codrone EDU JROTC EDITION

User Manual

ROBOLINK

Welcome to your
CoDrone EDU (JROTC edition) journey!

For the best experience, **all users** should go through this manual before flying the drone to understand **proper use** and **safe operation**, even experienced users. Our warranty assumes proper use of the drone.

Once you've read through this manual, head over to our "Getting Started" course to learn about piloting, coding, and more.
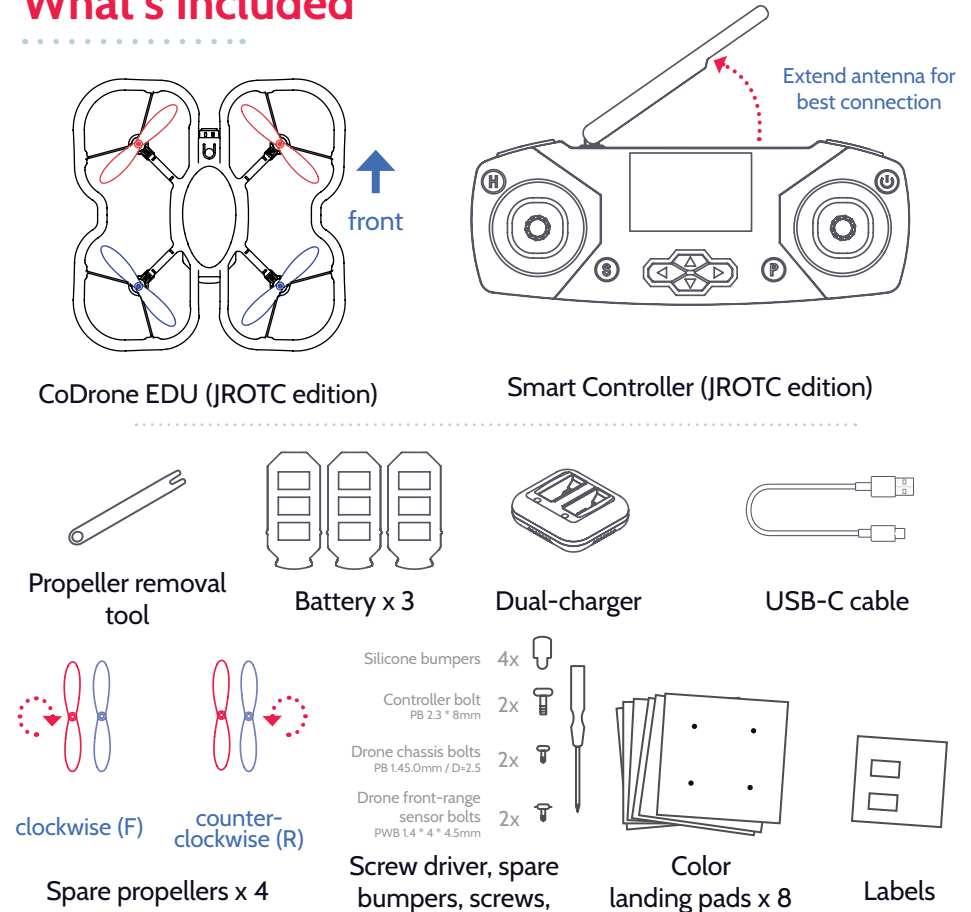

learn.robolink.com/codrone-edu

This QR code and link also appear at the end of this manual on page 22.

Table of Contents

What's Included

Extend antenna for best connection

front

CoDrone EDU (JROTC edition)

Smart Controller (JROTC edition)

Propeller removal tool

Battery x 3

Dual-charger

USB-C cable

clockwise (F)

counter-clockwise (R)

Spare propellers x 4

Silicone bumpers 4x

Controller bolt 2x
PB 2.3 * 8mm

Drone chassis bolts 2x
PB 1.45.0mm / D=2.5

Drone front-range sensor bolts 2x
PWB 1.4 * 4 * 4.5mm

Screw driver, spare bumpers, screws,

Color landing pads x 8

Labels

Before You Fly

Whether you're new to drones or a seasoned pilot, always run through these safety checks and guidelines before using your CoDrone EDU (JROTC edition). Our warranty coverage assumes proper use of the drone.

