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Aideepen ESP32-CAM-MB

Aideepen ESP32-CAM W-BT Board ESP32-CAM-MB User Manual

Brand: Aideepen | Model: ESP32-CAM-MB

1. Introduction

The Aideepen ESP32-CAM W-BT Board is a compact and versatile development module designed for IoT applications requiring camera functionality and wireless connectivity. This manual provides essential information for setting up, operating, and maintaining your ESP32-CAM module.

Package Contents:

- 1 x ESP32-CAM-MB Camera Module
- 1 x USB-TTL Serial Adapter Module

2. Product Features

The ESP32-CAM W-BT Board offers a range of features for embedded development and IoT projects:

- Compact design: The HK-ESP32-CAM-MB module measures 39.8mm x 27mm, allowing it to function independently as a minimal system.
- Secondary Development Support: Designed to facilitate further application development.
- Upgraded Connectivity: Features a Micro USB interface for convenient and reliable firmware connection, supporting both manual and automatic downloads without complex wiring.
- Dual-Mode Wireless: Integrates Wi-Fi (802.11b/g/n/e/i) and Bluetooth (4.2 BR/EDR and BLE standard) capabilities.
- High Performance: Equipped with two high-performance 32-bit LX6 CPUs, operating at a main frequency of 80MHz to 240MHz.
- Memory: Includes built-in 520KB SRAM and external 4MB PSRAM.
- Peripheral Support: Supports various interfaces including UART, SPI, I2C, PWM, ADC, and DAC.
- Camera Compatibility: Supports OV2640 and OV7670 cameras, with a built-in flash.
- Storage: Features a TF card slot, supporting up to 4GB.
- Low Power Consumption: Offers multiple sleep modes, with deep sleep current as low as 6mA.
- Network Configuration: Supports STA/AP/STA+AP working modes and Smart Config/AirKiss one-click network configuration.

3. Components Overview

This section details the main components of the Aideepen ESP32-CAM W-BT Board and its accompanying USB-TTL adapter.

