FREENOVE FNK0085

Freenove ESP32-S3 CAM Board User Manual

Model: FNK0085

1. Introduction

The Freenove ESP32-S3 CAM Board is a compact and powerful microcontroller board featuring integrated wireless connectivity and an onboard camera. Designed for various embedded projects, it includes a dual-core 32-bit microprocessor, 8 MB Flash, 8 MB PSRAM, 2.4 GHz Wi-Fi, and Bluetooth 5 (LE). This manual provides essential information for setting up, operating, and maintaining your ESP32-S3 CAM Board.

2. Package Contents

The Freenove ESP32-S3 CAM Board package typically includes the following components:

- Freenove ESP32-S3 WROOM Board
- USB Cable
- Camera Module
- 1GB Memory Card
- USB Memory Card Reader

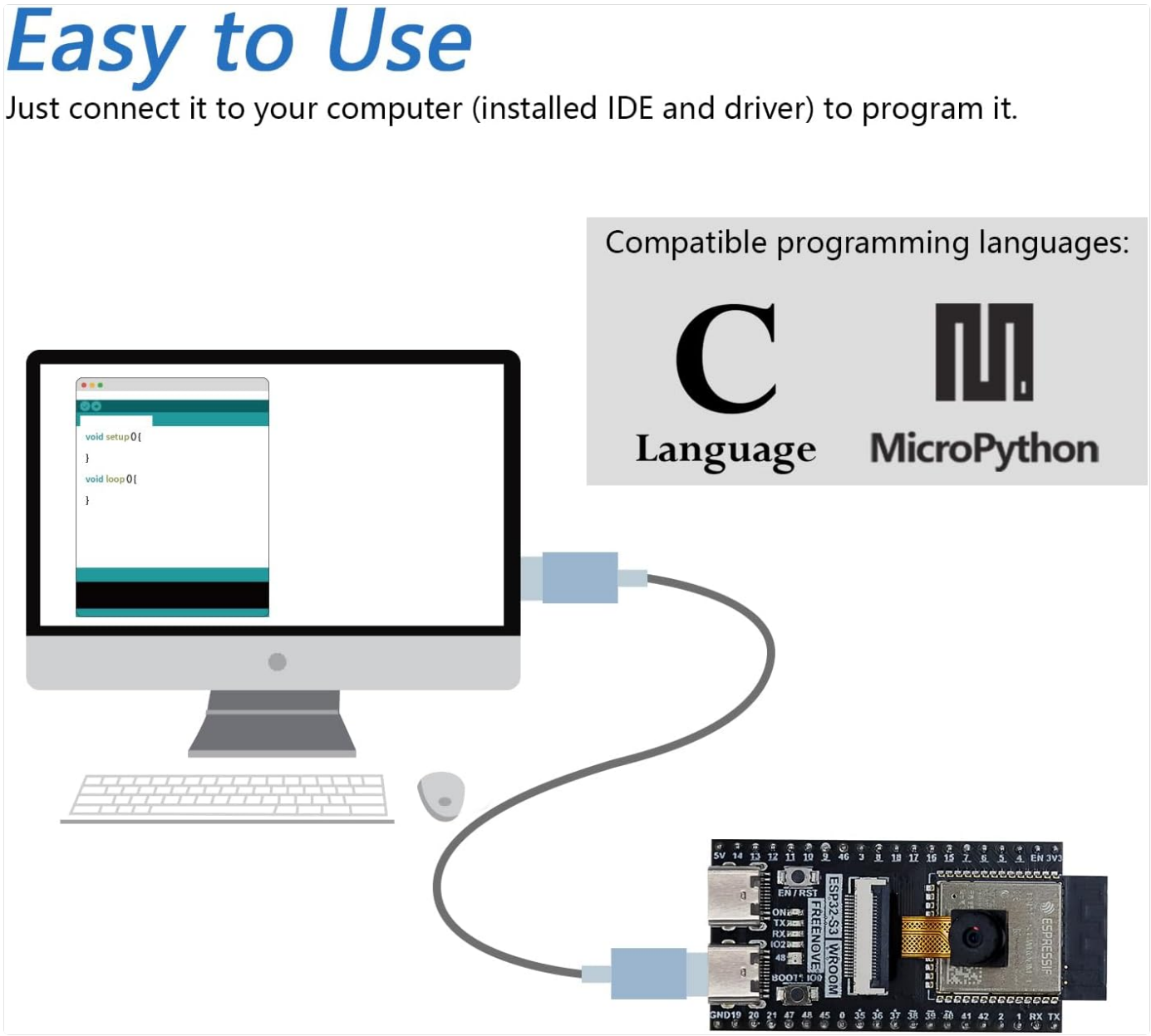


Image 2.1: The ESP32-S3 CAM Board with its accessories, including the USB cable, camera module, 1GB memory card, and USB card reader.