⚠️ **CAUTION**

CoDrone EDU (JROTC edition) is designed for **indoor use** only. Rules for drone flight outdoors will also vary depending on your location. Due to its light weight, the drone also cannot withstand wind. For those reasons, you should keep your drone indoors.
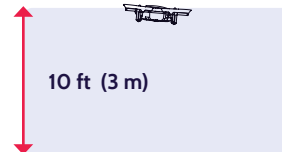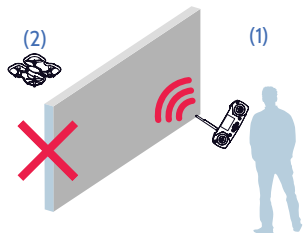
1 Check the environment

10 ft (3 m)
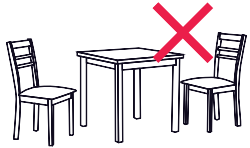
Designate an open area for flight without obstacles.
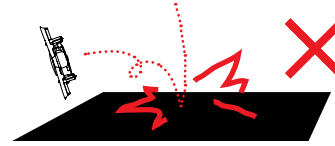
Put away fragile items and open liquids.

Try to keep your drone below 10 ft to avoid damage.

(2)   (1)

To maximize signal strength and safety, maintain line of sight between yourself/the controller (1) and the drone (2).

The signal has difficulty passing through people, glass, and walls.
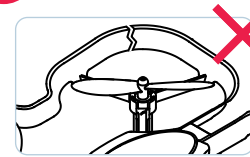
4

To minimize damage during unexpected crashes, avoid flying over hard surfaces like concrete and cement.
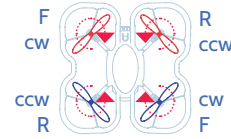
For best performance, avoid flying over dark carpets or highly reflective surfaces. Surfaces that are bright, flat, well-lit, and patterned will work best.
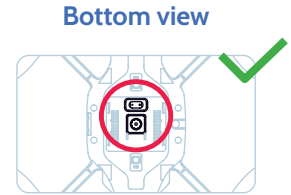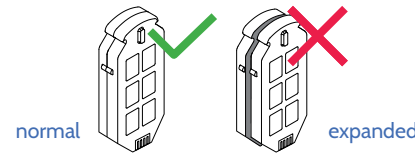
2 Check your drone

Bottom view
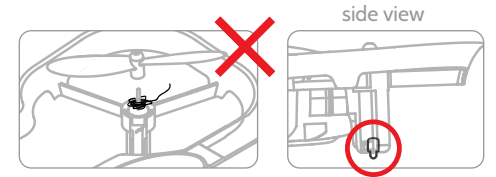
No major structural damage to motor arms or frame.

F cw   R ccw
ccw R   cw F

Propellers and motors are in the correct position (see page 18).

Bottom sensors are not obstructed.
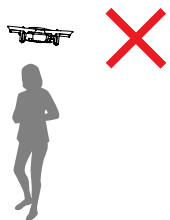
side view

normal   expanded

Drone battery has not expanded and has no signs of structural damage.
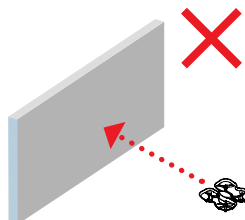
No debris under the propellers. Propellers can spin freely. Check motors (see page 21), and that
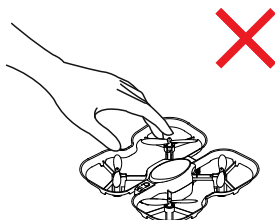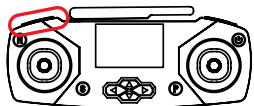
5

3 Know the rules of operation
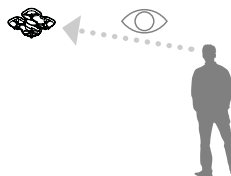
Do not fly over people.

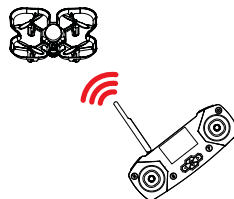Do not intentionally crash into walls or at people.

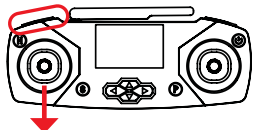Keep hands, fingers, and other objects away from propellers.

Using land is the safest way to stop your drone.

The pilot or a spotter should always maintain a visual on the drone.

