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@Makeblock



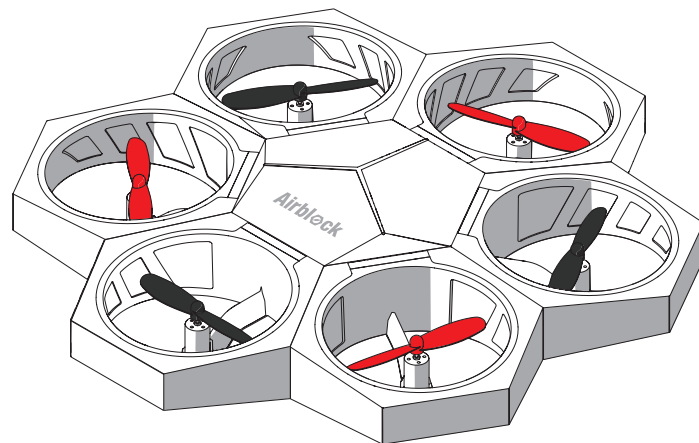
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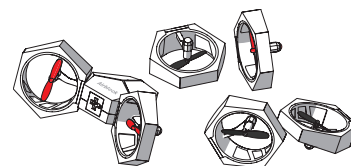
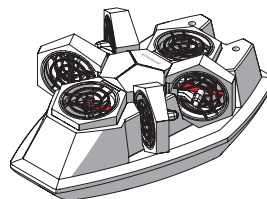
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# Airblock

The Modular & Programmable Drone



## USER MANUAL



# Table of Contents

P02 **Downloading the Software**

P03 **Parts List**

P04 **Introduction to Master Controller Module**

P05 **Introduction to Battery**

P06 **Introduction to Power Module**

P10 **Introduction to Stickers**

P12 **Aircraft Mode User Guide**

- Operating Environment
- Items to Note
- Installation Steps
- Controls

P18 **Hovercraft Mode User Guide**

- Operating Environment
- Items to Note
- Installation Steps
- Controls

P27 **Custom Mode User Guide**

- Methods to Use
- Operating Environment
- Items to Note
- Programming

P31 **FAQs**

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# Downloading the Software

A tablet or smartphone is required to control the Airblock.



## App Store Download

Search "Makeblock" and install the application from app store.

## Official Website Download

<http://learn.makeblock.com/en/software/>

Login to download the corresponding version of application.

### System and Device Requirements

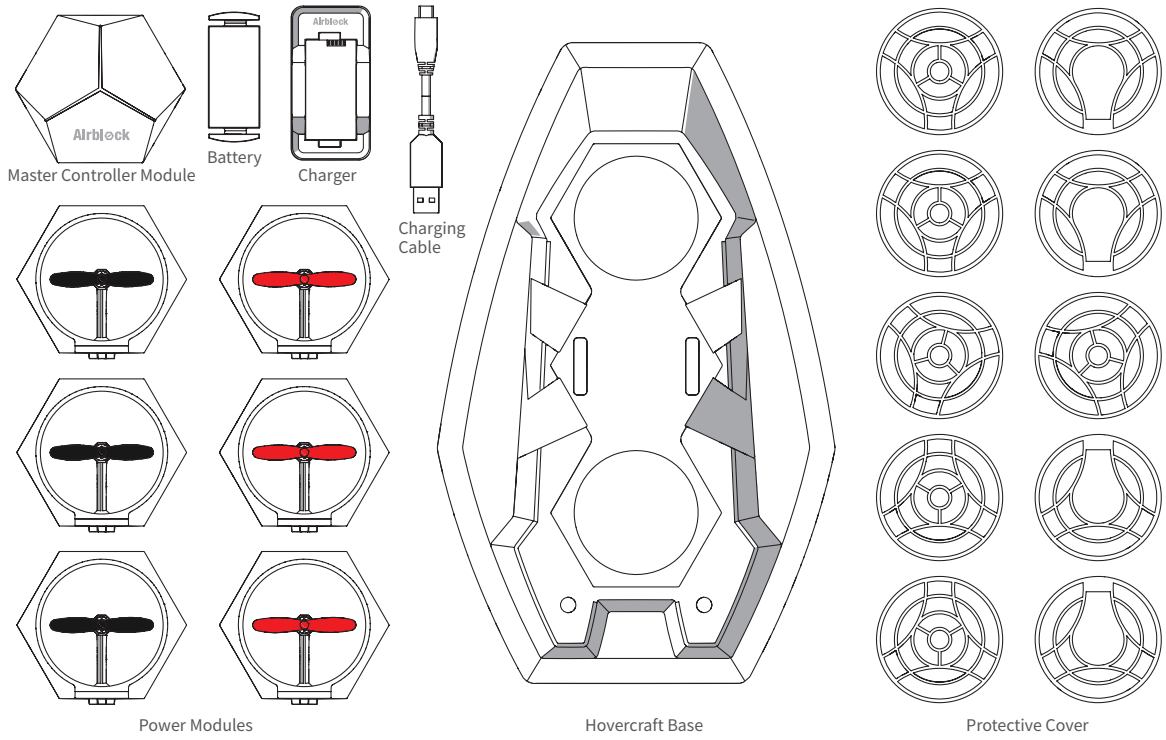
iOS devices (including iPhone5, iPad mini, iPad 3 or later models) need to support iOS 9.0 or above versions. Android devices need to support Android 4.1 or above versions.

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# Parts List



# Introduction to Master Controller Module

The master controller module includes components such as 6 power module plug-in sockets, 3 colored light indicators, ultrasonic sensor, barometer, gyroscope, Bluetooth, microcontroller chip, etc.

Ultrasonic sensor: for measuring distance. Works together with the barometer to sense the height change value of the aircraft.

