

Radar

Introduction

The radar assembly is divided into three main stages. In the first stage, the MB3 expansion board, battery pack, and LED strip are installed. In the second stage, the servo motor is mounted. In the third stage, the ultrasonic sensor is attached.

Contents

Introduction	1
Contents	1
Motivation	2
What Can It Be Used For?	2
What Is This Electronic Device Useful For?	2
Required Components	3
Assembly	5
MB3 Expansion Board and Battery Pack	5
LED Strip	5
Servo Motor	6
Ultrasonic Sensor	6
Complete Radar	8

Motivation

Build a custom radar unit capable of measuring the distance to surrounding objects. The project combines an ultrasonic sensor, a servo motor, and an RGB LED strip. The servo motor rotates the ultrasonic sensor, while the LED strip provides a visual indication of the measured distance.

What Can It Be Used For?

- Detection of obstacles in the surrounding area
- Distance visualization using an LED strip
- Introduction to servo motor and ultrasonic sensor control
- Real-time display of measured values
- Expansion with a display or additional sensors

What Is This Electronic Device Useful For?

The Radar project provides an introduction to the fundamentals of robotics. It demonstrates how a servo motor, an ultrasonic sensor, and an LED strip can be combined to create a device capable of monitoring its surroundings.

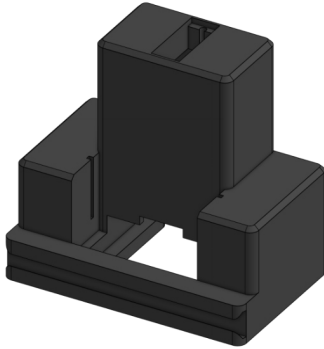
During operation, the sensor continuously rotates, measures the distance to nearby objects, and converts the measured values into a visual signal. The project is suitable for all age groups and does not require prior experience with electronics.

Required Components

3D-Printed Parts:

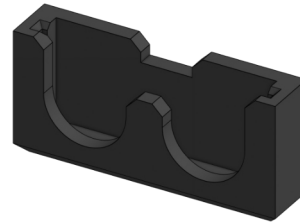
Radar body

1 pc



Ultrasonic sensor holder

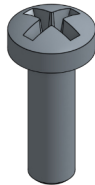
1 pc



Mechanical Components:

M3×10 screw

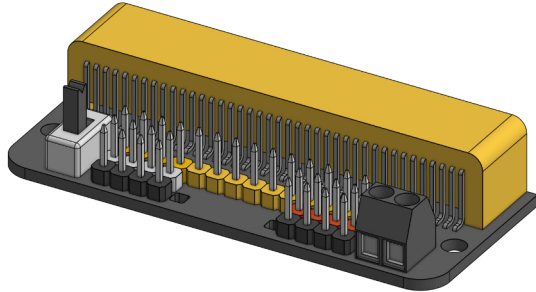
2 pcs



Electronic Components:

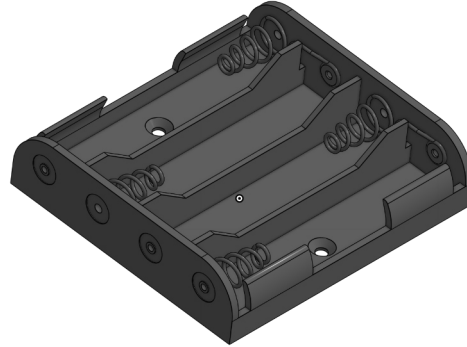
MB3 expansion board

1 pc



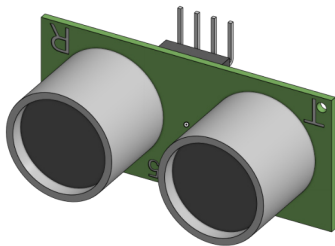
4xAAA battery holder

1 pc



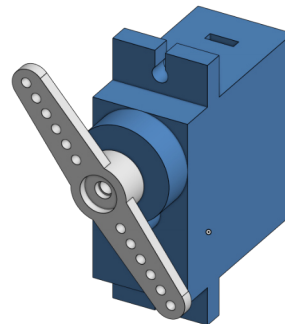
Ultrasonic sensor

1 pc



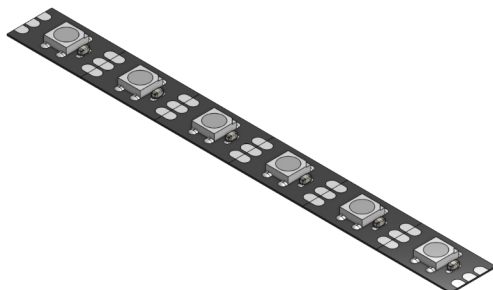
180° servomotor

1 pc



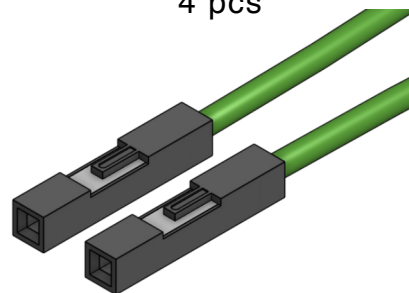
LED strip

1 pc



Dupont F/F cable

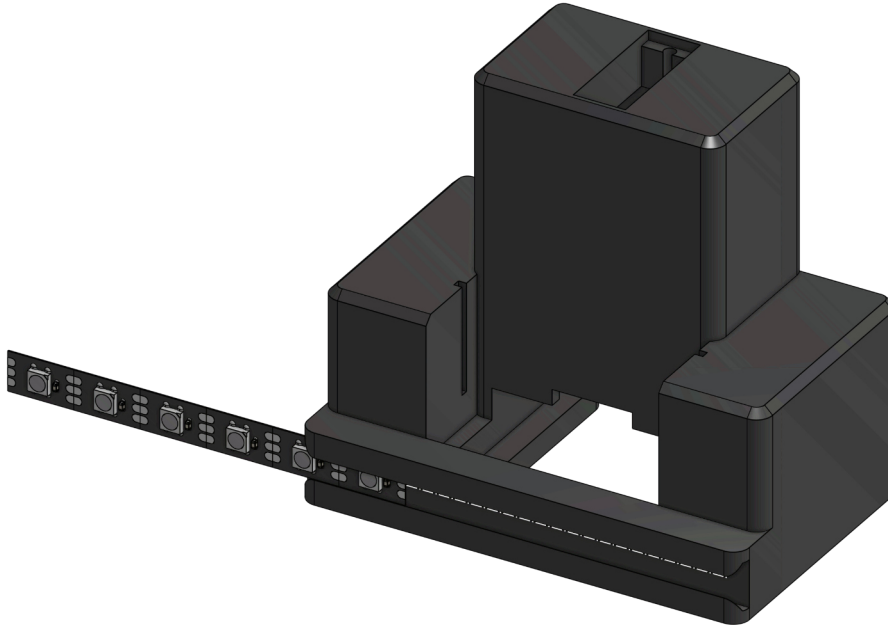
4 pcs



Assembly

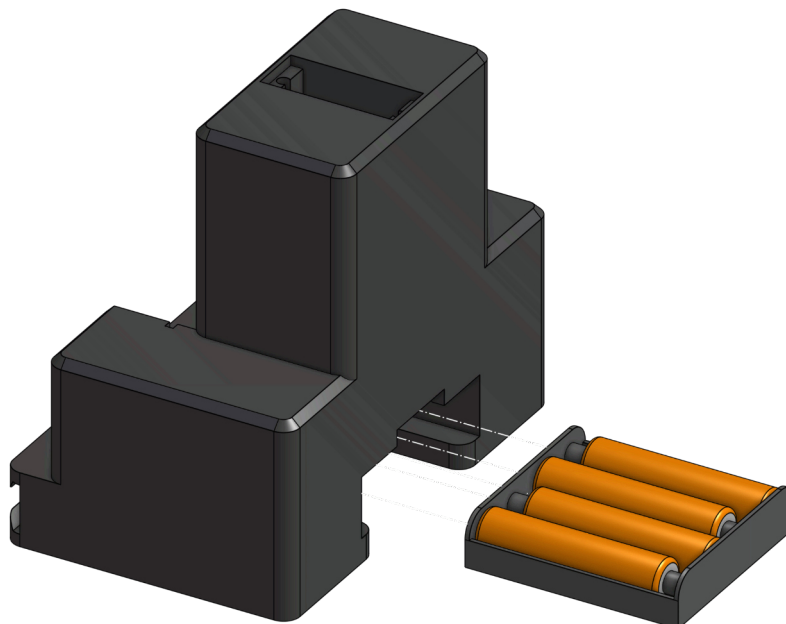
1. LED Strip

- Insert the LED strip into the front slot of the radar body.
- Position the LED strip in the center of the slot as shown in the illustration.



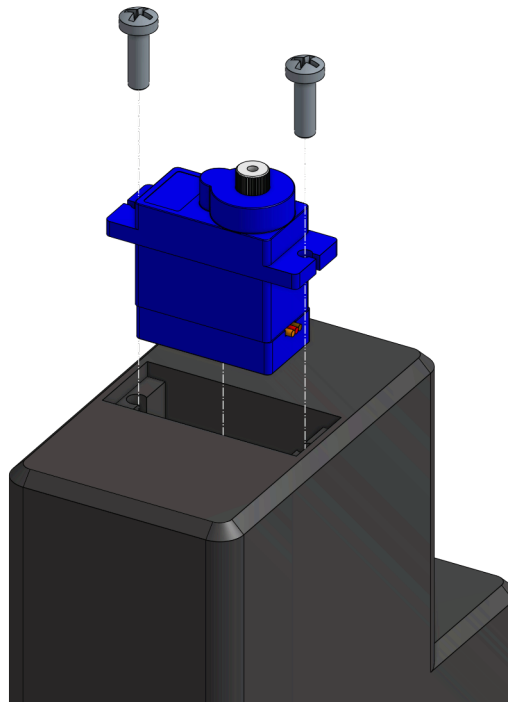
2. Battery Pack

- Insert the battery pack into the rear compartment of the radar body.
- Route the red and black wires towards the front of the assembly.



