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Elecrow ESP32-
WT 32-ETH01
Serial Port To
Ethernet Module



Elecrow ESP32-WT 32-ETH01 Serial Port To Ethernet Module User Manual

[Home](#) » [ELECROW](#) » Elecrow ESP32-WT 32-ETH01 Serial Port To Ethernet Module User Manual

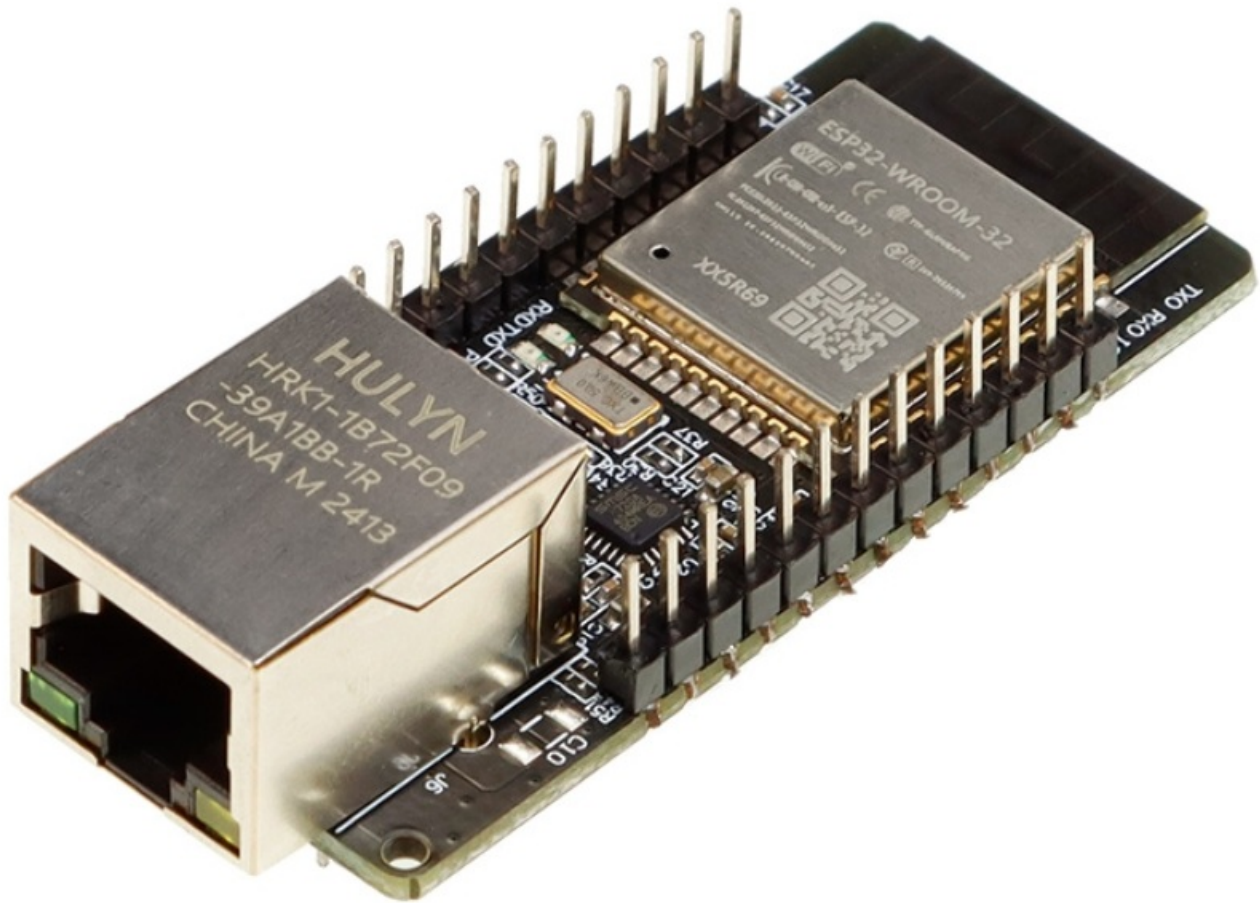


Contents

- [1 Elecrow ESP32-WT 32-ETH01 Serial Port To Ethernet Module](#)
- [2 Product Overview](#)
- [3 Disclaimers and copyright announcements](#)
- [4 An Overview](#)
- [5 Features](#)
- [6 Hardware specifications](#)
- [7 Instructions for use](#)
- [8 Interface description](#)
- [9 Product function](#)
- [10 Basic functions](#)
- [11 FAQs](#)
- [12 Documents / Resources](#)
 - [12.1 References](#)
- [13 Related Posts](#)

