LONELY BINARY ESP32-S3 N16R8

LONELY BINARY ESP32-S3 N16R8 Gold Edition Development Board User Manual

Model: ESP32-S3 N16R8

1. Introduction

This manual provides essential information for setting up, operating, and maintaining your LONELY BINARY ESP32-S3 N16R8 Gold Edition Development Board. This board is designed for Internet of Things (IoT), Artificial Intelligence (AI), and advanced automation projects, offering robust performance with its dual-core Xtensa LX7 processor, ample memory, and versatile connectivity options.

2. Product Overview

The ESP32-S3 N16R8 Gold Edition Development Board features a powerful ESP32-S3 microcontroller with 16MB Flash and 8MB PSRAM. It includes integrated 2.4GHz WiFi and Bluetooth 5.0 LE for wireless communication. The board is equipped with dual USB Type-C ports for power and data, and comes with a 2.54mm expansion board for flexible prototyping.

Key Features:

- **Flagship ESP32-S3 N16R8 MCU:** Dual-core Xtensa LX7 at 240 MHz with 16MB Flash and 8MB PSRAM.
- **Versatile 2.54mm Expansion Board:** Female/male pins compatible with standard jumper wires for breadboard prototyping and sensor integration.
- **Lead-Free Gold Edition PCB:** Eco-friendly black board with immersion gold plating for enhanced corrosion resistance and durability.
- **Advanced Wireless Connectivity:** 2.4GHz WiFi (802.11 b/g/n) and Bluetooth 5.0 LE, supporting Station, SoftAP, and mixed modes.
- **Broad Compatibility:** Works with Arduino IDE, MicroPython, and ESP-IDF.
- **Dual USB Type-C Ports:** Dedicated ports for power (5-12V) and data for flexible programming and standalone operation.

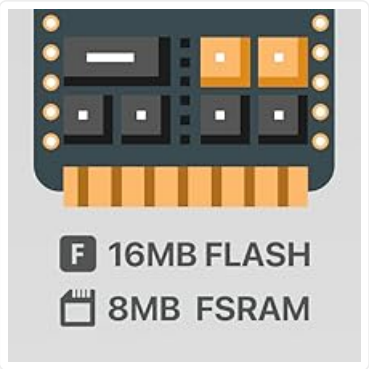


Image: Graphic highlighting the 16MB Flash and 8MB PSRAM memory specifications of the ESP32-S3 N16R8 board.

Image: Graphic indicating the gold plating feature on the development board's PCB.

3. Package Contents

Verify that all items are present in your package:

- 1 × LONELY BINARY ESP32-S3 N16R8 Gold Edition Development Board (16MB Flash, 8MB PSRAM)
- 1 × 2.54mm Expansion Board (Female and Male Pins)
- 1 × USB Type-C Cable