Colored light indicator: functions as power supply indicator. Brightness and color of light may be adjusted on the application program.

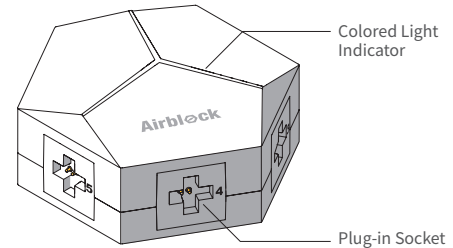
The following sensors are built-in:

Barometer: senses height changes.

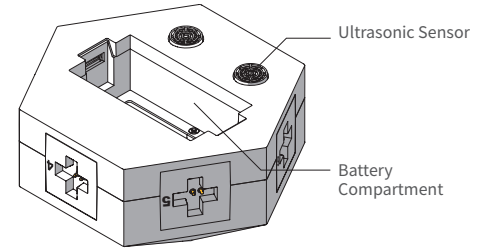
Gyroscope: senses position and orientation of master controller module.

Bluetooth Module: real-time data collected by sensors can be read by the application program after establishing Bluetooth connection to tablet or smartphone.

Front View



Back View



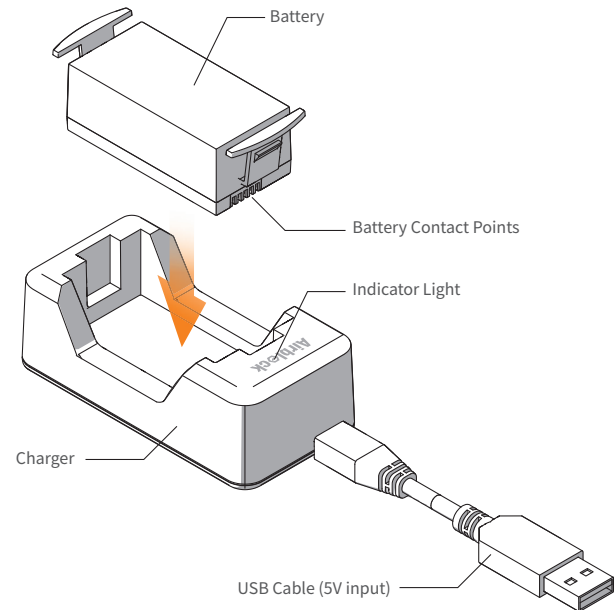
## Battery

Airblock does not have a power switch. When a battery with sufficient power is inserted into master controller module, the master controller module automatically enters standby mode. When inserting battery into master controller module or battery charger, please ensure that the contact points are placed in the correct direction. Charger will display a red light while battery is charging, and a green light when battery is fully charged.



### Items to Note:

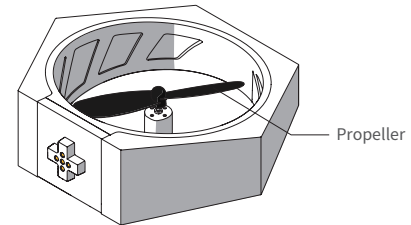
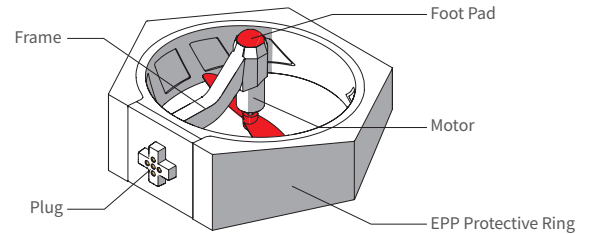
- If unused for an extended period of time, battery should be removed from the master controller module to prevent damage due to battery leakage.
- Do not charge battery for more than 12 hours.
- Do not use battery in places of high temperature and high humidity. Exposure of battery to excessive shock or impact may result in battery malfunction or explosion.



# Power Module

## Introduction to structure

The Power Module is made up of parts such as the motor, propellers, plug, frame, etc. Indicator light installed within the frame will light up when motor starts running. The light indicator and foot pad of the aircraft head power module are red. For other power modules, the foot pad is black and light indicator is green.

