for 2 seconds before the drone stops working

1.CoDrone Mini Block Description:Motion Block

set THROTTLE to 50 %

throttle : Vertical Move Up and Down

Rise+

set YAW to 50 %

yaw : Turn left, move right.

Turn right+

set PITCH to 50 %

pitch : Forward, Reverse Movement

Forward+
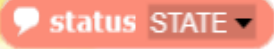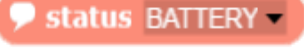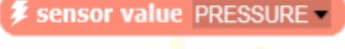
set ROLL to 50 %

roll : Left, right, right.

Rightward movement +

2. CoDrone mini-block description – drone information and sensor block

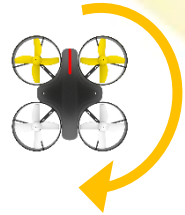|	
status STATE ▼	Shows the flight status of the drones. (atmospheric/landing/take-off/flight, etc.)
status HEADLESS ▼	Shows what direction the drone's flight is based on. (Headless / Normal)
status TRIM PITCH ▼	Shows the value of the fine adjustment for the pitch.
status TRIM ROLL ▼	Shows the fine adjustment value for the roll.
status SENSOR ORIENTATION ▼	Shows the current status of the drone according to the angle measuring sensor. (Normal / Start Flipping / Flip)
status BATTERY ▼	Shows the remaining battery percentage of the drone.
sensor value ROLL ▼	Shows how much the drone's gas is tilted from side to side.
sensor value PITCH ▼	Shows how much the drone's gas is tilted up and down.
sensor value YAW ▼	Shows how the drone's fuselage rotates left and right.
sensor value TEMPERATURE ▼	Shows the internal temperature of the drone.
sensor value PRESSURE ▼	Shows the air pressure measured by the drone.

3. CoDrone Mini-block description – fine-tuning block

trim PITCH INCREASE ▼	Hovering, drone moving backwards. Click to adjust.
trim PITCH DECREASE ▼	Hovering, drone moving forwards. Click to adjust.
trim ROLL INCREASE ▼	Hoverling, drone moving left. Click to adjust.
trim ROLL DECREASE ▼	Hoverling, drone moving right. Click to adjust.
trim TRIM RESET ▼	Resets fine adjustment values. (back to 0)

3. CoDrone Mini-block description – fine-tuning block

Mastering the Hovering

What is hovering? A movement of floating in the air, maintaining a constant height and fixed position, which is the basis for all drone movements. For autonomous flights to work well, the hovering motion should be learnt first.

Steps for Correct Hovering

(a) take off

(b) make sure the drone does not move in any direction.

● When the drone goes to the left   `trim PITCH INCREASE ▼`

● When the drone goes to the right   `trim PITCH DECREASE ▼`

● When the drone runs back   `trim ROLL INCREASE ▼`

● When the drone goes forward   `trim ROLL DECREASE ▼`

Fine-tuned values are CoDrone Mini-control Appears on the block palette.

P: pitch value R: roll value

4. CoDrone mini-block description – speed level adjustment and dexterity

speed level LEVEL 3 ▼	Determines the level of drone speed. - Level 1: Low speed control - Level 2: Medium Speed Control - Level3: Maximum speed control.
flight event FLIP_FRONT ▼	Demonstrating dexterity (dumbling) Block (forward / back / right / left)

COM30 SPD:3 P:30 R:30
Connect drone
Disconnect drone

speed level LEVEL 3 ▼

The speed level values are displayed on the CoDrone Mini Control Block palette (SPD).

TIP

Equal pitch value for speed level 1 and 3
Even if it's 50 it's a big difference in speed.
If you want to control it at dynamic speed, you need to set the speed level at 3.
If you want a safe speed, you can control it by 1.

5. CoDrone Mini Block Description – LED Control Block

light color ■ mode NONE ▼	Turns off the drone's LED.
light color ■ mode HOLD ▼	Turns on the drone's LED in the specified color.
light color ■ mode FLICKER ▼	Blinks the drone's LED to assigned colors.
light color ■ mode FLICKER DOUBLE ▼	Flashes the drone's LED twice.
light color ■ mode DIMMING ▼	Dims the drone's LED.
light color ■ mode SUNRISE ▼	Brightens the drone's LED.
light color ■ mode SUNSET ▼	Turns on the drone's LED, and then slowly dim it.

