



YCHIOT

UWB TO WiFi

user_manual

Version V1.3

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1. UWB TO WiFi Kit Introduction

1.1 Brief introduction

The UWB TO WiFi Kit Board is designed to transfer the TOF Message Data from **UWB Mini 3 module** Or **UWB Mini3s Modules** Or **UWB Mini3sPLUs Modules** to the remote server to archiving remote management and monitoring of location data. The Development Board is equipped with MXCHIP's WiFi module. The kit is easy to configure and achieve the function .

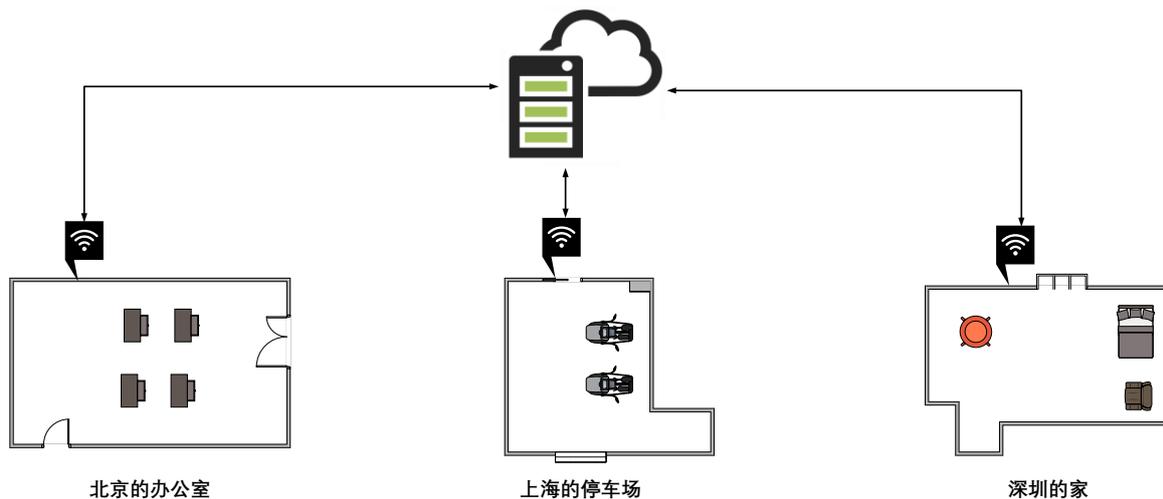


Figure 1.1 LPS network diagram

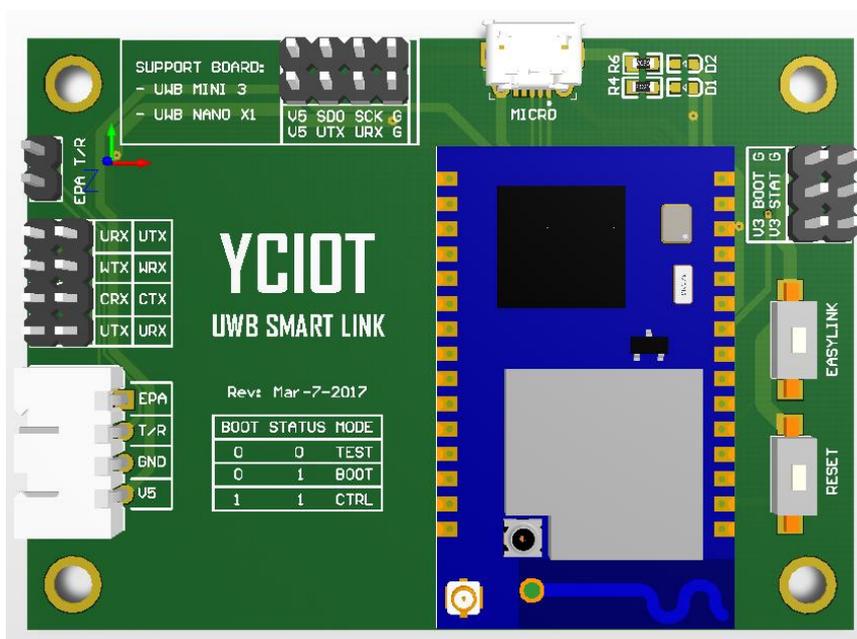


Figure 1.1.1 UWB Smart link Development Board 3D rendering Diagram



Figure 1.1.2 Mini3 + UWB Smart Link

1.2 Introduction to UWB Mini 3 module

UWB Mini 3 is a positioning and ranging module based on UWB technology developed by YCHIOT, which the module adopts STM32F105 single chip microcomputer as the main control chip. Peripheral circuits include: DWM1000 module, power module, LED indicator module, dial switch, reset circuit and so on. [The module can be used either as a base station or as a label to switch through a dial switch.](#)