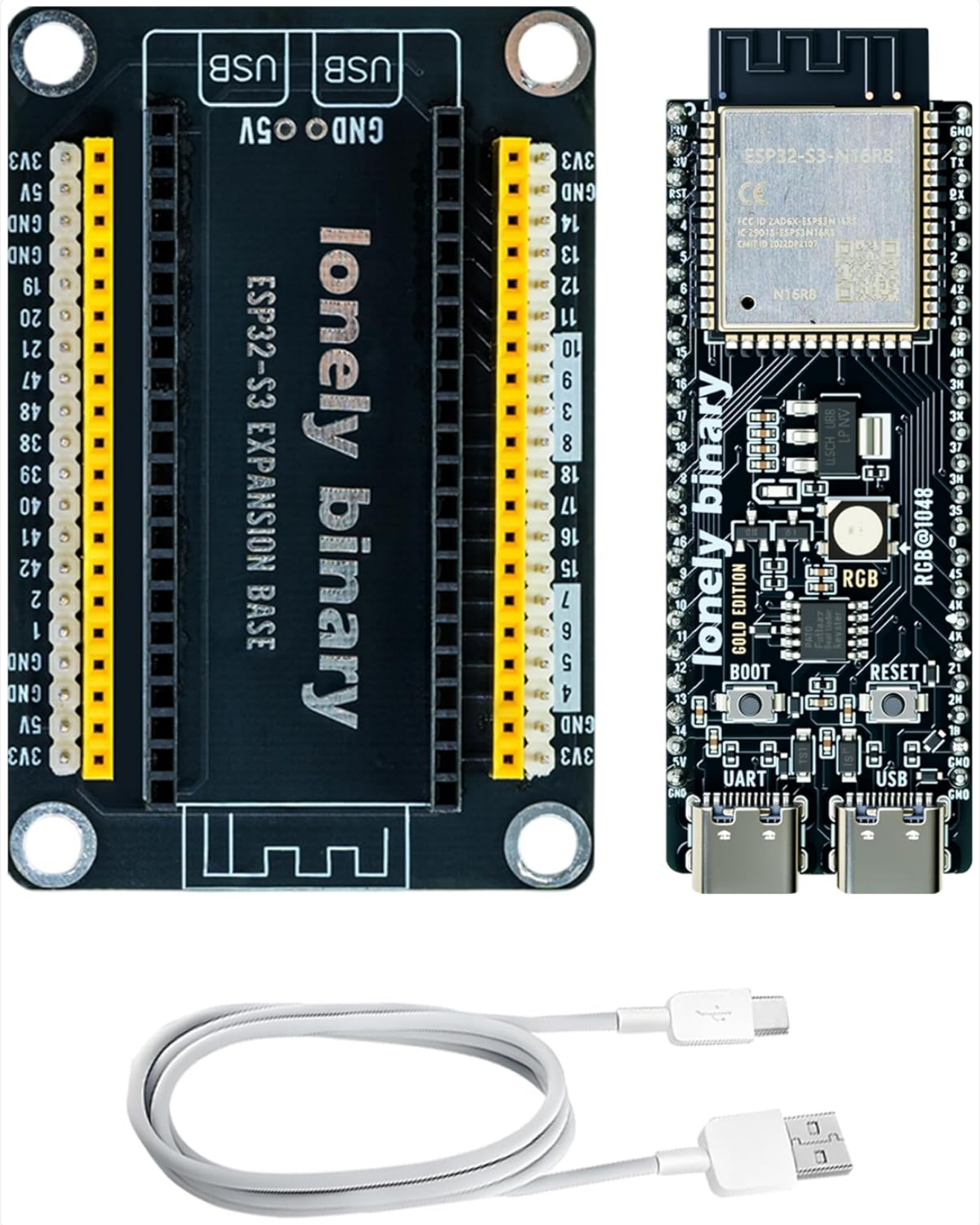


Image: The complete package contents, including the ESP32-S3 development board, the 2.54mm expansion base, and a USB Type-C cable.

4. Setup

4.1 Assembling the Expansion Board

1. Align the ESP32-S3 N16R8 Development Board with the 2.54mm Expansion Board, ensuring the pins match the headers.
2. Gently press the development board into the expansion board until it is securely seated.