Controlling CoDrone Mini with Rokit Brick

Example of CoDrone Mini Lab

Make sure to check the items below before practicing CoDrone.

1) Check the hover status.

2) Check the gas mode.

3) Clear the angle value of the block to zero.

1. Example of flying CoDrone Mini-spaces

The CoDrone Mini-tab has drone / yaw / pitch / roll / dexterity.
There are several drone control blocks to operate. Let's combine
these and existing scratch blocks to code your own drones.

Example of a green flag button popping up in the air for a while and
then stopping (take it by hand)

Five seconds After take off	▶	Landing

① Take-off   ② 5 s   ③ Landing

```
when 🏳 clicked
↑ take off
wait 5 secs
↓ landing
```

```
when space ▼ key pressed
⏸ stop
```

Spacebar: Emergency
Landing Key

TIP

**Wait five seconds after the take-off block, meaning after
the drone has received the take-off order.**

2. Example of Mini-movement of a CoDrone with Rokit Brick.

An example of a green flag button that pops up in the air for a while and lands in the hand.

take-off order 3 seconds later.	▶	Pitch (+30) One second after the command.	▶	Landing

① take-off   ② 1s   ③ Landing
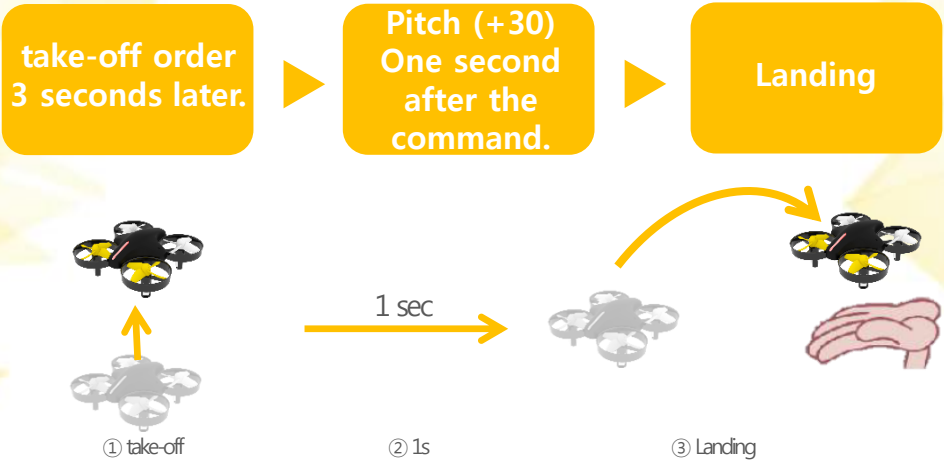
1 sec


```
when [green flag] clicked
↑ take off
wait (3) secs
set [PITCH ▼] to (30) %
wait (1) secs
↓ landing
```

```
when [space ▼] key pressed
❚❚ stop
```

3. Example of Mini-movement of a CoDrone with Rokit Brick.

When you click on the green flag button, the drone takes off, moves forward, and then moves on.
I want you to fly sideways (left)

Take-Off order	▶	Peach 50% 1.5 sec	▶	Roll 50% 1.5 sec	▶	Landing

① take-off   ② Pitch (forward) 1.5 sec   ③ Roll(Left movement) 1.5 sec   ④ Landing

when 🏳 clicked
↑ take off
wait 3 secs
set PITCH to 50 %
wait 1.5 secs
set PITCH to 0 %
set ROLL to -50 %
wait 1.5 secs
set ROLL to 0 %
↓ landing

when space key pressed
⏸ stop

1.5 s movement in forward direction (pitch)

Clear the forward direction output (pitch) to zero

Move left (-roll) for 1.5 seconds.

Clear left-hand output (roll) to zero

* Different time or pitch output values can be used to adjust the travel distance.

In the example above, before changing the direction of movement of the drone to the left, why did you clear the value of the forward direction to zero?

