EF ELECFREAKS Cutebot-1

ELECFREAKS microbit Mini Cutebot Kit Instruction Manual

Your guide to assembling, operating, and maintaining your programmable robot car.

Introduction

The ELECFREAKS microbit Mini Cutebot Kit is a programmable robot car designed for STEM education. This kit, compatible with BBC Micro:bit V1 and V2 (not included), allows users to learn graphical MakeCode programming through various interactive projects. This manual provides essential instructions for assembly, operation, maintenance, and troubleshooting to ensure a successful and engaging experience.



This image displays the ELECFREAKS microbit Mini Cutebot Kit, showcasing its compact design, integrated ultrasonic sensor, and the slot for the micro:bit board.

Package Contents

Please verify that all the following items are included in your kit:

- Cutebot Car
- Line-tracking Map
- HC-SR04 Ultrasonic Sensor
- Instruction Manual
- AAA Battery Holder
- 3M Foam Tape

Note: The micro:bit board and AAA batteries are NOT included and must be purchased separately.



This image displays the complete packing list for the ELECFREAKS Cutebot Kit, including the main car body, line-tracking map, HC-SR04 ultrasonic sensor, instruction manual, AAA battery holder, and 3M foam tape. Please note that the micro:bit board and AAA batteries are sold separately.

Setup Instructions

1. **Install AAA Batteries**

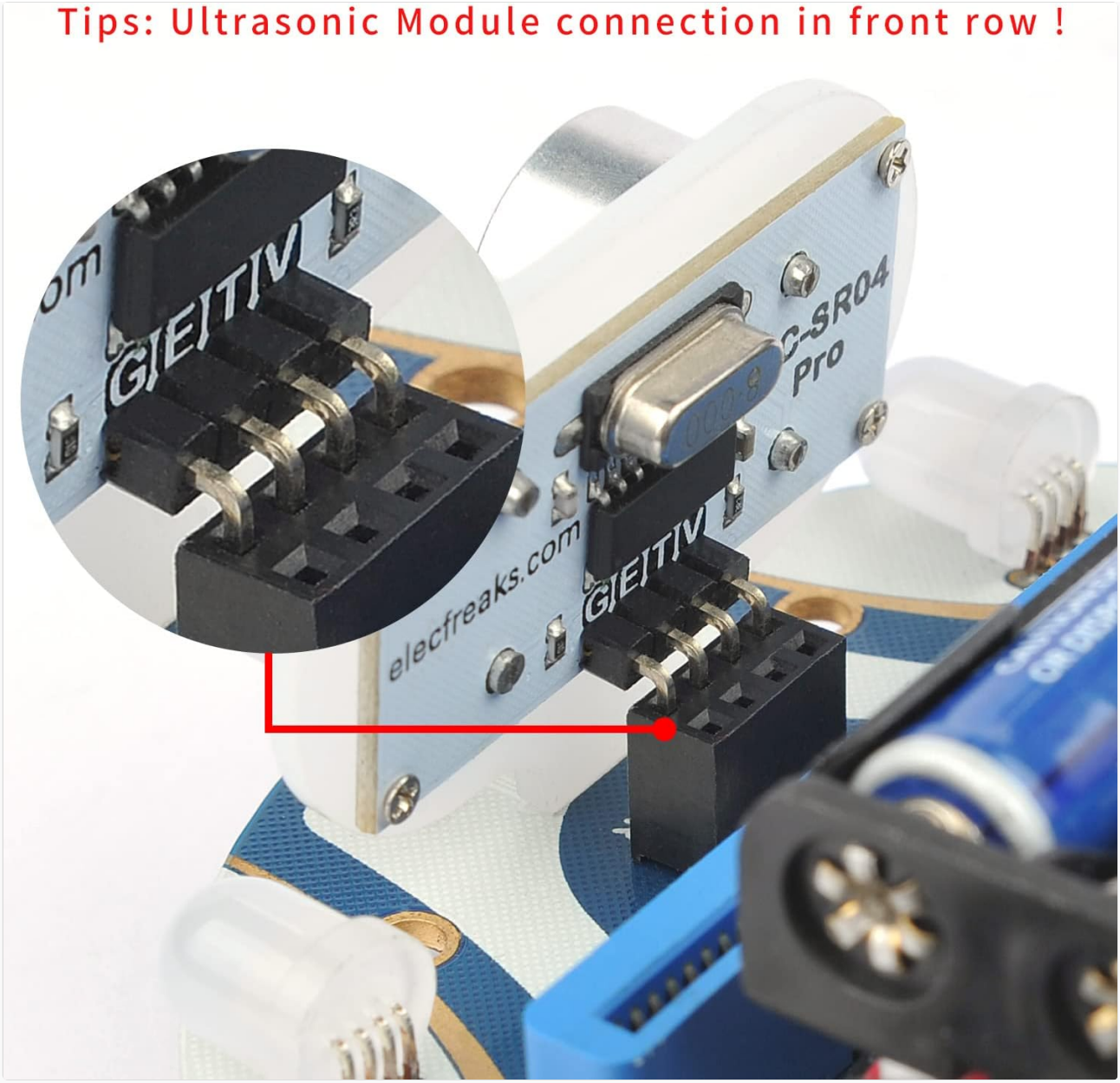
   Insert 3 AAA batteries into the battery holder. Ensure correct polarity as indicated inside the holder. The battery holder then connects to the Cutebot car.

