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› JacobsParts WT32-ETH01 ESP32 Module Ethernet WiFi Bluetooth Development Board 100Mbps RJ45 User Manual

JacobsParts WT32-ETH01

JacobsParts WT32-ETH01 ESP32 Module User Manual

Comprehensive Guide for Your Development Board

1. INTRODUCTION

The JacobsParts WT32-ETH01 is an embedded serial to Ethernet module built around the ESP32 series WT32-S1 Microcontroller Unit (MCU). This module integrates an optimized TCP/IP protocol stack, simplifying the networking functions for embedded devices and reducing development time. It offers both half-pad and through-hole connector compatibility, making it versatile for various applications.

The board's universal width allows for direct soldering to other boards, connectors, or breadboards, providing flexibility in its use. The ESP32 series IC features integrated 2.4GHz Wi-Fi and Bluetooth dual-mode capabilities, delivering high RF performance, stability, versatility, reliability, and ultra-low power consumption.

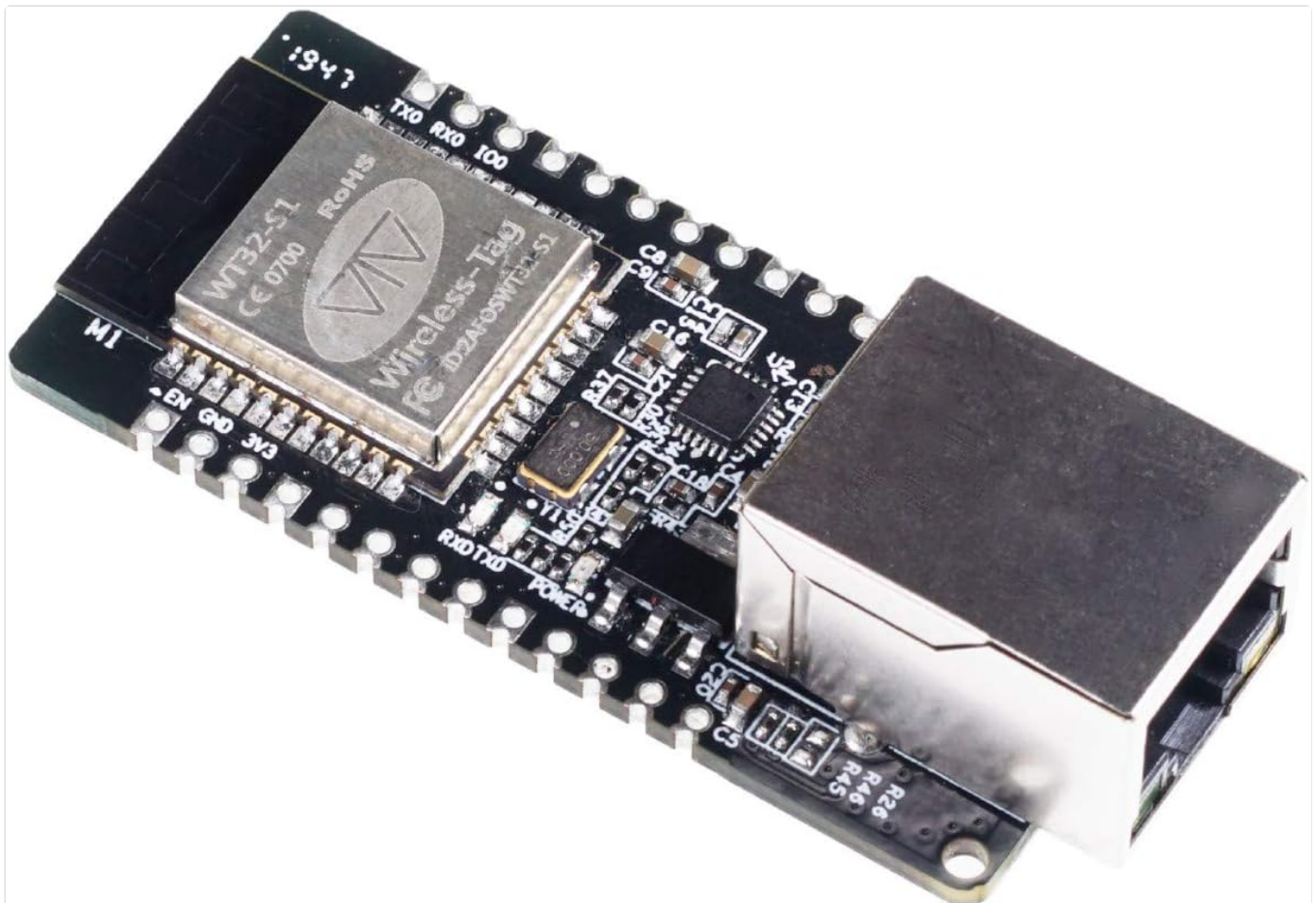


Figure 1.1: Top-down view of the JacobsParts WT32-ETH01 ESP32 Module, showcasing its compact design with the WT32-S1 module and RJ45 Ethernet port.

2. PRODUCT FEATURES

The WT32-ETH01 module is designed with robust features to support a wide range of embedded applications:

- **Microprocessor:** 240MHz dual-core ESP32 series WT32-S1 MCU.
- **Memory:** 4MB SPI flash memory.
- **Ethernet Connectivity:** Onboard 10/100Mbps RJ45 Ethernet with LAN8720A PHY.
- **Wireless Connectivity:** 802.11n Wi-Fi and Bluetooth 4.2.
- **Compatibility:** Compatible with half-pad and through-hole connectors.
- **Form Factor:** Universal board width for direct soldering or use with breadboards.
- **Power Consumption:** Designed for ultra-low power consumption.





Figure 2.1: Detailed view of the WT32-ETH01 module, highlighting the integrated Ethernet port and main components.

3. PACKAGE CONTENTS

Upon opening the package, verify that all components are present and undamaged:

- 1 x JacobsParts WT32-ETH01 ESP32 Module
- Unsoldered header pins (may be included separately for user assembly)

Note: The manufacturer has addressed previous feedback regarding pre-soldered pins. Newer shipments include separate, unsoldered header pins, allowing users to solder them in the desired orientation.