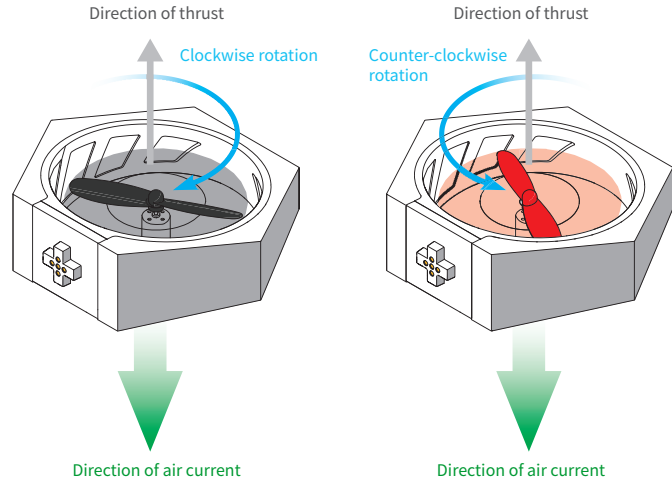




# Power Module

## Introduction to Operating Principles

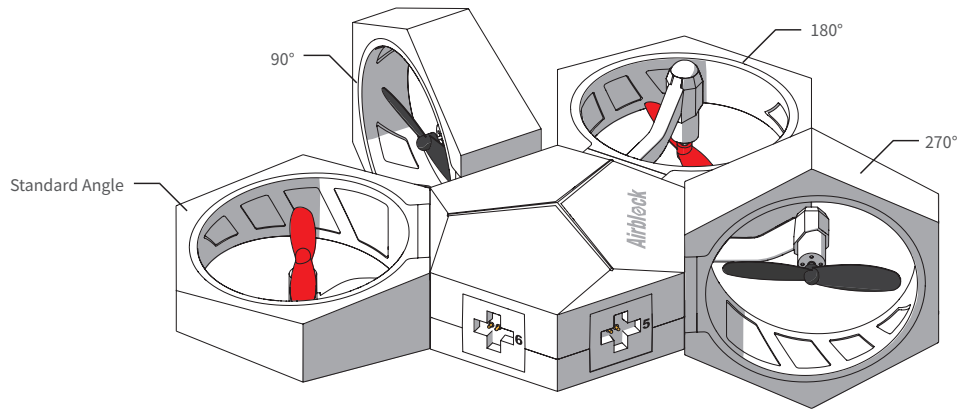
In order to offset the self-rotation of the aircraft, the propellers are classified as black clockwise rotating propellers and red counter-clockwise rotating propellers; the motors are classified as clockwise rotating and counter-clockwise rotating as well. After successful connection to the master controller module, the motor will start spinning, thus pushing air downwards which in turn generates an upward thrust.



# Power Module

## Installation Angle

Each power module may be installed onto its corresponding port on the master controller module at 4 different angles.

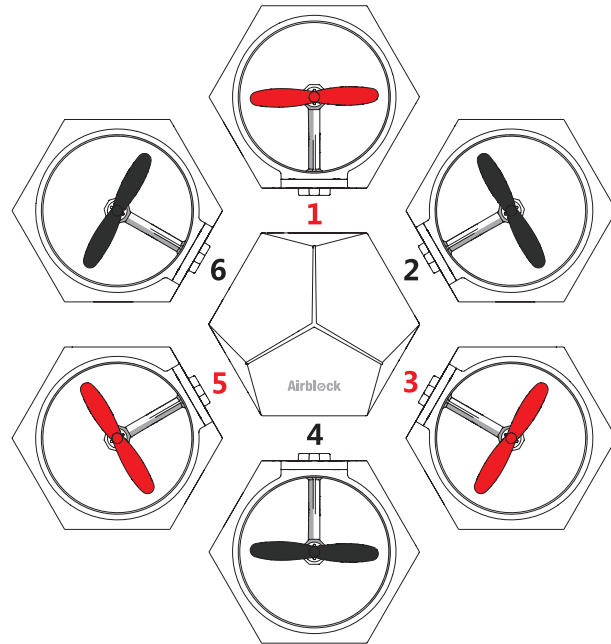


# Power Module

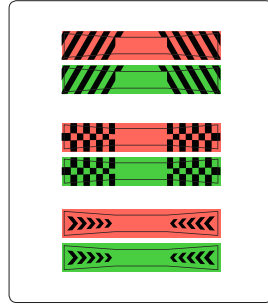
## Port Numbers

Install red propeller power module onto Port 1, 3, 5 respectively (aircraft head module with red foot pad will be installed onto Port 1).

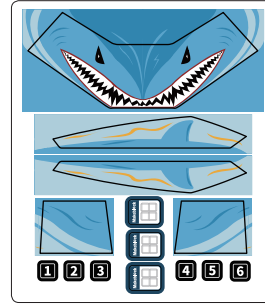
Install black propeller power module onto Port 2, 4, 6 respectively.



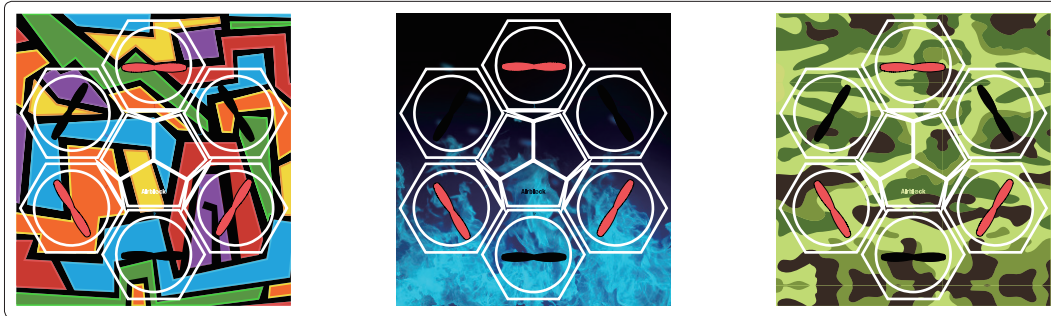
# Stickers



Power Module Stickers



Hovercraft Stickers



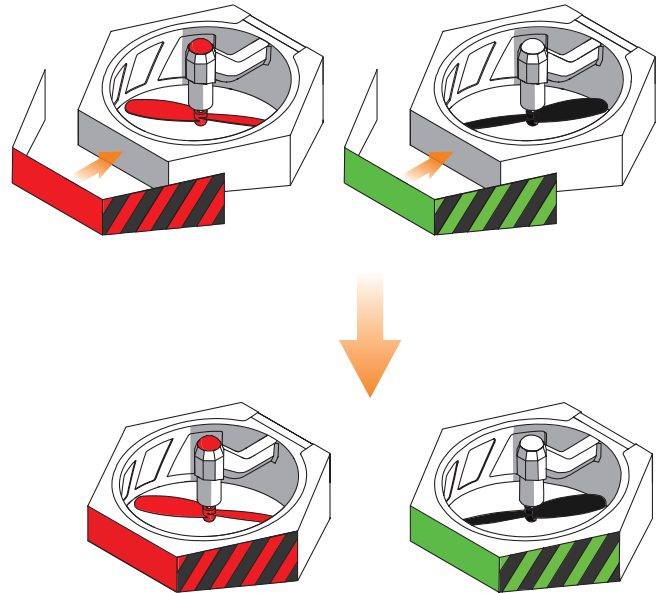
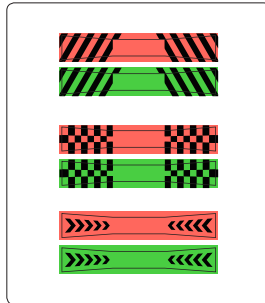
Fuselage Stickers (Random gift. The picture is for reference only, please make the object as the standard.)

