

makeblock

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motionblock

Quick Start Guide

Model:MMB-K01-YSJ



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## Welcome to the world of MotionBlock!

MotionBlock is a transforming robot that can be programmed to do plenty of fun things. Using different combinations of the blocks, you can easily turn the robot into a variety of shapes. By recording motions of the robot offline or controlling it with the synchronizer, you make the robot do whatever you want. And with the Makeblock app and mBlock, you are about to unlock the full potential of MotionBlock. Now, let's start the journey!

### Building the Robot

Choose a robot shape to build and enjoy the fun of building.

01

### Software Controlling

Control your robot with software to bring it to life.

02

### Recording Motions

Make your robot do whatever you can imagine without a phone or computer.

03

### Learn Coding

Explore what more you can do with MotionBlock by using block-based language and Python.

04

## Building the Robot

Makeblock offers plenty of samples that inspire you to transform MotionBlock into different shapes. You can download the Makeblock app to see the 3D building guides. In this package, you can also find the **Robotic Arm + Synchronizer Building Instruction**. Following the instruction, you know how to manipulate the robot to do whatever you want without using a phone or computer.

### A. Mechanical Arm + Synchronizer Building Instruction: Quick building and synchronizing control.

The **Synchronizer** is a device that allows you to manually control the robot to perform tasks. That is to say, the Synchronizer and the robot can simultaneously perform the same actions.

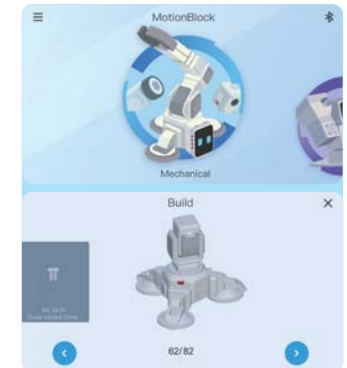
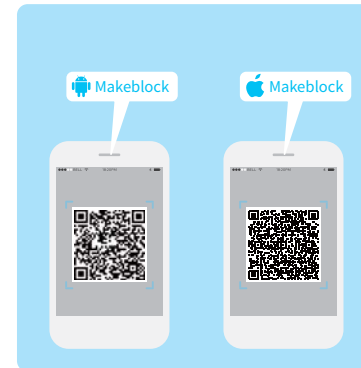


## Building the Robot

### B. Makeblock App: Follow 3D guides to transform your MotionBlock into different robotic figures.

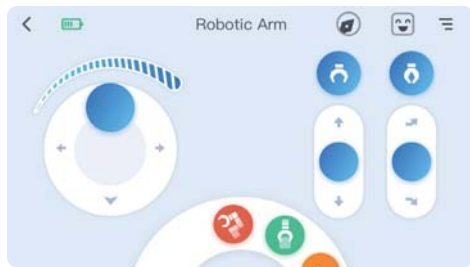
How to get started?

1. Scan the QR code below with your phone or tablet to download the app. Or you can search for "Makeblock" in applications stores.



## Software Controlling

After you build your robot, you come to the control interface. For each robot shape, the app offers different controlling mechanisms. It's time to activate the robot!



### Control Interface

Built-in control mechanisms that are easy to pick up.



### Motions Editor

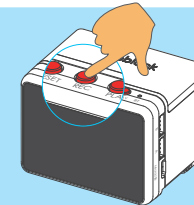
Record motions of the robot frame by frame and play the recording. The interface can show you rotational angles of each servo.

## Recording Motions

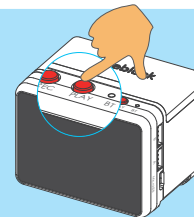
You can record a sequence of motions (90 seconds at most) of the robot without using a phone or computer and play the recordings later.

How to get started?

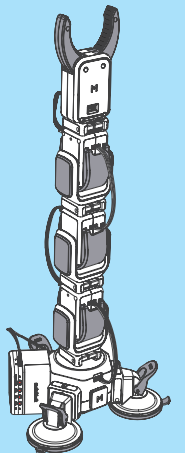
- 1 Press the REC button to record the motions.



- 3 Press the PLAY button to play the recordings.



- 2 After finishing recording a sequence of motions, you can press the REC button once again to stop recording.