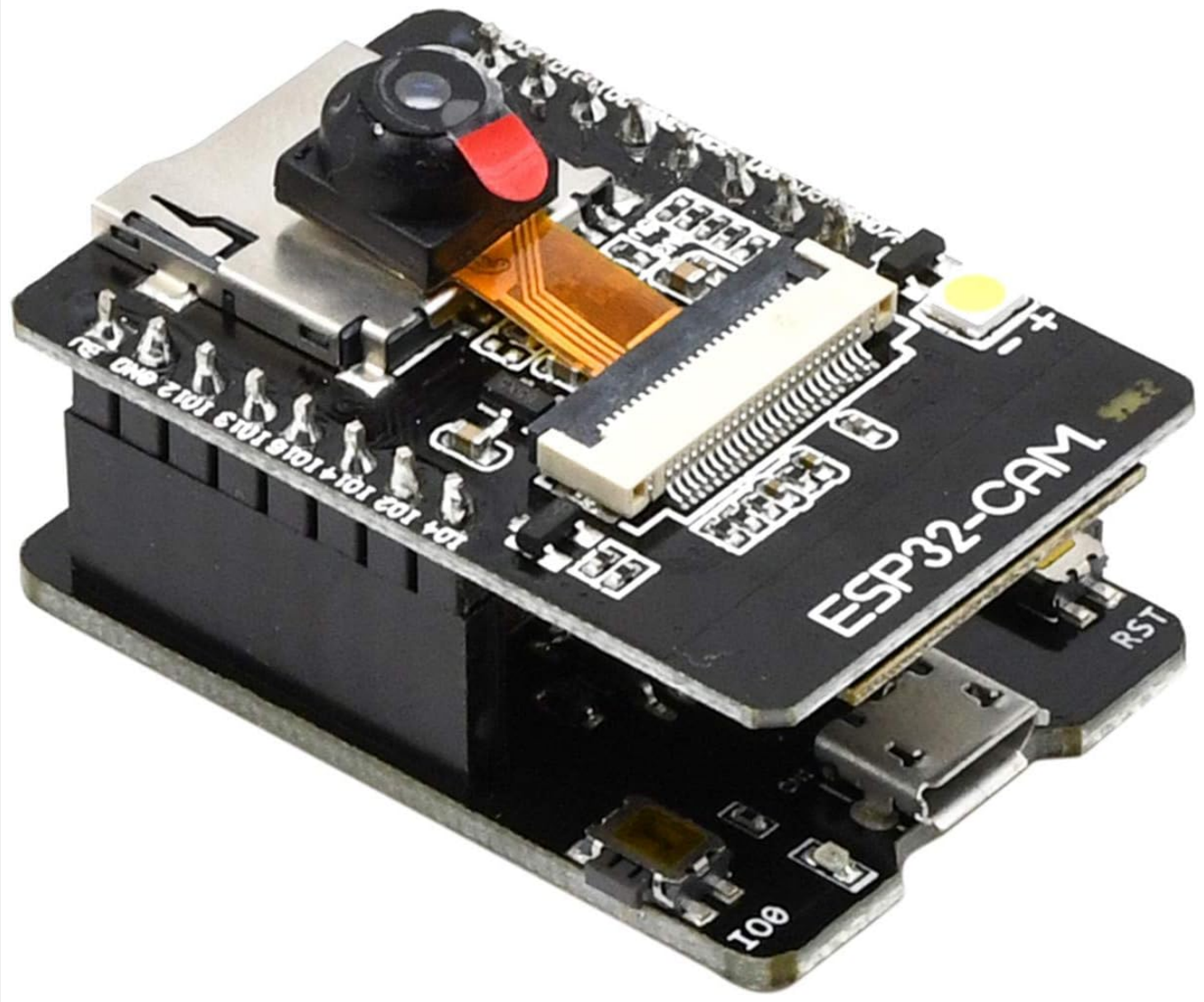

Figure 3.1: The Aideepen ESP32-CAM-MB module with the OV2640 camera attached, showcasing its compact form factor.