# Stickers

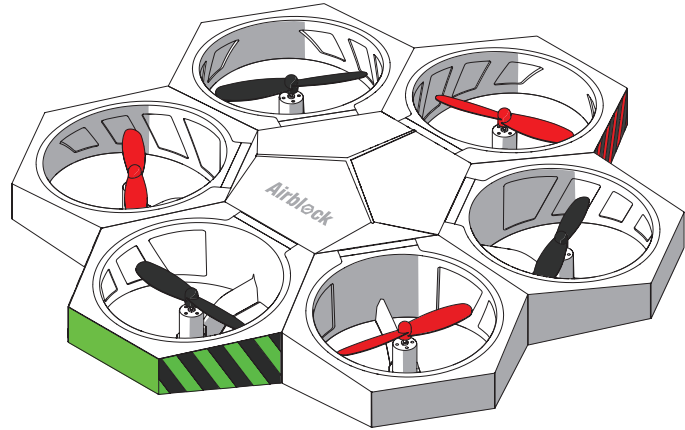
## Power Module Stickers:

Attach to the side of power module, in order to better distinguish the direction of fuselage in flight. It is recommended to attach red sticker to the aircraft head power module (Position 1) and green sticker to a black propeller power module (Position 4). The other power modules do not need stickers.

There are 3 different styles of stickers -- you can choose which to use.



# Aircraft User Guide



## Operating Environment

Space larger than 3x3x3 meters are recommended for indoor flying.



### Items to Note:

- Land surfaces: aircraft should take off from relatively hard and flat surfaces. Soft surfaces such as carpets and grass may cause interference to the ultrasonic sensor.
- Water surfaces: do not operate aircraft on water surfaces, or fly aircraft in the air above water surfaces. This is to prevent occurrences of a short circuit which may cause fire damage to the machine if accidentally dropped into the water.
- Outdoors: a windy outdoor environment may interfere with the aircraft's normal flight.
- Before starting, make sure the module is assembled correctly and the protective cover is not installed. The protective cover affects airflow and will cause the aircraft not to take off. Place aircraft on the open ground, ensuring there are no obstacles within a 2 meter radius.
- If you press the power button during flight, the aircraft will immediately drop, which may damage the equipment.
- More space is needed when performing flight stunts in order to avoid collisions.
- Motor and propellers rotating at high speeds may cut people or animals, or become entangled in their hair or fur. Please move away from people and animals before operating Airblock.
- Dust, hair, fur, or water trapped in Airblock may result in motor malfunction or damage to electronic parts.

# Installation Step 1

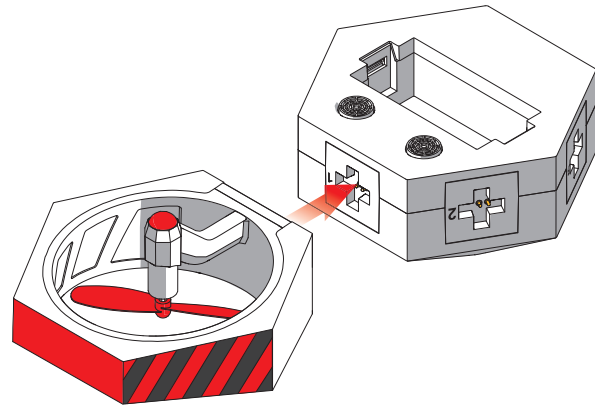
## Installing the aircraft head power module

Install aircraft head power module with red foot pad onto Port 1 of the master controller module.



**Note:**

If head module is installed in the incorrect position, it will not properly control the direction of flight.

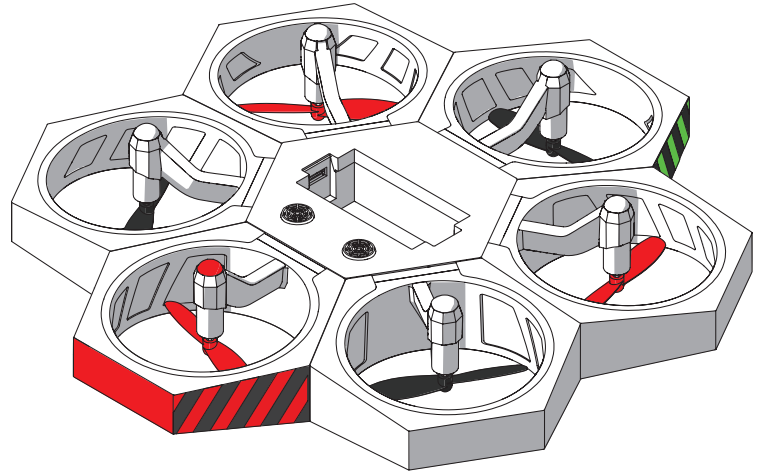




## Installation Step 2

### Installing the other power modules

Install the remaining power modules in sequence onto the master controller module.



