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

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

Model: ESP32-CAM W-BT Board ESP32-CAM-MB

1. Introduction

This manual provides essential information for the setup, operation, and maintenance of your Aideepen ESP32-CAM W-BT Board (ESP32-CAM-MB). This development board integrates an ESP32 chip with Wi-Fi and Bluetooth capabilities, a Type-C USB interface, and an OV2640 2MP camera module, making it suitable for various IoT applications and embedded projects.

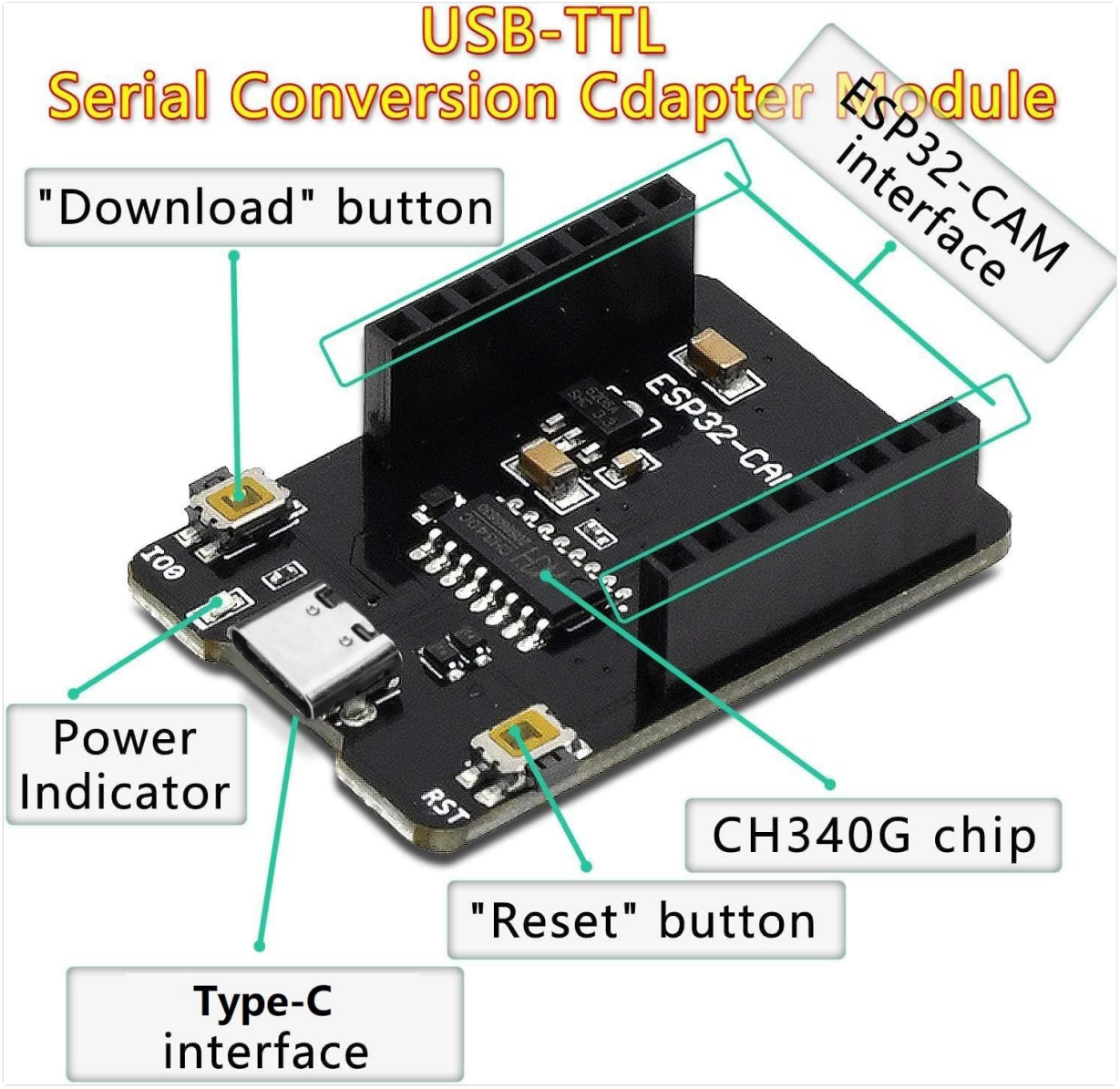

Image 1.1: Aideepen ESP32-CAM W-BT Board with OV2640 Camera Module.

2. Package Contents

Verify that all items listed below are included in your package:

- ESP32-CAM W-BT Board (ESP32-CAM-MB)
- OV2640 2MP Camera Module

3. Key Features

- **Upgraded Type-C Interface:** Features a Type-C USB interface for convenient and reliable firmware connection.
- **Dual-Mode Development Board:** Based on ESP32 design, supporting both Wi-Fi and Bluetooth (W-BT).
- **High-Performance CPU:** Equipped with two high-performance 32-bit LX6 CPUs, operating from 80MHz to 240Mhz.
- **Compact Design:** Small camera module with dimensions of 39.8mm x 27mm, capable of independent operation.
- **Ultra-Low Power Consumption:** Deep sleep current as low as 6mA.

- **Integrated Camera:** Includes an OV2640 2MP camera module.
- **Expandable Storage:** Supports TF cards (up to 4GB).
- **Image Upload:** Supports image Wi-Fi upload functionality.

4. Setup Instructions

4.1. Camera Module Installation

To install the OV2640 camera module onto the ESP32-CAM board:

1. Carefully align the camera module's ribbon cable connector with the corresponding slot on the ESP32-CAM board.
2. Gently push the ribbon cable into the slot until it is fully seated. Ensure the connection is secure.
3. Once the camera is connected, the ESP32-CAM board can be inserted into the ESP32-CAM-MB adapter board, aligning the pins correctly.

Image 4.1: Assembled ESP32-CAM W-BT Board with OV2640 Camera.

4.2. Connecting to a Computer

The ESP32-CAM-MB features a Type-C USB interface for direct connection to your computer. This simplifies programming and power supply. You may need to install a CH340G serial driver for your operating system to recognize the device. Drivers are typically available from the CH340G manufacturer's website or common microcontroller development resources.