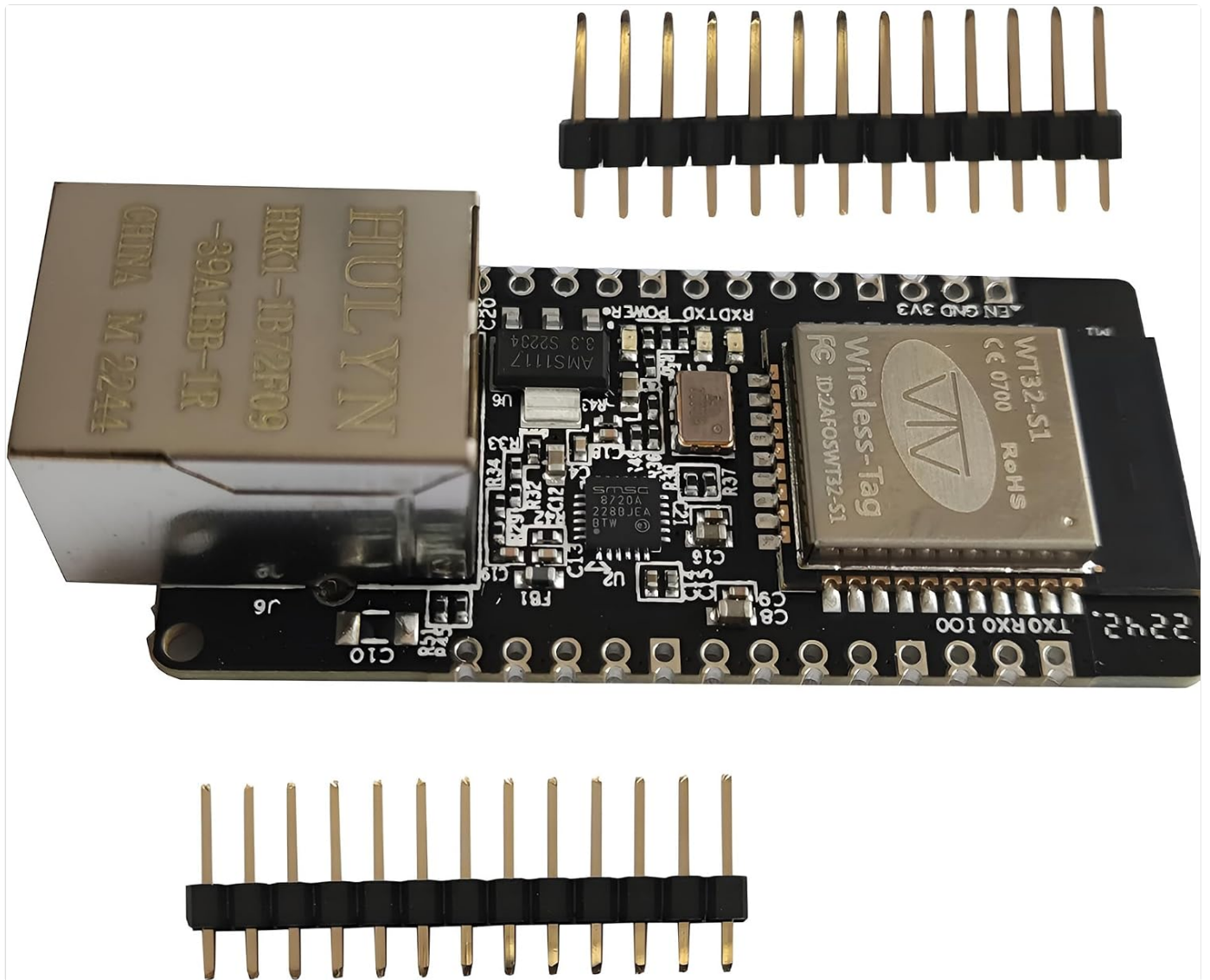


Figure 3.1: The WT32-ETH01 development board shown alongside the separate header pins, ready for user assembly.

4. SETUP

4.1 Pinout Diagram

Understanding the pinout is crucial for proper integration and programming of the WT32-ETH01 module. Refer to the diagram below for pin assignments and functions.