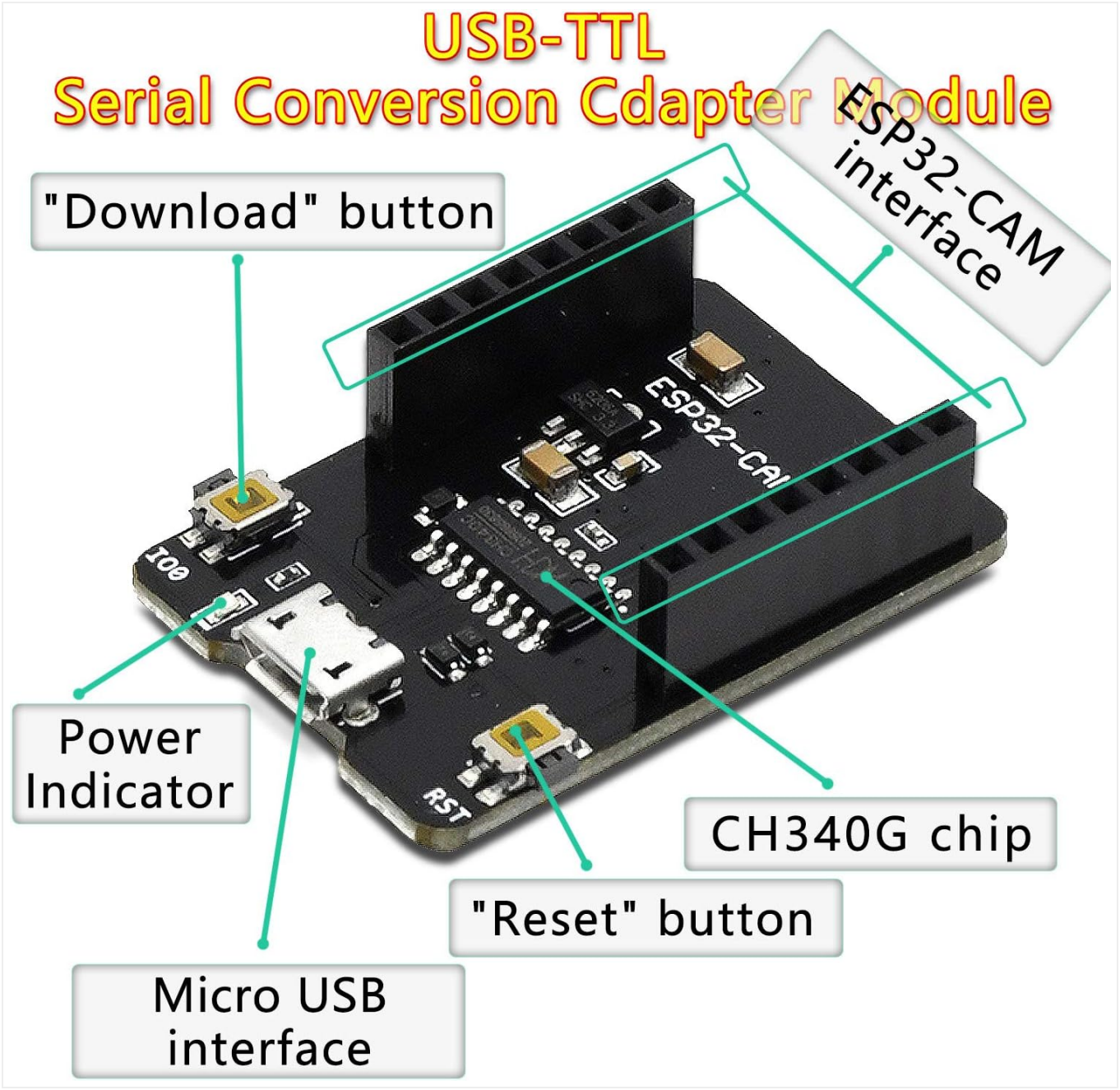

Figure 3.2: Detailed view of the USB-TTL Serial Conversion Adapter Module. Key components include the Micro USB interface for power and data, a CH340G chip for serial communication, a power indicator LED, a 'Download' button for programming mode, and a 'Reset' button.