3. Product Overview

The ESP32-S3 WROOM board is equipped with various features to support a wide range of applications. Key components and their functions are outlined below:

- **Microprocessor:** Dual-core 32-bit, operating at up to 240 MHz.
- **Memory:** 512 KB SRAM, 8 MB Flash, and 8 MB PSRAM.
- **Wireless Connectivity:** Integrated 2.4 GHz Wi-Fi and Bluetooth 5 (LE).
- **Camera:** Onboard camera interface for image and video capture.
- **RGB LED:** Programmable multi-color LED for status indication.
- **USB-OTG:** USB On-The-Go functionality.
- **Code Uploader:** Onboard mechanism for easy code flashing.
- **Memory Card Slot:** Supports SDMMC for external storage.
- **GPIO Pins:** General Purpose Input/Output pins for connecting external sensors and actuators.

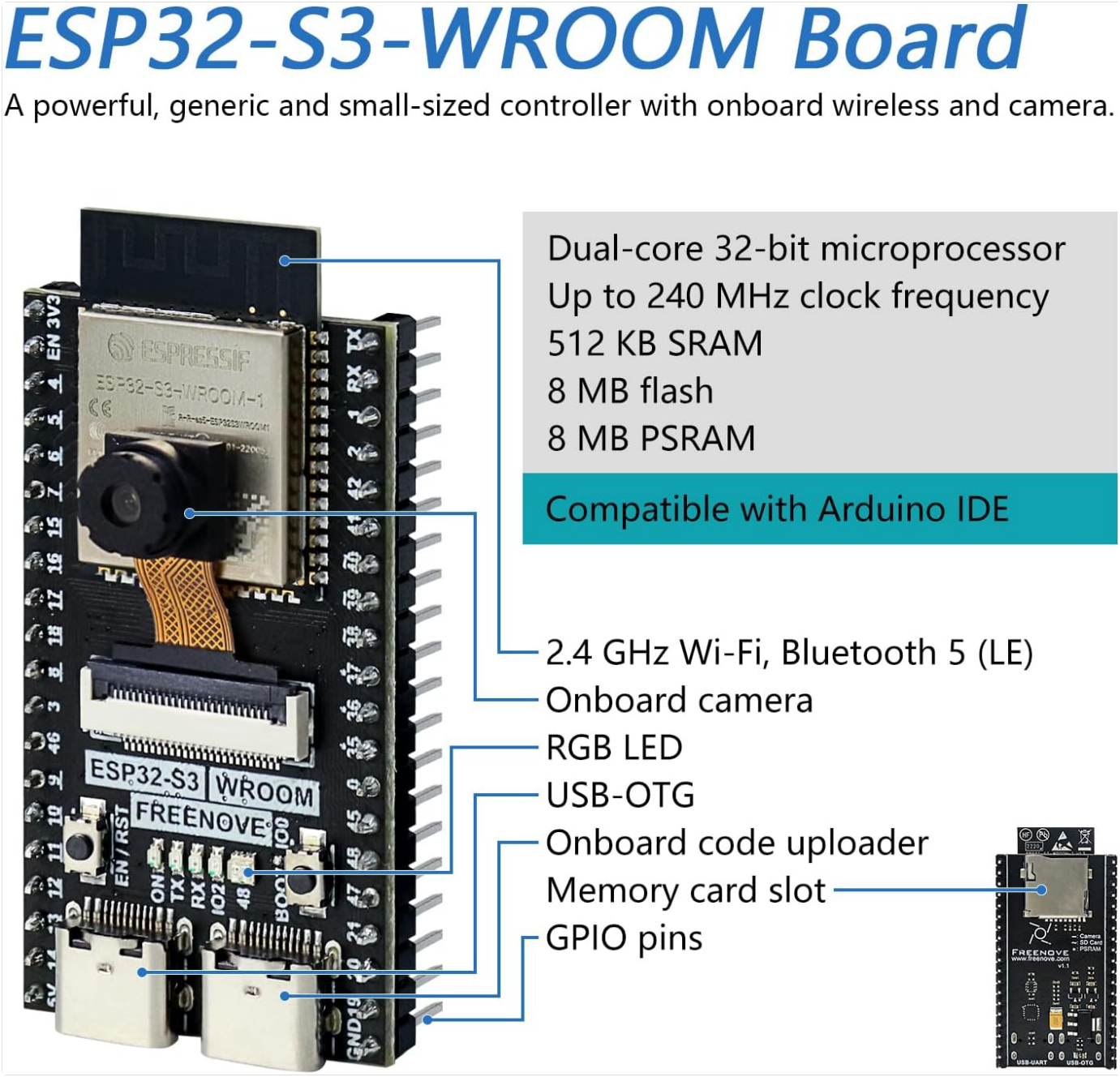


Image 3.1: A detailed view of the ESP32-S3 WROOM Board, indicating the location of its dual-core processor, memory, wireless modules, camera, and various I/O pins.

4. Setup Guide

To begin using your Freenove ESP32-S3 CAM Board, follow these steps for initial setup:

1. **Software Installation:** Install the necessary Integrated Development Environment (IDE) and drivers on your computer. Refer to the official Freenove tutorial for detailed instructions on environment configuration, which typically includes setting up the Arduino IDE or MicroPython environment.