Advance if not cleared to zero when turning like this (peach)
The velocity of the direction is still left, so we give it a left-hand roll value to the left.
As you move, you move diagonally. Therefore, the forward speed must be zero.
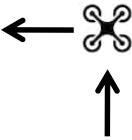
If the pitch value is cleared to zero
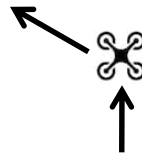
If the pitch value has not been cleared to zero

4. Example of Mini-movement of a CoDrone with Rokit Brick.

Adjusting the hover condition of the drone (fine tuning exercise)

For precise control using coding, after the drone takes off and is in place, wait and make sure that it does not move in any direction as much as possible. Use the fine-tuning blocks to adjust the hover.

Take-off	▶	Hoverling Condition observation	▶	Adjust by pressing the w,a,s,d key	▶	Landing

① take-off   ② hoverring observation   ③ fine adjustment   ④ stop
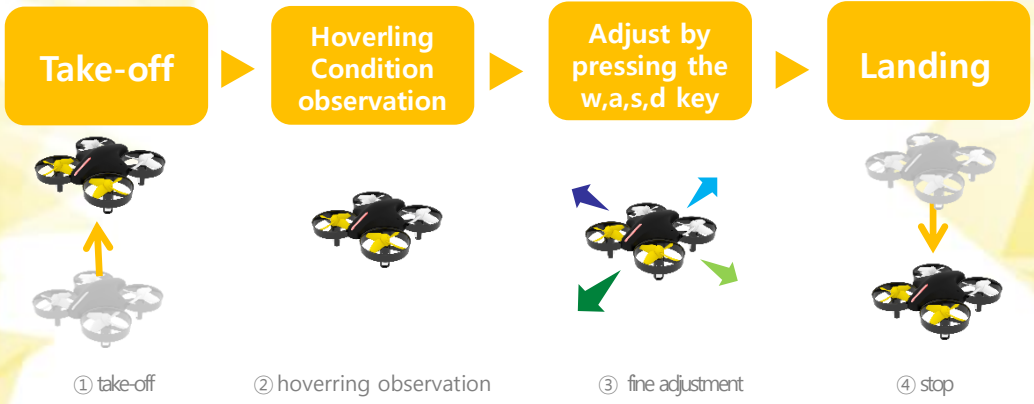
when 🚩 clicked
↑ take off

when space ▼ key pressed
⏸ stop

when w ▼ key pressed
trim PITCH INCREASE ▼

when a ▼ key pressed
trim ROLL INCREASE ▼

when s ▼ key pressed
trim PITCH DECREASE ▼

when d ▼ key pressed
trim ROLL DECREASE ▼

```
      W
 A   S   D      fine adjustment
```
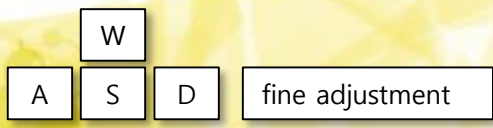
5. Example of flying CoDrone acrobatics

Example of flying and landing in a circle, right after CoDrone take-off

Take-off 2 sec ▶ **Rotary Flight 4 Repetitions** ▶ **Landing**

① take-off　　　② Rotary Flight 4 repetitions　　　③ Landing

```
when  s ▼  key pressed
↑ take off
wait  5  secs
repeat  4
    set  THROTTLE ▼  to  0  %
    set  YAW ▼  to  -100  %
    set  PITCH ▼  to  100  %
wait  2  secs
↓ landing
```

```
when  space ▼  key pressed
⏸ stop
```

Changing the yaw value and the deviation value at the same time
> Make it rotate in a circle

6. LED Animation Example

Control the LEDs in a drone for different color and animation effects

Example of slowly turning on and off, changing colors at intervals of 2 seconds

7. to Queen during the flight to (Dumpling)

A drone that takes off goes back and forth and does a trick-or-treating in the air.

