



Technical Support

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Airblock 1S

Modular&Programmable Drone

USER MANUAL

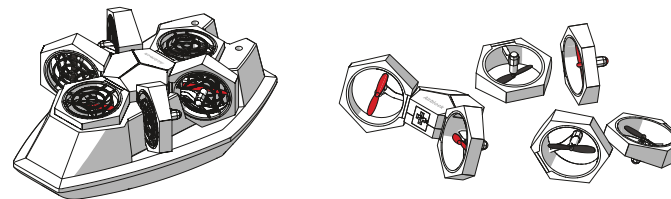
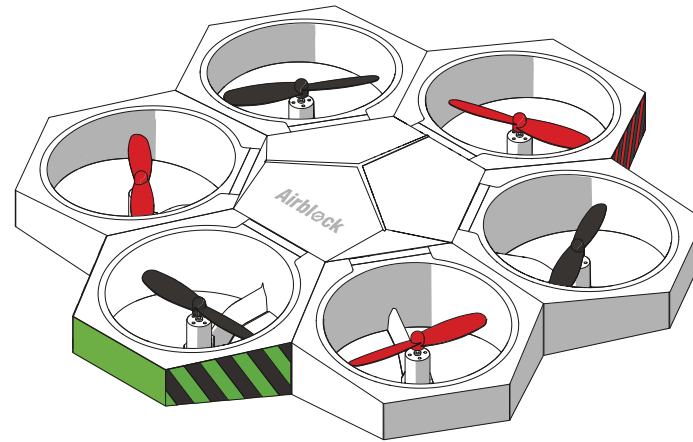


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Software Download

A tablet or smartphone is required to control the Airblock 1S.



Download from App Store

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

Download from Official Website

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

Login to download the corresponding version.

System and Device Requirements

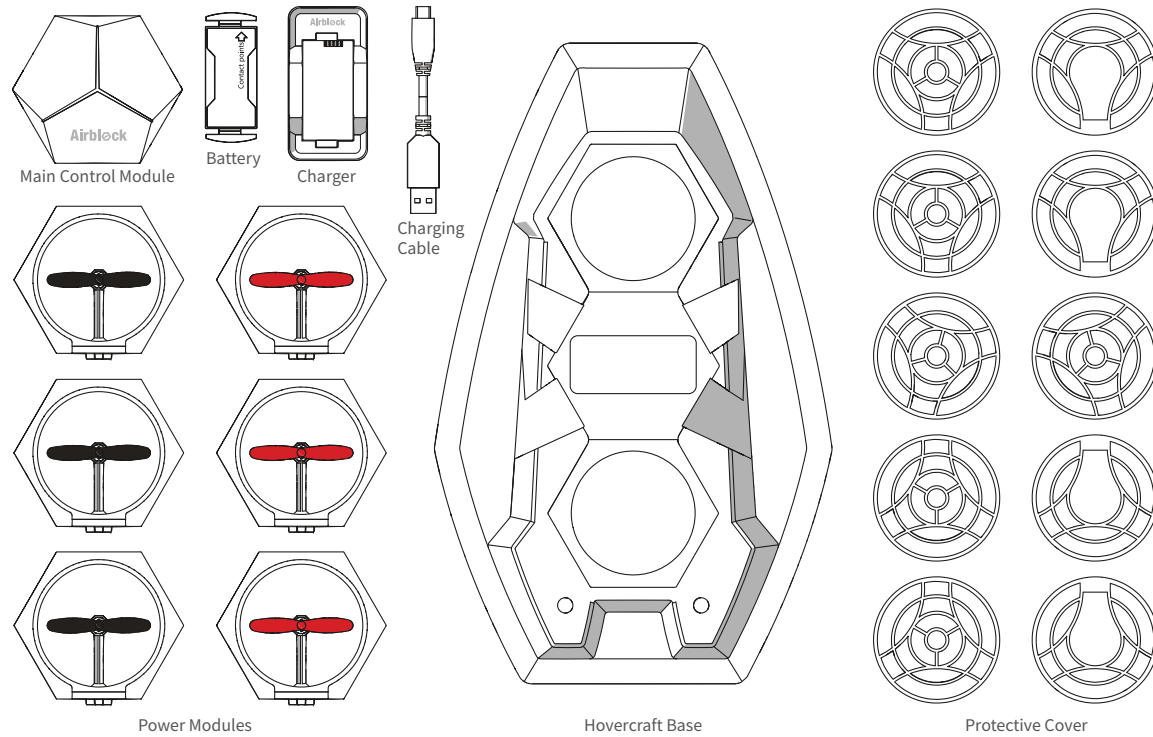
For iOS Devices: Requires iOS 9.0 or later versions. Compatible with iPhone5, iPad mini, iPad 3 or later models. For Android Devices: Requires Android 4.3 or later versions.

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Parts List



Main Control Module

The main control module includes 6 power module plug-in sockets, 3 LEDs, an optical flow sensor, a barometer, a gyroscope, Bluetooth, a microcontroller chip, etc.

Optical flow sensor can detect the horizontal direction movement of the aircraft.

LED works as power supply indicator. Brightness and color is adjustable through programming.

