

Introduction to mBot2



Compared to mBot, mBot2 is overall upgraded in its main control board, extensibility, power supply, motion system, sensor design, and chassis.

CyberPi — main control board

mBot2 uses CyberPi as its main control board. CyberPi is developed independently by Makeblock. For details about CyberPi and how to use it, see [CyberPi <https://www.yuque.com/makeblock-help-center-en/cyberpi/cyberpi>](https://www.yuque.com/makeblock-help-center-en/cyberpi/cyberpi) and [CyberPi Operation Guide <https://www.yuque.com/makeblock-help-center-en/cyberpi/cyberpi-start>](https://www.yuque.com/makeblock-help-center-en/cyberpi/cyberpi-start).

Performance comparison

Main control board	CyberPi	mCore
Processor core	ESP32-WROVER-B	ATmage328/P
Processor clock frequency	240 MHz	20 MHz
Onboard ROM	448 KB	1 KB
Onboard SRAM	520 KB	2 KB
SPI Flash	8 MB	/
PSRAM	8 MB	/



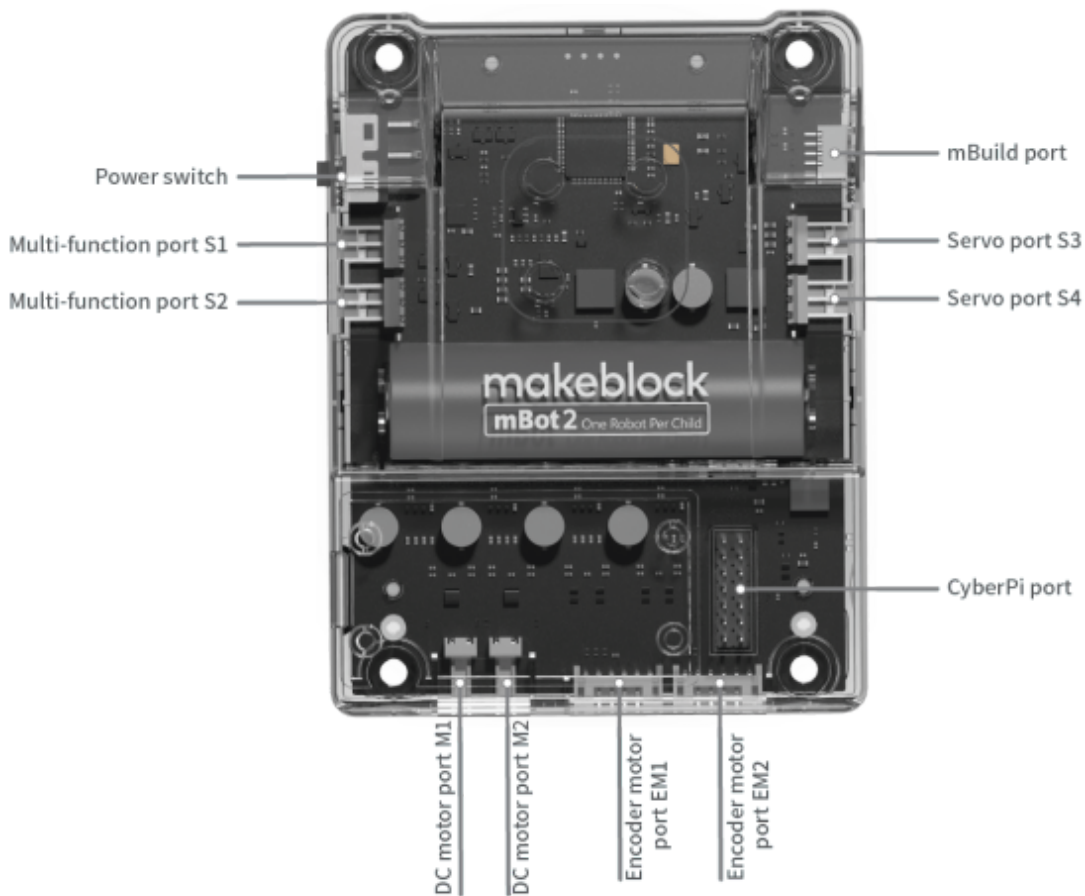
Function comparison

Main control board	CyberPi	mCore
Mode switching	No firmware update required	Firmware update required
Multi-thread processing	Supported	Not supported
Number of programs it can store	8	1
Python	Supported, microPython+Python3	Not supported
Communication mode	Bluetooth + WiFi WiFi LAN communication	Bluetooth or 2.4G varying according to product version IR communication
Button input	Joystick (five-direction control) Button × 2 Home button	Button Reset button
Onboard sensor	Light sensor Microphone (can record sounds and can function as a sound sensor) Gyroscope Accelerometer	Light sensor
Onboard output	1.44-inch full-color display Speaker RGB LED × 5	Buzzer RGB LED × 2



mBot2 Shield — extensibility

The extensibility and power supply of mBot2 depend on mBot2 Shield.



Extensibility comparison

	mBot2	mBot
Encoder motor port	2	0
DC motor port	2	2
Servo port	4	0
Port for LED strips	2 (also serve as servo ports)	0
Port for Arduino modules	2 (also serve as servo ports)	0
Number of electronic modules it can be extended with	More than 10* (through the mBuild port)	4

*No more than 10 mBuild modules are recommended for the best performance experience.