2. **Connect Micro:bit Board**

   Carefully insert your micro:bit board (not included) into the designated slot at the rear of the Cutebot car. Ensure it is securely seated and the gold edge connector is fully engaged.

3. **Attach Ultrasonic Module**

   Connect the HC-SR04 ultrasonic sensor to the front port of the Cutebot. It is crucial to plug it into the front port for proper functionality. Incorrect connection will prevent the Cutebot from operating.



This image illustrates the correct method for connecting the HC-SR04 ultrasonic module to the front port of the Cutebot. Improper connection may prevent the robot from operating as intended.

Operating Instructions

The ELECFREAKS Cutebot is designed for programmable robotics. It requires programming via the MakeCode editor or Python.

1. **Accessing MakeCode Editor**

   Visit the official MakeCode editor website for micro:bit. You can find tutorials and the Cutebot extension at wiki.elecfreaks.com/en/.

2. **Installing Cutebot Extension**

   Within the MakeCode editor, add the Cutebot extension to access specific programming blocks tailored for the robot's features.

3. **Programming Basic Functions**

   The Cutebot supports various functions through programming:

- **Line Following:** Utilize the bottom sensors to detect and follow lines on the included map or custom tracks.
- **Distance Tracking:** Program the ultrasonic sensor to measure distances.
- **Obstacle Avoidance:** Use the ultrasonic sensor to detect obstacles and program the robot to navigate around them.
- **Light Show:** Control the RGB LED headlights and clearance lamps for custom light patterns.
- **Wireless Remote Control:** If using a compatible micro:bit game controller (sold separately), program the Cutebot for remote operation.
- **Seeking the Light:** Program the robot to respond to light sources using its sensors.



This image illustrates the core functionalities of the ELECFREAKS Cutebot, including line following, distance measurement, obstacle avoidance, customizable lighting, remote control capabilities, and light-seeking behaviors, all achievable through programming.