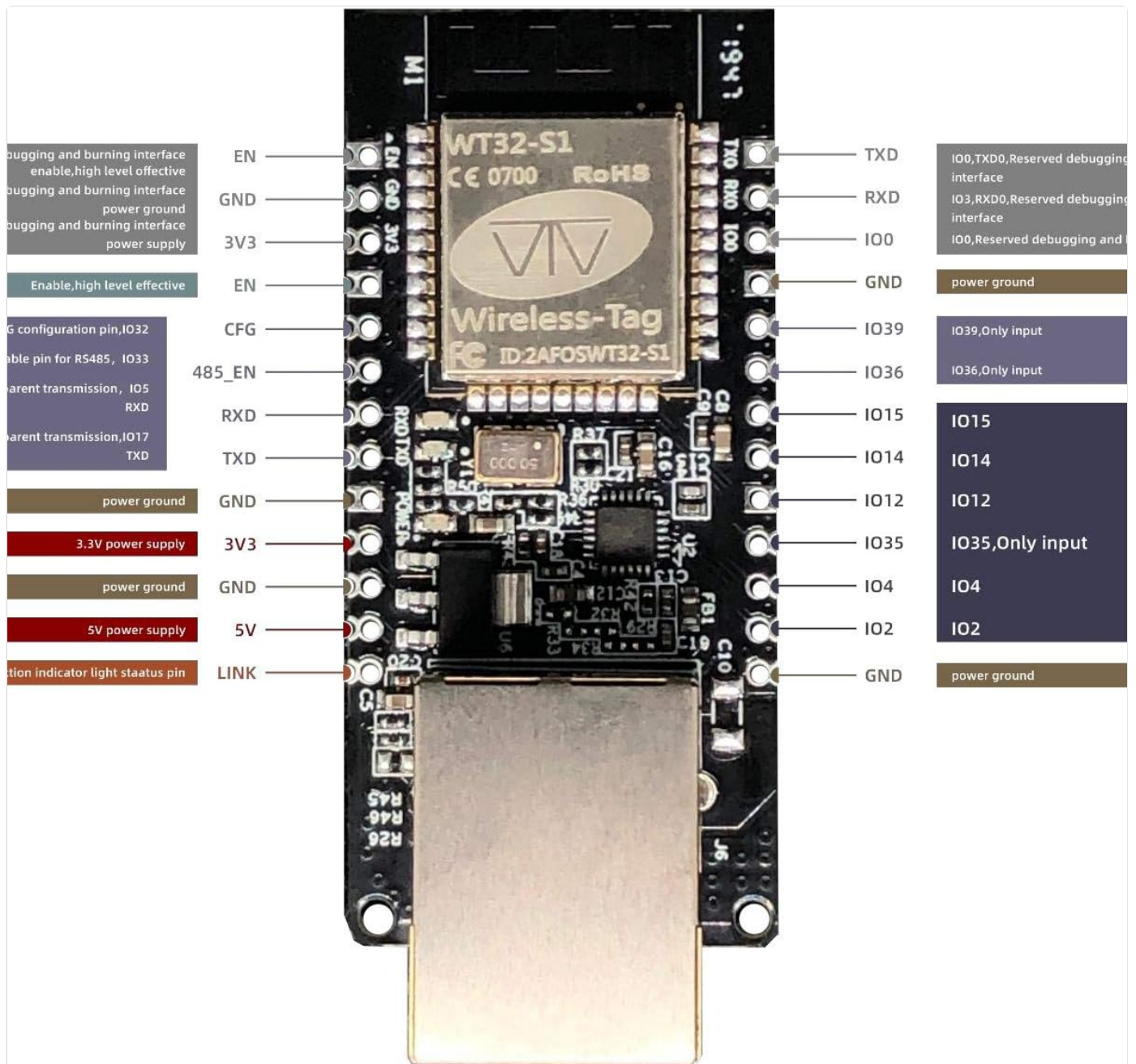


Figure 4.1: Detailed pinout diagram for the WT32-ETH01 module, indicating the function of each pin for power, data, and control.

4.2 Initial Connection and Power Supply

The WT32-ETH01 requires a 3.3V or 5V power supply. Ensure stable power delivery to prevent damage to the module.

1. **Power Connection:** Connect the 3V3 or 5V pin to your power source and GND to ground.
2. **Programming:** This module does not have an onboard USB-to-serial converter. A separate USB-to-TTL serial adapter (e.g., FTDI, CP2102) is required for programming. Connect the adapter's TX to the module's RXD, RX to the module's TXD, and GND to GND.
3. **Boot Mode:** To enter flash mode for programming, typically GPIO0 needs to be pulled low during reset/power-up. Consult the ESP32 documentation for specific boot mode requirements.

4.3 Software Environment Setup

To develop applications for the WT32-ETH01, you will need to set up a development environment. Popular choices include:

- **ESP-IDF (Espressif IoT Development Framework):** The official development framework for ESP32. Provides a robust set of tools and libraries.
- **Arduino IDE with ESP32 Core:** A simpler environment, popular for hobbyists and rapid prototyping.

- **PlatformIO:** An open-source ecosystem for IoT development, supporting various boards and frameworks, including ESP32.

Refer to the official Espressif documentation or the specific framework's guides for detailed installation and configuration instructions.

5. OPERATING INSTRUCTIONS

5.1 Ethernet Operation

The WT32-ETH01 features an integrated 10/100Mbps RJ45 Ethernet port. To utilize Ethernet connectivity:

1. **Physical Connection:** Connect a standard RJ45 Ethernet cable from the module's port to a network switch, router, or directly to a computer (if configured for direct connection).
2. **Software Configuration:** Your firmware running on the ESP32 must initialize and configure the Ethernet interface. This typically involves setting up DHCP or static IP addresses and managing network protocols (TCP/IP, UDP, HTTP, etc.).
3. **Status Indicators:** The RJ45 port includes LED indicators for link status and activity. Refer to the LAN8720A PHY datasheet for specific LED behavior.

