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› Adept Smart Car Kit for ESP32-WROVER User Manual

Adept ADE033

Adept Smart Car Kit for ESP32-WROVER User Manual

Model: ADE033 | Brand: Adept

INTRODUCTION

The Adept Smart Car Kit for ESP32-WROVER is an educational robotics platform designed for learning coding, IoT, and robotics. This kit is fully compatible with the Arduino IDE and provides a comprehensive set of components for building and programming a versatile smart car. It supports various functions including line tracking, obstacle avoidance, video transmission, and multiple remote control methods.



Image: The fully assembled Adept Smart Car Kit, showcasing its compact design and included remote control. The car features an ultrasonic sensor at the front and an ESP32-WROVER board with various modules mounted on its chassis.

PACKAGE CONTENTS

Before beginning assembly, please verify that all components listed below are present in your kit. This kit consists of loose pieces and requires self-assembly.

- 1 Set Structure Parts (Acrylic)
- 1x ESP32-WROVER Board
- 1x Adept ESP32 Robot Expansion Board
- 1x ESP32-CAM
- 1x CAM Expansion Board
- 1x OLED Display
- 1x Ultrasonic Module
- 1x 3-CH Line Tracking Module
- 1x Light Tracing Module
- 1x IR Remote Control
- 1x 16x8 LED Matrix Module

- 1x WS2812 RGB LED Module
- 4x Servo Motor
- 2x TT Motor
- 2x Front Wheel
- 2x Rear Wheel
- 1x 2.4G Antenna
- 1x Battery Holder
- 4x F624ZZ Bearing
- 4x F687ZZ Bearing
- 1x Type-C USB Cable
- Other Necessary Accessories (Cables, Nuts, Screws, Copper Standoffs, Nylon Standoffs, Tools, etc.)

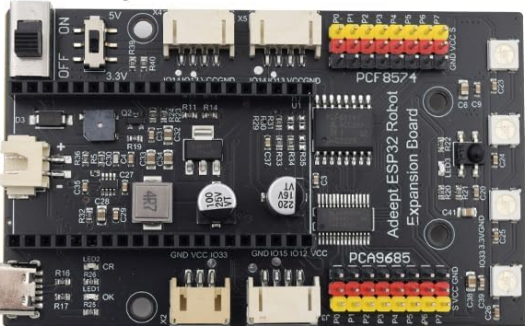
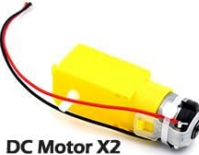
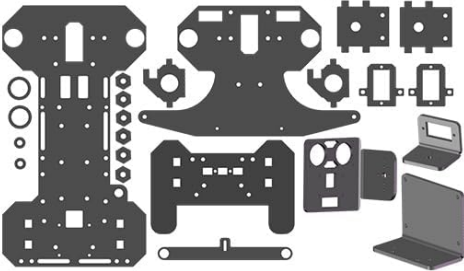
Packing List									
 ESP32 Expansion Board X1		 ESP32 WROVER X1		 Front wheel X2		 Rear wheel X2			
 Light Tracking Module X1		 Servo x4		 Ribbon x1		 OLED Screen X1		 SR-04 Ultrasonic Module X1	
 LED matrix X1		 Three-line tracing module x1		 F624ZZ Bearing X4		 F687ZZ Bearing X4		 18650 Battery case X1	
 Camera Cable X1		 WS2812 LED X1		 IR remote control X1		 ESP32 Camera X1		 DC Motor X2	
 external antenna X1		 Camera Interface Board X1		 M3 Nut X20		 M1.6 Nut X4			
 Cross Socket Wrench x1		 Phillips screwdriver x1		 M2 Nut X18		 M4 Nut X2			
 Acrylic structural parts X1		 M2*10 Screw X10		 M1.6*10 Screw X4		 M2*8 Screw X8		 M3*5 Screw X8	
		 M2*14 Screw X4		 M3*30 Screw X4		 M4*40 Screw X2		 M3*8 Screw X4	
		 M3*12 Screw X5		 M3*12 Screw X6		 M3*18 Screw X2		 M3*30 Screw X8	
 Winding tube x1								 M2*11 Screw X4	
 M4 Spring Washer x8		 Small Cross-head Screwdriver x1		 Type-C USB Cable X1		 5P 3-CH Line Tracking Module - 18cm		 4P OLED Module - 15cm	
 4P 12C Matrix Display Module - 20cm		 3P Light Tracking Module - 19cm		 3P WS2812 Module - 16cm					

Image: A visual representation of all individual components and parts included in the Adept Smart Car Kit, laid out for easy identification and inventory check.