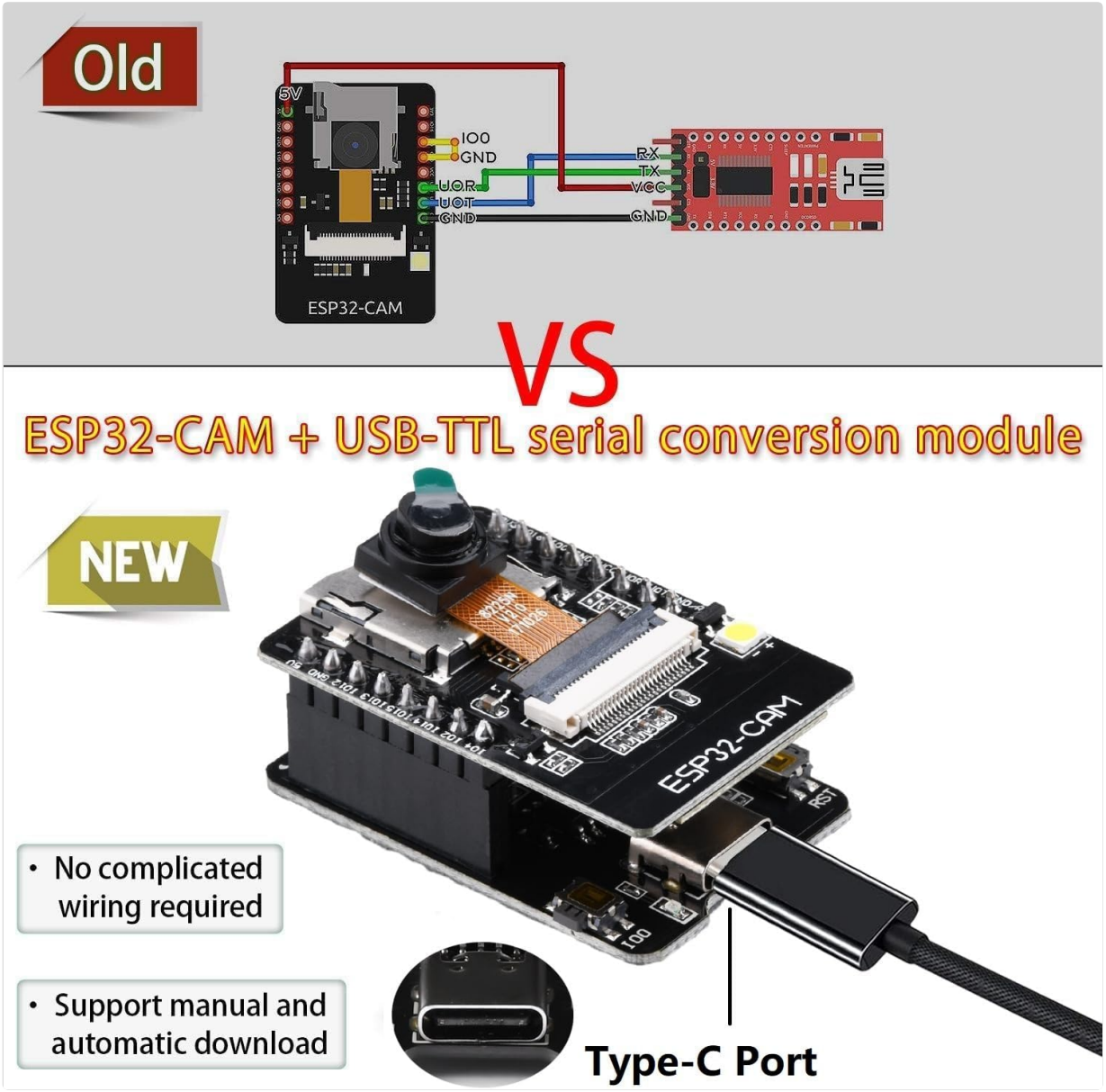

Image 4.2: Comparison highlighting the convenience of the Type-C interface.

4.3. Antenna Configuration

The board defaults to using the onboard antenna. If an external antenna is required for improved range or specific applications, DIY welding is necessary to switch to the external antenna connection point. Refer to the board's silkscreen for antenna location details.