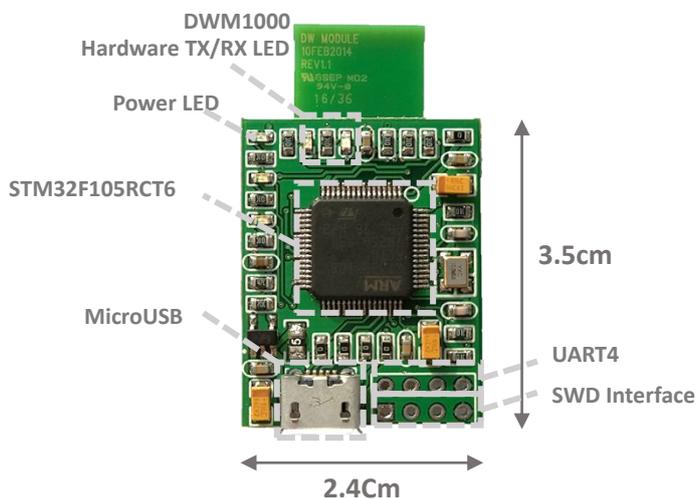


Figure 1.3.1 UWB Mini3 front diagram

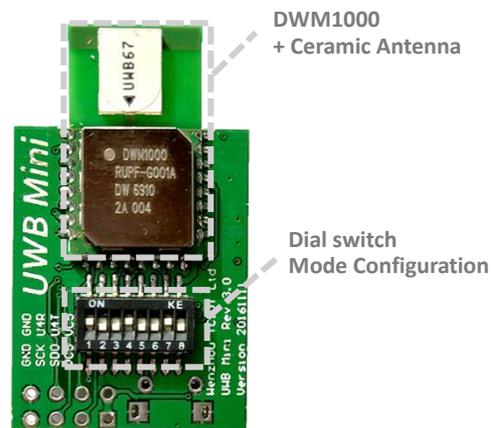


Figure 1.3.2 UWB Mini3 back diagram

1.3 WIFI module MXCHIP EMW3162

EMW3162 is a low-power, low-cost embedded Wi-Fi module introduced by Shanghai Keio (mxchip) with built-in high-performance, low-power Cortex-M3 Microcontrollers, 128KB RAM + 1MB Flash. The module runs the MiCOIoT operating system, supports two of development, and allows users to take advantage of MiCO's TCP/IP protocol stack, A variety of security encryption algorithms to implement a variety of embedded Wi-Fi applications. We also offer a range of standalone firmware to meet different scenarios, such

as UART-WIFI transparent transmission, Easy Link configuration, All kinds of access services and so on. For the relevant firmware, please visit the following website to download: [HTTP://DEVELOPER.MICO.IO/DOWNLOADS/10](http://DEVELOPER.MICO.IO/DOWNLOADS/10)



Figure 1.3 EMW3162 WiFi module

1.4 TTL to USB chip CH340

CH340 is a USB bus transfer chip developed by Jiangsu Qin Heng Company (WCH), WHICH realizes USB switch serial port or USB turn printing port.