KEY COMPONENTS AND MODULES

The Adept Smart Car Kit integrates several key electronic components and modules to enable its diverse functionalities. Understanding these components is crucial for assembly and programming.

- **ESP32-WROVER Board:** The central processing unit, providing Wi-Fi and Bluetooth connectivity.
- **Adept ESP32 Robot Expansion Board:** Integrates an 8.4V battery charger and provides interfaces for various sensors and motors.
- **ESP32-CAM:** Enables video transmission capabilities.
- **OLED Display:** A small screen for displaying information.
- **Ultrasonic Module:** Used for distance measurement and obstacle avoidance.
- **Line Tracking Module:** Detects lines for autonomous navigation.
- **Light Tracing Module:** Allows the car to follow light sources.
- **IR Remote Control:** For wireless control of the car.
- **Servo Motors:** Control steering and sensor positioning.
- **TT Motors:** Provide propulsion for the wheels.

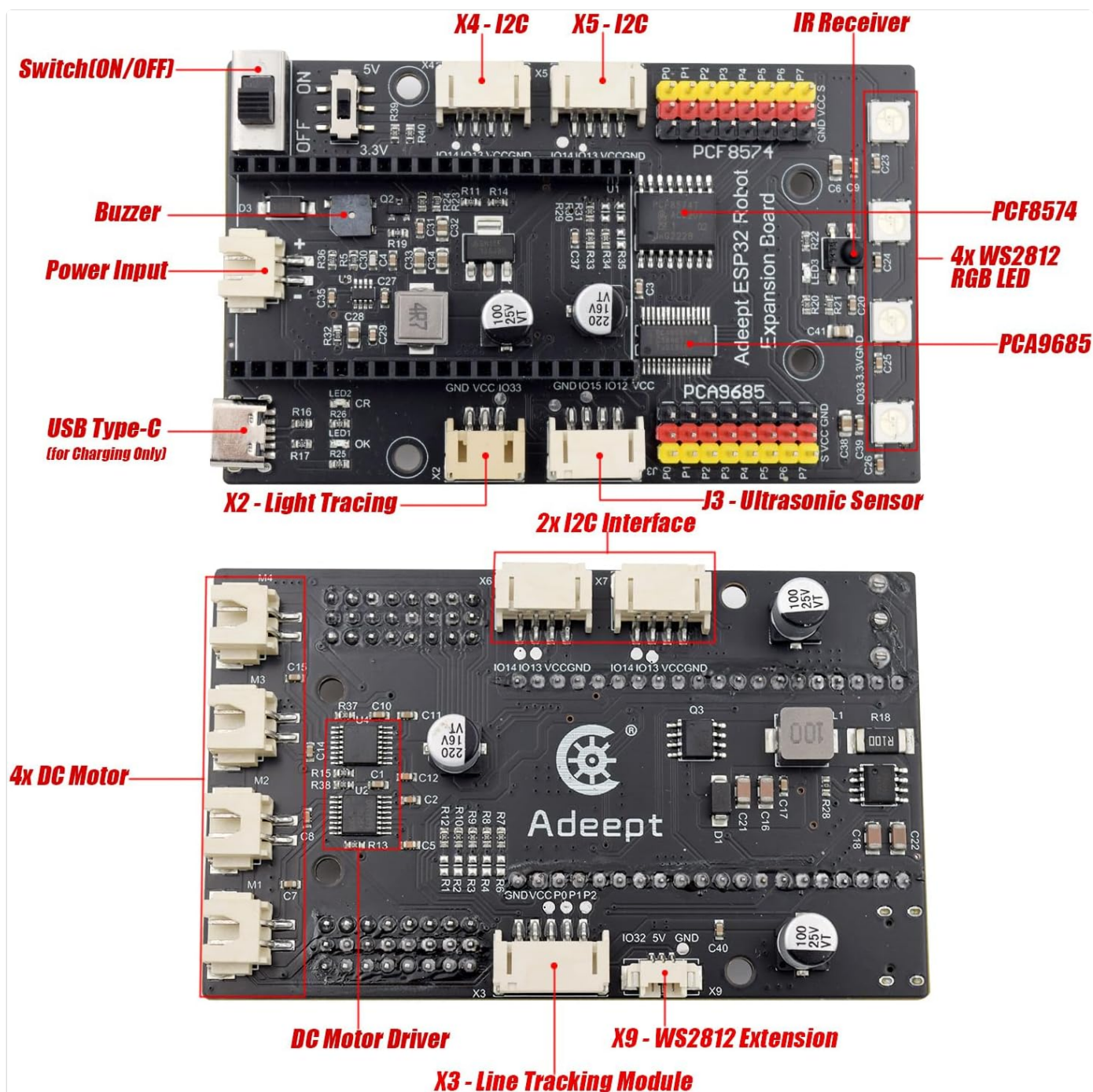


Image: An annotated diagram highlighting the placement and function of key sensors and modules on the Adept Smart Car, including the Ultrasonic Range Sensor, ESP32-WROVER-Dev, 16*8 Dot Matrix Display, OLED Display, IR Receiver, Light Tracking Module, 3CH Line Tracking Module, and WS2812 RGB LED.