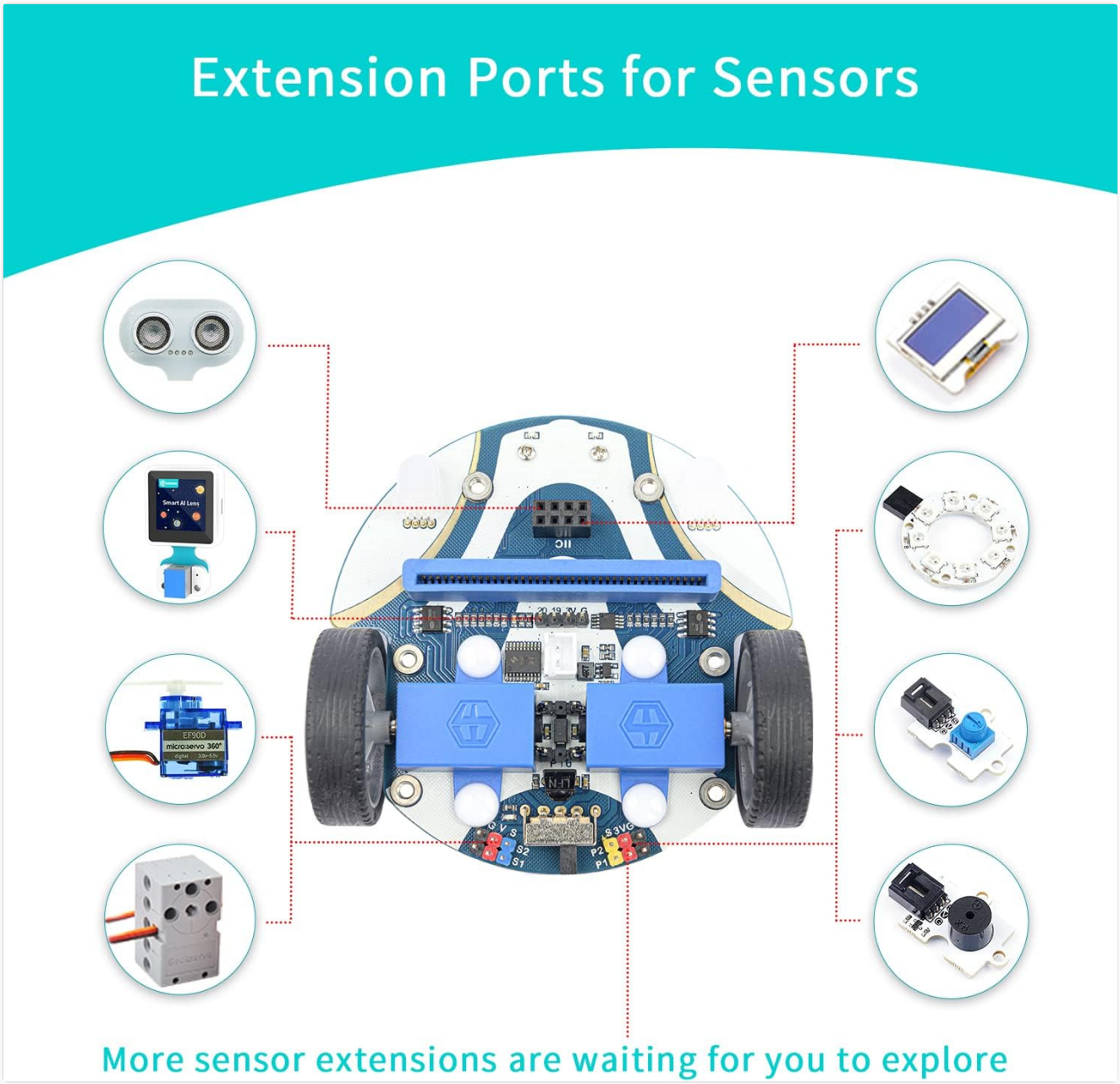
4. ### Uploading Code

   After writing your code in MakeCode, download the .hex file and drag it onto your micro:bit drive when connected to your computer. The micro:bit will automatically flash the new program.

Extension Ports and Sensors

The Cutebot features multiple extension ports for enhanced functionality and custom projects, allowing for broad

expandability.