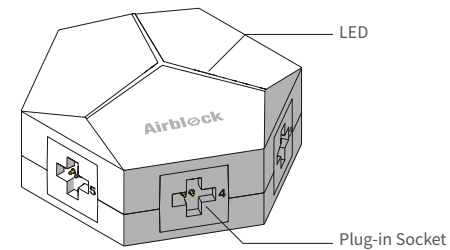
The following are built-in sensors:

Barometer can sense height changes.

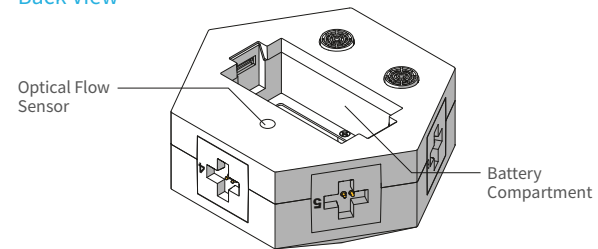
Gyroscope can sense position and orientation of the main control module.

Bluetooth module can establish connection with tablets or smartphones. Application program can read the real-time data collected by sensors.

Front View



Back View



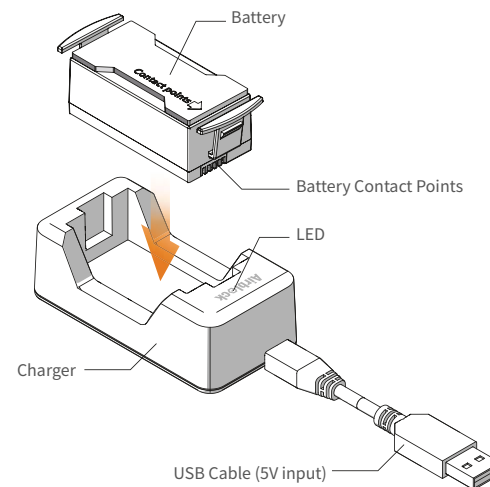
Battery

Airblock 1S does not have a power switch. When a fully charged battery is inserted into the main controller, the controller automatically enters standby mode.

When inserting battery into main control module or battery charger, please ensure that the contact points are placed in the correct direction. A red light indicates that charging is ongoing. A green light indicates that the battery is fully charged.

Warning:

- If unused for an extended period, battery should be removed from the main control module, and charged for half an hour before safekeeping to prevent damage due to overdischarging.
- Do not charge the battery for more than 12 hours.
- Do not use battery in high temperature or high humidity environment. Battery failure and explosion may be caused by battery impact.
- Electric wires, plugs, cases and other assembly units must be checked regularly whether they are damaged or not. Do not use it if there is any damage until it has been fully repaired.
- Battery types which can be used: Airblock special rechargeable lithium battery.
 - a. Rechargeable battery must be used under adults' supervision.
 - b. Rechargeable battery should be removed from the product before charging.
 - c. The battery should be put in with the correct polarity.
 - d. Exhausted battery should be removed from the main control module.
- Power terminal shall not short-circuit.



Power Module

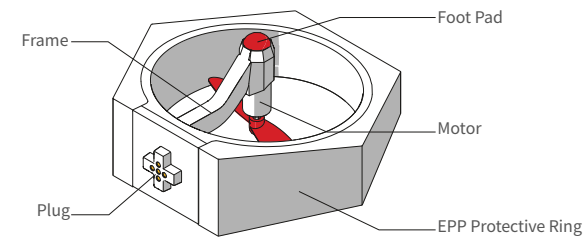
Introduction to structure

The Power Module includes a motor, a propeller, a plug, a frame, etc.

LED is installed on the frame. LED lights up when the motor is activated.

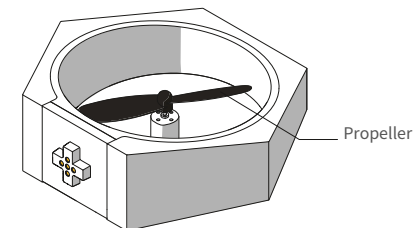
LED on aircraft front power module and foot pad are red.

Foot pads on other power modules are black. LED as indicators are green.



Warning:

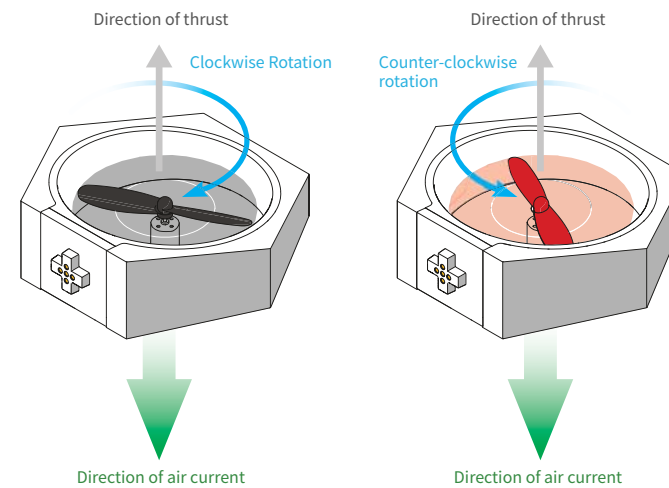
- Do not touch the high speed rotating propellers to avoid injury or breaking off propellers.
- Motor would be hot after activated. To avoid scald, do not touch the motors when it is activated or turn off within 5 minutes.