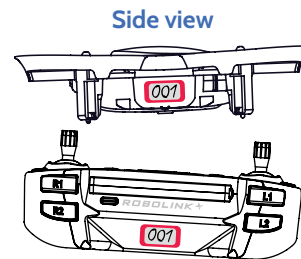Extend and point the antenna at the drone for best signal strength.

Only use Emergency Stop for emergencies when you need to stop the motors.

CAUTION

Using Emergency Stop from above 10 ft or at high speeds could damage your drone, so **use it sparingly**. It's best to catch your drone when possible.

4 Label your drone

Side view

We've included a set of stickers for you to label your paired drone and controller. For example, you can label them with "001." That way, you'll know which drone and controller go together without powering them on.

This is **especially important in classroom settings**, or anywhere there are multiple drones and controllers.

5 Check your firmware

The drone and controller occasionally have firmware updates. We recommend updating to the latest version.
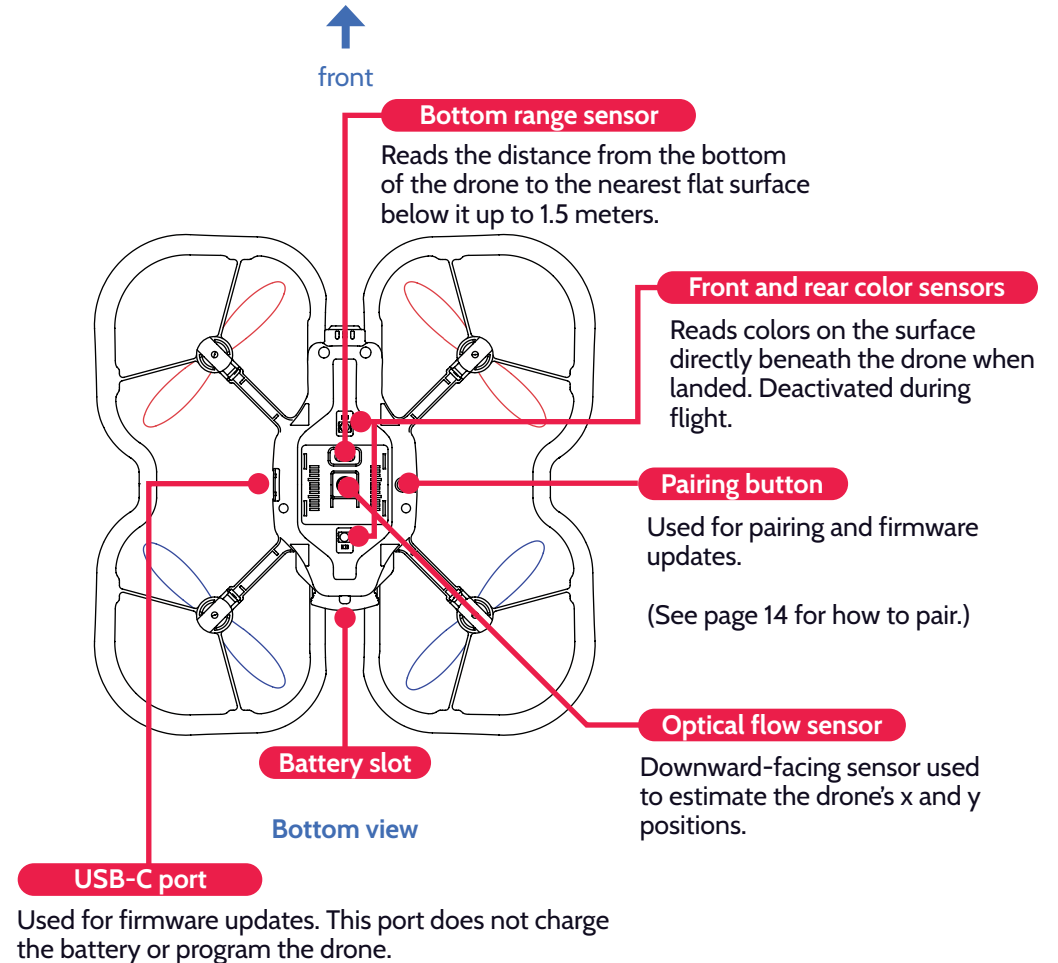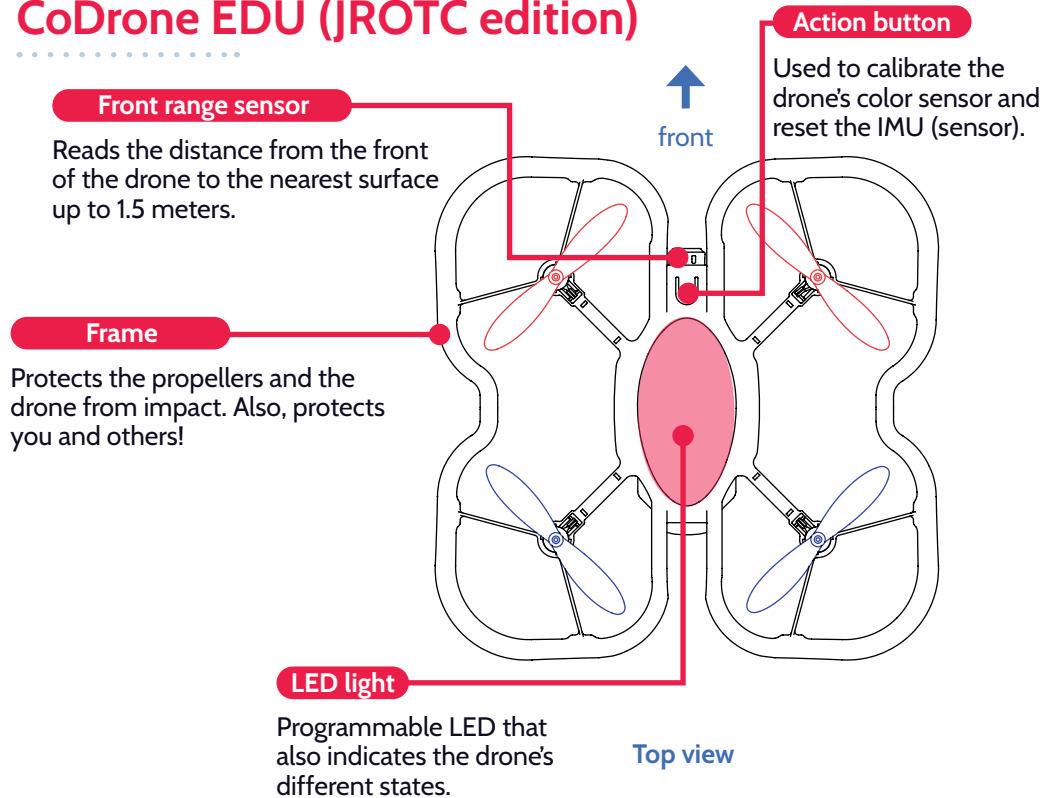
robolink.com/codrone-edu-jrotc-firmware