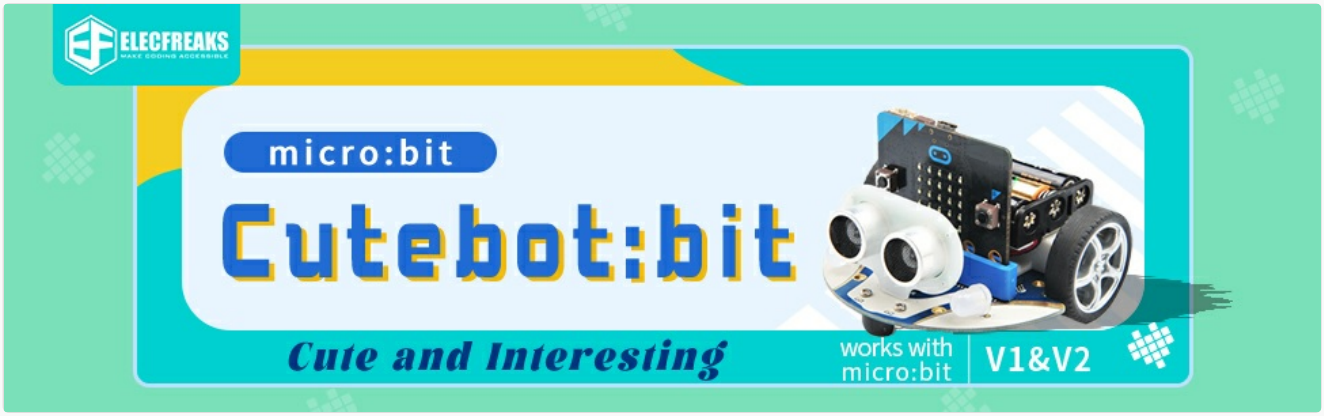


This diagram highlights the various extension ports available on the Cutebot, allowing for connection of additional sensors and modules to expand its capabilities. These include 3PIN ports for general sensors and compatibility with building blocks for structural modifications.

- **3PIN Ports:** For connecting external sensors and modules.
- **Building Block Extension:** Compatible with standard building blocks for creative modifications.
- **IIC Port (P19, P20):** For I2C communication with compatible modules like OLED displays.
- **Ultrasonic Port:** Dedicated port for the HC-SR04 ultrasonic sensor.
- **Servo Connections (S1, S2):** For connecting servo motors.
- **IR Receiving Module:** For infrared remote control (remote sold separately), connects to P16.
- **Rainbow LED (P15):** Programmable Neopixel LEDs.
- **Right Tracking Sensor (P14) & Left Tracking Sensor (P13):** For line-following functionality.

Specifications

Feature	Detail
Working Voltage	3.5V - 5V
Dimensions	85.68mm x 85.34mm x 38.10mm (3.4 x 1.34 x 1.57 inches)
Item Weight	9.2 ounces
Infrared Control	Connects to P16
RGB Headlights	2 x RGB
Rainbow LED	2 x Neopixel connect to P15
Motor Type	GA12-N20 DC micro gear deceleration motor (300RPM)
Ultrasonic Sensor Type	HC-SR04 (2cm-400cm Contactless distance detection, precision ±1.5mm)
Expansion IO Ports	Power switch, Servo Connections (S1, S2), P1, P2 (GVS lead-out), IIC Port (P19, P20), Ultrasonic Port
Manufacturer Recommended Age	7 years and up



This diagram provides a detailed overview of the Cutebot's internal components and external connections, alongside a comprehensive table of its technical specifications and a reminder of the packing list.

Maintenance

- **Cleaning:** Use a dry, soft cloth to clean the robot. Avoid water or cleaning solutions, as these can damage electronic components.
- **Battery Replacement:** Replace AAA batteries when performance degrades. Always ensure correct polarity when inserting new batteries.
- **Storage:** Store the Cutebot in a dry, cool place away from direct sunlight and extreme temperatures when not in use.
- **Sensor Care:** Keep sensors (ultrasonic, line-tracking) clean and free from dust or obstructions for optimal performance.

Troubleshooting

- **Robot does not power on:**
  - Check if AAA batteries are inserted correctly and are not depleted.
  - Ensure the micro:bit board is securely seated in its slot.
  - Verify the power switch is in the "ON" position.
- **Robot does not move or respond to code:**
  - Confirm the ultrasonic module is plugged into the**front port**. Incorrect connection will prevent operation.
  - Ensure the micro:bit board has the correct program uploaded. Re-upload the .hex file if necessary.
  - Check for any loose connections or obstructions to the wheels.
- **Line following is erratic:**
  - Clean the line-tracking sensors on the bottom of the robot.
  - Ensure the line on the map is clear and has sufficient contrast.
  - Adjust the speed in your code; high speeds can make line following difficult.
- **Ultrasonic sensor not detecting:**
  - Verify the sensor is clean and unobstructed.
  - Ensure the sensor is correctly plugged into the front port.
  - Check your code for correct ultrasonic sensor block usage.
- **Connection issues with MakeCode:**
  - Ensure your micro:bit is connected to your computer via USB.
  - Try a different USB cable or port.
  - Update your browser or try a different browser.

Support and Resources

For additional support, detailed tutorials, and learning materials, please visit the official ELECFREAKS Wiki:

wiki.elecfreaks.com/en/

If you require technical assistance, please contact ELECFREAKS customer support through their Amazon store by navigating to the product page and clicking "Ask a question" to send an email.

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