Power Module

Introduction to Operating Principles

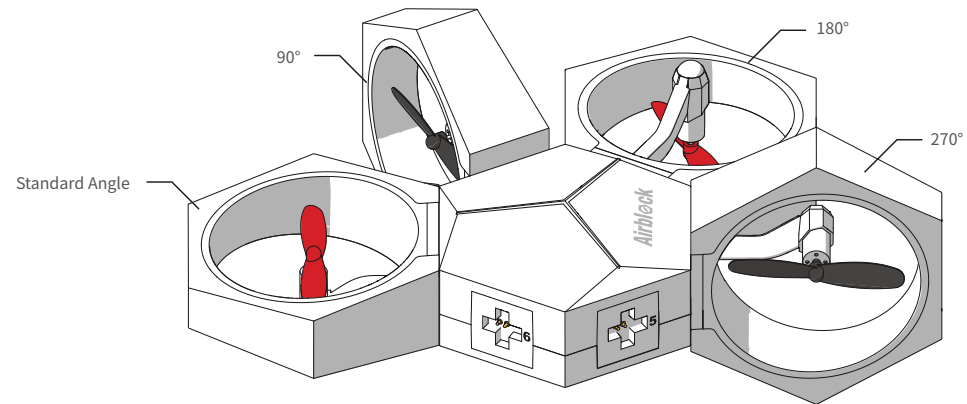
In order to offset the self-rotation of the aircraft, the propellers are classified in red (counter-clockwise rotation) and black (clockwise rotation). Motors are also classified as clockwise and counter-clockwise rotation. After connecting to main control module, the motor starts spinning and pushes air downwards to generate an upward thrust.



Power Module

Installation Angle

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

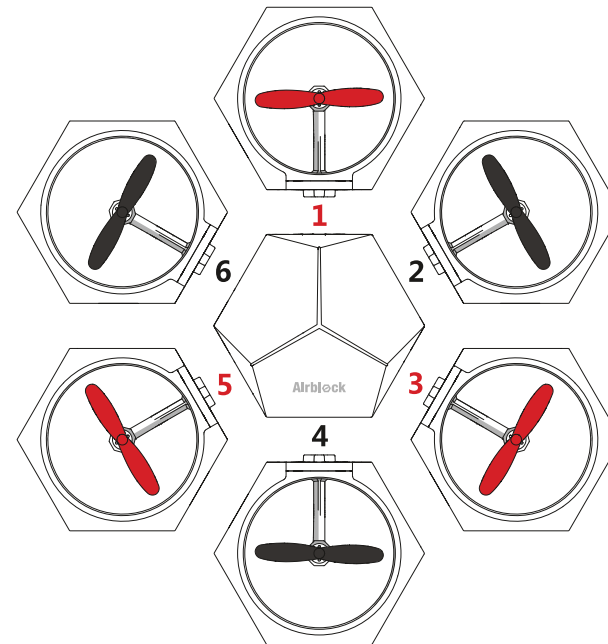


Power Module

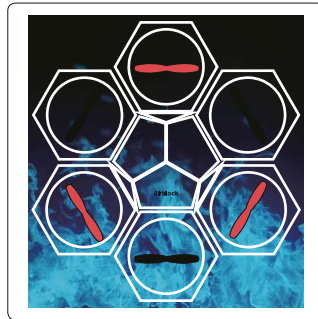
Port Numbers

The power modules of red propellers are connected to Ports 1, 3, 5 respectively, with the front module to Port 1.

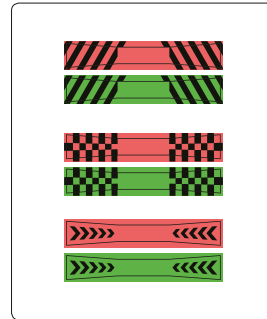
Connect the power modules of black propellers to Ports 2,4,6.