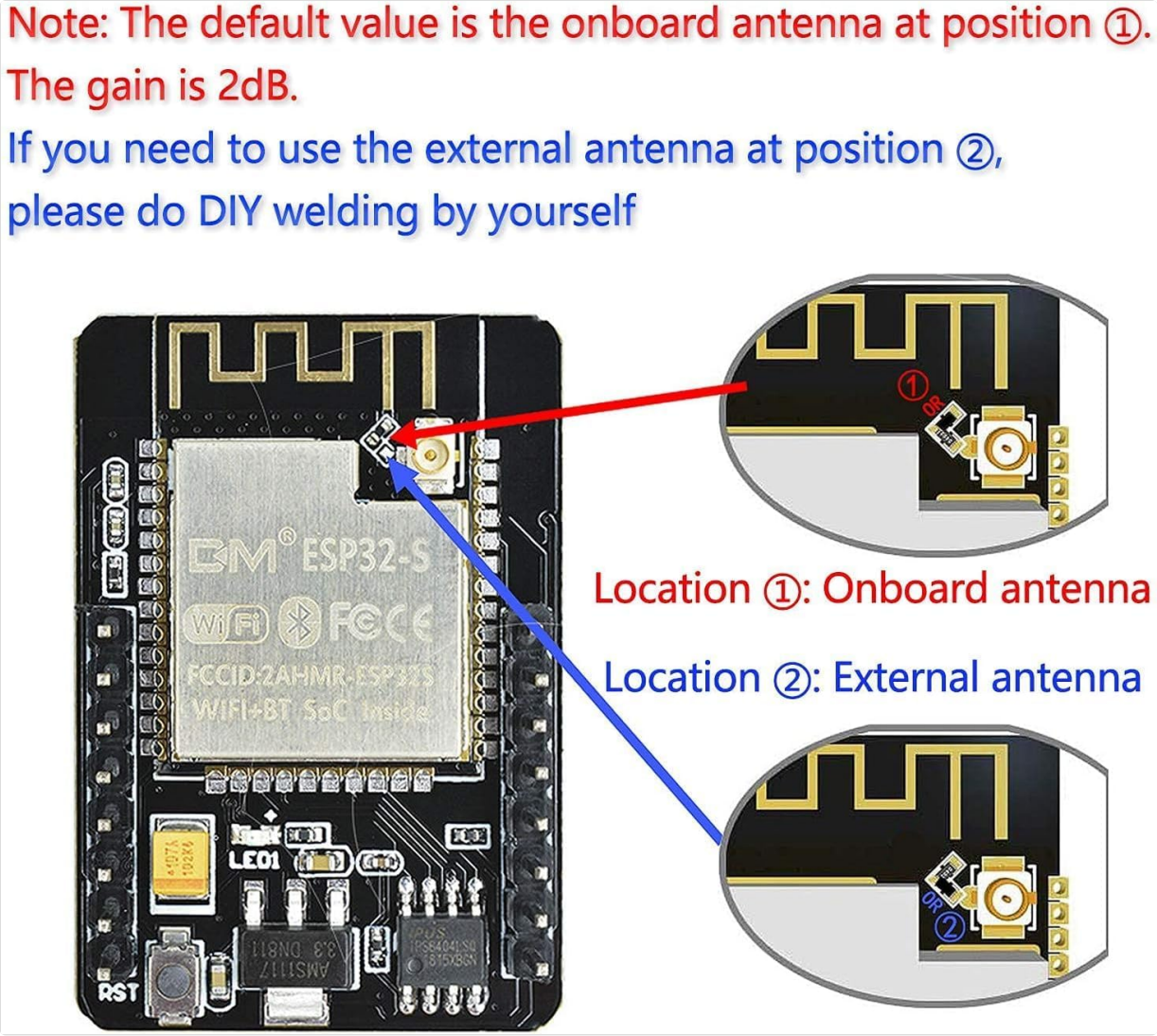

Image 4.3: Antenna configuration options on the ESP32-CAM board.

4.4. Programming Environment

The ESP32-CAM W-BT Board is compatible with various development environments, including the Arduino IDE and NodeMCU. Ensure you have the correct board definitions and libraries installed for your chosen environment. The Type-C interface supports both manual and automatic program downloads.

5. Operating Instructions

5.1. Basic Operation

Once programmed, the ESP32-CAM W-BT Board can operate independently. Depending on your uploaded firmware, it can perform tasks such as:

- Capturing images and streaming video via the OV2640 camera.
- Connecting to Wi-Fi networks for data transmission or web server hosting.
- Utilizing Bluetooth for short-range communication.
- Interacting with other sensors or actuators via its GPIO pins.

5.2. Powering the Board

The board can be powered via the Type-C USB port. Ensure the power supply meets the board's voltage requirements (typically 5V DC). The power indicator LED will illuminate when the board is receiving power.

5.3. Reset and Download Buttons

The board includes a "Reset" button to restart the ESP32 chip and a "Download" button (often labeled IO0) used for entering bootloader mode during firmware flashing. Consult your specific programming guide for the correct sequence to use these buttons for uploading code.