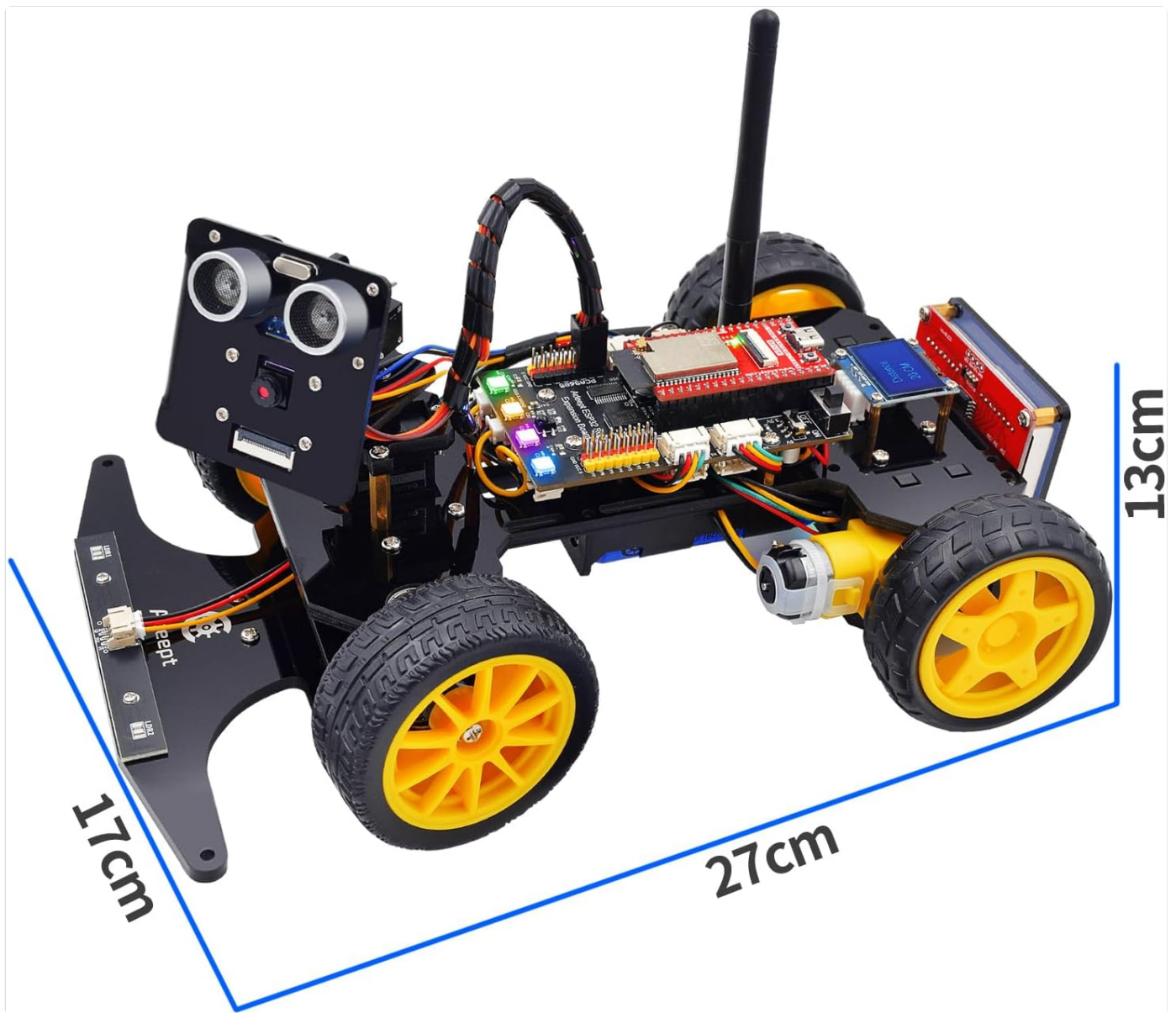


Image: Detailed views of the Adept ESP32 Robot Expansion Board, showing its various ports and components such as the USB Type-C charging port, power input, buzzer, LED indicators, I2C interfaces, and motor drivers.

SETUP AND ASSEMBLY

The Adept Smart Car Kit requires assembly. Detailed, step-by-step tutorials are provided digitally. Please refer to the download link found on the card included in your kit for the most up-to-date assembly instructions and code examples. Paper tutorials are not included as the content is frequently updated.

1. Initial Servo Angle Adjustment

Before full assembly, it is recommended to adjust the initial angle of the servo motors to ensure proper alignment during the build process. Specific instructions for this step are available in the provided digital tutorials (Lesson 0001).

2. Mechanical Assembly

Follow the comprehensive assembly guide (Lesson 0002) to connect the acrylic structure parts, motors, wheels, and electronic modules. Ensure all screws, nuts, and standoffs are securely fastened according to the instructions.