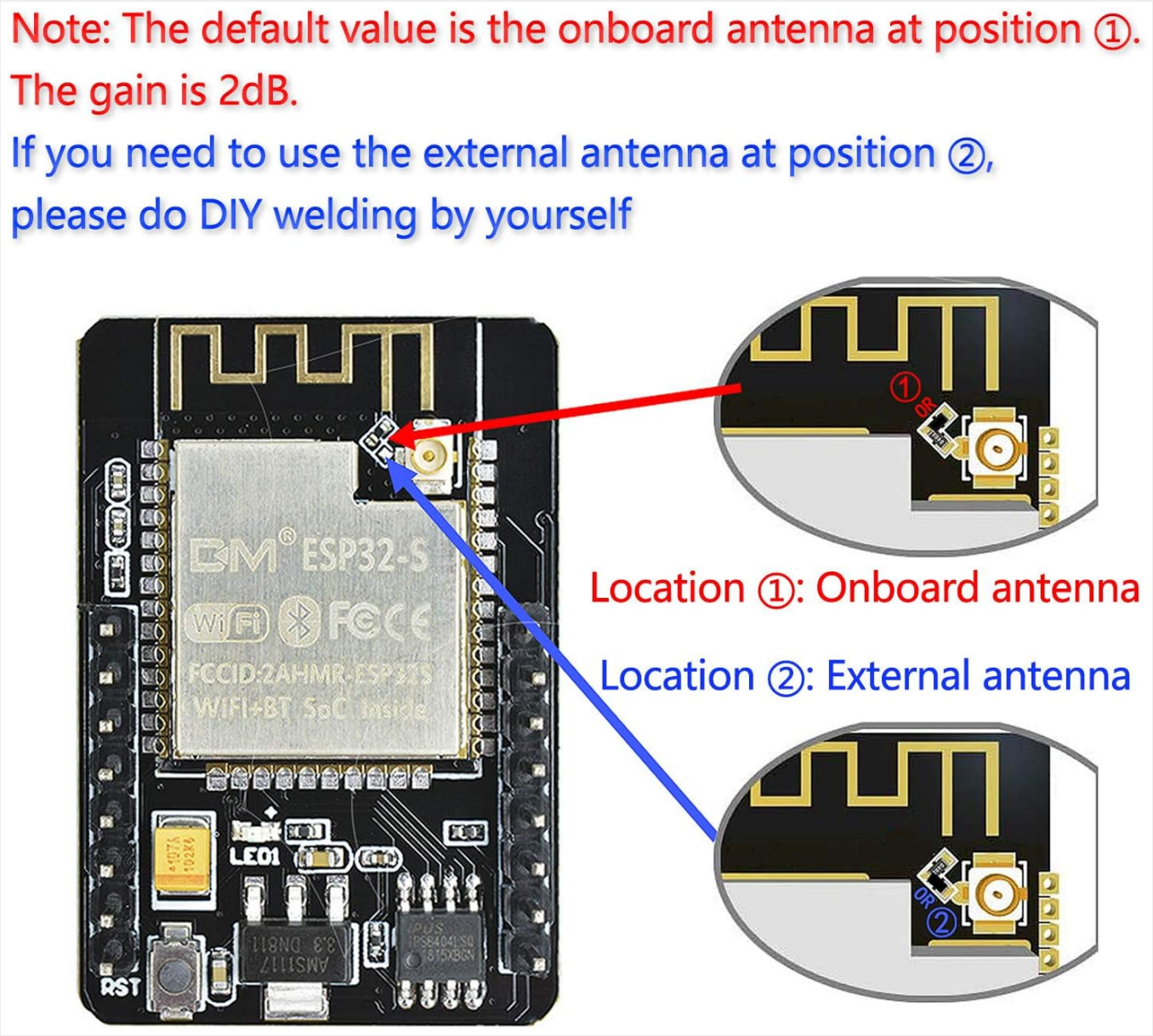

Figure 3.3: Antenna configuration options for the ESP32-CAM. The module defaults to an onboard PCB antenna (Location 1) with a 2dBi gain. An external antenna (Location 2) can be used by performing DIY welding.

4. Specifications

The following table outlines the technical specifications of the Aideepen ESP32-CAM W-BT Board:

Specification	Value
Processor	240 MHz (Dual-core 32-bit LX6 CPU)
RAM	Internal 520KB + External 4MB PSRAM
Wireless Type	802.11b/g/n/e/i (Wi-Fi), Bluetooth 4.2 BR/EDR and BLE
Operating System	FreeRTOS
Supported Interfaces	UART, SPI, I2C, PWM, ADC, DAC
Supported Cameras	OV2640, OV7670
TF Card Support	Maximum 4GB

Specification	Value
Deep Sleep Current	As low as 6mA
Dimensions (Module)	39.8mm x 27mm (1.59 x 1.06 inches)
Item Weight	0.704 ounces
Antenna Form	Onboard PCB antenna, gain 2dBi

5. Setup Guide

Follow these steps for the initial setup of your ESP32-CAM W-BT Board:

1. **Driver Installation:** If your computer does not automatically recognize the USB-TTL adapter, you may need to install the CH340G serial driver. These drivers are widely available online for various operating systems.
2. **Connect the Module:** Carefully connect the ESP32-CAM module to the USB-TTL serial adapter. Ensure the pins are correctly aligned and fully seated.
3. **Connect to Computer:** Use a **data-rated Micro USB cable** to connect the USB-TTL adapter to your computer. Note that a charging-only cable will not work for data transfer and programming.
4. **Prepare Development Environment:**
    - Open your preferred Integrated Development Environment (IDE), such as Arduino IDE.
    - Install the ESP32 board definitions and necessary libraries (e.g., ESP32-CAM libraries).
    - Select the correct board (e.g., "AI Thinker ESP32-CAM" or "ESP32 Wrover Module") and the appropriate COM port from the IDE's tools menu.
5. **Upload Firmware:**
    - Load a sample sketch (e.g., "CameraWebServer" from the ESP32 examples).
    - Modify the sketch to include your Wi-Fi network credentials (SSID and password).
    - To enter programming mode, press and hold the 'Download' button on the USB-TTL adapter, then press the 'Reset' button. Release both buttons.
    - Initiate the upload process from your IDE.