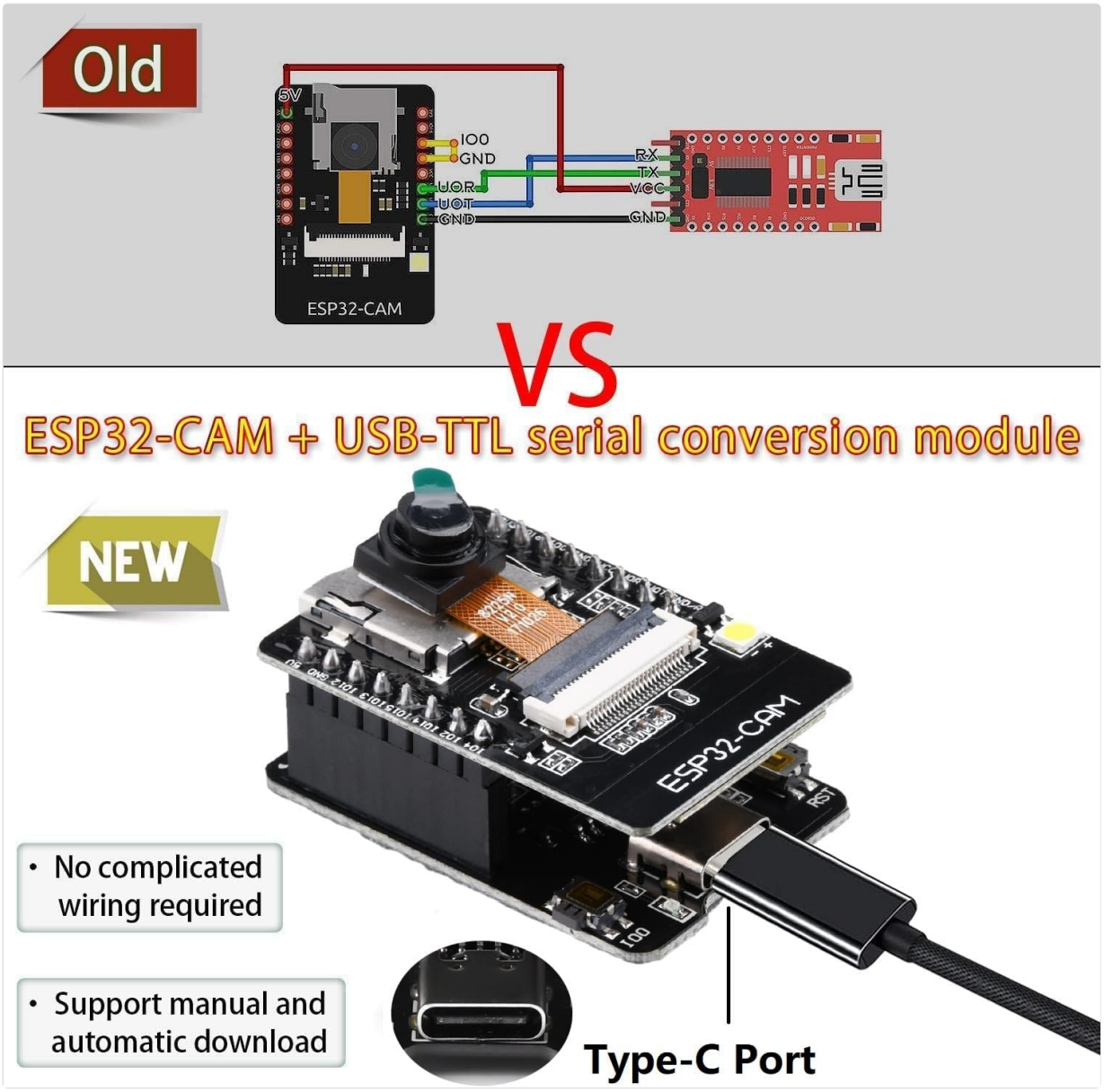

Image 5.1: ESP32-CAM-MB board with key components labeled.