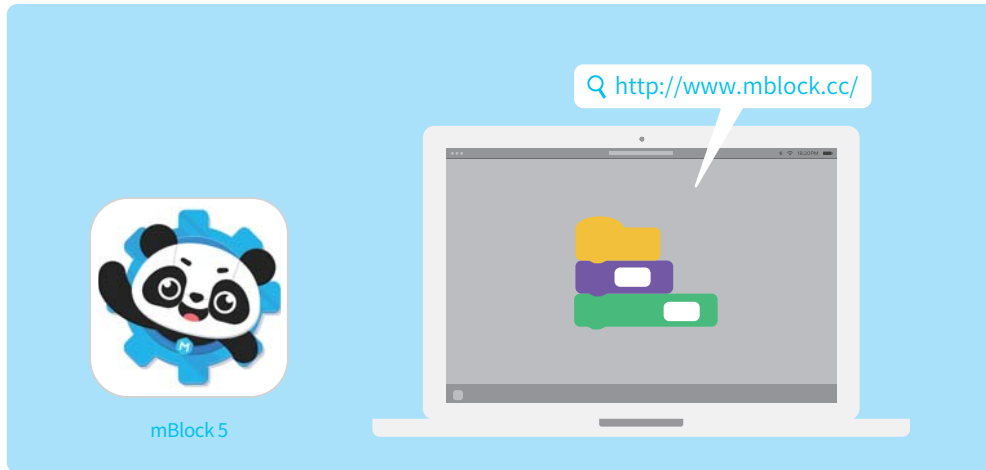




## Learn Coding

mBlock supports block-based programming and Python, allowing children to easily transition from beginning levels to advanced programming.

Download mBlock at: <http://www.mblock.cc>



## Learn Coding



### How to get started?

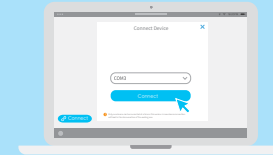
- 1 Use the Micro USB cable to connect the Master Control to your computer.



- 2 Open mBlock and go to the Devices Library to add MotionBlock.

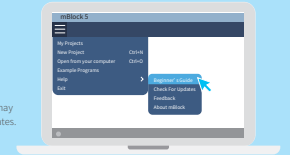


- 3 Click **Connect** at the bottom left corner to connect your robot.

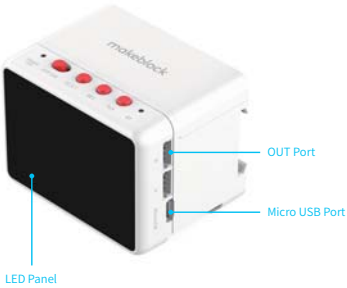


- 4 Go to **Menu** to access Help guides. Now start coding!

Note: Actual interfaces may vary slightly due to updates.



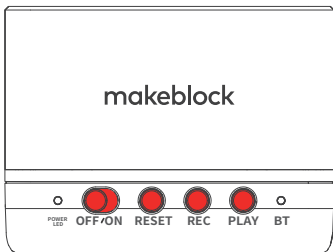




The Master Control block serves as the brain of a robot. It can be :

- Used to record motions of MotionBlock and replay the recordings.
- Connected to the Makeblock app with its built-in Bluetooth and used to control MotionBlock.
- Connected to a computer via the USB cable. You can use mBlock to control the robot.

OUT Port	Micro USB Port	LED Panel
The Master Control has 4 ports in total on sides, A, B, C and D. The ports can connect to blocks and the Synchronizer.	This port connects the Master Control to a computer, allowing you to program MotionBlock with mBlock.	The LED Panel consists of 192 blue LEDs (16x12). It can be: (1) Used to indicate the status of your robot. (2) Programmed to display images, numbers, texts and more. It gives your robot emotions and personalities.



Indicator

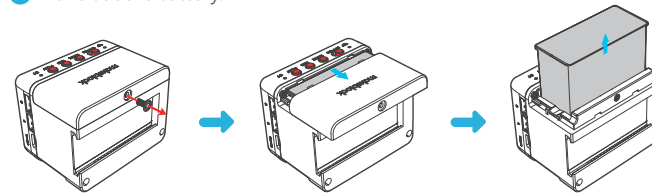
Power Indicator	Bluetooth Indicator
This indicator tells you the battery level. Solid Green: High Level Flash in red: Low Battery. You need to charge your robot.	This indicator lets you know the Bluetooth connection status. Flashing: Not connected Solid On: Successfully connected

Buttons

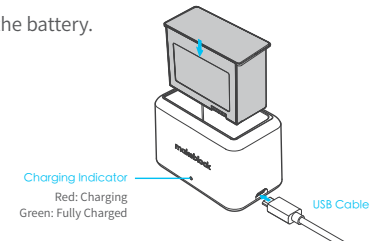
RESET Button	Record Button	Play Button
Short Press: Short press the RESET button to recover all the servos when your robot fails to work properly. Long Press: (for more than 3 seconds): Long press the button to set the current position of the servo as the zero position.	Press the button to start recording motions (90 seconds at most), and press it again to stop recording.	Press the button to play or pause the recording.