1.5 Glossary of Professional Terms

Table 1.5 Glossary of Professional terms

Shorthand	Full English	Meaning
ANCHOR		A base station, also known as a beacon anchor, is a node in which position coordinates are obtained by other means in advance.
DW1000		A chip from decawave
DWM1000		A module from decawave
IC	integrated circuit	Chip
PHY	physical layer	Physical Layer
PSR	preamble symbol repetitions	Leading symbol repetition
RTLS	real time location system	Real-time Positioning system
day		Label
TX	receive	Receive
TCXO	temperature compensated crystal oscillator	Temperature compensated crystal oscillator
TDOA	time difference of arrival	TDOA positioning is a method of locating by using time difference. By measuring the time at which the signal reaches the monitoring station, the distance of the signal source can be determined.
TOA	time of arrival	TOA Positioning is a method that directly uses signal arrival time to locate.
TOF	time of flight	TheTfLflight time ranging methoduses signals to measure the distance between nodes using the flight time of the signal to and fro between two asynchronous transceivers (transceiver) (or reflected faces).
TX	transmit	Send
TWR	two-way ranging	The two-way ranging method, that is, two asynchronous transceivers (transceiver) , can obtain the ranging value.
UWB	ultra-wide band	UWB (Ultra Wideband) is a carrier-free technology that transmits data using a narrow pulse of non-sine waves from nanosecond to slightly second.

2. UWB TO WIFI Kit Hardware connection

1.6 Introduction to Hardware interface

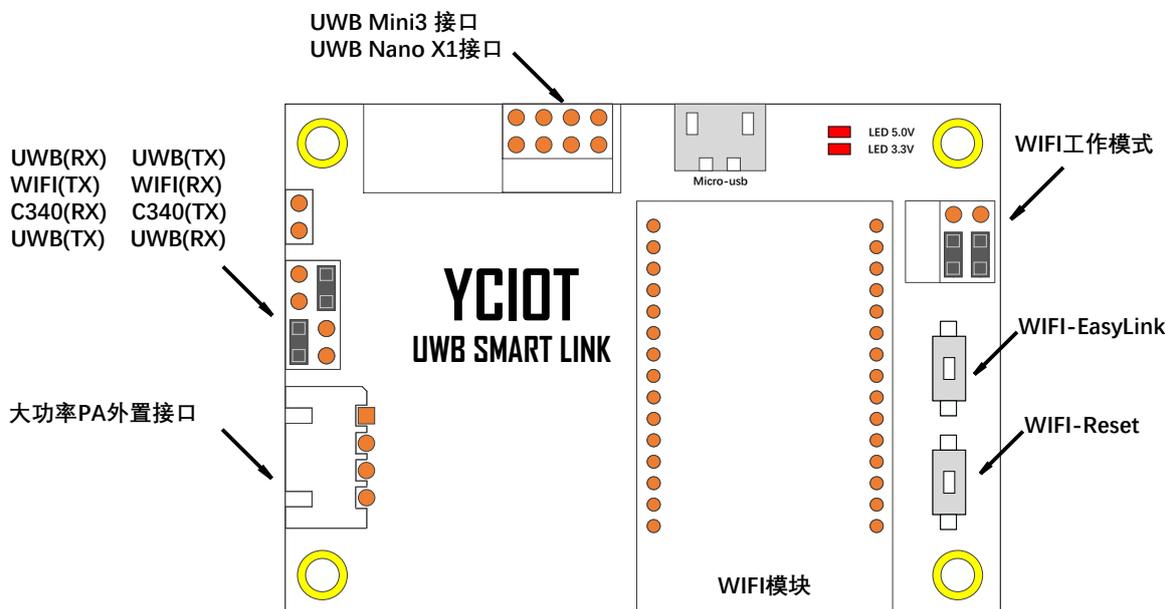


Figure 2.1 Smart Link Hardware Interface Introduction

1.7 Smart Link Jump hat usage method

1.7.1 WIFI working mode settings

Mode	Level	Jumping Hat Connection method	Note
TEST Mode	BOOT = 0V; STATUS = 0in		Manufacturer Test Usage
BOOT Mode	BOOT = 0V; STATUS = 3.3in		WIFI Firmware Updates
Control Mode	BOOT = 3.3V; STATUS = 3.3in		Normal communication mode (commonly used)

1.7.2 UWB/WIFI/CH340 Channel Toggle Settings

Serial number	Jumping Hat Connection method	Note	Note
1		UWBmodule data, all the way to the CH340to the computer serial debugging assistant, all the way to theWIFI module	Common
2		UWB modulecommunicates separately with WIFI module	
3		Computer serial debugging assistant debugging WIFI module	
4		Computer Serial port debugging assistant debugging UWB module	

3. UWB To WiFi Kit Web Configuration

1.8 Introduction to Web Configuration

In this section, we take the LAN connection as an example, set the WiFi module to TCP Client mode, use the computer as a servers server, and leave the WiFi module and the computer on the same network (Yanchuang _Work)and connect to the same router(Xiaomi router).