## Installation Step 3

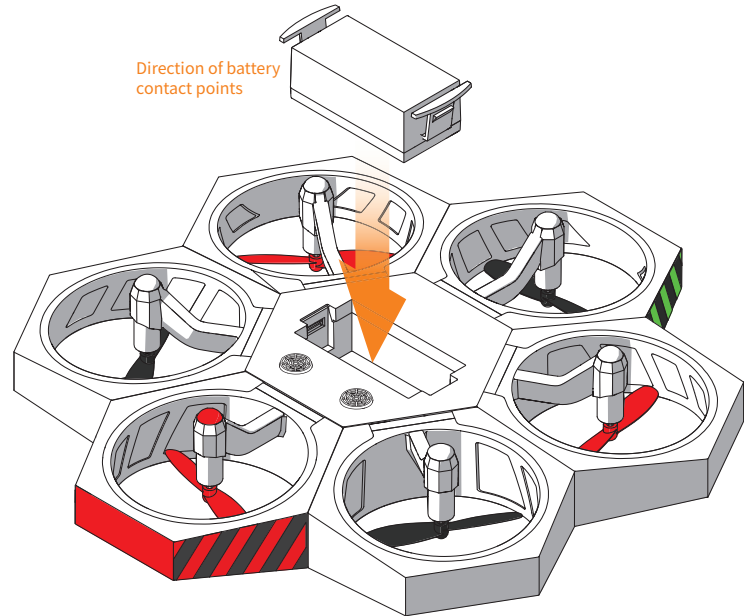
### Installing the battery

After fully charged battery is inserted, Airblock automatically turns on and enters standby mode. The top indicator light of master controller module will turn on and display a white light. When Bluetooth connection is successful, the light will turn red.



#### Items to Note:

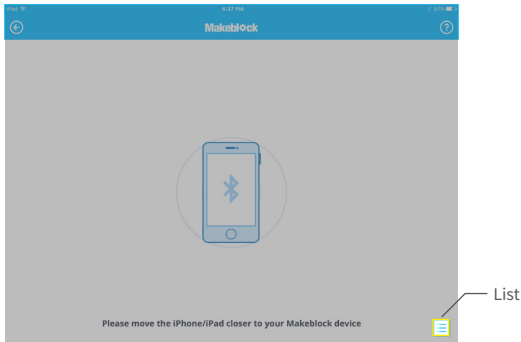
Before actually taking off, please ensure Airblock has its top facing upward and is placed on flat ground. The picture on the right shows the bottom part of Airblock.



# Controls

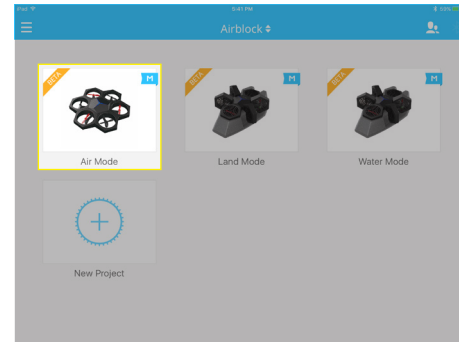
## Step 1

Follow the instructions on the first page of User Guide to download and install the application. Open the Makeblock application and move tablet or smartphone within close distance to running Airblock, Bluetooth connection should be paired automatically. If connection is not successful, tap the "☰" icon on the bottom right hand side of the touchscreen and select manually.

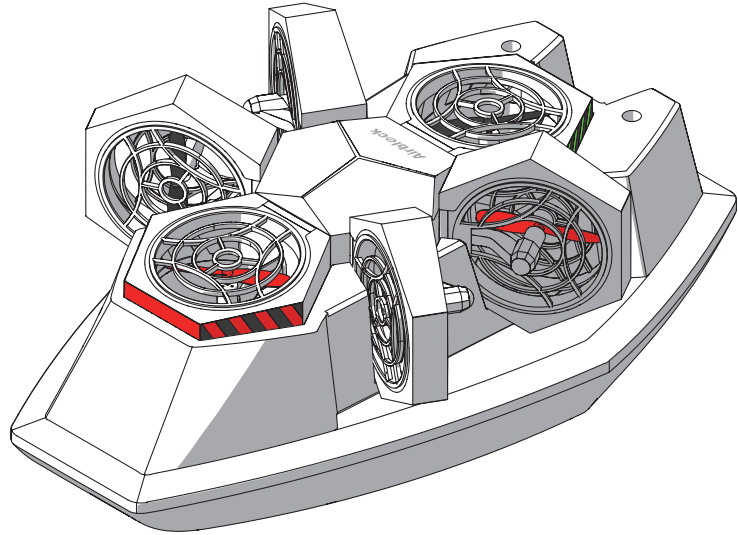


## Step 2

Open aircraft control interface after successful connection is made. (Note: interface or icons may vary after each software update. Please follow the interface of the latest download. This instruction manual is for reference purposes only.) Follow procedures on the New User Guide to familiarize yourself with the functions of the different keys and learn how to use Airblock.



# Hovercraft User Guide



## Operating Environment

Recommended for use on flat, level land surfaces.

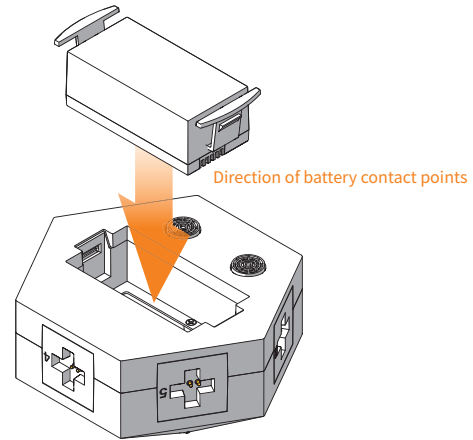


### Items to Note:

- Software: App controls are separate for land and water modes. Make sure to select the corresponding mode for your environment.
- Land surfaces: do not drive or fly hovercraft on muddy surfaces, uneven surfaces, or mesh floors.
- Water surfaces: do not drive or sail hovercraft on water surfaces with waves or obstacles. Control range via Bluetooth is limited; do not use Hovercraft over wide area on water surfaces.
- Motor and propellers rotating at high speeds may cut people or animals, or become entangled in their hair or fur. Please move away from people and animals before operating Airblock.
- Dust, hair, fur, or water trapped in Airblock may result in motor malfunction or damage to electronic parts.