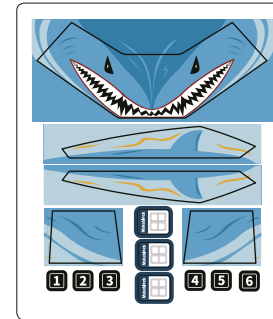
Stickers



Fuselage Stickers



Aircraft Head&Tail
Identification Stickers



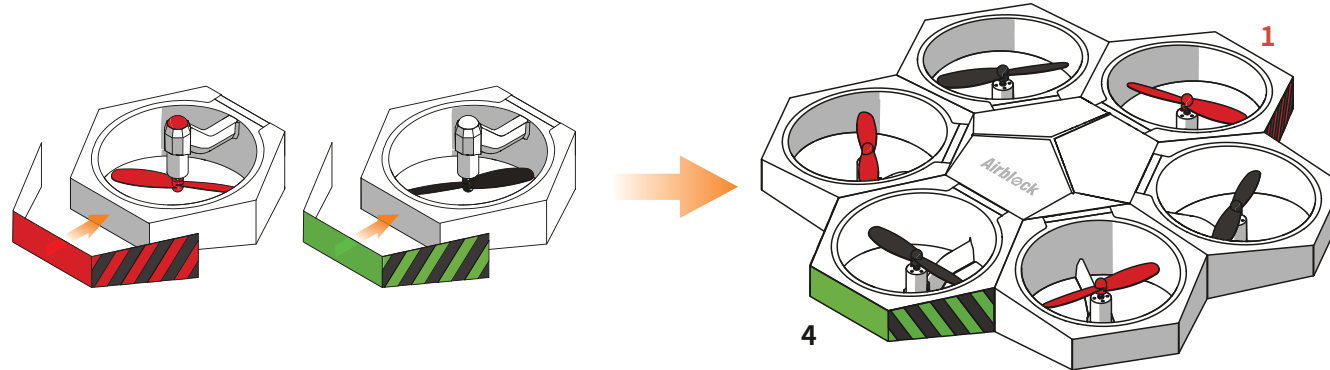
Hovercraft Stickers

Stickers

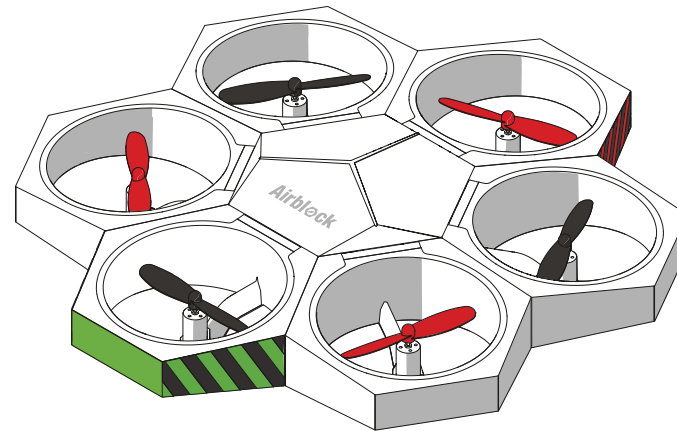
Aircraft Head&Tail Identification Stickers

Attached to power module side in order to distinguish the direction of Airblock 1S during flight.

It is recommended to attach a red sticker to the aircraft front power module (Position 1) and a green sticker to the black propeller power module (Position 4).



User Guide to Aircraft Mode



Operating Environment

Space larger than $3\text{m} \times 3\text{m} \times 3\text{m}$ is recommended for indoor flying.

Warning:

- Ground: the best operating environment for optical flow sensor is flat surface with obvious figure or texture.
- Water: do not start or fly the aircraft over water to prevent accidental falling into water, which can cause short circuit and fire damage to the machine.
- Outdoors: a windy environment may interfere the aircraft's normal flight.
- Before starting, make sure each module is assembled correctly and the protective cover is removed. The protective cover could affect the airflow and aircraft takeoff can be interfered. Place the aircraft on an open ground. Ensure no obstacles within a two-meter radius.
- Shutting down power on Makeblock App during flight can cause sudden drop to the aircraft. This may damage the equipment.
- Aerobatic flight needs a larger space in order to avoid collisions.
- High speed rotating motors and propellers may cause injury. Please keep a safety distance from the aircraft before operating Airblock 1S.
- Dust, hair, fur, or water trapped in Airblock 1S may result in motor malfunction or damage to electronic parts.

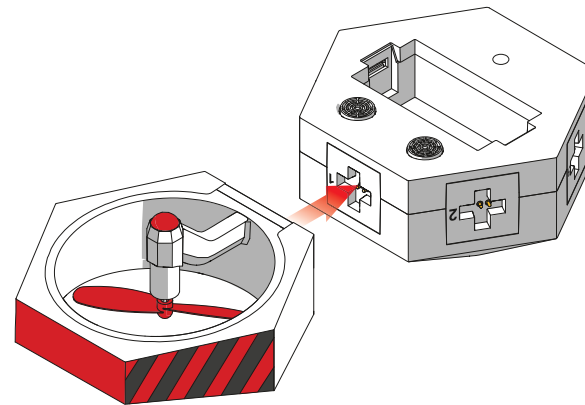
Installation Step 1

Installing the aircraft front power module

Install aircraft front power module with red foot pad onto Port 1 of the main control module.

 Warning:

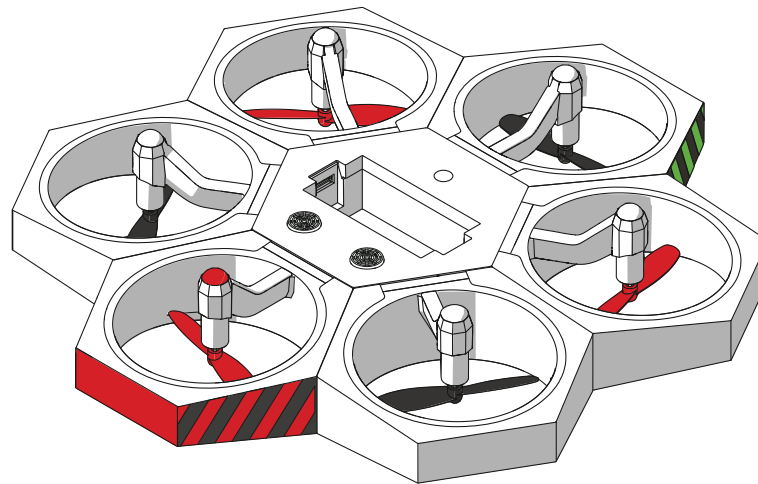
If the front module is installed improperly, the direction of flight can not be controlled properly.



Installation Step 2

Install other power modules

Install the remaining power modules in sequence onto the main control module.