Forward	▶	Front Flip	▶	Reverse	▶	Back Flip

3 - repetitions

① Forward　　　② Front Flip　　　③ Reverse　　　④ Back flip
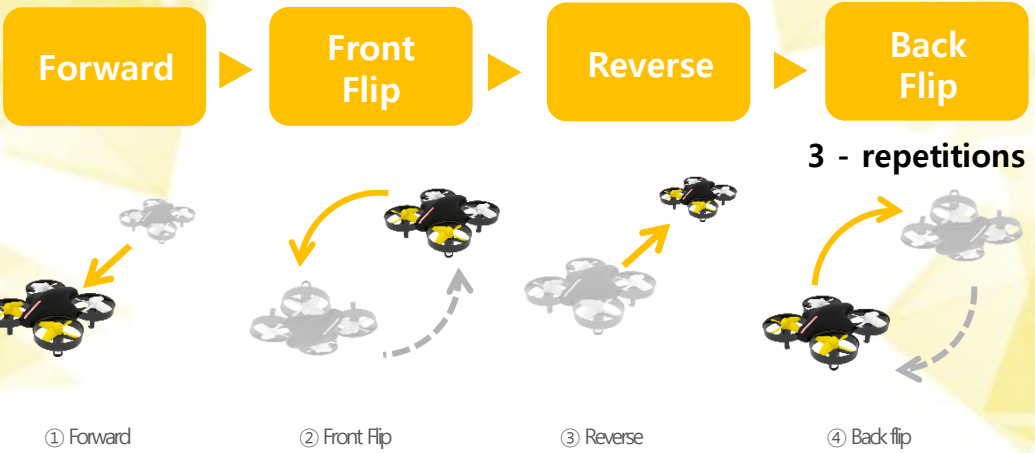
```
when 🏳 clicked
↑ take off
wait 5 secs
repeat 3
  set PITCH ▾ to 40 %
  wait 2 secs
  set PITCH ▾ to 0 %
  wait 2 secs
  flight event FLIP FRONT ▾
  wait 2 secs
  set PITCH ▾ to -40 %
  wait 2 secs
  set PITCH ▾ to 0 %
  flight event FLIP REAR ▾
  wait 2 secs
↓ landing
```

```
when space ▾ key pressed
⏸ stop
```

Forward at 40% power for 2 Seconds

Exceeding week + requires waiting time (set to 2 seconds)

Reverse to 40% output for 2 seconds

Exceeding week + requires waiting time (set to 2 seconds)

8. Example of receiving CoDrone sensor values – Attitude control values

Example of receiving and utilizing control values related to CoDrone Mini's posture

1) Receiving the position control value of the CoDrone Mini

The magnetic field on the bottom of the CoDrone. If there is an object that stands out,
The YAW angle is continuous. There can be a growing and decreasing phenomenon.

2) Receive the attitude control value of the CoDrone and rotate the sprites.

Before coding, I'd like to put the sprite on it.
Upload CoDrone Image
It should.

3) Receiving the attitude control value of the CoDrone

Depending on the sensor state of the CoDrone,
The angle you need to subtract from the YAW,
It can be different.

Create Variable Block
To use a variable, you must create a variable block.

Click on Variables tab > Create Variables Block > Enter variable name > Create variable block

Motion	Control
Looks	Sensing
Sound	Operators
Pen	**Variables**
Codrone mini	Controller

Make a variable
Delete a variable ⇦Click!

Make a variable
Delete a variable
✓ **roll**

Variable name

• for all sprites	for this sprite only
OK	Cancel
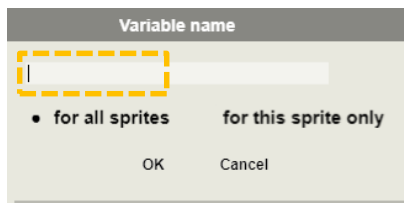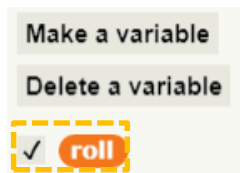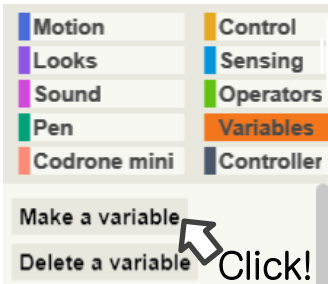
9. Receiving CoDrone Sensor Value Example – Receiving Battery Value and Drone Status

Examples of receiving battery values and the state of a drone

1) Receiving Codrone Mini's battery value

On the Variables tab before coding
The battery value variable you want to save:
You must create a new one.