- 1) Power on the hardware, enter control mode (see 2.2.1), the computer will search for a wireless network: MXCHIP_XXXXXX (XXXXXX is the module's MAC address after six bits), find the network, click Connect.
- 2) The connection is successful, open the browser, enter "10.10.10.1" in the Address bar, you can go to the Web page configuration page, start configuring the WIFI module through the Web page, configured in TCP client mode. (Detected, supported browsers: Internet Explorer, Edge Browser, Google Chrome, UC browser, etc.). If the page does not work or cannot be loaded, refresh the page to move on to the next step.



Figure 3.2 Web page configuration loginIP

- 3) Pop-up authentication dialog box, first use, default username: admin, Password: admin, click "Login", go to the configuration page.
- 4) The Web page opens the Administration page, as shown in the following table:

1)	Running state;
2)	Mode selection;
3)	Wireless access point settings;
4)	Wireless terminal settings;
5)	Serial port settings;
6)	Network settings;
7)	Module management; (EMW3165 only supports English pages)

1.9 Mode selection

Click "Mode Selection" in the left column and select "Wireless access point and wireless terminal mode" in the right column. Click "Save", according to the prompt, wait for the module to restart, the WIFI module green light will flash once, indicating that the module reboot is successful, after the restart need to reconnect the network (MXCHIP_XXXXXX); (This sentence can be changed places but do not know where to put, because it is a repetitive statement)

1.10 Wireless access point parameter settings

Click "Wireless access point parameter Settings" in the left column and configure the parameters in the right column, as shown in the following table:

Table 3.3 Wireless access point parameter setting parameter Table

Wireless access point parameter settings	Parameters	Note
Network Name (SSID)	MXCHIP_XXXXXX	Default does not modify
Encryption method	Disable	Default does not modify
IP Address	10.10.10.1	Default does not modify
Subnet mask	255.255.255.0	Default does not modify
Gateway Address	10.10.10.1	Default does not modify

1.11 Wireless terminal settings

Click on the left column "Wireless terminal Settings", click Search in the right column, you can automatically get, the current computer can search for the wireless network, select the network, click OK. When presenting, we used a network name of: YanChuang_Work, Password: yciot123456. Configuration complete, click "Save", according to the prompt, wait for the module to restart, WIFI module green light will flash once, indicating that the module restart is successful, after the restart need to reconnect the network (MXCHIP_XXXXXX), configured as shown in the following table:

Table 3.4 wireless terminal Settings Table

Wireless terminal settings	Parameters	Note
Network Name (SSID)	YanChuang_Work	Computers Join the network
Encryption method	Enable	Can be modified
Network password	Andciot123456	Password for the network to which the computer is added
Automatically obtain IP addresses	DHCP Auto	Default does not modify
IP Address	Automatic Software acquisition	Default does not modify
Subnet mask	Automatic Software acquisition	Default does not modify
Gateway Address	Automatic Software acquisition	Default does not modify

1.12 Serial Port Settings

Click on the left column "serial settings", in the right column to configure parameters, configuration complete, click Save, according to the prompt, wait for the module to restart, WIFI module green light will flash once, indicating that the module restart is successful, after the restart need to reconnect the network (MXCHIP_XXXXXX), configured as shown in the following table:

Table 3.5 serial Port Setup table

Serial Port Settings	Parameters	Note
Baud rate	115200	Default does not modify
Data bits	8	Default does not modify
Check bit	None	Default does not modify
Stop bit	1	Default does not modify
RTS/CTS	Disable	Default does not modify
Auto Frame mode	Disable	Default does not modify
Auto Frame trigger time (MS)	500	Default does not modify
Auto Frame trigger length (byte)	1024	Default does not modify

Note: Some customers report that the data transmitted by WIFI has a certain carton, but the amount of

data is correct, because the automatic frame Mode will affect the visual display of WIFI transmission data.