# Installation Step 1

## Installing the battery



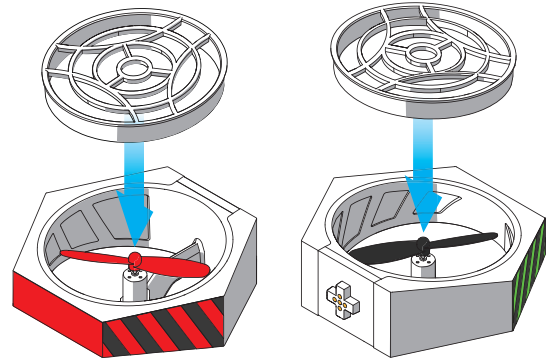
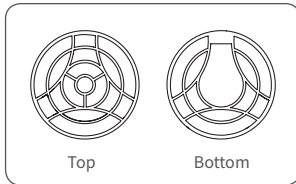
## Installation Step 2

### Installing the protective cover

Installation of protective covers is required in Hovercraft mode to protect propellers from damage and to prevent propellers from causing damage.

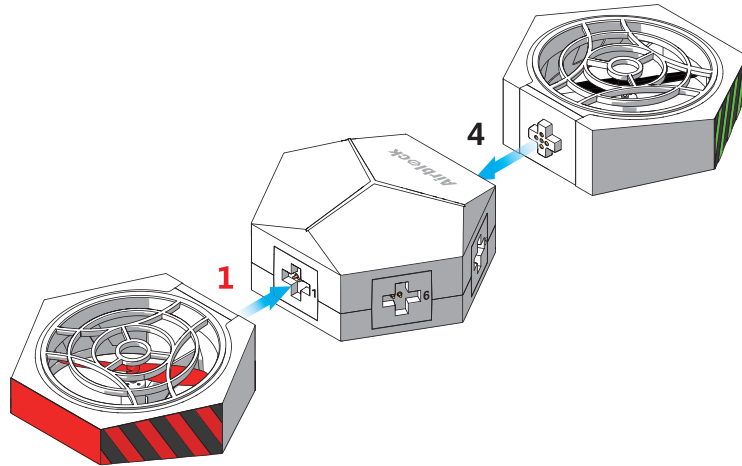
Protective covers are required only on top part of the power modules at Port 1 and 4.

There are two types of protective covers; take note during installation.



## Installation Step 3

Connect the aircraft head power module and a black propeller power module to Port 1 and 4 on the master controller module respectively.





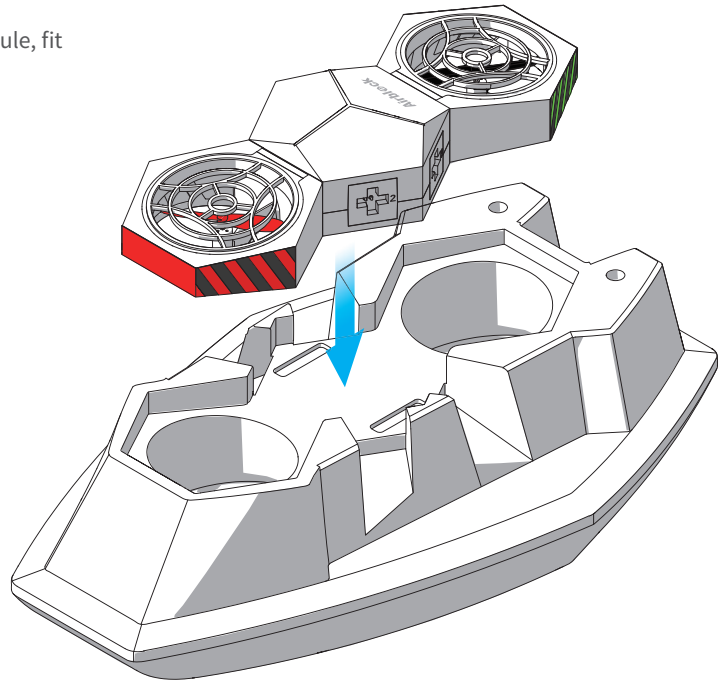
## Installation Step 4

After connecting power modules to the master controller module, fit the master controller module onto the hovercraft hull.



**Note:**

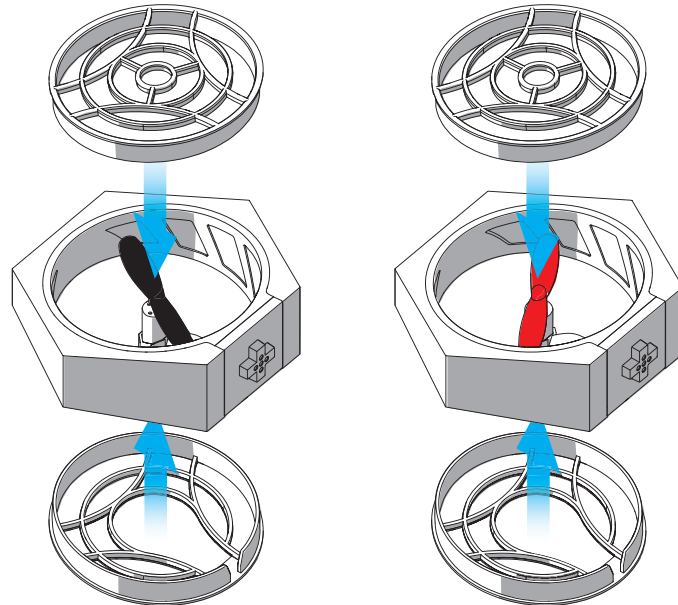
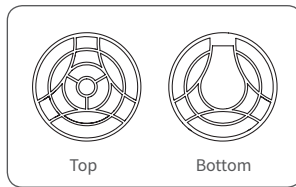
Port 1 faces forwards (the smaller end of the hull is the bow)  
If the master controller module is installed in the incorrect direction, it will not be able to control the direction of the hovercraft.