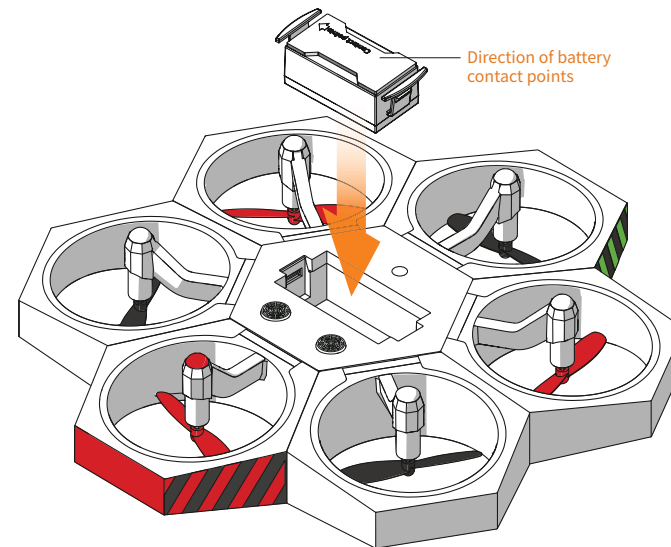
Installation Step 3

Battery Installation

After a fully charged battery is inserted, Airblock 1S will be automatically turned on and enters the standby mode. The LED on the main control module top will display a white light. When Bluetooth is successfully connected, the light in front will turn red, and the light at rear will turn green.

 Warning:

- Before taking off, please ensure Airblock 1S has its top facing upward and Airblock 1S is placed on a flat ground. The picture on the right shows the situation when Airblock 1S has its bottom facing upward.
- In Aircraft mode, the protective cover must be removed.



Control

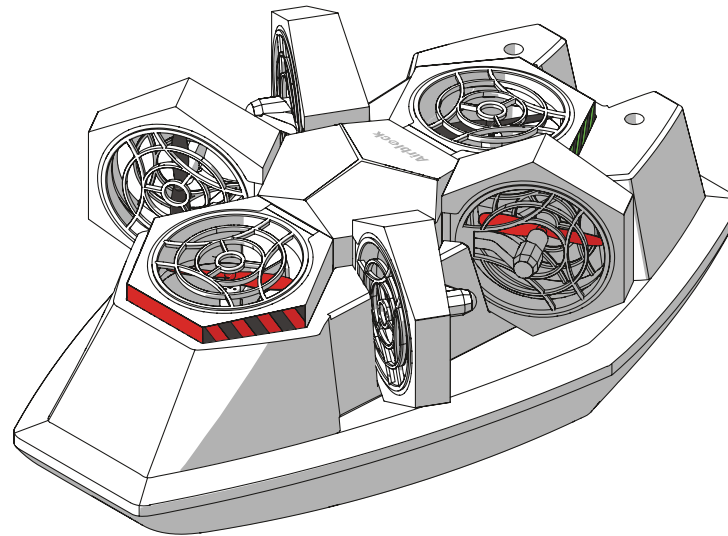
Step 1

Follow the instructions on the first page of User Guide to download and install the application. Open the Makeblock application and move the tablet or smartphone close to the running Airblock 1S, Bluetooth connection should be paired.

Step 2

Enter the control interface after successful connected. Follow the procedures on the New User Guide to familiarize with the functions of different keys and learn how to use the Airblock 1S.

User Guide to Hovercraft Mode



Operating Environment

Recommended to operate in open area.

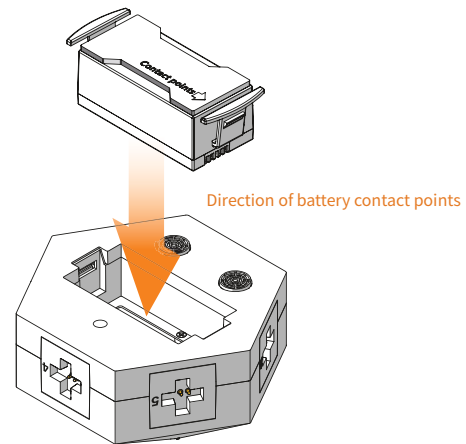


Warning:

- Software: Choose Land or Water mode to control depending on the environment.
- Land: do not drive the hovercraft on muddy , rugged , or mesh surfaces.
- High speed rotating motors and propellers may cause injury. Please keep a safety distance from the aircraft before operating Airblock 1S.
- Dust, hair, fur, or water trapped in Airblock 1S may result in motor malfunction or damage to electronic parts. Hovercraft must be installed correctly under user manual before operating on the water.