Sensors and Modules

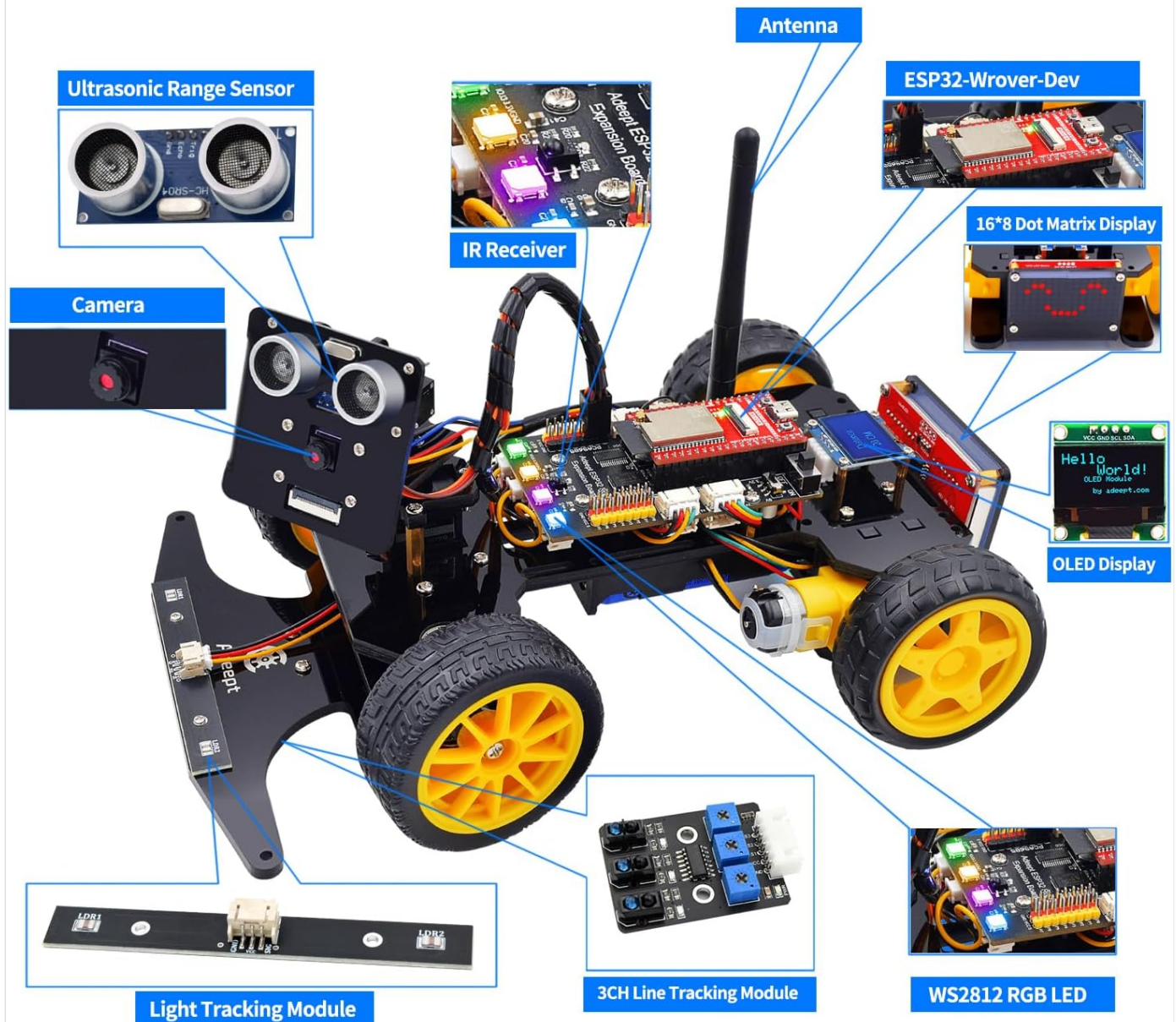


Image: Various angles of the assembled Adept Smart Car, providing a visual guide for checking the completed mechanical structure from the front, bottom, and top.