Power supply

The power supply for mBot2 has been upgraded.

Power supply comparison

	mBot2	mBot
Capacity	2500 mAh	1800 mAh
Discharge rate	3C	1C
Rated power	27.75 W	6.66 W

Motion system

mBot2 uses the high-precision encoder motors that have been used in mBot Ranger, and we have redesigned the circuits for the encoder motors to ensure the operation safety and quality.

Motor performance comparison

	mBot2	mBot
Rotational speed range	1–200 RPM	47–118RPM±10%
Rotational angle accuracy	≤5°	N/A
Detection accuracy	1°	N/A
Torque (in operation)	1500 g·cm	≥672 g·cm
Material of the output shaft	Metal	Plastic

Motor control comparison

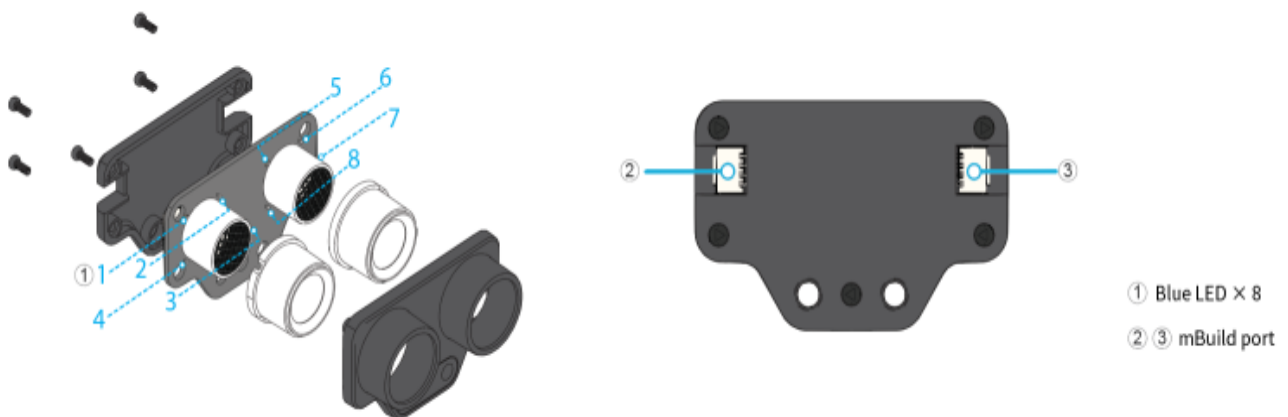
	mBot2	mBot
Turning	Precise turning	
Moving straight forward	Deviation: ≤2% Providing the command for moving forward XX mm	Providing only the command for moving forward for XX seconds
Functioning as a servo	Supported Angle control accuracy: ≤5°	Not supported
Functioning as a knob	Supported	Not supported

Detection accuracy: 1°

Ultrasonic Sensor 2 and Quad RGB Sensor — sensor design

Ultrasonic Sensor 2

We have improved our ultrasonic sensor and added blue LEDs, which may increase the potential of mBot2 for emotion expression and interaction.

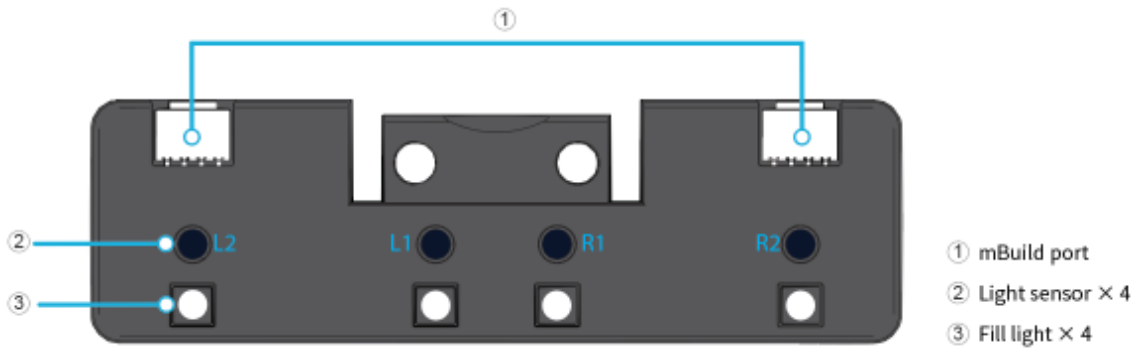


Ultrasonic sensor comparison

	mBot2	mBot
Plastic casing to improve the durability and quality	Yes	No
Built-in chip to improve the operation stability	Yes	No
Blue LED (additional function)	8	0

Quad RGB Sensor

Quad RGB Sensor is a new design based on the line-following sensor. It uses visible light as fill lights, which significantly reduce the interference of ambient light. In addition, it provides the function for recognizing colors. With four light sensors, it can support more programming scenarios.



Line-following sensor comparison

	mBot2	mBot
Plastic casing to improve the durability and quality	Yes	No
Line-following sensor	4	2
Color sensor	4 (also serve as line-following sensors)	No
Light sensor	4 (also serve as line-following sensors)	No
Fill light	Visible light	IR light
Ambient light calibration to significantly reduce the interference of ambient light	Yes	No

Chassis

We have optimized the chassis to ensure that it complies to the hole spacing specifications of the mechanical parts. In addition, we have increased the number of through-holes