Complete safety guide

These steps only cover the basics for safe use of the CoDrone EDU (JROTC edition). If it's your first time flying, please reference our complete safety guide.

robolink.com/codrone-edu-safety

Getting to Know Your CoDrone EDU (JROTC edition)

Action button

Used to calibrate the drone's color sensor and reset the IMU (sensor).

Front range sensor

Reads the distance from the front of the drone to the nearest surface up to 1.5 meters.

Frame

Protects the propellers and the drone from impact. Also, protects you and others!

LED light

Programmable LED that also indicates the drone's different states.

front

Top view

8

Bottom range sensor

Reads the distance from the bottom of the drone to the nearest flat surface below it up to 1.5 meters.

Front and rear color sensors

Reads colors on the surface directly beneath the drone when landed. Deactivated during flight.

Pairing button

Used for pairing and firmware updates.

(See page 14 for how to pair.)

Optical flow sensor

Downward-facing sensor used to estimate the drone's x and y positions.

Battery slot

USB-C port

Used for firmware updates. This port does not charge the battery or program the drone.

front

Bottom view

9

Getting to Know Your Controller

Using your controller, you can pilot your drone or connect your controller to your computer for coding. These are the controls for the controller while in the remote control state. For a complete video guide to the controller, visit:

robolink.com/codrone-edu-jrotc-controller

L1

Press: Change flight speed (30%, 70%, 100%).

Press and hold: Take off / Land.

H

Press: Turn LCD screen backlight on / off.

Press and hold: Return home during flight.

Left joystick

Left and right: Yaw (rotate left and right).

Up and down: Throttle (move up and down).

S

Press: Go to previous display mode screen.

Press and hold: Go to the Settings menu.