2. **Hardware Connection:** Connect the ESP32-S3 CAM Board to your computer using the provided USB cable. Ensure the camera module is securely connected to the board's camera interface.
3. **Memory Card Insertion:** If using the included 1GB memory card, insert it into the designated memory card slot on the board.

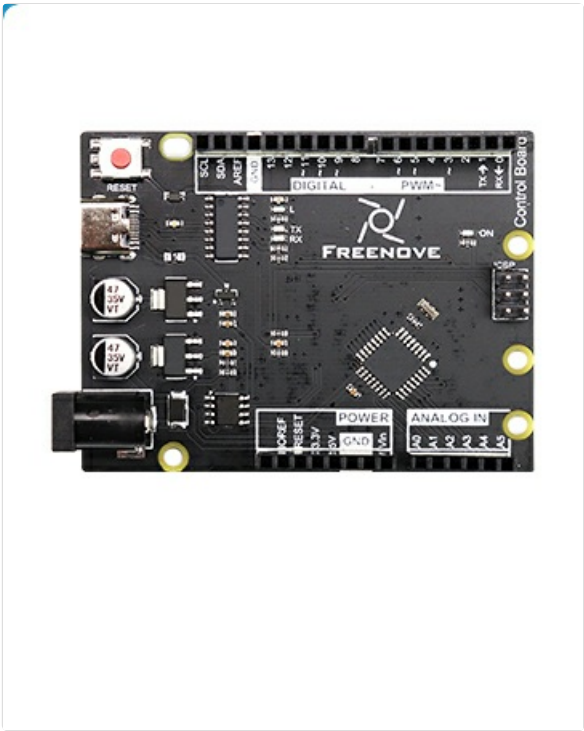


Image 4.1: The ESP32-S3 CAM Board connected to a computer, illustrating the ease of programming once the IDE and drivers are installed.

5. Programming and Operation

The ESP32-S3 CAM Board supports programming in both MicroPython and C languages. Freenove provides a comprehensive tutorial with code examples to guide users through various projects.

- **Accessing Tutorials:** The download link for the detailed tutorial and code examples can be found on the product packaging. This tutorial includes step-by-step guides and explanations for typical projects.
- **Project Examples:** The tutorial covers projects such as LED control, serial communication, Bluetooth Low Energy (BLE) data passthrough, SDMMC memory card operations, various WiFi working modes (Station, AP, AP+Station), TCP/IP client/server applications, and camera web server functionalities.

Project Examples

Includes several typical example projects with code.