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Elecrow ESP32-WT 32-ETH01 Serial Port To Ethernet Module



Specifications

- Product Name: ESP32-WT32-ETH01
- Version: 1.2
- Date: October 23, 2020
- Size: Compact
- RF Attestation: FCC / CE / RoHS
- Wi-Fi Protocol Frequency Range: 2.4~2.5 GHz
- Serial Port Baud Rate: 80~5000000
- Working Voltage: 5V or 3.3V
- Working Current: Mean 80 mA, Minimum 500 mA
- Operating Temperature Range: Normal Temperature
- Package: Half-pad / Connector through-hole connection (optional)

Product Overview

The ESP32-WT32-ETH01 is an SOC integrating 2.4GHz Wi-Fi and Bluetooth dual mode with high RF performance, stability, and ultra-low power consumption.

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Amendant record

version number	Composed person / modifier	Date of formulation / modification	Change the reason	Main changes (Write the key points.)
V 1.0	Mark	2019.10.21	The first time to create	Create a document
V 1.1	Li nfuliang	2019.10.23	Perfect the document	Add the product functional section

An Overview

WT 32-ETH 01 is an embedded serial port to Ethernet module based on ESP 32 series. The module integrates the optimized TCP / IP protocol stack, which facilitates users to easily complete the networking function of embedded devices and greatly reduces the development time cost. In addition, the module is compatible with the semi-pad and the connector through-hole design, the plate width is the general width, the module can be directly welded on the board card, can also be welded connector, can also be used on the bread board, convenient for users to use in different scenarios.

ESP 32 Series IC is an SOC integrating 2.4GHz Wi-Fi and Bluetooth dual mode, with ultra-high RF performance, stability, versatility and reliability, as well as ultra-low power consumption.

Features

class	project	size of product
Wi -Fi	RF attestation	F CC /CE /RoHS
	protocol	802.11 b / g / n / e / i (802.11n, speed up to 150 Mbps)
		A-MPDU and A-MSDU aggregation, supporting the 0.4 _s protection interval
	frequency range	2.4~2.5 G Hz
PDA	protocol	Comply with the Bluetooth v 4.2 BR / EDR and BLE standards
	radio frequency	An NZIF receiver with a-97 dBm sensitivity
	Network outlet specifications	RJ 45,10 / 100Mbps, cross-direct connection and self-adaptation
	Serial port port rate	80~5000000

hardware	Onboard, Flash	32M bit
	working voltage	5V or 3.3V power supply (choose either one)
	working current	Mean: 80 mA
	supply current	Minimum: 500 mA
	operating temperature range	-40°C ~+85°C
	Ambient temperature range	normal temperature
	package	Half-pad / connector through-hole connection (optional)
software	Wi-Fi pattern	Station /softAP /SoftAP +station /P2P
	The Wi-Fi security mechanism	WPA /WPA2/WPA2-Enterprise/WPS
	Encryption type	AES /RSA/ECC/SHA
	firmware upgrade	Remote OTA upgrade via the network
	software development	The SDK is used for user secondary development
	networking protocol	IPv4 TCP/UDP

The IP acquisition method	Static IP, DHCP (the default)
Simple and transparent, transmission way	TCP Server/TCP Client/UDP Server/UDP Client
User configuration	AT+ order set