Antenna

Extend and point at drone for best connectivity.

USB-C port

Used for coding and controller firmware updates.

LCD screen

Displays drone information and settings. Can also be programmed with code.

Direction pad

If the drone begins to drift while flying, use the direction pad to trim (stabilize) it.

(See page 17 for how to trim.)

R1

Press: Change LED color on drone and controller.

Press and hold: Prepare drone to flip during flight. Then, push the right joystick in the direction you want to flip.

⏻

Press: When connected to a computer by USB cable, this button switches between the remote control and LINK state, which is used for coding.

Press and hold: Power on / off.

USB light

A green flashing light means that the controller is receiving USB power. If a battery is inserted, it also means the battery is charging. A solid green light means it is fully charged.

Right joystick

Left and right: Roll (move left and right).

Up and down: Pitch (move forward and backward).

P

Press: Go to next display mode screen.

Press and hold: Pairing mode.
(See page 14 for how to pair.)

Powering On

Powering on the controller

The controller uses the same battery as the drone. Press and hold the ⏻ button until you hear a chime to power on.

You can also use a USB-C cable to power the controller with a computer or external power source. If you want to pilot the drone, make sure the controller is not in the LINK state by pressing the ⏻ button.
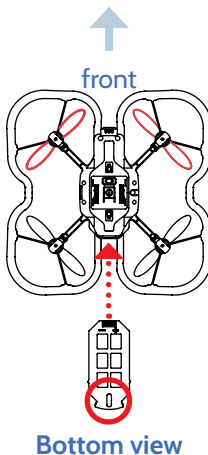
To power off, press and hold the ⏻ button or unplug the USB-C cable.
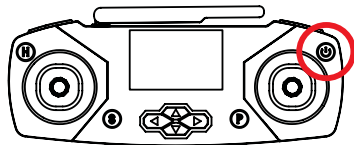
Powering on the drone

Power on the drone by inserting the battery into the battery slot. Note the **small tab** on one side of the battery. Insert the battery so that the side with the small tab is facing downward.

To power off the drone, grab the battery firmly and pull the battery out fully.

front

Bottom view

CAUTION

Practice safe battery use. Don't leave charging batteries unattended. Store batteries away from extreme heat or cold. This will help extend its lifetime. Do not charge or use a damaged or expanded battery. Discard lithium polymer batteries safely according to local e-waste guidelines.
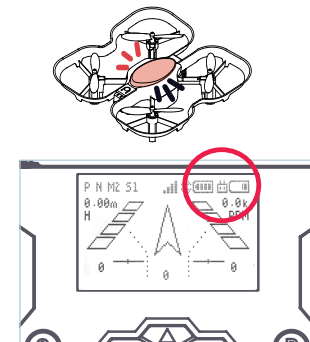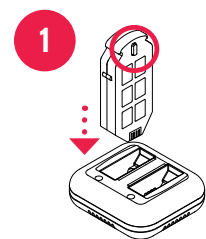
Charging

Low battery

You can check your drone and controller's battery levels on the LCD screen. When the drone battery is low, the **drone will beep**, **the LED will flash red**, and the controller will vibrate.
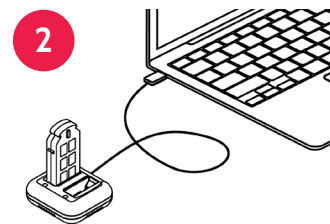
The battery can be charged while in the controller. Plug the controller into an external power source to charge the battery.
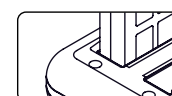
Charging the drone battery

1

Insert the battery into the charger, with the **tab** facing towards the middle of the charger.

2

Plug the USB-C cable into the charger. Plug the other end into a power source, like a computer or external power source.

A solid red light means the battery is **charging**.

The light will turn off when the battery is **fully charged**.

TIP

When charging two batteries, make sure the power source can deliver 5 Volts, 2 Amps. USB-C "smart charging" is not supported.

If batteries appear not to be charging, try disconnecting and reconnecting the cable.

Pairing

Your new drone and controller are **already paired out of the box**. If you want to pair the controller to another drone, you can pair by following these steps.

How to pair

Please note, the drone and controller **only need to be paired once**. Once paired, they will **pair automatically** when powered on and within range.