6. Operating Instructions

Once the firmware is successfully uploaded, you can begin operating your ESP32-CAM module:

1. **Accessing Camera Stream:** After uploading, open the Serial Monitor in your IDE (set baud rate to 115200). The module will output an IP address. Enter this IP address into a web browser on a device connected to the same network to access the camera interface and start streaming video.
2. **Wi-Fi Image Upload:** The module supports uploading images via Wi-Fi. Refer to the specific firmware documentation or example sketches for details on implementing this functionality.
3. **Utilizing Sleep Modes:** For battery-powered applications, configure the ESP32-CAM to use its deep sleep modes to achieve ultra-low power consumption. Consult the ESP32 documentation for programming sleep modes.
4. **TF Card Storage:** Insert a TF card into the module's slot for local storage of images or video. Ensure your firmware includes code to interact with the TF card.

7. Maintenance

Proper care and maintenance will ensure the longevity and optimal performance of your ESP32-CAM module:

- **Handling:** Always handle the module by its edges to avoid touching sensitive components or damaging solder joints.
- **Cleaning Contacts:** If connection issues arise, gently clean the gold contacts on the camera ribbon cable and the module's connector using a soft, dry cloth or a pencil eraser.
- **Storage:** Store the module in an anti-static bag or container in a dry environment when not in use to prevent electrostatic discharge and moisture damage.
- **Power Supply:** Ensure a stable 5V power supply is used. Fluctuations can lead to unstable operation or damage.

8. Troubleshooting

This section addresses common issues and their potential solutions:

Module Not Recognized / Programming Errors:

- **USB Cable:** Ensure you are using a **data-rated USB cable**. Many USB cables are designed for charging only and lack the necessary data lines for communication.
- **Drivers:** Verify that the CH340G serial driver is correctly installed on your computer.
- **COM Port:** Double-check that the correct COM port is selected in your IDE.
- **Connection:** Ensure the ESP32-CAM module is securely and correctly seated on the USB-TTL adapter.
- **Programming Mode:** Confirm the module is in programming mode by pressing the 'Download' button before and during the upload process.

Camera Not Working / Error 0x105:

- **Camera Connection:** Ensure the camera ribbon cable is securely connected to the ESP32-CAM board.
- **Camera Model:** Verify that the camera module is an OV2640 or OV7670, as these are the supported models. Incompatible cameras may not function.
- **Power Supply:** Insufficient or unstable power can cause camera initialization failures. Ensure a stable 5V supply.
- **Firmware Configuration:** Review your firmware code for correct camera model and pinout settings.

Web Page Slow / Video Stream Issues:

- **Wi-Fi Stability:** Ensure a strong and stable Wi-Fi connection between the ESP32-CAM and your network.
- **Power:** If experiencing instability, try boosting the input voltage slightly (e.g., to 5.2V) to ensure adequate power delivery, especially during Wi-Fi and camera operations.
- **Serial Monitor Errors:** Check the serial monitor for messages like "E (489) esp_core_dump_flash: No core dump partition found!" which may indicate firmware or memory issues.

Physical Issues:

- **Out of Focus Camera:** If the camera image is blurry, the lens may need adjustment. Gently rotate the lens to focus. Some lenses may have a small glue spot that needs to be carefully removed before adjustment.
- **Interference:** If experiencing significant interference, consider repositioning the module or adding shielding.

9. Warranty and Support

Aideepen is committed to customer satisfaction and product quality.

- **Warranty:** Each product purchased from Aideepen includes 24 months of service.

- **Replacements:** If you encounter any quality issues with your item, a replacement can be provided.
- **Customer Support:** For further assistance, technical inquiries, or to report product issues, please contact Aideepen customer support.

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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.

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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