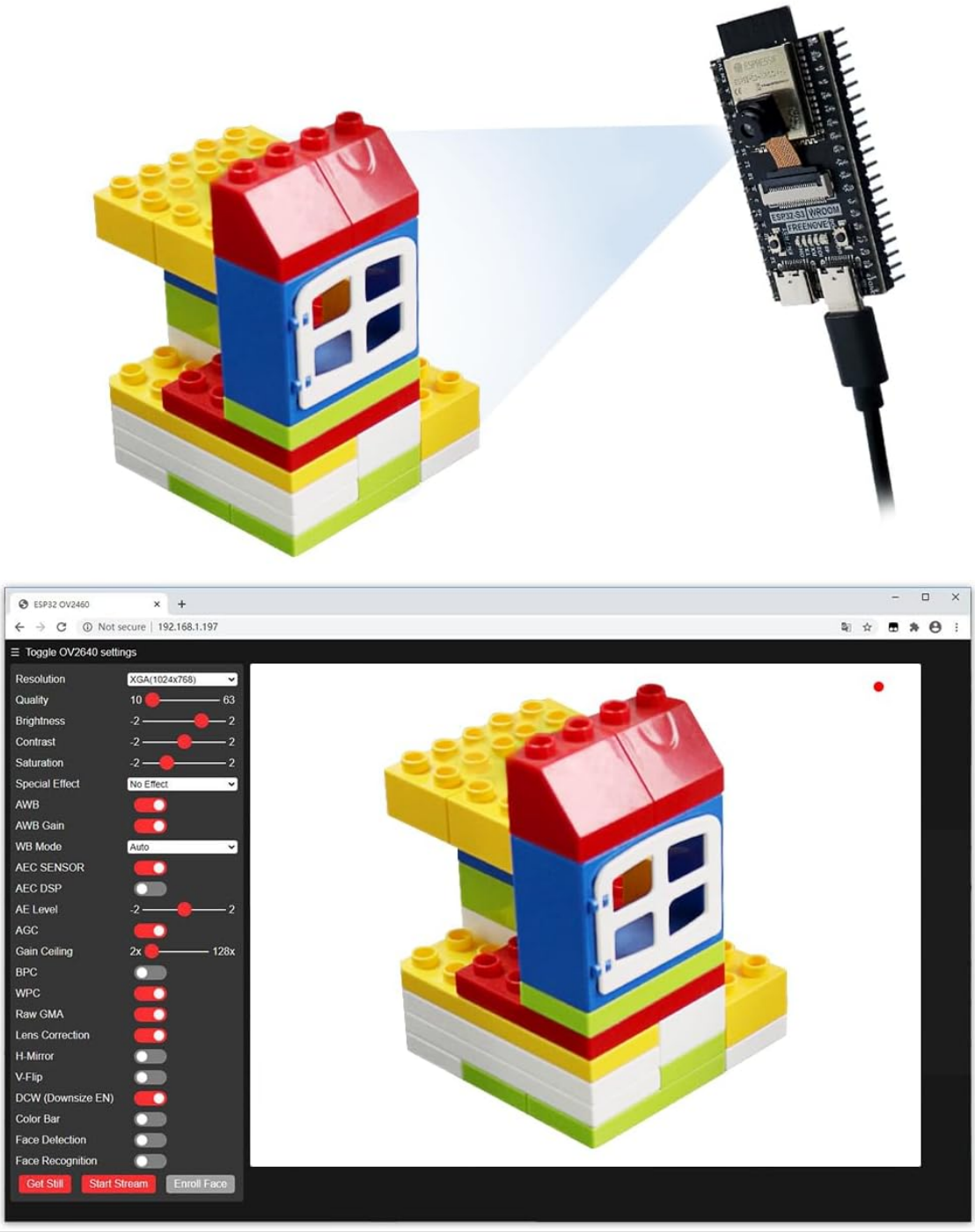
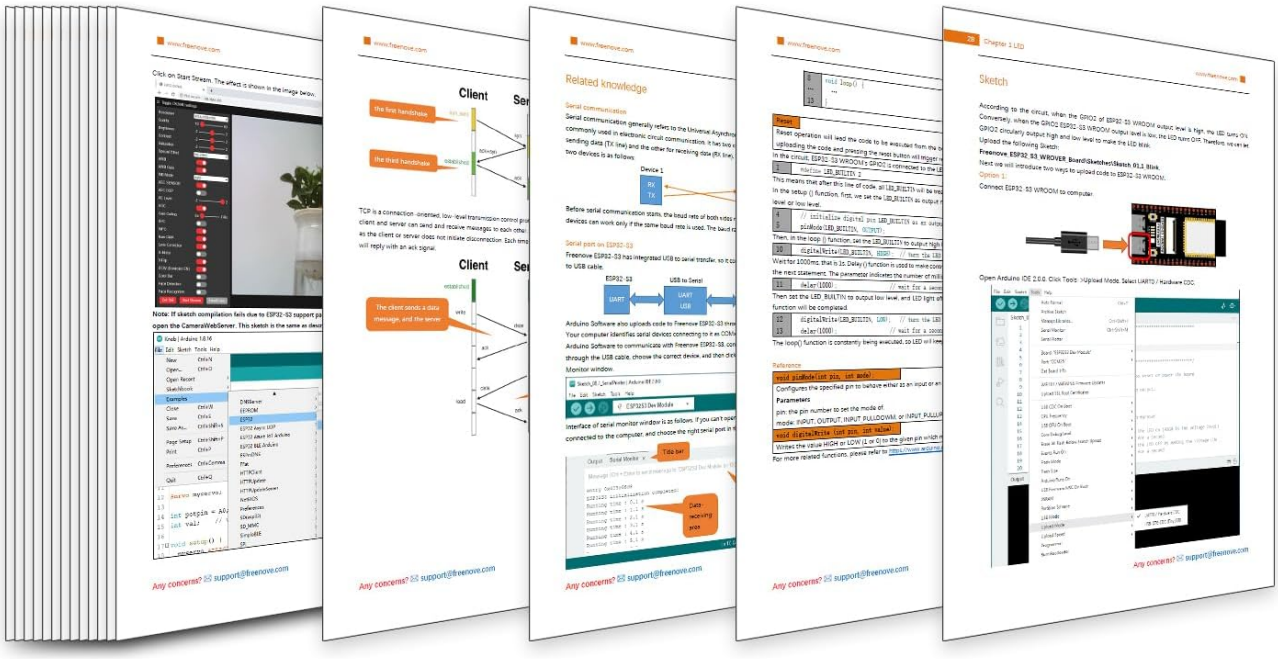