Charging the Battery

1 Take out the battery.

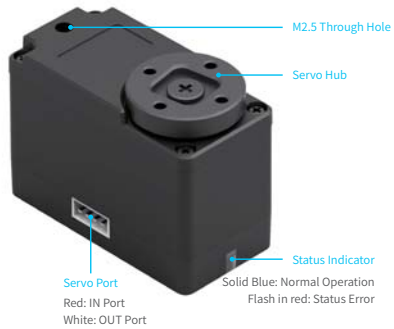


2 Charge the battery.



Safety Tips:

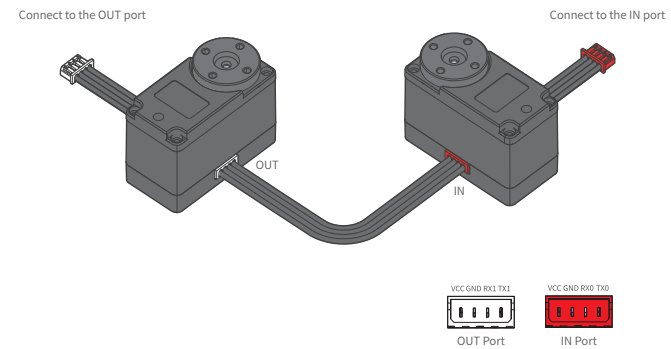
- Take out the battery if you do not intend to use the master control for some time, in order to protect the battery from over-discharging.
- DO NOT use the battery under high temperature or high humidity environments.
- Damages or explosions might happen if the battery gets bumped, so please be careful.



The **Smart Servo** is the core driver of MotionBlock. It supports continuous rotations of 360 degrees.

Specifications	
Torque	25kg-cm
Speed	60rpm
Accuracy	0.088°
Range	0-360 degrees continuous rotation
Voltage	DC 7.4V
Feedback	Angle, Speed, Temperature, Voltage, Current
Communication	UART
Protection	Stall, Temperature
Operation Temperature	0°C - 50°C

### Wiring the Servos



### Safety Tips:

- The servo delivers high torque so there might be risks of danger when the servo is working. Please follow the instructions when handling the servo.
- A wet servo might cause a short circuit, which will end up in damages.
- The gears or the motor might be damaged if the servo gets stuck when it is rotating.
- **DO NOT** disassemble the servo on your own. It includes non-repairable parts inside.





## Notes

- This product is recommended for users aged 10 and above.
- To protect yourself from hurts, please follow the instructions to assemble the silicone cases for the swinging wrapping blocks.
- DO NOT touch the joints of the robot or surrounding parts when the robot is working.
- DO NOT fiddle with the robot when it is working, which otherwise might cause hurts and damage the robot.
- Try not putting the robot at high places or on the edges of tables, in case the robot falls down and damages happen.
- After the servo works for a long period, it will get hot and turn on the temperature protection mode. This is normal so please wait for a while.
- In some cases, the motions range of the robot might be influenced by the connection cables. To avoid entangled wires and servo stalling, please make sure the robot doesn't move out of the range.

No matter how DIY the end consumer is, the number of wireless modules and motors remains the same.

## FAQ



Can I use the Micro USB port to charge the master control?

No. The Micro USB port only connects the master control to a computer. You should take the lithium battery out of the master control and charge the battery in the charging stand.



I started the robot up but the servo indicators of some blocks didn't light up. And the robot didn't react to my commands. How do I fix this?

The cause might be that the metal domes of servo connection cables have poor contact, or that cables are damaged. Use another connection cable to try again.



## Help and Resources

If you find out any content presented in this manual is inconsistent with actual situations or if you have any problems or suggestions, feel free to contact us.

Technical Support: [support@makeblock.com](mailto:support@makeblock.com)

### 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 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.

### FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.