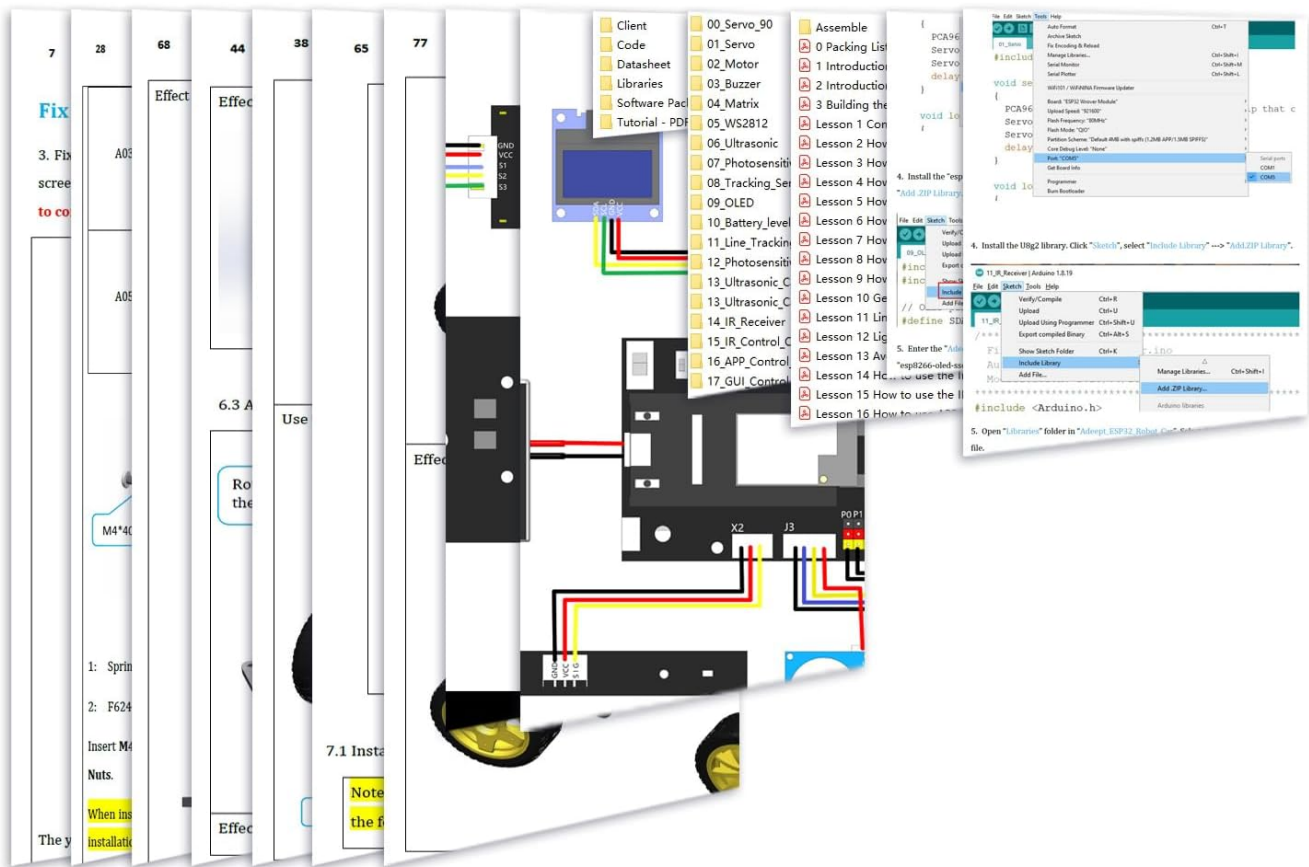
BUILDING THE ARDUINO DEVELOPMENT ENVIRONMENT

To program the Adept Smart Car, you will need to set up the Arduino Integrated Development Environment (IDE) and configure it for the ESP32-WROVER board. Detailed instructions for this setup are provided in the digital tutorials (Lesson 003).

- **Introduction of ESP32-WROVER:** Understand the capabilities and pinout of the ESP32-WROVER board (Lesson 001).
- **Introduction of Adept ESP32 Expansion Board:** Familiarize yourself with the expansion board's features and connections (Lesson 002).
- **Software Installation:** Install the Arduino IDE and necessary board packages and libraries.
- **Code Upload:** Learn how to upload example code to your ESP32 board.

Tutorial and Code

Complete PDF Tutorials – 280+ Pages, 20 Lessons, Easy to Build and Code;
Based on ESP32-WROVER-IE - Fully Compatible with Arduino IDE



The download link can be found on the box! (No paper tutorial)

Image: A composite image showing screenshots of the Arduino IDE interface with example code, alongside pages from the digital tutorial, illustrating the comprehensive nature of the provided learning resources.

OPERATING INSTRUCTIONS AND FUNCTIONS

The Adeept Smart Car Kit supports a variety of functions, each with dedicated lessons in the provided tutorials. These lessons guide you through the programming and operation of each feature.

- **Servo Motor Control (Lesson 01):** Learn to control the movement and positioning of the servo motors.
- **DC Motor Control (Lesson 02):** Understand how to drive the TT motors for car movement.
- **Buzzer Operation (Lesson 03):** Program the buzzer for sound alerts.
- **LED Matrix Display (Lesson 04):** Control the 16x8 LED matrix for displaying patterns or text.
- **WS2812 RGB LED Control (Lesson 05):** Program the addressable RGB LEDs for various lighting effects.
- **Distance Measurement (Lesson 06):** Utilize the ultrasonic sensor to measure distances to objects.
- **Line Tracking (Lesson 07):** Implement code for the car to follow a black line on a light surface.
- **Light Tracing (Lesson 08):** Program the car to move towards a light source.