Image 5.1: An illustration of a project example where the ESP32-S3 CAM Board is used to capture an image, which is then displayed via a web server interface.

Tutorial Examples

Provides step-by-step guide and detailed explanations.



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

Image 5.2: A visual representation of the detailed tutorial pages provided by Freenove, offering step-by-step guidance and code explanations.

6. Specifications

Feature	Detail
Processor	Dual-core 32-bit, up to 240 MHz
Flash Memory	8 MB
PSRAM	8 MB
Wireless Connectivity	2.4 GHz Wi-Fi, Bluetooth 5 (LE)
Onboard Camera	Yes
Operating System	Embedded

Model Number	FNK0085
Dimensions (LxWxH)	4.92 x 3.15 x 0.98 inches
Item Weight	2.39 ounces

7. Maintenance

To ensure the longevity and optimal performance of your Freenove ESP32-S3 CAM Board, observe the following maintenance guidelines:

- **Handling:** Handle the board with care to avoid physical damage to components or connectors. Avoid touching the electronic components directly to prevent electrostatic discharge.
- **Storage:** Store the board in a dry, anti-static environment when not in use. Keep it away from extreme temperatures and humidity.
- **Cleaning:** Use a soft, dry, lint-free cloth to clean the board. Avoid using liquids, solvents, or abrasive materials, as these can damage the components.
- **Power Supply:** Ensure a stable and appropriate power supply (5V via USB) is used to prevent damage to the board.

8. Troubleshooting

If you encounter issues with your Freenove ESP32-S3 CAM Board, consider the following troubleshooting steps:

- **Connectivity Issues:** Ensure the USB cable is securely connected to both the board and your computer. Verify that the correct drivers are installed and that the board is recognized by your Integrated Development Environment (IDE).
- **Camera Functionality:** If the camera is not working, double-check its physical connection to the board's camera interface. Refer to the official tutorial for specific camera initialization and usage instructions within your chosen programming language. Some users have reported that covering the onboard antenna with tape and then copper foil can improve video capture stability, though this may affect WiFi range.
- **Code Upload Errors:** Confirm that your programming environment is correctly configured and that you are using the appropriate code for your board model (MicroPython or C). Check for syntax errors in your code.
- **Power Problems:** If the board does not power on, check the USB connection and try a different USB port or cable. Ensure your computer's USB port provides sufficient power.
- **Tutorial Access:** If you cannot find the tutorial, locate the download link provided on the product box.

9. Support and Resources

Freenove offers technical support for any questions or problems you may encounter with your ESP32-S3 CAM Board.

- **Official Tutorials:** Detailed tutorials and code examples are available for download. The link is typically printed on the product box.
- **Technical Support:** For assistance, refer to the contact information provided on the product packaging or visit the official Freenove website.
- **Online Resources:** Explore the Freenove website for additional documentation, forums, and community support.

Image 9.1: The front of the product box, indicating where to find the tutorial download link.

Image 9.2: The back of the product box, displaying manufacturer details and contact information for support.

Ask a question about this manual

Ask about setup, troubleshooting, compatibility, parts, safety, or missing instructions. Manuals+ will review the question and use this page's manual context to help answer it.

Name

Anonymous

Email

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