1.13 Network Settings

The module supports two TCP, UDP connections. Each connection supports four communication protocols:

- 1) TCP Server
- 2) TCP Client
- 3) UDP Unicast
- 4) UDP Broadcast

Click on the left column "Network Settings", in the right column to configure parameters, configuration complete, click Save, according to the prompts, wait for the module to restart, WIFI module green light will flash once, indicating that the module restart is successful, after the restart need to reconnect the network (MXCHIP_XXXXXX), configured as shown in the following table:

- IP Address Acquisition tool: Native IP extraction .exe

Table 3.6 Network Settings

Network connection 1 settings	Parameters	Note
Agreement	TCP Client	Default does not modify
Remote ports	5000	Default does not modify
Server address (IP or domain name)	192.168.31.222	Can be modified
Network Connection 2settings	Parameters	Note
Agreement	BySable	Default does not modify
Local ports	No	Default does not modify

1.14 Module Management

Module management does not make changes;

4. Test data with TCP&UDP test tools

In the case of LAN connectivity as an example, the computer, as a Server, is connected to the same router as the UWB Smart Link (Client); the software used in this section is " TCP&UDPTest Tool ". This debugging tool is used to test the receipt and sending of TCP / UDP communication connections and test data on the server or client when developing a network communication program. The debugging process and methods are as follows:

- 1) Plug the UWB MIN3/UWB Nano X1 into the Smart Link board;
- 2) Jump cap Connection; connect the UTX and WRX together, the TX that represents the UWB module sends the foot to the RX receiving foot of the WIFI module; the UTX and CRX are connected together to send the FOOT to the TX on BEHALF of the UWB moduleCH340 The RX of the module receives the foot; the specific connection method is shown in the following figure.

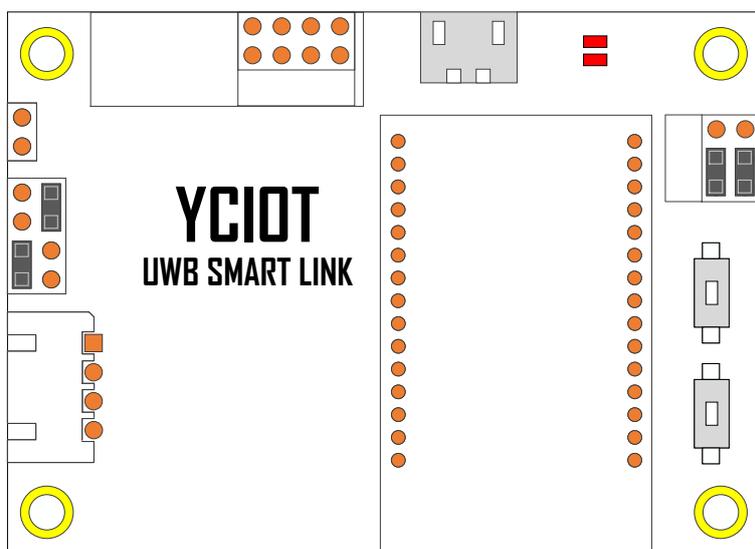


Fig. 4.2 Jumping hat connection method diagram

Connected by the image above, the UWB module Tag or Anchor can send the data by serial port:

- Through the CH340 chip, the data is passed on to the local computer and displayed on the serial debugging assistant software ;
 - Through the WIFI Module to use the data to TCP Way to reach On the server InTCP&UDP Display on the test tool;
- 3) Open it TCP&UDP Test tools, connected to the network where the wireless terminal settings are located, where we connect to the network: YanChuang_Work;
 - 4) Click "Create Server" to set the native port to 5000;