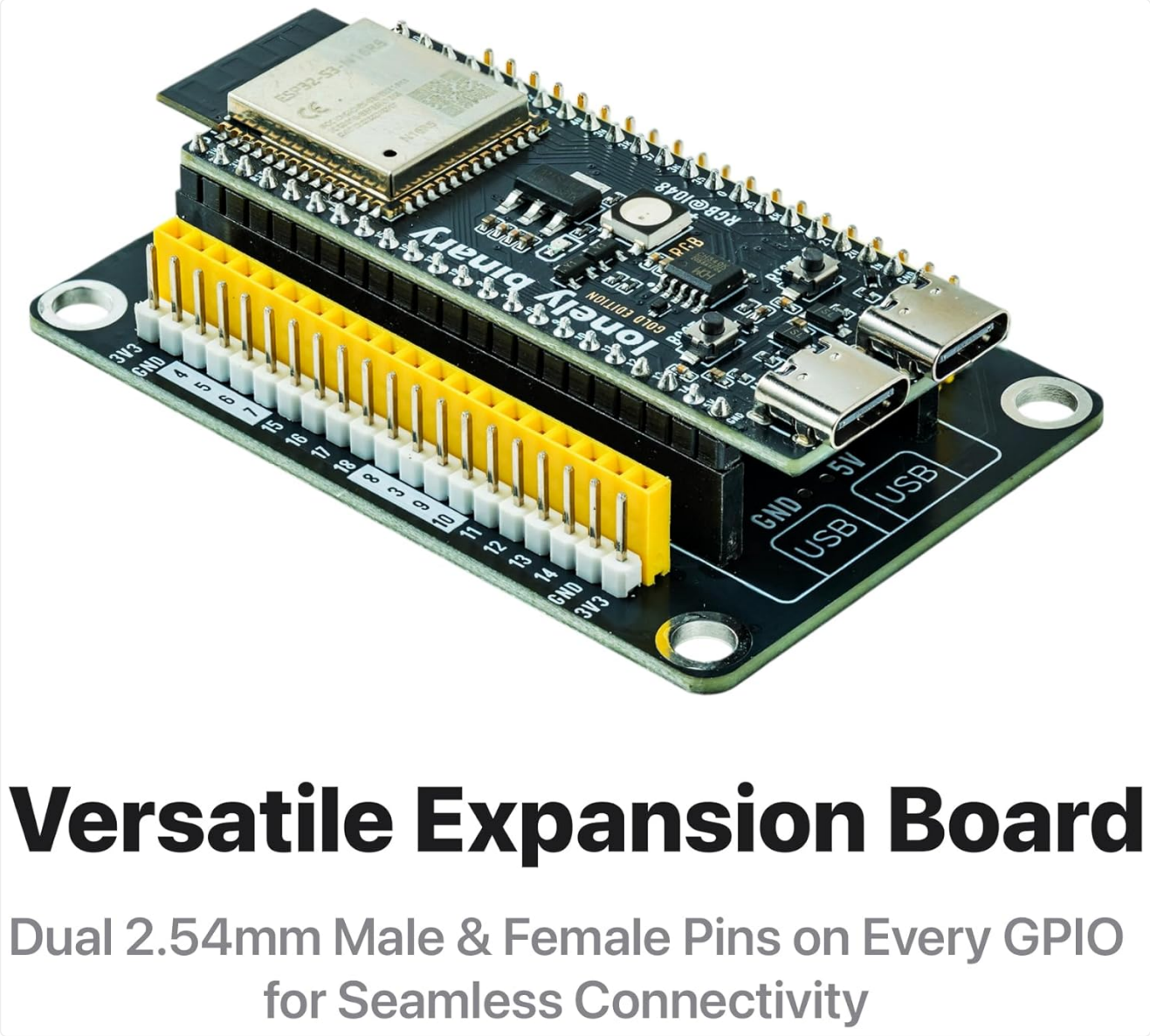


Image: The ESP32-S3 development board securely connected to the 2.54mm expansion board, ready for use.

4.2 Connecting to a Computer

1. Connect one end of the provided USB Type-C cable to the**USB (Data)** port on the ESP32-S3 board.
2. Connect the other end of the USB Type-C cable to an available USB port on your computer.
3. The board should power on, and your computer may attempt to install necessary drivers.

Image: A detailed view of the two USB Type-C ports on the ESP32-S3 development board, labeled for data and UART.

4.3 Software Environment Setup

The ESP32-S3 N16R8 supports various development environments:

- **Arduino IDE:** Download and install the Arduino IDE. Add ESP32 board support via the Boards Manager.
- **MicroPython:** Flash the MicroPython firmware onto the board. Refer to the official MicroPython documentation for ESP32-S3.
- **ESP-IDF:** For advanced development, install Espressif IoT Development Framework (ESP-IDF).

Detailed instructions for each environment can be found on their respective official websites.

5. Operating Instructions

5.1 Programming the Board

Once your development environment is set up and the board is connected, you can upload your code. The USB (Data) port is typically used for flashing firmware and serial communication.

5.2 Wireless Connectivity

The ESP32-S3 supports 2.4GHz WiFi and Bluetooth 5.0 LE. You can configure these features within your code to enable network communication, connect to other Bluetooth devices, or create a local access point.

5.3 Powering the Board

The board can be powered via the USB Type-C data port from your computer. Alternatively, the dedicated USB Type-C power port can accept 5-12V input for standalone operation.

6. Pinout Diagram

Understanding the pinout is crucial for connecting peripherals and sensors. Refer to the diagram below for GPIO assignments and power pins.