Hardware specifications

System block diagram

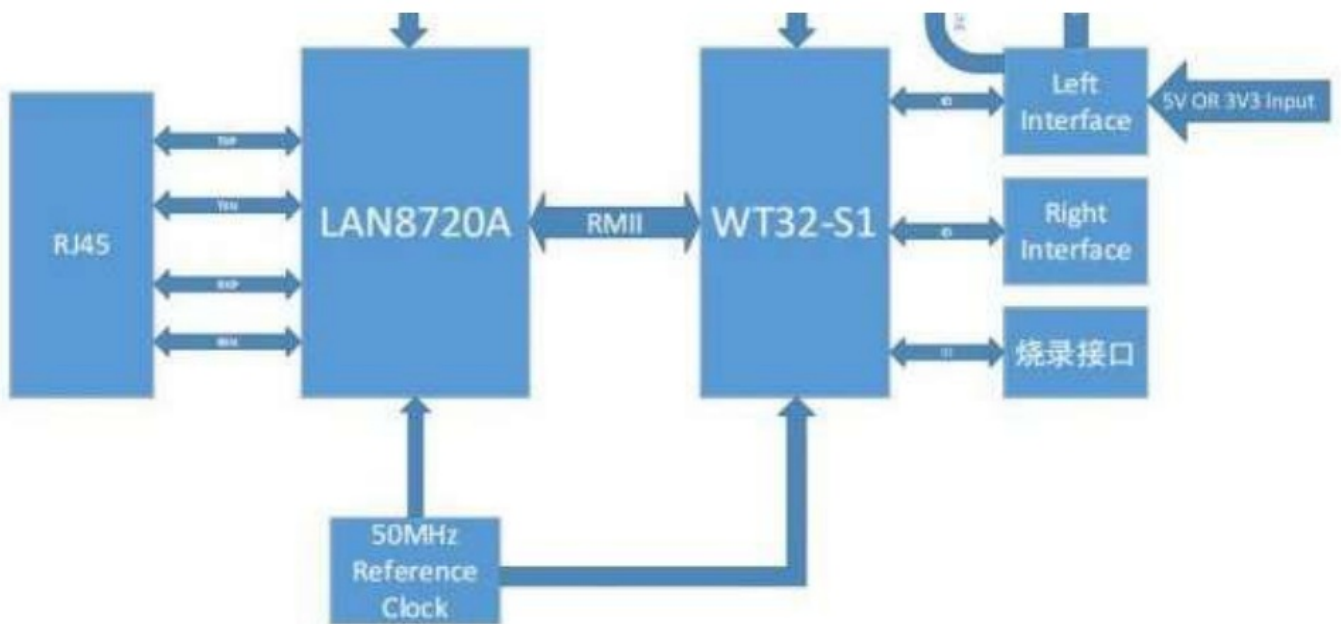


Figure 1-1 Block diagram of the system

Physical picture





Figure-2 Product physical picture

Pin description

Table-1 Debug the burning interface

pin	name	description
1	E N1	Reserved debugging burning interface;, enabling, high level effective
2	GND	Reserved debugging and burning interface; GND
3	3V3	Reserved debugging and burning interface; 3V3
4	TXD	Reserve the debugging and burning interface; IO 1, TX D 0
5	R XD	Reserve the debugging and burning interface; IO3, RXD 0
6	IO 0	Reserved debugging and burning interface; IO 0

Table-2 for module IO description

pin	name	description
1	E N1	Enabling, and the high level is effective
2	C F G	IO32, CFG
3	485_EN	IO 33, RS 485 of the enabling pins
4	R XD	IO 35, RXD 2
5	TXD	IO17, T XD 2
6	GND	G ND
7	3V3	3V3 power supply
8	GND	G ND

9	5V2	5V power supply
10	LINK	Network connection indicator pins
11	GND	G ND
12	IO 393	IO 39, with support for input only
13	IO 363	IO 36, with support for input only
14	IO 15	IO15
15	I 014	IO14
16	IO 12	IO12
17	IO 5	IO 5
18	IO 4	IO 4
19	IO 2	IO 2
20	GND	G ND

Note 1: The module by default enables a high level.

Note 2: 3V3 power supply and 5V power supply, two can only choose one!!!

Note 3: Only inputs are supported for IO39 and IO36.

Power supply characteristics

Power supply voltage

The power supply voltage of the module can be 5V or 3V3, and only one one can be selected.

Power supply mode

Users can choose freely according to their needs:

1. Through hole (welding needle):

- The power supply is connected by the DuPont line;
- Using the bread board connection way of power supply;

2. Half welding pad (directly welded in the board card): the user board card power supply.

Instructions for use

1. Power-on instructions

If the DuPont line: find the 3V 3 or 5V power input, connect the corresponding voltage, the indicator light (LED 1) light, indicating the success of the power.

2. Description of the indicator light

1. LED1: power indicator light, normal power on, light on;
2. LED3: serial port indicator, RXD 2 (IO35) data flow, the light on;
3. LED4: serial port indicator light, when TXD 2 (IO 17) has data flow, the light is on;

3. Description of the use mode

Three ways of use, users can choose according to their needs:

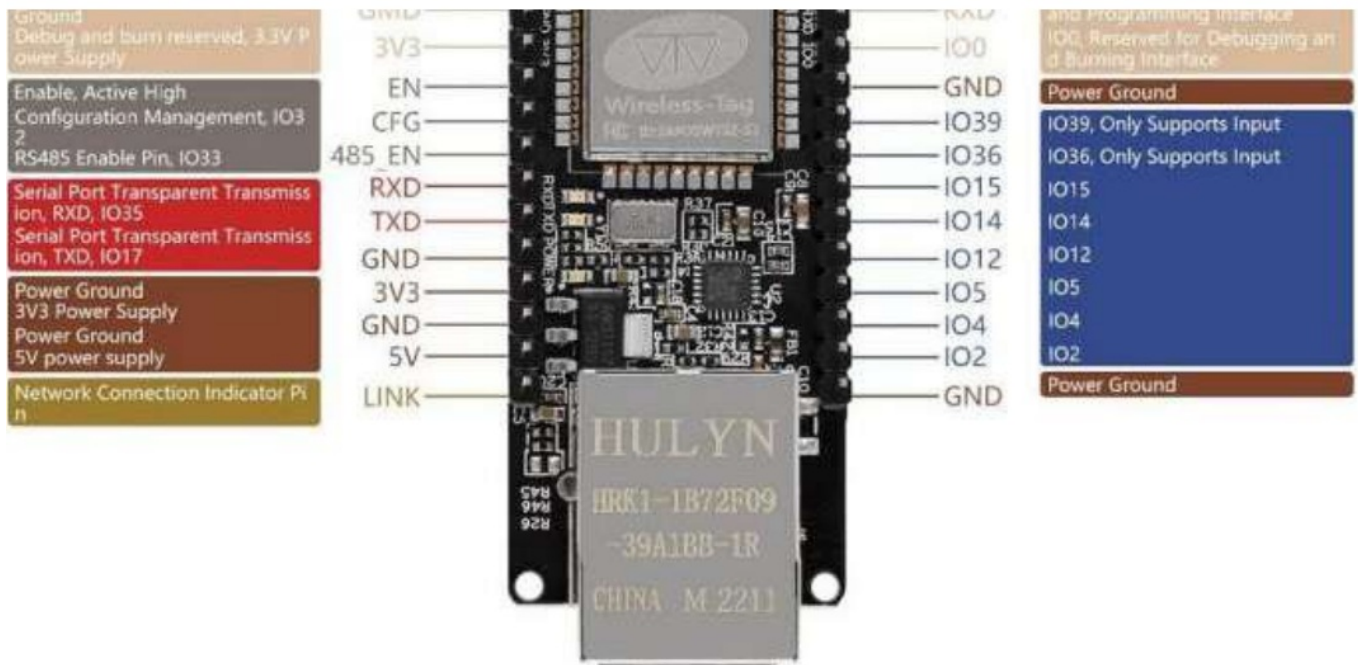
1. Through hole (welding needle): use DuPont wire connection;
2. Through hole (welding needle): put on the bread board;
3. Semi-pad: the user can directly weld the module on their own board card.

4. Description of the network port working indicator light

Table-3 Description of port port indicator

The RJ 45 indicator light	function	explain
green light	Connection status indication	The green light is on when properly connected to the network
yellow light	Data indicating	The module has data flashing when received or sending, including the module receiving the network broadcast package

Interface description



Product function

Default parameter

project	content
Serial port port rate	115200
Serial port parameters	None /8/1
Transmission channel	Serial port Ethernet transmission

Basic functions

Set the IP / subnet mask / gateway

1. The IP address is the identity representation of the module in the LAN, which is unique in the LAN, so it cannot be repeated with other devices in the same LAN. The IP address of the module has two acquisition methods: static IP and DHCP / dynamic IP.

- **static state IP**

Static IP needs to be set manually by users. In the process of setting, pay attention to write IP, subnet mask and gateway at the same time. Static IP is suitable for scenarios that need the statistics of IP and devices and need to correspond one to one. Pay attention to the corresponding relationship of IP address, subnet mask and gateway when setting. Using a static IP requires setting up for each module and ensuring that the IP address is not repeated within the LAN and on other network devices.

- **DHCP / dynamic IP**

The main function of DHCP / dynamic IP is to dynamically obtain IP address, Gateway address, DNS server address and other information from the gateway host, so as to avoid the cumbersome steps of setting IP address. It is applicable to the scenarios where there are no requirements for IP, and it does not require IP to correspond to modules one by one.

Note: The module cannot be set to DHCP when directly connected to the computer. Generally, the computer does not have the ability to assign IP address. If the module is set to DHCP directly connected to the computer, the module will be waiting for IP address assignment, which will cause the module to carry out normal transmission work. The module default is static IP: 192.168.0.7.

2. The subnet mask is mainly used to determine the network number and host number of the IP address, indicate the number of subnets, and judge whether the module is in the subnet. The subnet mask must be set. The commonly used class C subnet mask: 255.255.255.0, the network number is the first 24, the host number is the last 8, the number of networks is 255, the module IP is within 255, the module IP is considered in this subnet.
3. Gateway is the network number of the network where the current IP address is located. If the device like the router is connected to the external network, the gateway is the IP address of the router. If the setting is wrong, the external network cannot be connected correctly. If the router is not connected, there is no need to set it.