Installation Step 1

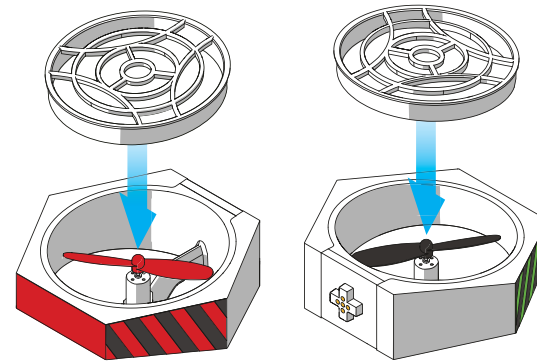
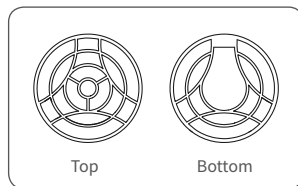
Battery Installation



Installation Step 2

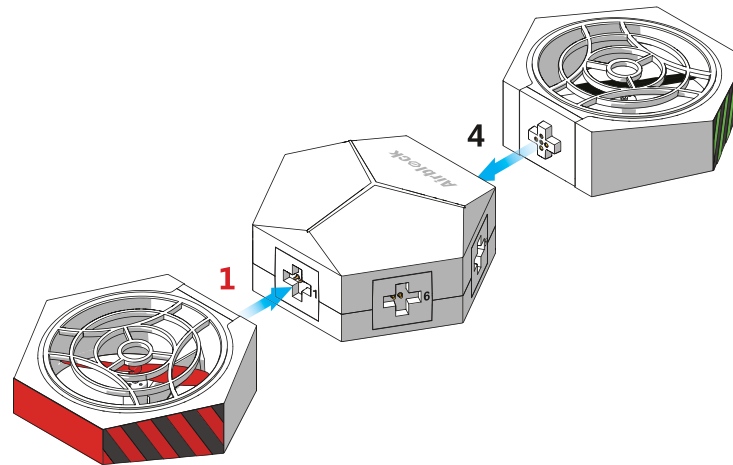
Install the protective cover

The protective covers must be installed in Hovercraft mode to protect the propellers and prevent the propellers from causing damage. The protective covers of Port1 and 4 are required only on the top side of the power modules. There are two types of protective covers; Pay attention to their difference during installation.



Installation Step 3

Connect the front power module and a black propeller power module to Port 1 and 4 on the main control module respectively.

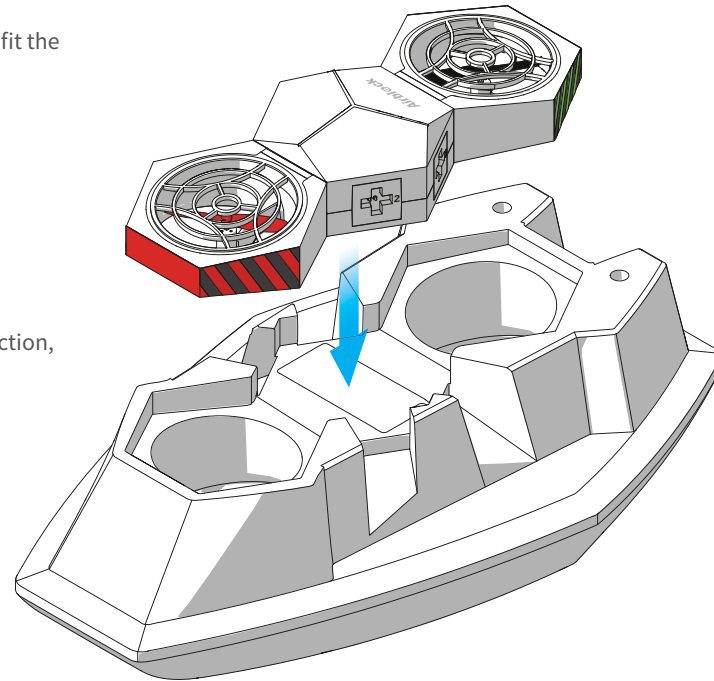


Installation Step 4

After connecting power modules to the main control module, fit the main control module onto the hovercraft hull.

 Warning:

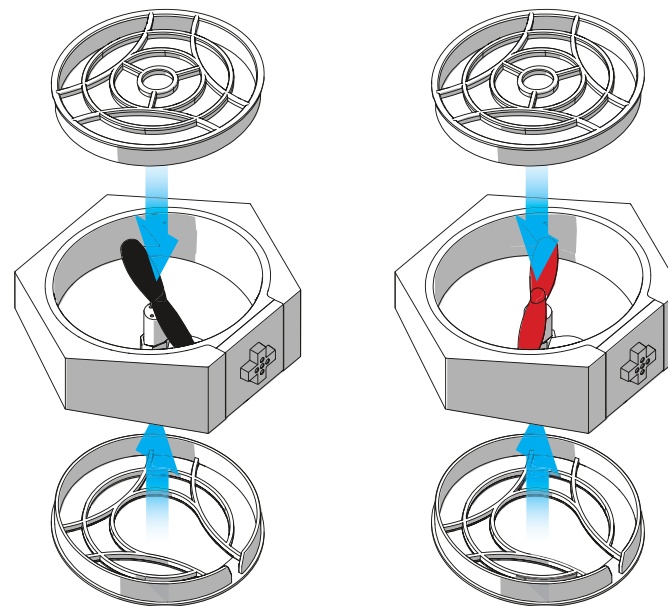
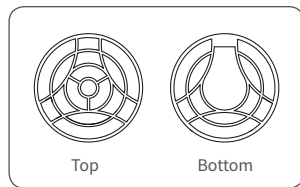
Port 1 faces forwards (the smaller end of the hull is the bow)
The main control module must be installed in the correct direction,
or it will not be able to control the direction of the hovercraft.