## Installation Step 5

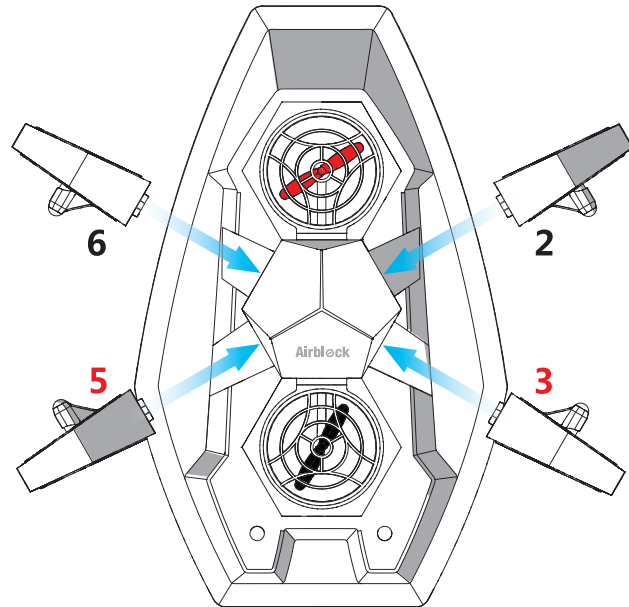
Protective covers are required on both the top and bottom parts of the other power modules.

There are two types of protective covers; take note during installation.



## Installation Step 6

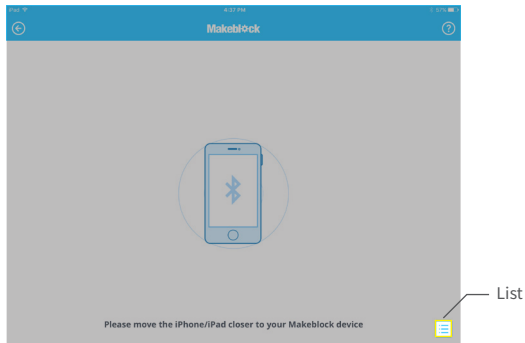
After fitting the protective covers, attach the 4 power modules onto master controller module according to the directions in diagram below. Check that the protective covers are fitted in the accurate places and that the power modules are attached securely to the master controller module.



# Controls

## Step 1

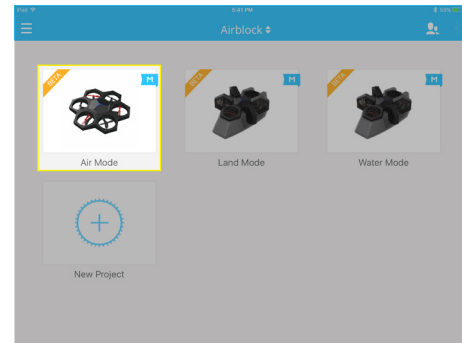
Follow the instructions on the first page of User Guide to download and install the application. Open the Makeblock application and move tablet or smartphone within close distance to running Airblock, Bluetooth connection should be paired automatically. If connection is not successful, tap the list "☰" icon on the bottom right hand side of the touchscreen and select manually.



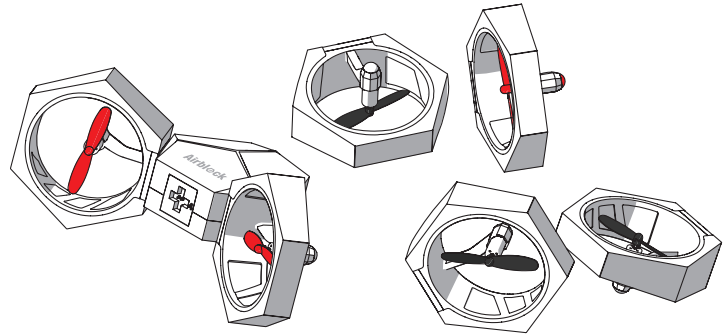
## Step 2

Open hovercraft control interface after successful connection is made. (Choose Land or Water Mode according to the corresponding environment. Incorrect mode selection may cause safety problems; pay attention! Software interface or icons may vary after each software update. Please follow directions of the latest download. This instruction manual is for reference purposes only.)

Follow procedures on the New User Guide to familiarize yourself with the functions of the different keys and learn how to use Airblock.



# Custom Mode User Guide



## Methods to Use

You may connect the power modules to the master controller module at different angles and use the Airblock as a propeller and blower according to your own creativity. Propulsion forces in different directions and wind speeds of varying intensity may be achieved by setting the motor at different rotating speeds in the programming application.

## Operating Environment

Recommended for use on flat, clean floors or tables.