1 **Put drone in pairing mode**

Insert a battery into the drone. Press and hold the pairing button on the bottom of the drone **until the drone LED is flashing yellow**.

front

Bottom view

flashing yellow
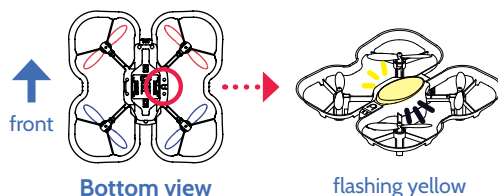
2 **Press and hold P**

Power on the controller. Make sure you aren't in the LINK state (see page 12), if your controller is connected to a computer. Press and hold the P button until you hear a chime.
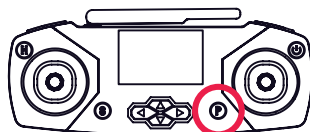
3 **Verify that you're paired**

You should hear a chime, and the lights on the drone and controller should turn solid. You should see a ‚ıl symbol on the screen.

Verify that you are paired by **pressing R1 a few times**. The colors of the drone and controller should change together.
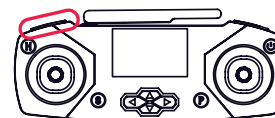
If the LED on your drone is **flashing red** and the controller screen says **"Searching..."**, your drone and controller are not paired.

Paired!

Not paired

SEARCHING...

solid color

flashing red
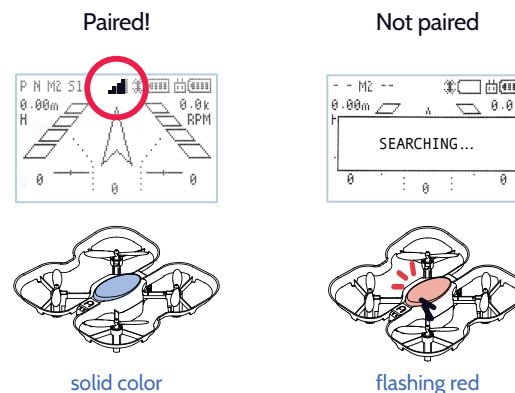
Basic Flight Commands
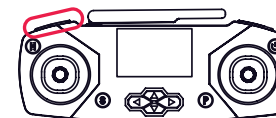
Here are a set of common commands you can use with the controller to pilot the drone.

Taking off, landing, stopping, and changing speed

Take off
Press and hold L1 for 3 seconds.

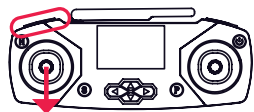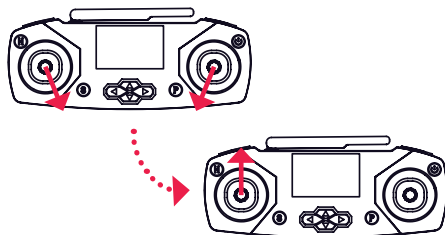The drone will take off and hover at about **70-90 cm above ground**.

Land
During flight, press and hold L1 for 3 seconds.

Quick take off
To start the motors, push both joysticks downward, angling them toward the middle. Then, push up on the left joystick to take off.

This method will take off more quickly than the L1 method (see page 15).

Emergency Stop
Press and hold L1 and pull down on the left joystick.

Use this to shut the motors off immediately.

CAUTION

Whenever possible, press and hold L1 to land safely. However, if the drone is going to crash or at risk of getting damaged, you can use Emergency Stop to shut off the motors. **Memorize Emergency Stop**, it will be useful if you lose control of the drone when testing code.

Using Emergency Stop from above 10 ft or at high speeds could damage your drone, so **use it sparingly**. It's always safest to catch your drone whenever possible.
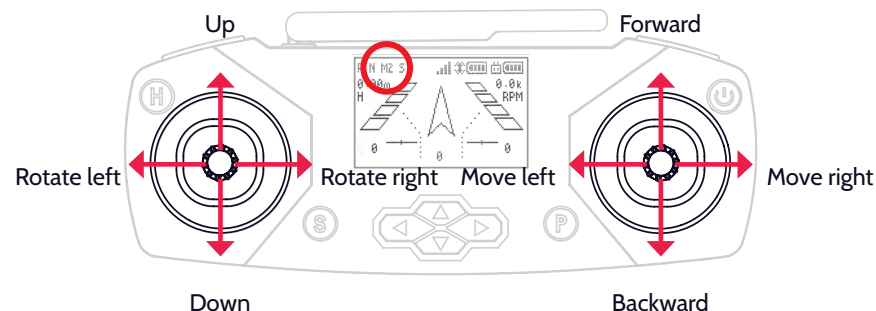
Change speed
Press L1 to change the speed between 30%, 70%, and 100%. The current speed is indicated in the screen's top left corner with S1, S2, and S3.
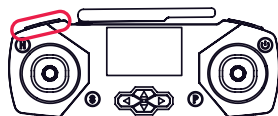
Movement during flight