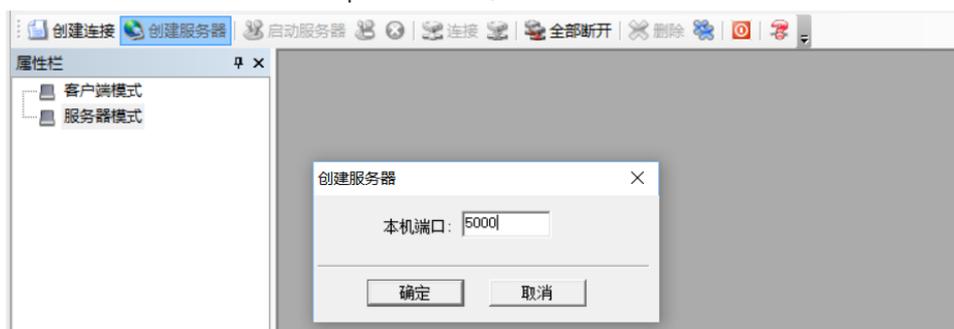


Figure 4.4 tcp/udpAssistant Port Settings

- 5) Click Start Server, if the connection is successful, the Smart Link hardware module is automatically assigned to the IP 192.168.31.169:63663, indicating that the TCP server has successfully connected to the WIFI module.



Figure 4.5 tcp/udp Assistant Display

- 6) In the above operation, we have sent the UWB Positioning kit data through the serial port way, in two ways can be observed in the TOF Report Message Locate the data message:
 - Figure 4.6.1 on the serial debugging assistant, received the CH340 TOF reporting Message data message, as shown in Figure 4.6.1;
 - On the TCP&UDP test tool, you receive the TOF reporting Message data message via the WIFI module, as shown in Figure 4.6.2;

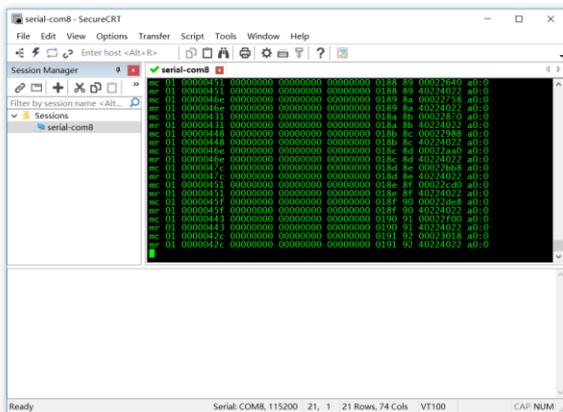


Figure 4.6.1 Serial assistant debugging display

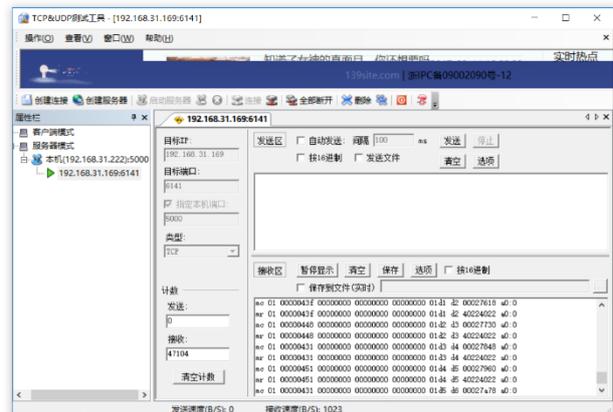


Figure 4.6.2 TCP&UDP test

5. Document Management Information table

Theme	Um37-UWB_TO_WiFi_user_manual_V1.3
Version	V1. 3
Reference documents	UWB Mini3 Instructions manual V3.2.6 DFM0021CN-MiCO-AT instruction Transmission firmware User manual-V1.10 EMW3162 Bootloader Mode usage Instructions
Creation time	2017/3/10
Create a person	Zhipeng Wu / Lynn
Latest release date	2019/5/1

Change people	Date	Document Change record
Lynn	2017/3/10	UWB Smart Link V1. 1.6Product Description Brochure
Lynn	2017/4/20	UWB Smart Link V1. 2Product Description Brochure
Lynn	2017/9/5	UWB Smart Link V1. 3Product Description Brochure