Makeblock mBot Ranger

Makeblock mBot Ranger 3-in-1 Programmable Robot Kit User Manual

Model: mBot Ranger

Introduction

The Makeblock mBot Ranger is a versatile 3-in-1 programmable robot kit designed to introduce users to robotics, programming, and STEM concepts. This kit allows you to build three distinct robot forms: a tank robot, a self-balancing robot, and a racing car robot. It supports graphical programming with Scratch and text-based programming with Arduino C, making it suitable for various skill levels.

This manual provides essential information for the assembly, operation, maintenance, and troubleshooting of your mBot Ranger kit.

Image: The Makeblock mBot Ranger kit can be assembled into a self-balance car, a robot tank, or a racing car, demonstrating its 3-in-1 versatility.

Safety Information

Please read and understand all safety warnings before using the product.

- **Choking Hazard:** Small parts are included. Not suitable for children under 3 years.
- Recommended age for assembly and advanced programming is 10 years and older.
- Ensure all connections are secure before powering on the robot.
- Use only recommended batteries (6 AA batteries).
- Adult supervision is recommended during assembly and initial use.

Setup and Assembly

The mBot Ranger kit allows for the construction of three different robot configurations. Follow the detailed instructions provided in

the physical assembly guide included with your kit for each specific build.

1. Unpacking and Component Identification

Carefully unpack all components and verify against the parts list in your assembly guide. The main components are made from a high-quality aluminum alloy.

2. Battery Installation

1. Locate the battery compartment on the main control board.
2. Insert 6 AA batteries, ensuring correct polarity.
3. Close the battery compartment securely.

3. Robot Assembly

Refer to the step-by-step instructions in the included assembly manual for building your chosen robot form (Tank, Self-balancing, or Racing Car). Ensure all screws and connectors are tightened appropriately.

Image: A user assembling the mBot Ranger, highlighting the easy and engaging assembly process with the provided manual and tools.

4. Software and App Installation

- Download the official Makeblock App from your device's app store (iOS/Android) or the Makeblock website.
- For PC programming, download the mBlock software, which supports Scratch-based graphical programming and Arduino C. Visit the official Makeblock website for the latest version.

Operating Instructions

1. Connecting to the Robot

1. Ensure the robot is powered on.
2. Open the Makeblock App on your smartphone/tablet or mBlock software on your computer.
3. Follow the in-app/software instructions to connect via Bluetooth. Ensure your device's Bluetooth is enabled.

2. Basic Control and Pre-programmed Functions

The Makeblock App provides various control modes and pre-programmed functions, including:

- **Voice Control:** Control the robot using voice commands.
- **Racing Car Mode:** Drive the robot like a remote-controlled car.
- **Draw and Run:** Draw a path on your screen for the robot to follow.
- **Avoid Obstacle:** The robot uses its ultrasonic sensor to detect and avoid obstacles.
- **Line Following:** The robot uses its line tracking sensor to follow a black line on a light surface.
- **Musician:** Program the robot to play musical notes using its buzzer.

Image: The Makeblock App interface on a tablet, illustrating the diverse control and play modes available for the mBot Ranger.

3. Programming the Robot

The mBot Ranger supports two primary programming environments:

- **Scratch-based Graphical Programming (mBlock):** Ideal for beginners, this block-based programming allows you to drag and drop commands to create complex behaviors.
- **Arduino C Programming:** For advanced users, the mBlock software also supports text-based Arduino C programming, offering greater control and customization. The robot uses the same chip as the Arduino Mega 2560.

The kit includes various modules to enhance programming possibilities:

- Ultrasonic Sensor
- Line Tracking Sensor
- 2 Light Sensors
- Gyroscope Sensor
- 12 RGB LEDs

- Buzzer
- Temperature Sensor
- Bluetooth Module

Image: The mBot Ranger demonstrating its programming capabilities, with a laptop showing both Scratch block-based and Arduino C code environments.

Maintenance

1. Cleaning

To maintain optimal performance, regularly clean the robot's exterior with a soft, dry cloth. Avoid using harsh chemicals or abrasive materials. Ensure sensors are free from dust and debris.

2. Battery Care

- Replace all 6 AA batteries when the robot's performance diminishes.

- Remove batteries if the robot will not be used for an extended period to prevent leakage.
- Dispose of used batteries responsibly according to local regulations.

3. Component Inspection

Periodically check all mechanical connections and electronic components for any signs of wear or damage. The aluminum alloy components are durable but can be damaged by excessive force.

Troubleshooting

- **Robot not powering on:**
  - Ensure 6 fresh AA batteries are correctly installed with proper polarity.
  - Check the power switch is in the "ON" position.
- **Bluetooth connectivity issues:**
  - Ensure the robot is within range of your device (typically 10 meters).
  - Verify Bluetooth is enabled on your smartphone/tablet/computer.
  - Restart both the robot and your device.
  - Update the Makeblock App or mBlock software to the latest version. Older app versions may have compatibility issues.
  - If using a computer, ensure your Bluetooth adapter is functioning correctly.
- **Robot moves slowly or erratically:**
  - Replace old batteries with fresh ones. Low battery power can affect motor performance.
  - Ensure all motor connections are secure.
  - Check for any obstructions in the wheels or tracks.
- **Ultrasonic sensor not detecting accurately:**
  - Ensure the sensor is clean and free from dust or obstructions.
  - The ultrasonic sensor has a specific detection angle; ensure objects are within this angle.
  - Avoid using the sensor on soft, sound-absorbing surfaces or highly reflective surfaces, which can affect accuracy.
- **Line tracking sensor not working:**
  - Ensure the sensor is clean.
  - Verify the line is dark and distinct on a light background.
  - Check the lighting conditions; extreme light or darkness can affect performance.

Specifications

Feature	Detail
Model Name	mBot Ranger
Brand	Makeblock
Product Dimensions	27.2 x 22 x 9.8 cm
Item Weight	1.6 kg

Feature	Detail
Material	Aluminum Alloy
Power Source	6 AA Batteries (required)
Recommended Age	10 years and up
Programming Languages	Scratch (mBlock), Arduino C
Main Control Board	Based on Arduino Mega 2560 chip
Sensors Included	Ultrasonic Sensor, Line Tracking Sensor, 2 Light Sensors, Gyroscope Sensor, Temperature Sensor
Actuators/Outputs	12 RGB LEDs, Buzzer, Motors
Connectivity	Bluetooth Module
Assembly Required	Yes
GTIN (UPC)	687765729324
ASIN	B07KG4JHBH

Warranty and Support

Warranty Information

For detailed warranty information, please refer to the official Makeblock website or the warranty card included with your product. Warranty terms and conditions may vary by region.

Customer Support

If you encounter any issues or have questions regarding your Makeblock mBot Ranger, please visit the official Makeblock support website for FAQs, tutorials, and contact information. You can also find community forums and educational resources there.

- **Official Website:** www.makeblock.com
- **Makeblock App:** Available on iOS and Android app stores.
- **mBlock Software:** Downloadable from the official Makeblock website.

you@example.com

After a successful submission, we securely hash the supplied account or form email before sending it to Microsoft Advertising for conversion attribution. Privacy details.

Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

Submit question