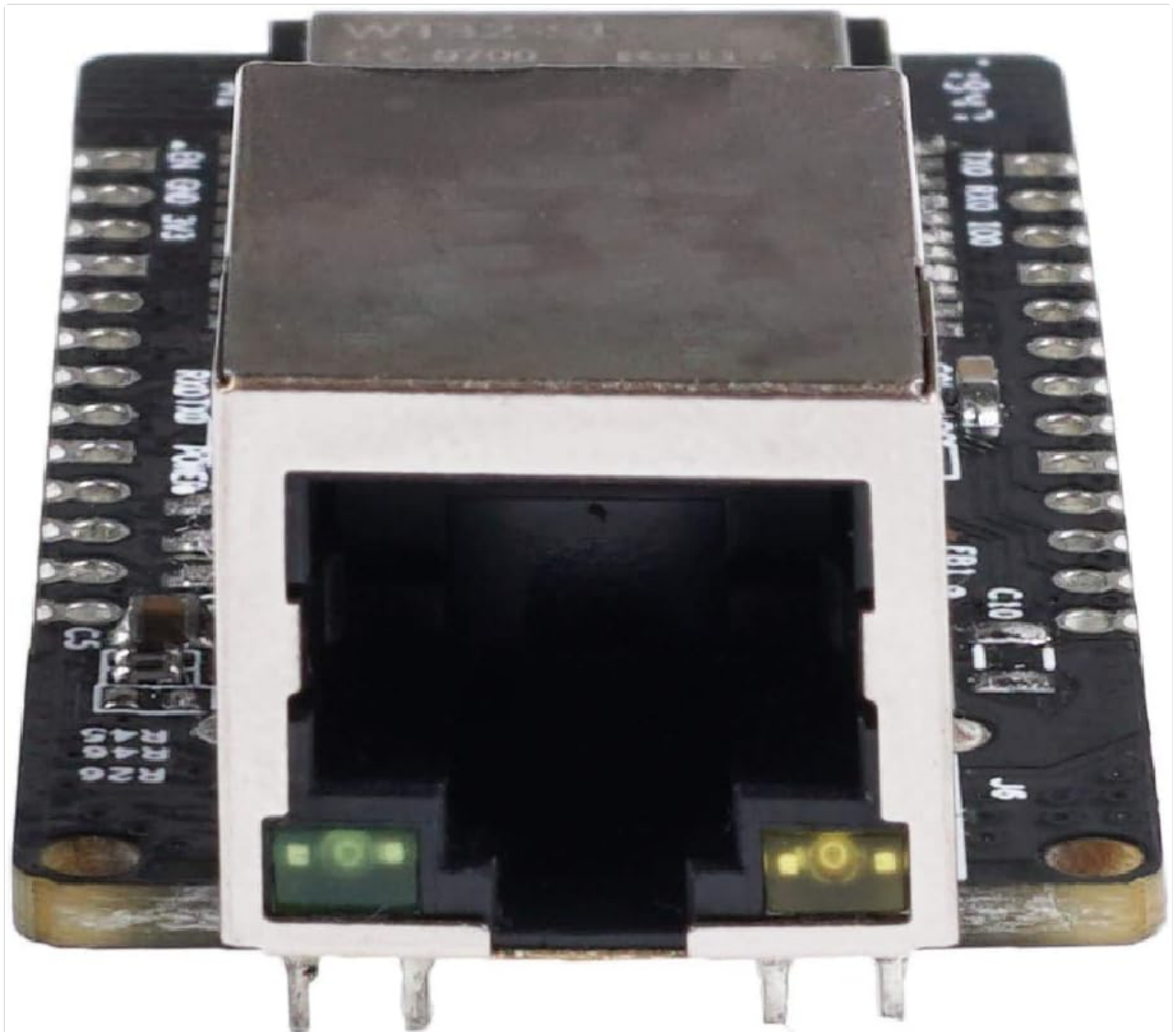


Figure 5.1: Front view of the WT32-ETH01 module, showing the RJ45 Ethernet port with its integrated status LEDs.

5.2 Wi-Fi and Bluetooth Operation

The ESP32 module supports 802.11n Wi-Fi and Bluetooth 4.2. These wireless functionalities are managed through your firmware.

- **Wi-Fi:** Configure the ESP32 to connect to an existing Wi-Fi network (Station mode) or create its own (Access Point mode). Libraries within ESP-IDF or Arduino provide functions for scanning networks, connecting, and handling data transmission.
- **Bluetooth:** The module supports Bluetooth Classic and Bluetooth Low Energy (BLE). Implement Bluetooth profiles and services as needed for your application, such as connecting to mobile devices or other Bluetooth-enabled sensors.

5.3 General Purpose Input/Output (GPIO)

The WT32-ETH01 exposes various GPIO pins from the ESP32 for interfacing with external components, sensors, and actuators. Refer to the pinout diagram (Figure 4.1) for available GPIOs. Ensure proper voltage levels (typically 3.3V) when connecting external circuitry to avoid damage.