While flying, these are the controls for the drone, using the joysticks. The following is using Mode 2 controls, which is the default.
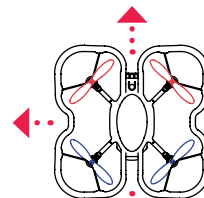
Up
Forward

Rotate left
Rotate right   Move left
Move right

Down
Backward

Trimming your drone

Drifting forward?
Press down

Drifting left?
Press right

Drifting right?
Press left

Drifting back?
Press up

Trimming to prevent drift
Use the direction pad buttons to trim the drone if it drifts when hovering.

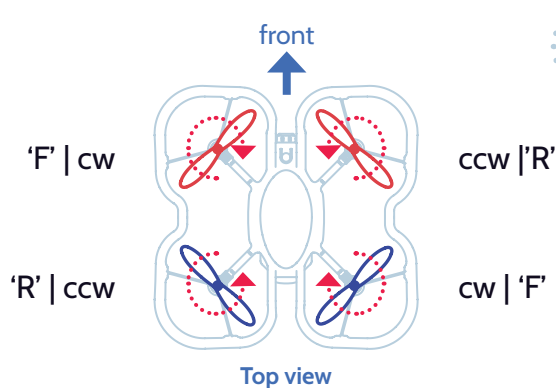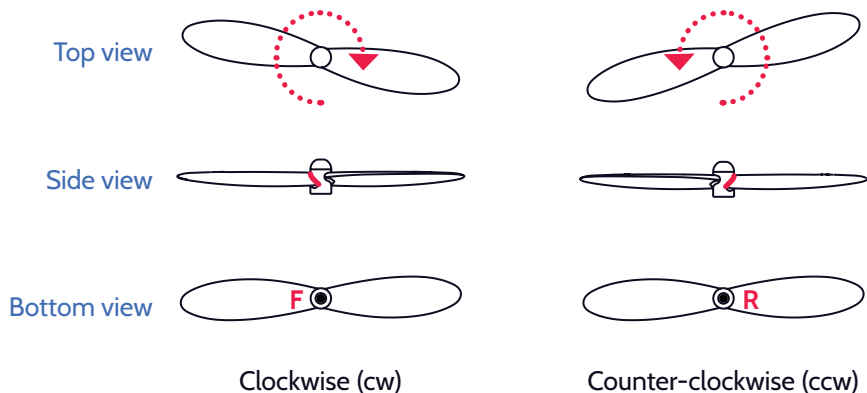Trim in the opposite direction that the drone is drifting.

Complete controller guide

Take a look at our complete video guide about the controller:

robolink.com/codrone-edu-jrotc-controller

Propellers

Your CoDrone EDU comes with 4 spare propellers. You can use the **propeller removal tool** to remove them. Propeller placement is important for the drone to fly correctly. There are **2 types of propellers**.

Top view

Side view

Bottom view

F

R

Clockwise (cw)　　　　Counter-clockwise (ccw)

'F' | cw

'R' | ccw

front

ccw |'R'

cw | 'F'

Top view

Please note, a **propeller's color does not indicate its rotation**. However, we recommend placing the red propellers at the front of the drone. This will help identify the front of the drone during flight.

Removing propellers

Propellers can be removed to clear out debris from under the propeller hub. A propeller should be replaced if it's bent, chipped, or cracked, and it begins affecting the drone's flight. Use the included **propeller removal tool** to remove the propeller.
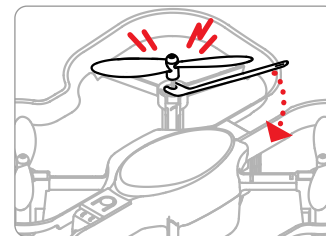
1. Insert fork-shaped end of tool under propeller hub.
2. Push handle down like a lever.
3. Push new propeller onto the shaft of the motor.
4. Check propeller rotation, and perform flight check.