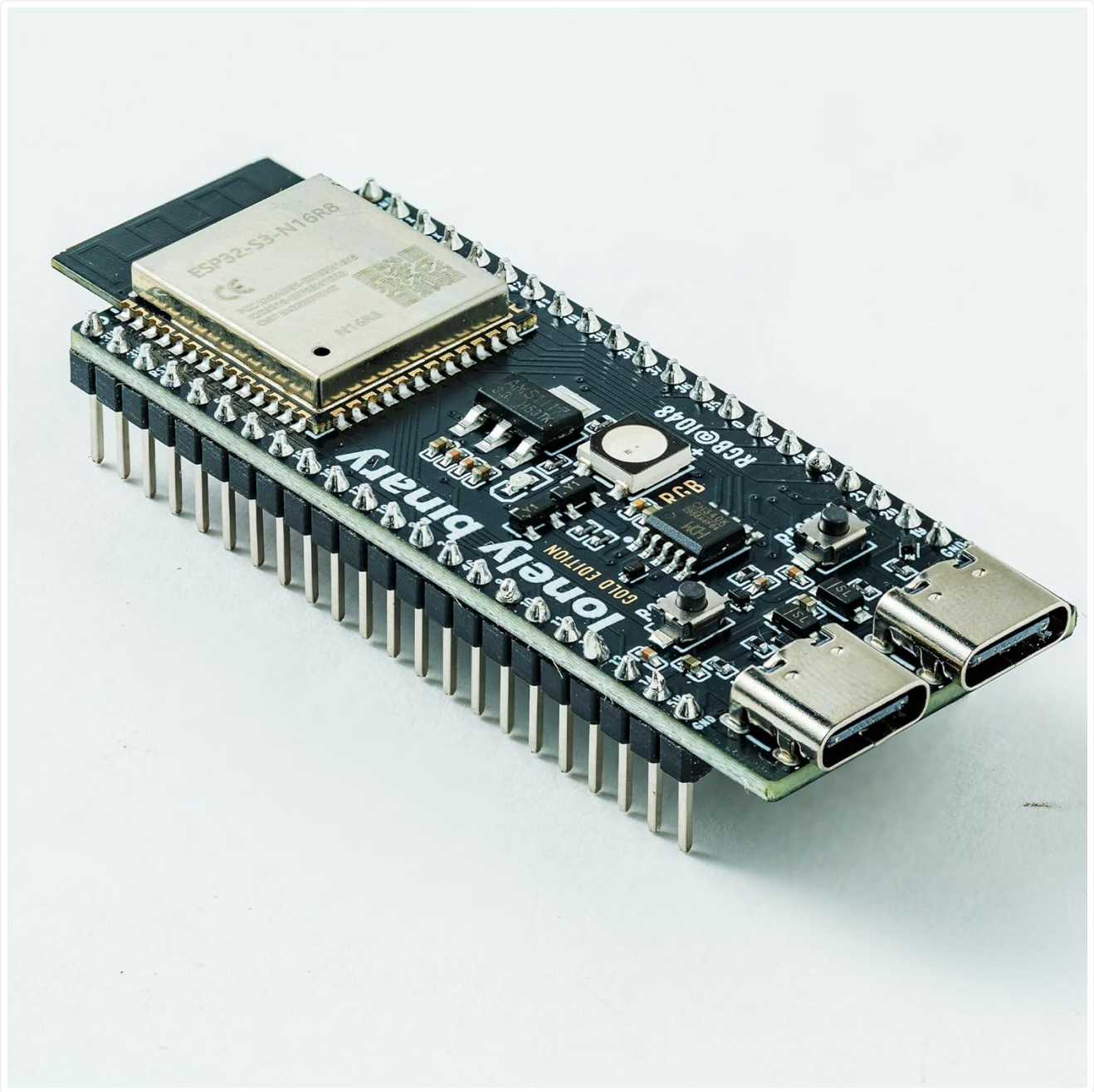


Image: Comprehensive pinout diagram for the ESP32-S3 N16R8 development board, showing all GPIOs, power pins, and special functions.

7. Specifications

Feature	Specification
Microcontroller	ESP32-S3 N16R8 (Dual-core Xtensa LX7, 240 MHz)
Flash Memory	16MB
PSRAM	8MB
Wireless Connectivity	2.4GHz WiFi (802.11 b/g/n), Bluetooth 5.0 LE
USB Ports	2 x USB Type-C (Data, Power)
Expansion Board	2.54mm pitch headers (Female and Male Pins)
Operating System Compatibility	Arduino IDE, MicroPython, ESP-IDF
PCB Finish	Immersion Gold Plating, Lead-Free
Item Weight	3.84 ounces
Package Dimensions	5.51 x 3.94 x 0.71 inches

Image: Certification mark indicating the product is lead-free, highlighting its eco-friendly design.

8. Maintenance

To ensure the longevity and proper functioning of your ESP32-S3 N16R8 Development Board, follow these maintenance guidelines:

- **Handle with Care:** Avoid dropping the board or subjecting it to physical shock.
- **Keep Dry:** Protect the board from moisture and liquids.
- **Cleanliness:** Keep the board free from dust and debris. Use a soft, dry brush or compressed air for cleaning.
- **Static Electricity:** Always handle the board in an anti-static environment to prevent damage from electrostatic discharge.
- **Storage:** Store the board in its original packaging or an anti-static bag when not in use.