2) Controlling CoDrone Mini with Rokit Brick
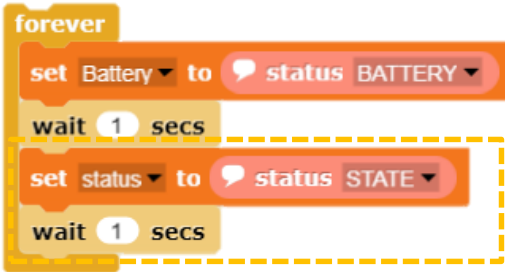
We're receiving battery values, and we're going to use a variety of blocks to check the flight status.
You can check it.
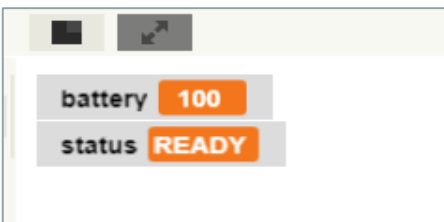
Variables printed on canvas

Controlling CoDrone Mini with Rokit Brick

Manipulate

Using the Controller

Use the controller buttons or joysticks to create a script that performs interesting actions.

SPPED   LED/FLIP

Y   Y

X   X

UP

LEFT   ON/OFF   RIGHT

DOWN

RESET

PAIRING
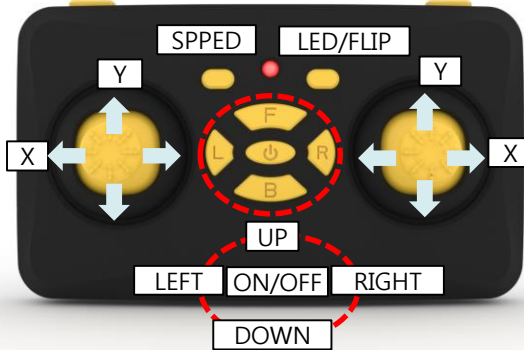
💬 **button status**

Button status notification :
-UP: No button on the controller is pressed
-PRESS: One of the controller's buttons is pressed
-DOWN: One of the controller's buttons is just being pressed.

💬 **button input**

Tells which buttons are pressed (see figure above)

left joystick

```
VALUE X
VALUE Y
DIRECTION
EVENT
```

Left / Right joystick status indication
-X-axis direction change from -100 to +100
    (- : Left, + : Right)
-Y-axis direction change from -100 to +100
    (+: Up, - : Down)
    Direction: The direction (position) of the joystick
    towards is abbreviated as shown below.
    Reminders
    Event : Detects and displays the direction of the
    joystick changing
    (IN/OUT/STAY)
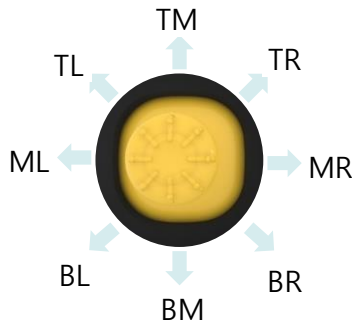
Controller color change block:
Change the LED color of the controller. Block to change
the color of the drone as shown below.
Set the same LED color for the controller and the drone
when used in conjunction with .I can do it.

controller light ☐ **turn** ON ▼

controller light ☐ **turn** ON ▼
wait 0.5 **secs**
controller light ☐ **turn** ON ▼

```
when 🏳 clicked
forever
  if  💬 button input = PRESS
  if  💬 button input = UP
    change y by 1
  if  💬 button input = DOWN
    change x by -1
  if  💬 button input = LEFT
    change y by -1
  if  💬 button input = RIGHT
    change x by 1
```

Confirm the button first
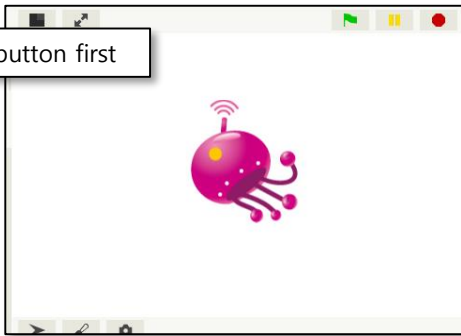
Click on the button 📄 > Appearance >
click on the rollink > Select harry_1