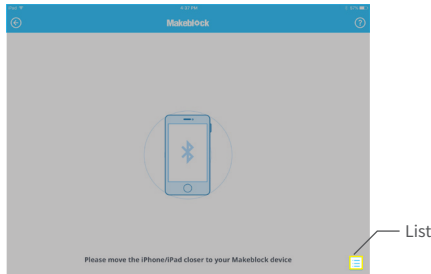
### Items to Note:

- Land surfaces: it is best to use Airblock on smooth, flat, and level land surfaces.
- Water surfaces: only the hovercraft may be placed in the water. Use of Airblock in other forms on water surfaces must not be in contact with water. Dropping the Airblock into water by accident may result in fire damage due to a short circuit.
- In the air: Airblock is unable to fly normally in Custom Mode.
- Keep a distance of at least 2 meters from people or animals before running Airblock.
- Motor and propellers rotating at high speeds may cut people or animals, or become entangled in their hair or fur. Please move away from people and animals before operating Airblock.
- Dust, hair, fur, or water trapped in Airblock may result in motor malfunction or damage to electronic parts.

# Programming

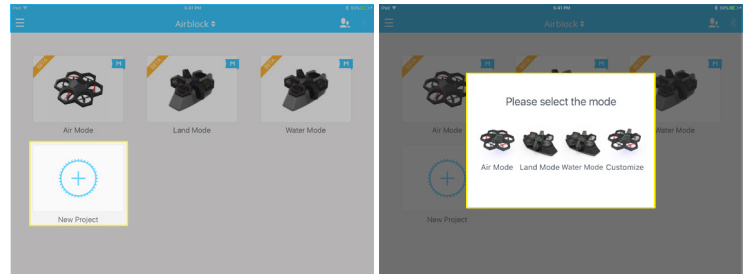
## Step 1

Follow the instructions on the first page of User Guide to download and install the application. Open the Makeblock application and move tablet or smartphone within close distance to running Airblock, Bluetooth connection should be paired automatically. If connection is not successful, tap the "☰" icon on the bottom right hand side of the touchscreen and select manually.



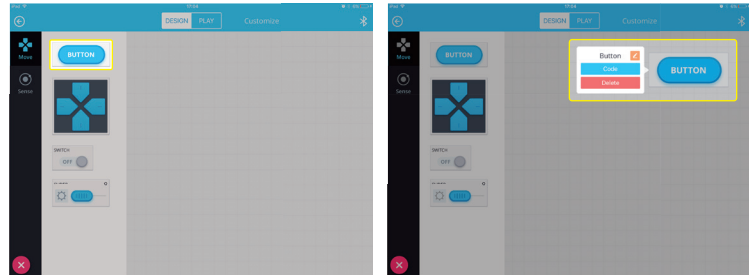
## Step 2

Tap on the "New Project" option and select "Customize" to create a new program for controlling Airblock.



### Step 3

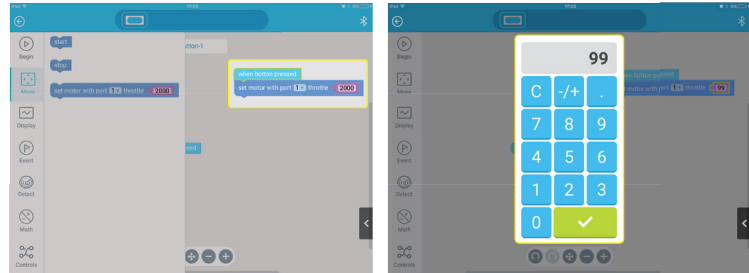
In "DESIGN" mode, drag and drop required keys modules into the edit section on the right. Tap on the module to enter into "Code" mode.



### Step 4

In "Code" mode, drag the motor speed block to "When button pressed" and enter the corresponding number to set the motor speed.

At the same time, make sure the motor speed is "0" for "when button released", otherwise the motor may continue uncontrolled, causing danger.





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# Common Problems

## Propellers are not spinning

---

### Poor connection

1. Check if the connection of the power module and master controller module is too widely-spaced, if connection is uneven, or if foreign matter is present.
  2. Check if the contact points of the metal spring pins have oxidized or are damaged.
- 

### Motor axis is stuck

Check if any foreign matter is tangled on the motor's axis; remove foreign matter.

---

### Switch off Bluetooth connection

Use application to reconnect to Bluetooth.

---

### Application settings error

When programming the motor in Custom Mode, if the motor does not start when application is launched, check if the port numbers in the block are correct.

## Direction is incorrect

---

### Aircraft head module is installed in the wrong position

1. When in Aircraft mode, if you encounter problems controlling the direction, check if aircraft head module with red light indicator is in the wrong position. Follow installation steps in User Guide and re-install.
2. When in Hovercraft mode, check if the master controller module is installed in the correct direction. Follow installation steps in User Guide and re-install.

## Firmware upgrade

---

To optimize user experience, we will continue to upgrade the software. After connecting to the device Bluetooth, you can click the setting icon on the upper left corner of application, select the firmware information to view the current firmware version of the device. If there is an upgrade, you may click the upgrade. If the upgrade fails, you can try to upgrade again after connecting to the device Bluetooth.

---

## Common Problems

### Power supply indicator light does not light up

---

#### **Battery has no power**

Try again after charging battery for half an hour or longer.

---

#### **Incorrect battery installation**

Battery is installed upside down or in the incorrect location. Re-install battery using the correct method and confirm that battery is installed in proper place.

---

#### **Static electricity causing abnormality**

Static electricity may cause an abnormal shutdown. Remove the battery to reinstall.

---

### Aircraft is unable to take off

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#### **Power supply is insufficient**

After successful connection to the application, you may check the power supply level in the control interface. If power supply is less than 20%, please charge the battery.

---

#### **Protective cover is not removed**

Protective cover must be taken off for Aircraft mode. Protective cover is only applicable for use in Hovercraft mode.

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#### **Power module is installed in the wrong direction**

Check all power modules; the foot pad side must be facing downwards.

---

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

 **WARNING:**

**CHOKING HAZARD**

- Small parts. Not for children under 3 years.  
Children to use only under adult's supervision.