- **OLED Display Usage (Lesson 09):** Display text and graphics on the OLED screen.
- **Battery Level Information (Lesson 10):** Monitor the car's battery status.
- **Line Tracking Car (Lesson 11):** Combine line tracking with car movement.
- **Light Tracing Car (Lesson 12):** Combine light tracing with car movement.
- **Obstacle Avoidance and Automatic Following (Lesson 13):** Program the car to detect and navigate around obstacles, or follow objects.
- **IR Remote Control (Lesson 14 & 15):** Use the included IR remote to control the car's movements and functions.
- **Wi-Fi Remote Control Car (Lesson 16):** Control the car wirelessly via a smartphone application.
- **Video Transmission:** Utilize the ESP32-CAM for real-time video streaming from the car.



Image: A collage illustrating the diverse functionalities of the Adept Smart Car, including control via IR remote, autonomous obstacle avoidance, following a line, displaying information on the OLED screen, showing patterns on the LED matrix, streaming video, tracing light, and illuminating with WS2812 RGB LEDs.

Proper maintenance ensures the longevity and optimal performance of your Adeept Smart Car Kit.

- **Cleaning:** Regularly clean the acrylic parts and electronic components with a soft, dry cloth. Avoid using liquids or abrasive cleaners.
- **Battery Care:** Ensure the battery is charged using the integrated 8.4V charger via the Type-C interface. Do not overcharge or completely discharge the battery. Store the car with a partially charged battery if not in use for extended periods.
- **Component Inspection:** Periodically check all connections, screws, and wires to ensure they are secure and undamaged.
- **Software Updates:** Keep your Arduino IDE, ESP32 board packages, and libraries updated to the latest versions for compatibility and performance improvements. Refer to the official Adeept tutorials for guidance on updates.

TROUBLESHOOTING

If you encounter issues with your Adeept Smart Car Kit, consider the following common troubleshooting steps:

- **Car Not Moving:**
 - Check battery charge level.
 - Verify motor connections to the expansion board.
 - Ensure the correct code for motor control is uploaded and running.
- **Sensors Not Responding:**
 - Confirm sensor module connections are secure and correctly wired.
 - Check if the sensor's corresponding code is correctly implemented and uploaded.
 - Ensure no physical obstructions are blocking the sensor.
- **Code Upload Errors:**
 - Verify the correct board (ESP32-WROVER Dev Module) and COM port are selected in Arduino IDE.
 - Ensure all necessary libraries are installed.
 - Check for syntax errors in your code.
 - Disconnect and reconnect the USB cable.
- **Wi-Fi/IR Remote Control Issues:**
 - For IR, ensure line of sight between remote and IR receiver. Check remote battery.
 - For Wi-Fi, ensure both the car and your control device are on the same network (if applicable) or that the car's access point is correctly configured and connected to.

For more detailed troubleshooting or specific issues, refer to the comprehensive digital tutorials provided by Adeept, or visit the Adeept support resources online.

SPECIFICATIONS

Feature	Detail
Product Dimensions	9.5 x 6.5 x 3.2 inches (24.13 x 16.51 x 8.13 cm)
Item Weight	2.42 pounds (1.09 kg)
Model Number	ADE033

Recommended Age	14 years and up
Control Board	ESP32-WROVER
Expansion Board	Adept ESP32 Robot Expansion Board (with 8.4V battery charger)
Connectivity	Wi-Fi, Bluetooth, IR
Sensors Included	Ultrasonic Module, 3-CH Line Tracking Module, Light Tracing Module, ESP32-CAM
Displays/LEDs	OLED Display, 16x8 LED Matrix Module, WS2812 RGB LED Module



Image: The Adept Smart Car with its approximate dimensions (length, width, height) clearly indicated in centimeters, providing a visual reference for its physical size.

WARRANTY AND SUPPORT

For information regarding product warranty, technical support, or additional resources, please refer to the documentation

provided with your purchase or visit the official Adeept website. The comprehensive digital tutorials are your primary resource for assembly, programming, and operational guidance.

Adeapt Store Link: [Visit the Adeapt Store on Amazon](#)