Restore the factory Settings

AT instruction to restore factory setting: restore factory through AT + RESTORE. 6.2.3 Firmware upgrade

The way to upgrade the module firmware is the OTA remote upgrade, and by upgrading the firmware, you can get more application functions.

- The firmware upgrade connects the network through either a wired road or a wifi.
- Operation GPIO2 ground, restart the module and enter OTA upgrade mode.
- Complete the upgrade, disconnect the GPIO 2 to the ground, restart the module, and the module enters the normal working mode.

Function setting of AT instruction

The user can enter the AT command to set the function of the module. Refer to the esp32 wired module AT instruction set for details.

Data transmission transmission function

The module has four data transmission ports: serial port, wifi, Ethernet, and Bluetooth. Users can combine the four data ports through AT instructions for data transmission transmission.

Set up / query the transmission channel of the module through the AT + PASSCHANNEL instruction. The setup is complete and requires a restart module to take effect.

The socket function

The Socket working mode of the module is divided into TCP Client, TCP Server, UDP Client, and UDP Server, which can be set by AT instruction. Please refer to the esp32 cable module AT command routine v 1.0.

TCP Client

1. TCP Client Provides a client connection for the TCP network services. Proactively initiate connection requests and establish connections to the server to realize the interaction between serial port data and server data. According to the relevant provisions of TCP protocol, TCP Client is the difference between connection and disconnection, thus ensuring the reliable exchange of data. Usually used for data interaction between devices and servers, it is the most commonly used way of network communication.
2. When the module is connected to TCP Server as TCP Client, it needs to pay attention to the parameters such as the target IP / domain name and the target port number. The target IP can be a local device with the same local area, or the IP address of different LAN or the IP across the public network. If the server is connected across the public network, the server is required to have a public network IP.

TCP Server

Usually used for communication with the TCP clients within the LAN. Suitable for a LAN where there are no servers and multiple computers or mobile phones request data from the server. There is a difference between connection and disconnection as TCP Client to ensure reliable exchange of data.

UDP Client

UDP Client A non-connected transmission protocol that provides a simple and unreliable information transmission service oriented to transactions. Without connection establishment and disconnection, you only need to make an IP and port to send the data to the other party. It is usually used for data transmission scenarios with no requirement for packet loss rate, small packets and fast transmission frequency, and data to be transmitted to the specified IP.

UDP Server

UDP Server Means not verifying the source IP address on the basis of ordinary UDP. After receiving each UDP packet, the target IP is changed to the data source IP and port number. The data is sent to the IP and port number of the nearest communication.

This mode is usually used for data transmission scenarios where multiple network devices need to communicate with modules and do not want to use TCP due to their fast speed and frequency... Serial port function

AT instruction setting

The user can enter the AT command to set the function of the module.

Transmission of serial port data

Through AT instructions, the user can make the module into the data transmission mode, and the module can directly transfer the serial port data to the corresponding data transmission end (wifi, Ethernet and Bluetooth) through the set data transmission channel.

Bluetooth function

Bluetooth data transmission

Through the existing Bluetooth function of the module, the module can obtain Bluetooth data, and can directly transfer the Bluetooth data to the corresponding data transmission end (wifi, Ethernet and serial port) through the set transmission channel.

Wifi function

Internet access

Module wifi is connected to the Internet or local area network through the router, and the user has to configure the socket function through AT instructions. The module can establish a TCP / UDP connection, which can access the user's specified server.

Cable and network port access function

Stable network connection can be obtained through the wired network to ensure the acquisition of stable network data.

Internet access

The module is connected to the Internet or LAN through the wired network, and the user configures the socket function through the AT instructions. The module can establish a TCP / UDP connection and access the user's specified server.

FAQs


- **Q: Can I power the ESP32-WT32-ETH01 with both 5V and 3.3V simultaneously?**

A: No, you should choose either a 5V or a 3.3V power supply for the device.

- **Q: What is the default IP acquisition method of the ESP32-WT32-ETH01?**

A: The default IP acquisition method is DHCP, but you can also set a static IP if needed.

Documents / Resources

	Elecrow ESP32-WT 32-ETH01 Serial Port To Ethernet Module [pdf] User Manual ESP32-WT32-ETH01, ESP32-WT 32-ETH01 Serial Port To Ethernet Module, ESP32-WT 32-ETH01, Serial Port To Ethernet Module, Port To Ethernet Module, Ethernet Module
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References

- [User Manual](#)

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