6. MAINTENANCE

The WT32-ETH01 module is designed for durability and requires minimal maintenance. Adhere to the following guidelines to ensure its longevity:

- **Cleaning:** Keep the board clean and free from dust and debris. Use a soft, dry brush or compressed air for cleaning. Avoid using liquids or abrasive materials.
- **Storage:** Store the module in a dry, anti-static environment when not in use. Protect it from extreme temperatures and humidity.
- **Handling:** Always handle the board by its edges to avoid touching components, especially the exposed pins and solder joints. Use anti-static precautions (e.g., anti-static wrist strap) when handling to prevent electrostatic discharge (ESD) damage.
- **Firmware Updates:** Regularly check for updated firmware or libraries from Espressif or the community if you are using specific frameworks. Keeping your software up-to-date can improve performance, add features, and resolve bugs.

7. TROUBLESHOOTING

This section provides solutions to common issues encountered with the WT32-ETH01 module.

Problem	Possible Cause	Solution
Module not powering on.	Incorrect power supply voltage or polarity; loose connections.	Verify 3.3V or 5V power supply. Check all power connections (VCC, GND). Ensure sufficient current capacity from the power source.
Cannot upload firmware.	Incorrect serial adapter connections (TX/RX swapped); module not in boot mode; driver issues for serial adapter.	Double-check TX/RX connections. Ensure GPIO0 is pulled low during reset for flash mode. Install correct drivers for your USB-to-TTL adapter. Verify baud rate settings.
Ethernet connection unstable or not detected.	Faulty Ethernet cable; incorrect network configuration in firmware; power supply issues affecting PHY.	Test with a known good Ethernet cable. Review your firmware's Ethernet initialization code. Ensure the power supply is stable and can provide enough current, especially during Ethernet activity.

Problem	Possible Cause	Solution
Wi-Fi or Bluetooth not functioning.	Antenna issues; incorrect firmware configuration; interference.	Ensure the onboard antenna is not obstructed. Verify Wi-Fi/Bluetooth initialization and configuration in your code. Check for strong interference sources.
Module gets excessively hot.	Overvoltage; short circuit; high current draw from peripherals.	Immediately disconnect power. Re-check power supply voltage. Inspect for any accidental short circuits on the board. Reduce current draw from connected peripherals if possible.

If you encounter issues not listed here, consult the official ESP32 documentation or relevant community forums for further assistance.

8. SPECIFICATIONS

Detailed technical specifications for the JacobsParts WT32-ETH01 ESP32 Module:

- Model Name:** WT32-ETH01
- Microcontroller:** ESP32 series WT32-S1 MCU (240MHz dual-core microprocessor)
- Flash Memory:** 4MB SPI flash memory
- Ethernet:** 10/100Mbps RJ45 Ethernet (LAN8720A PHY)
- Wi-Fi:** 802.11n
- Bluetooth:** Bluetooth 4.2
- Operating System Compatibility:** Linux (for development environment)
- Item Weight:** Approximately 0.8 ounces (22.7 grams)
- Package Dimensions:** Approximately 5 x 5 x 3 inches (12.7 x 12.7 x 7.6 cm)
- Power Supply:** 3.3V or 5V (via pins)
- Connectivity Technology:** Bluetooth, Ethernet, Wi-Fi

For the most up-to-date and detailed technical information, please refer to the official datasheet:[WT32-ETH01_datasheet_V1.4.pdf](#)

9. WARRANTY AND SUPPORT

9.1 Warranty Information

JacobsParts products are typically covered by a limited warranty against defects in materials and workmanship. For specific warranty terms and conditions, including duration and coverage details, please refer to the purchase documentation or contact JacobsParts directly. Keep your proof of purchase for warranty claims.

9.2 Customer Support

For technical assistance, troubleshooting, or inquiries regarding your JacobsParts WT32-ETH01 module, please contact JacobsParts customer support. You may find contact information on their official website or through the retailer where the product was purchased.

Online Resources:

- Official Datasheet: <https://manuals.plus/m/7c2beb4fd835806c73dc157a7c5f3886b48b19016e5a4679242a94105434bc18>
- JacobsParts Website: (Please refer to your product packaging or search online for the official JacobsParts website for direct support contacts.)

When contacting support, please have your product model number (WT32-ETH01) and a detailed description of your issue ready.

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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.

Name

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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