Installation Step 5

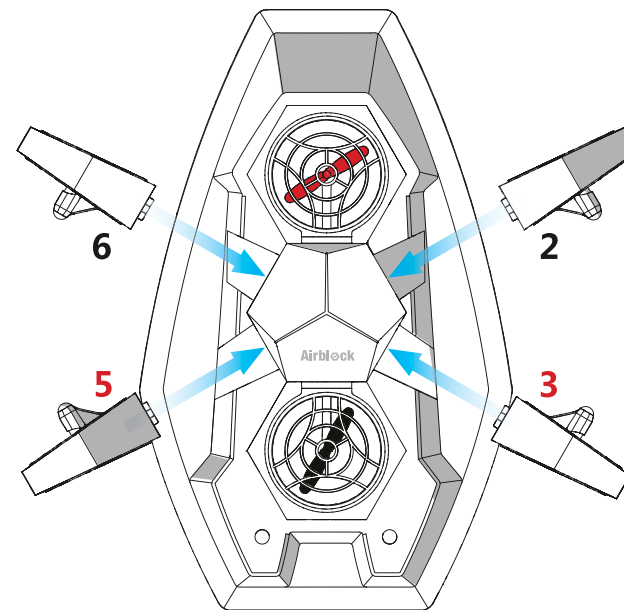
Protective covers are required on both top and bottom sides of other power modules.

There are two types of protective covers; Pay attention to their difference during installation.



Installation Step 6

After fitting the protective covers, attach the 4 power modules onto the main control module according to directions indicated in the diagram below. Check if the protective covers are fitted in the accurate places and if the power modules are attached securely to the main control module.



Control

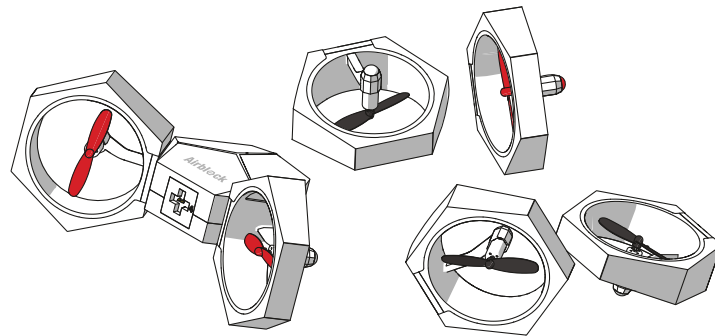
Step 1

Follow the instructions on the first page of User Guide to download and install the application. Open the Makeblock application and move the tablet or smartphone close to the running Airblock 1S, Bluetooth connection should be paired.

Step 2

Enter the hovercraft control interface after successful connection.
Follow procedures on the New User Guide to familiarize with the functions of the different keys and learn how to use Airblock 1S.

User Guide to Custom Mode



Operating Methods

Based on your own ideas, you can mount the power modules at different angles as either propellers or air-blowers. Programming different rotational velocities of motors can achieve corresponding airflow velocities and thrusts in different directions.

Operating Environment

Recommended for use on flat, clean floors or tables.



Warning:

- Land: soft surfaces such as carpets and grass may cause interference to the ultrasonic sensor. It is recommended to take off from hard and flat surfaces.
- In the air: Airblock 1S is unable to fly normally in Custom Mode.
Keep a distance of at least 2 meters from people or animals before running Airblock 1S.
- High speed rotating motors and propellers may cause injury. Please keep a safety distance from the aircraft before operating Airblock 1S.
- Dust, hair, fur, or water trapped in Airblock 1S may result in motor malfunction or damage to electronic parts.

Programming

Examples for reference: <http://learn.makeblock.com>

Step 1

Follow the instructions on the first page of User Guide to download and install the application. Open the Makeblock application and move the tablet or smartphone close to the running Airblock 1S, Bluetooth connection should be paired.

Step 2

Tap on the "New Project" option and select "Customize" to create a new controlling program for Airblock 1S.

Step 3

In "DESIGN" mode, drag and drop required keys modules into the edit area on the right. Tap on the module to enter the "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, which can cause danger.

Troubleshooting

Propellers are not spinning

Poor connection

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

The motor shaft gets stuck

Check if any foreign matter is tangled on the motor shaft; remove the foreign matter.

Bluetooth disconnected

Use application to reconnect to Bluetooth.

Application settings error

If the motor does not operate when executive the program in Custom Mode, check if the "set motor" port number is right.

Direction is incorrect

Aircraft head module is installed in the wrong position

1. When in Aircraft mode, if you find errors in controlling the direction, refer to the installation steps of user manual, check if the aircraft head module with red LED is in the right position.
2. When in Hovercraft mode, refer to the installation steps of user manual, check if the main control module is installed in the correct direction.

Firmware upgrade

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

Power supply LED 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 in the incorrect position. Re-install the battery correctly and confirm that battery is installed properly.

Static electricity causing abnormality

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

Fail to take off

Power supply is insufficient

After successful connection to the application, you may check the power supply level in the control interface. When the battery icon turns red, it indicates low battery warning, please recharge the battery.

Protective cover is not removed

Protective cover must be removed for Aircraft mode.
Protective cover is only applicable for using Hovercraft mode.

Power module is installed in the wrong direction

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

Warranty

Warranted Terms

Parts	Warranty Period
Main Control Module	Six Months
Battery	Six Months (case broken due to operation is not included)
Power Modules, Hovercraft Base and Protective Covers	No applicable to this Limited Warranty. Makeblock only replaces the defective parts upon receiving.