5.4. Video Overview

For a visual guide on the Aideepen ESP32-CAM family and camera installation, please refer to the video below.

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Video 5.1: Overview of the Aideepen ESP32-CAM family and camera installation process.

6. Maintenance

To ensure the longevity and optimal performance of your ESP32-CAM W-BT Board:

- **Keep Dry:** Avoid exposure to moisture or liquids, as this can damage electronic components.
- **Clean Gently:** Use a soft, dry cloth to clean the board. Avoid harsh chemicals or abrasive materials.

- **Handle with Care:** Electronic components are sensitive. Avoid dropping the board or subjecting it to strong impacts.
- **Proper Storage:** When not in use, store the board in an anti-static bag or a dry, dust-free environment.

7. Troubleshooting

If you encounter issues with your ESP32-CAM W-BT Board, consider the following common solutions:

7.1. Device Not Recognized by Computer

- **Driver Installation:** Ensure the CH340G serial driver is correctly installed for your operating system.
- **USB Cable:** Try a different Type-C USB cable. Some cables are for charging only and do not support data transfer.
- **USB Port:** Connect to a different USB port on your computer.

7.2. Camera Not Functioning / No Image Output

- **Camera Connection:** Verify that the OV2640 camera module's ribbon cable is securely and correctly inserted into its connector on the ESP32-CAM board.
- **Power Supply:** Ensure the board is receiving adequate power. Insufficient power can lead to camera issues.
- **Firmware:** Confirm that your uploaded firmware includes the necessary code to initialize and operate the camera.

7.3. Firmware Upload Failure

- **Bootloader Mode:** Ensure the board is correctly placed into bootloader mode (usually by holding the IO0/Download button while pressing and releasing Reset, then releasing IO0).
- **Serial Port Selection:** In your IDE (e.g., Arduino IDE), verify that the correct serial port for the CH340G is selected.
- **Board Settings:** Confirm that the correct board (e.g., "AI-Thinker ESP32-CAM") is selected in your development environment.

7.4. Inconsistent Operation / Instability

- **Power Supply:** Use a stable and sufficient power supply. Voltage fluctuations can cause instability.
- **Connections:** Check all connections, especially if using external components, for loose or incorrect wiring.
- **Code Review:** Review your code for potential bugs, memory leaks, or resource conflicts.

8. Specifications

Feature	Detail
Brand	Aideepen
Model Name	ESP32-CAM
CPU Model	ARM Cortex A5 (LX6 CPU)
CPU Speed	2.4 GHz (Adjustable 80MHz to 240Mhz)
Processor Count	2
RAM Memory Installed Size	8 MB (Built-in 520 KB SRAM, External 4MB PSRAM)
Connectivity Technology	Bluetooth, I2C, Wi-Fi (802.11b/g/n/e/i, Bluetooth 4.2)
Operating System	FreeRTOS
Compatible Devices	Camera
Built-In Media	OV2640 Camera Module
Total USB Ports	1 (Type-C)
Operating Temperature	-20°C to 85°C
Deep Sleep Current	As low as 6mA
Dimensions	27 * 40.5 * 4.5mm (Module size)

9. Warranty and Support

9.1. Warranty Information

This Aideepen product comes with a 1-year warranty from the date of purchase. This warranty covers manufacturing defects and ensures the product functions as described under normal use. Please retain your proof of purchase for warranty claims.

9.2. Customer Support

For technical assistance, troubleshooting, or warranty inquiries, please contact Aideepen customer support. We are committed to providing support and improving product functionality. If there is any quality issue with your item, a new replacement may be provided within 24 months of purchase.
You can typically find contact information on the Aideepen official website or through the retailer where you purchased the product.