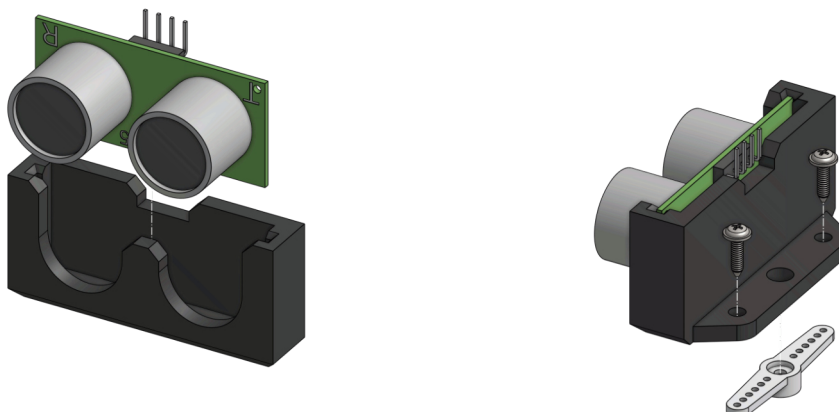
3. Servo Motor

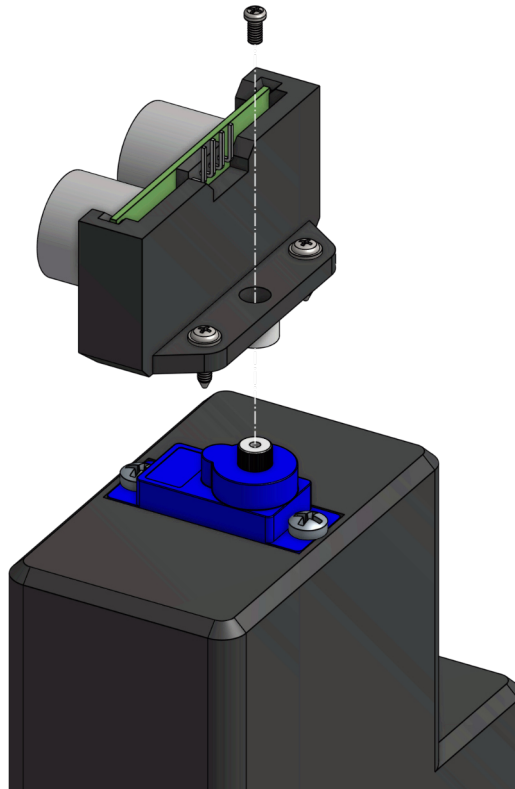
- Position the servo motor in the rear mounting slot of the radar body with the servo horn facing upwards.
- Route the servo cable underneath the battery pack as shown in the illustration.
- Secure the servo motor using two M3×10 screws.



4. Ultrasonic Sensor

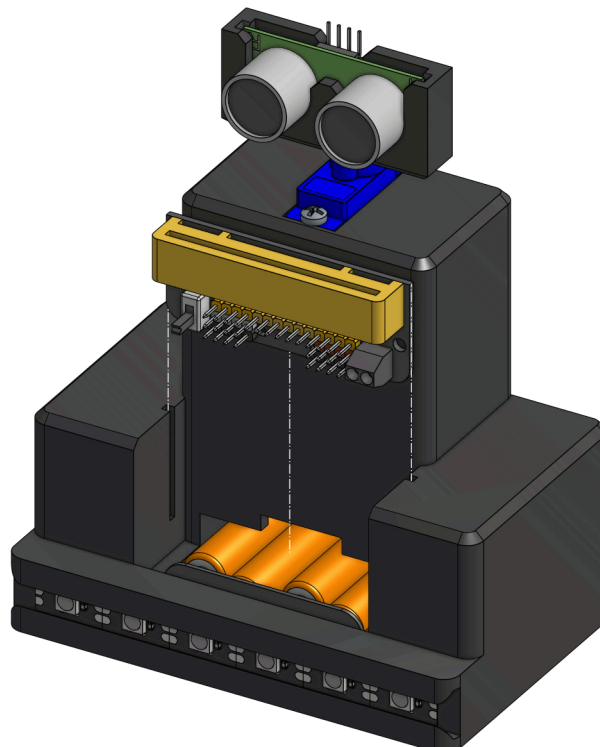
- Prepare the ultrasonic sensor holder and the ultrasonic sensor module.
- Insert the ultrasonic sensor module into the holder.
- Attach the servo horn to the underside of the holder.
- Mount the holder onto the servo motor output shaft.
- Secure the holder to the servo motor using the supplied servo screw.





5. MB3 Expansion Board

- Insert the MB3 expansion board into the MB3 holder.
- Connect the Dupont cables according to the wiring diagram.
- The radar assembly is now complete.



Circuit Diagram