R1   L1   H

Start the script when the controller's button is pressed

Check which button is pressed

3. Create a drone virtual-control exercise program with the controller

- **Left joystick Y-axis: Drone sprite. take-off or landing control**

- **Left joystick X-axis: Drone sprite. left and right rotation**

- **Right joystick X-axis: Drone sprite. left and right parallel shift**

- **Right joystick Y-axis: Drone sprite. back and forth movement**

Sprite is 📄 click > Shap > Click on rollink > select codron2_up

A   **Create Right Joystick Partial Script (Pre-Left and Left)**

Create left joystick partial script (take-off and left-hand rotation)

```
when I receive LJOYSTICK ▼
forever
  if  💬 left joystick DIRECTION ▼ = TM
    if  size < 100
      change size by 1

  if  💬 left joystick DIRECTION ▼ = BM
    if  size > 20
      change size by 1

  if  💬 left joystick DIRECTION ▼ = MR
    turn ↻ 1 degrees

  if  💬 left joystick DIRECTION ▼ = ML
    turn ↺ 1 degrees
```

To make a sprite smaller or larger. The effect of the drone rising or falling

C   **Create a startup script**

```
when 🏁 clicked
point in direction 90 ▼
go to x: 0  y: 0
set size to 50 %
broadcast LJOYSTICK ▼
broadcast RJOYSTICK ▼
```

```
when space ▼ key pressed
⏸ stop
```

Adjusting sprit size and orientation Zeroed

Left / Right Joystick Script Runs at the same time

```
when 🎮 button input = PRESS
forever
  if 🎮 button input = L1
    ⬇ landing
    wait 1 secs
  if 🎮 button input = R1
    ⬆ take off
    wait 1 secs
  if 🎮 button input = H
    ⏸ stop
    wait 1 secs
```

```
when I receive RJOYSTICK ▾
forever
  if 🎮 right joystick DIRECTION = TM
    change y by 1
  if 🎮 right joystick DIRECTION = BM
    change y by -1
  if 🎮 right joystick DIRECTION = MR
    change x by 1
  if 🎮 right joystick DIRECTION = ML
    change x by -1
```

```
when I receive LJOYSTICK ▾
forever
  if 🎮 left joystick DIRECTION ▾ = TM
    if size < 100
      change size by 1
  if 🎮 left joystick DIRECTION ▾ = BM
    if size > 20
      change size by 1
  if 🎮 left joystick DIRECTION ▾ = MR
    turn ↻ 1 degrees
  if 🎮 left joystick DIRECTION ▾ = ML
    turn ↺ 1 degrees
```

```
when 🚩 clicked
point in direction 90 ▾
go to x: 0 y: 0
set size to 50 %
broadcast LJOYSTICK ▾
broadcast RJOYSTICK ▾
```

```
when space ▾ key pressed
⏸ stop
```

4. Write a script to control a drone like RC mode with the controller
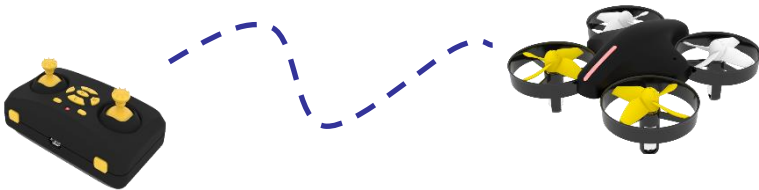
A   **Create a script to adjust the value of the Euler angle with the left and right joysticks**

```
when I receive GOGO ▾
forever
  set THROTTLE ▾ to 🎮 left joystick VALUE Y ▾ %
  set YAW ▾ to 🎮 left joystick VALUE X ▾ %
  set PITCH ▾ to 🎮 right joystick VALUE Y ▾ %
  set ROLL ▾ to 🎮 right joystick VALUE X ▾ %
```

X: throttle   X:pitch

Y:yaw   Y:roll

when (💬 button status) = PRESS and (💬 button input) = L1

⬇ landing

wait 2 secs

stop all ▾

L1 Button : All Euler values are set to zero before landing.