Attention: Power modules are consumable parts, so they are not applicable to Free Repairs. Users could simply purchase new power modules to replace the damages during use.

Precautions to operate Airblock 1S

- Beginners should operate Airblock 1S in an open indoor area for the first flight, in order to prevent dangers from falling or hitting to the ceiling, walls, or trees. (It is recommended to operate Airblock 1S in a space larger than 3m×3m×3m for indoor flying, or a windless open area for outdoor flying.)
- Do not turn off the power during flying except for emergency cases. Otherwise, the aircraft will drop immediately, which may cause damage.
- Due to the limitation of Bluetooth communication distance, it is recommended to control Airblock 1S in a safety radius within six meters. Once the distance between Airblock 1S and mobile device exceeds six meters, the Airblock 1S may lose control due to Bluetooth disconnection.

- Do not touch the propellers spinning area while holding the Airblock 1S or any individual module, in order to prevent accidents when power is suddenly turned on.

Terms of Service

- Replacement: The product can be replaced with the same product or a latest product with equivalent performance if there is a manufacturing defect which has been confirmed by Makeblock Co., Ltd. or the technical people of the authorized distributors within 7 days from the date of receipt. Makeblock Co., Ltd. has the designations and explanations of the replacement. Makeblock Co., Ltd. has the ownership of the defective product which is replaced.
- Replenishment: If you find out any missing parts of your products within 7 days from the date of receipt, Makeblock Co., Ltd. will ship you the missing products or components for free after confirmed by Makeblock Co., Ltd. or the technical people of the authorized distributors.
- Warranty Repairs: During the Warranty Period, if you find out any performance issue which is covered by this Limited Warranty, Makeblock Co., Ltd. will provide free service to repair or replace the defective components after confirmed by Makeblock Co., Ltd. or the technical people of the authorized distributors.
- Charged Repairs: Regarding the quality issue which does not apply to Free Repairs, Makeblock Co., Ltd. will provide charged repair service after confirmed by Makeblock Co., Ltd. or the technical people of the authorized distributors. The fees may vary according to the specific products and the damage level.

The followings are not in the scope of "Replacement" & "Warranty Repairs"

This limited warranty does not cover any damage caused by:

- not matching the national related standards in the operating environment, including but not limited to overvoltage, overcurrent, lightning, extreme high temperature, extreme high humidity, vibration.
- force majeure such as earthquake, fire, and etc.

- unexpected factors or human behaviors, such as liquid contact, abuse, oxidation, rust, and etc.
- failure to follow the product instructions to install, use, maintain, or store the product.
- transform, decompose, or assemble the product without authorization.
- transportation or storage when the purchaser ship the product back to Makeblock.
- including but not limited to other non-design, technical, manufacture, quality issue.

This Limited Warranty does not cover the product which has been exceeded the replacement and Warranty Period.

Special Notes

- The packing of the product, free gifts, consumable parts, and mechanical parts are not applying to this Limited Warranty. If you find any damage upon receiving, Makeblock will provide you free replacement. Please check timely the product after the receipt thereof. Makeblock will charge certain fees if you would add packaging, accessories or require refurbishment service.
- None of any warranty service made by an authorized distributor is covered by this warranty policy, and Makeblock shall not be held liable. In order to receive any benefits from the distributor's warranty and/or other policies, please keep any documents obtained during the purchase.
- If you purchase the product through authorized distributor, please contact the customer service of the authorized distributor first.
- "Replacement / Warranty Period" are available from the date of the receipt.
- In terms of discontinued products or products which are going to be discontinued, Makeblock Co., Ltd. will make relevant announcement and inform authorized distributors to notify customers the deadline of the Warranty Period. Makeblock Co., Ltd. and its authorized distributors will terminate the warranty service after the deadline of the Warranty Period.
- Regarding the repaired or replaced product, it shall be warranted for two months after the date Makeblock Co., Ltd. shipped it. If the original product remaining Warranty Period is more than two months, it shall apply to the original Warranty Period.
- The Limited Warranty does not apply to products that were resold by unauthorized resellers.

Notices to Customer Service

- When failure has occurred on your product, you could apply replacement / repair service with your receipt, invoice or other relevant proof, at the place where you purchased the product. The authorized distributors could assist their customers to apply replacement / repair service to Makeblock Co., Ltd. branches or headquarter. When you cannot contact your distributor, please contact Makeblock Co., Ltd. branches or the customer service of headquarter.
- During Warranty Period, Makeblock Co., Ltd. will cover the shipping cost for any product which apply to free repairs. Regarding the products which exceed Warranty Period, the freight out and home should on customer's charge.

Warranted Terms

Website	www.makeblock.com
Email	airblocksupport@makeblock.com; tec-support@makeblock.com
Address	4th Floor, Building C3, Nanshan iPark, No.1001 Xueyuan Avenue, Nanshan District, Shenzhen, Guangdong Province, China

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FCC STATEMENT :

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Warning: 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

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
- Consult the dealer or an experienced radio/TV technician for help.

RF warning statement:

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

The instruction has to be kept since it contains important information.



⚠ WARNING:

CHOKING HAZARD- Small parts. Not for children under 3 years.
Children should operate under adult's supervision.