9. Troubleshooting

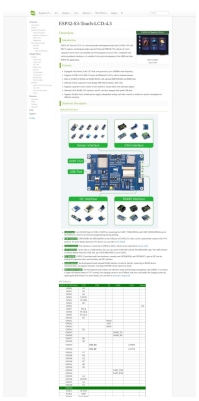
If you encounter issues with your development board, consider the following common problems and solutions:

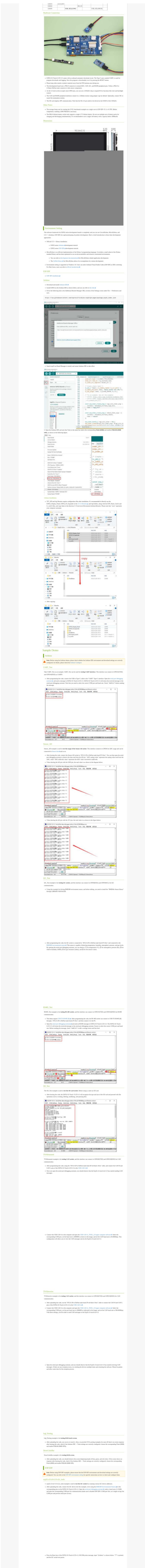
- **Board Not Detected:**
  - Ensure the USB Type-C cable is securely connected to the correct data port on the board and your computer.
  - Verify that necessary USB drivers are installed on your operating system.
  - Try a different USB port or cable.
- **Code Upload Failure:**
  - Check your development environment settings (e.g., correct board selected in Arduino IDE).
  - Ensure the board is in programming mode (often by holding the BOOT button while pressing and releasing RESET, then releasing BOOT).
  - Confirm that the serial port is correctly selected in your IDE.
- **WiFi/Bluetooth Connectivity Issues:**
  - Double-check your network credentials (SSID, password) in your code.
  - Ensure the board is within range of the WiFi access point or Bluetooth device.
  - Verify that the antenna (if external) is properly connected.
- **Power Issues:**
  - If using external power, ensure the voltage is within the specified 5-12V range and polarity is correct.
  - Check for any visible damage to the power components.

10. Warranty and Support

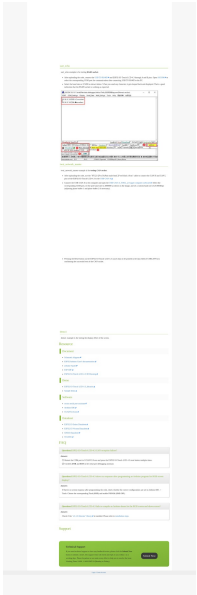
For specific warranty information, please refer to the product's purchase documentation or contact LONELY BINARY customer support. General support and resources, including tutorials and community forums, can often be found on the manufacturer's website or through the respective development environment communities (Arduino, MicroPython, ESP-IDF).

Related Documents - ESP32-S3 N16R8





[Waveshare ESP32-S3-Touch-LCD-4.3 Development Board: Features & Guide](#)
Explore the Waveshare ESP32-S3-Touch-LCD-4.3, a powerful microcontroller development board featuring a 4.3-inch capacitive touch display, WiFi, BLE 5, and multiple interfaces like CAN, RS485, and I2C. Learn about its hardware, setup, and sample demos for HMI development.

	
	[ESP32 Development Board Setup Guide for Arduino IDE] A comprehensive guide to setting up the ESP32 development environment within the Arduino IDE. Learn how to add board manager URLs, install ESP32 support, select the correct board and port, and enter download mode for ESP32-C3 modules.
	[Adafruit ESP32 Feather V2 Development Board Guide] Comprehensive guide to the Adafruit ESP32 Feather V2 development board, covering features, setup with Arduino IDE and MicroPython, low power usage, I2C, WiFi, and WipperSnapper IoT integration. Includes pinouts, examples, and troubleshooting.
	[JCZN ESP32-S3 Display Module: Arduino IDE Setup and Usage Guide] A comprehensive guide for JCZN ESP32-S3 display modules, detailing Arduino IDE setup, ESP32 board installation, library management (Arduino_GFX, LVGL), and sample program implementation.
	[NodeMCU ESP32 USB-C: Microcontroller Development Board Guide | Joy-IT] Comprehensive guide for the Joy-IT NodeMCU ESP32 USB-C microcontroller development board. Learn about its features, installation with Arduino IDE, usage examples, and support contact information.

ESP32-S3-Touch-LCD-4.3B

Overview

Introduction

Features

Hardware Description

Onboard Interface

[ESP32-S3-Touch-LCD-4.3B: Development Board Overview and Setup Guide]

Explore the ESP32-S3-Touch-LCD-4.3B, a powerful microcontroller development board from Waveshare. This guide covers its features, hardware description, interface details, and provides instructions for setting up the development environment using ESP-IDF and VSCode.