Motors

Motor placement is also important for the CoDrone EDU (JROTC edition). Like propellers, there are **2 types of motors**, indicated by the color of the wires. Motor directions should match propeller directions.

red / blue wires

Clockwise (cw)

black / white wires

Counter-clockwise (ccw)
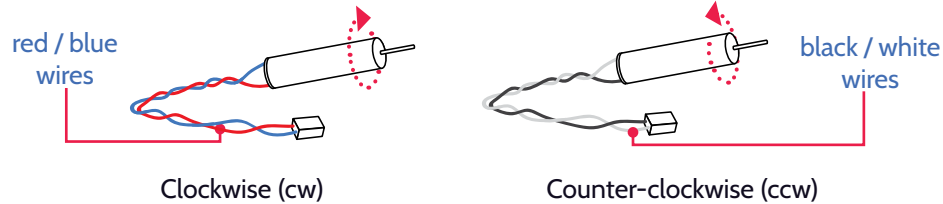
You can see the color of the motor wires by checking **underneath the arms of the drone frame**.

Front

ccw | black / white

red / blue | cw
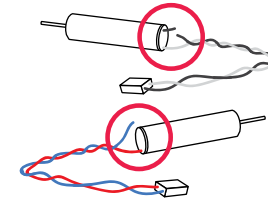
cw | red / blue

black / white | ccw

Top view
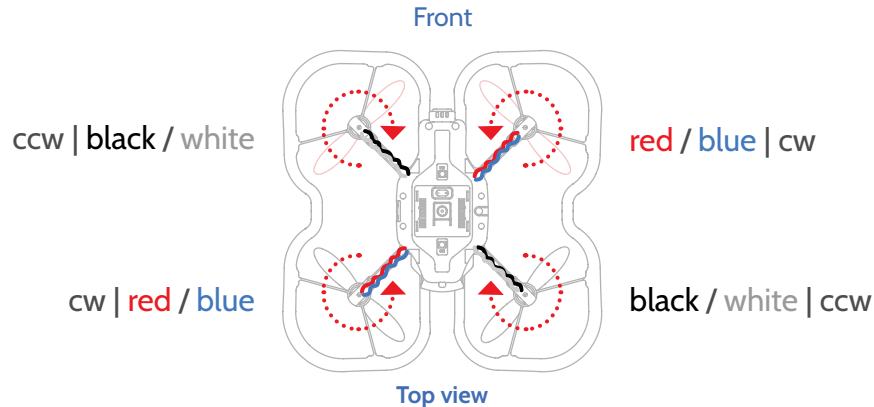
Inspecting motors

If your drone has issues flying, check propellers first. If the propellers don't seem to be the issue, check the motors. Motor issues usually result from hard crashes. Here are common signs that a motor should be replaced.
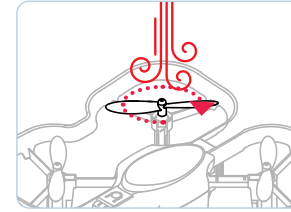
Blow on the attached propeller. Look for difficulty rotating or wobbling during rotation.

Check for breakages in the base or the wiring. This can happen from hard crashes.
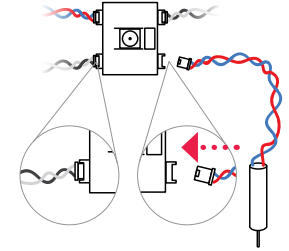
Remove the drone's bottom chassis. Then check if the motor is disconnected from the drone's board.

Replacing motors

Replacing motors is an involved process, so we recommend carefully following our motor replacement video.

Replacement motors are sold separately.

robolink.com/codrone-edu-jrotc-motors

Learning to Code with CoDrone EDU

To start learning how to code, head to our lessons:

learn.robolink.com/codrone-edu

Resources

Use these resources to help you on your journey learning to pilot and code with

For technical
questions and support:

help.robolink.com

For library functions and
documentation:

docs.robolink.com

Update

How to update your drone and controller's
firmware:

robolink.com/codrone-edu-firmware

Compete

Learn about the Aerial Drone Competition:

robolink.com/aerial-drone-competition

User Manual

Access a digital version of this manual:

robolink.com/codrone-edu-manual

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FUTURE READY LEARNING

www.robolink.com