

Deskbot / desk robot (Tischroboter) - very cool for adults but also children



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Summary

Small robot for your table. Esp32, 0.96 inch display, 2 motors + wheels

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DeskBot Assembly Guide

Materials Needed:

1. 3D printed base and lid
2. ESP32 microcontroller
3. Motors (2 pieces)
4. Wheels (2 pieces)
5. Screws and screwdriver
6. Wires for connections

7. Power source (e.g., battery)
8. Transistors or MOSFETs (to control the motors)
9. Diodes (to protect against back EMF)
10. Resistors (for the base of transistors or gate of MOSFETs)
11. 0.96 inch OLED display
12. Adhesive or double-sided tape (optional)
13. USB cable for programming the ESP32
14. Computer with Arduino IDE installed

Tools Required:

- 3D printer (for printing the base and lid)
- Screwdriver
- Soldering iron (optional)

Step-by-Step Instructions:

Print the Base and Lid:

- Use a 3D printer to print the base and lid of the DeskBot. Ensure the design files are correct and that your printer settings are optimized for a sturdy print.

Place the ESP32:

- Lay the ESP32 microcontroller in the designated area inside the base. Use adhesive or double-sided tape to secure it if necessary, ensuring it stays in place.

Attach the Motors:

- Position the motors on either side of the base. Use screws to securely attach them to the base. Make sure the motor shafts are positioned correctly for attaching the wheels later.

Install the Wheels:

- Push or screw the wheels onto the motor shafts. Ensure they are securely attached and can rotate freely.

Mount the OLED Display:

- Attach the 0.96 inch OLED display to the front of the DeskBot. Use screws or adhesive to secure it in place. Make sure it is properly oriented for visibility.

Wire the ESP32, Motors, and OLED Display:

- **Motors:**

- Connect the motors to the ESP32 through transistors or MOSFETs to handle the current.
- For each motor:
 - Connect one end of the motor to the collector of the NPN transistor (or drain of the N-channel MOSFET).
 - Connect the emitter of the NPN transistor (or source of the N-channel MOSFET) to ground.
 - Connect the base of the transistor (or gate of the MOSFET) to a GPIO pin on the ESP32 through a resistor.
 - Place a diode across the motor terminals to protect against back EMF (cathode to the positive terminal of the motor).
 - Connect the other end of the motor to the positive power supply.

- **OLED Display:**

- Connect the OLED display's VCC to the 3.3V or 5V pin on the ESP32 (check the display's specifications).
- Connect the GND of the OLED display to the ground (GND) pin on the ESP32.
- Connect the SCL (clock) pin of the OLED display to the corresponding I2C clock pin on the ESP32 (usually GPIO 22).
- Connect the SDA (data) pin of the OLED display to the corresponding I2C data pin on the ESP32 (usually GPIO 21).

Program the ESP32:

- Connect the ESP32 to your computer using the USB cable.
- Open the Arduino IDE and install the necessary libraries for the OLED display (such as Adafruit_SSD1306 and Adafruit_GFX).
- Write a program to control the DeskBot. This program should include code to control the motors and display eyes or other visuals on the OLED screen.
- Upload the program to the ESP32 using the Arduino IDE.

Verify Connections:

- Double-check all connections to ensure everything is wired correctly and securely.
- Test the motors and the OLED display to ensure they respond correctly to the ESP32 controls.

Secure the Lid:

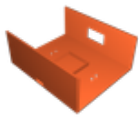
- Once everything is working correctly, place the lid onto the base. Use screws or adhesive to secure it in place.

Final Check:

- Power on the DeskBot and run the program. Verify that the DeskBot moves as expected and the OLED display shows the desired visuals.

Congratulations! Your DeskBot is now assembled and ready to use. Enjoy experimenting with and programming your new robot.

Model files



deskbot-box.stl



deskbot-cover.stl

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