Script is executed when the controller's button is pressed

when (💬 button status) = PRESS and (💬 button input) = R1

⬆ take off

wait 2 secs

broadcast GOGO ▾

R1 button : After takeoff, adjust the oiler angle and run the script, (Joystick-controlled)

TIP

When L1 is pressed (landed) the roll/ pitch/yow/roll value is set to zero because the Euler values that were previously executed during the next run can affect the flight.
If it doesn't clear up to zero, when it lands and takes off again,
The remaining values may cause the drone to fly in an unintended direction.

# Controlling CoDrone Mini with Rokit Brick

Appendix

Appendix 1 – Pairing

Pairing means connecting the drone and the controller with the same communication settings. Pairing allows only two devices to communicate without interference from other devices.
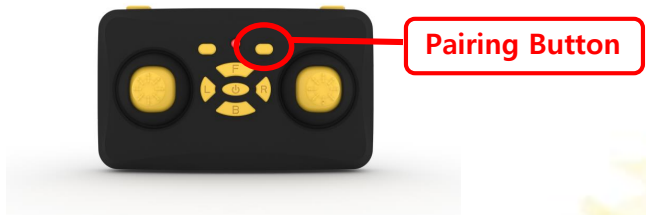Pairing may be disabled during use, or a drone or controller must be purchased and used with the existing device.

To pair, shake the drone five to six times as shown in the picture below.
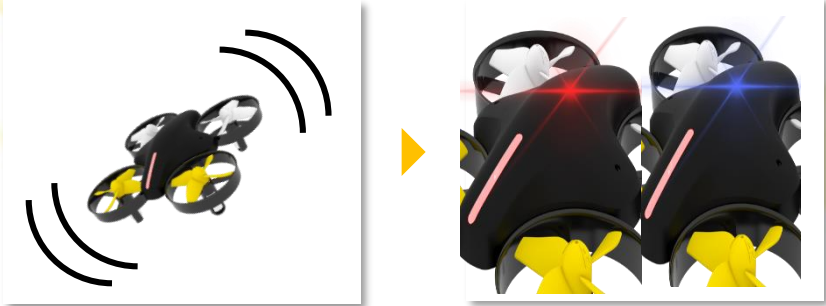
When the drone is ready for pairing, the LED on the top of the drone is red and blue.
It flashes as it repeats. Press the pairing button on the controller as shown below.

Pairing Button

Now we can control the drones with the controls.

- You only need to perform the first pairing once. (Pairing will be maintained)

- If it doesn't work, try again from the beginning.

- Depending on the environment, it may not be paired in a single attempt.

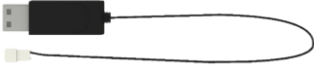- The drones and controls must be up-to-date

Appendix 2 – Charge drone battery

With the drone connected, check the remaining battery indication, such as the controller
If charging is required, the battery must be charged using the specified battery charger.

(See image below)

When the battery is connected, the LED on the charger illuminates and turns off when the charge is complete.

Charger	**Battery**
Drone Battery Specifications	- **Voltage :** 3.7V - **Capacity :** 220mAh - **Time of use :** About 8 minutes - **Charging time :** About 30 minutes
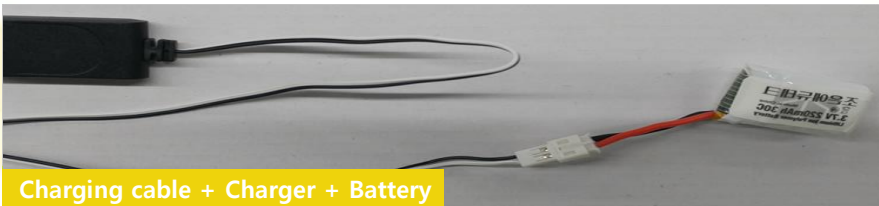
Charging cable + Charger + Battery

Charger + smartphone adapter

PC USB Port + Charging Cable

www.RobolinkSW.com

Youtube.com/CoDrone

• Download manuals and programs from online sites, Please check educational materials.
• 'Robolink SW / Arduino' is provided as an open source