

Wireless serial port module documentation

(USB upgrade version V2.0)





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Technical Parameters

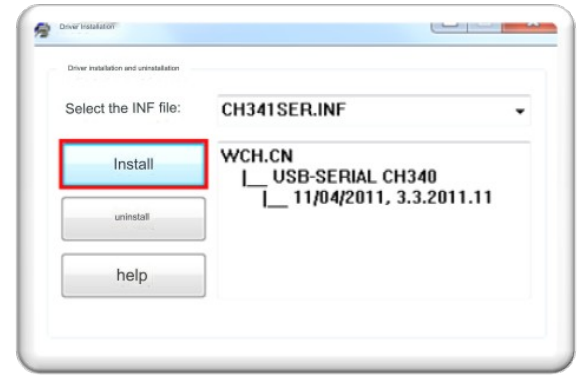
- Product size: 15x53mm
- USB to serial chip: CH340T
- Red light: power indicator light, after plugged into the USB port of the computer, the light will be on
- Green light: nRF24L01 self-test light, flashing means that the module is detected
- Support WINDOWS 98/ME/2000/XP/Server 2003/VI green light/Server 2008/Win7/Win8 32-bit/64-bit system
- Number of effective bytes in a single transmission: 1-31 bytes
- Communication format with other wireless modules: the 0th bit is the byte length of the transmitted data

Typical Application

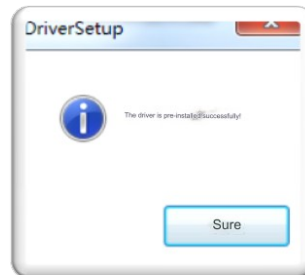
- Wireless remote control, digital transmission
- Wireless meter reading system
- Wireless Monitoring System
- Wireless data acquisition system
- VOIP system
- Access control system
- Wireless tag, wireless 232, wireless 422/485 data communication

1. Installation of USB wireless serial port module driver:

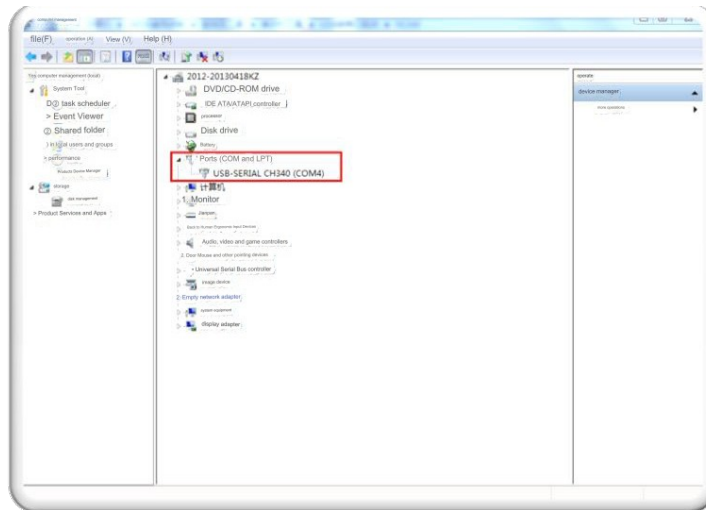
Double-click to open the installer shown in the figure above,



Click "Install" according to the prompt



Click OK to complete the driver installation after prompting "driver pre-installation successful". Then insert the USB wireless serial port module, the system will automatically adapt and assign the corresponding serial port according to the pre-installed driver. The WIN7 system is shown in the figure below:



The way to view the serial port: Right click on the computer -> Manage -> Device Manager -> Port (COM and LPT)

2. Detection of wireless module

Pull out the development board from the computer, and insert the "nRF24L01 wireless module", the insertion direction is as shown in the figure:



Then plug the development board into the USB port of the computer. At this time, the green status light flashes, indicating that a normal nRF24L01 wireless module has been detected.

3. How to use it



4. Details of system commands and formats

Note: All commands are capitalized, and the punctuation marks must be in English, without spaces!

Unchangeable parameters:

Address length must be 5 digits

Data length must be 32 bytes

Transmit power is 0dbm

1. The number of effective bytes in a single transmission: 1-31 bytes.

The number of bytes actually sent by nRF24L01+ is 32, and the bytes available to the user are 1-31. The 0th byte is reserved by the system and used for the statistics of the packet length of each transmission; for example, the serial port sends "abc" (ASCII code, 3 bytes), 3abc during actual transmission (the 0th byte is 3), **and the receiving end should judge the length of the received data packet according to the number in the 0th byte during actual processing.**

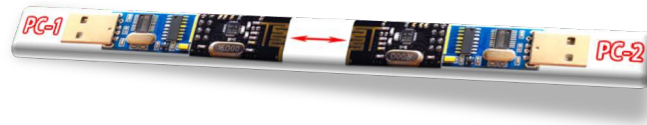
The module transmission protocol is shown in Table 3-1 below:

Table 3-1

Buff[0]	Buff[1]	Buff[2]	Buff[3]	Buff[..]	Buff[..]	Buff[31]
Length	Byte1	Byte2	Byte3	Byte31

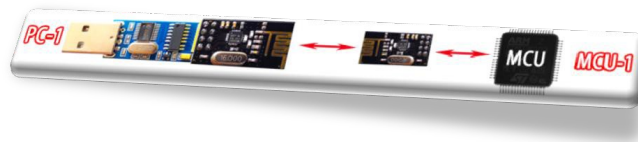
Byte0 is a reserved bit, which is used to count the length of data packets. Byte1~31 are user defined bits.

Usage 1: Communication between wireless serial port modules



There is no need to consider the protocol, the communication frequency, air transmission rate, and CRC check method are the same, the destination address of the sender is equal to the receive address of the receiver to communicate with each other.

Usage 2: wireless serial port module to send, single-chip microcomputer to receive

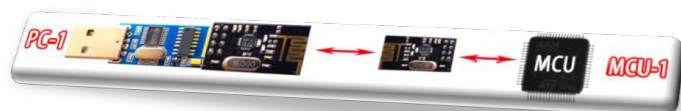


The MCU needs to start reading from Buff[1], and read the bytes of Buff[0]. Buff[1] is the first byte sent by the computer.

Computer sends "ABCDE" MCU receives C language example:

```
for(i=0;i< Buff[0];i++) //Buff[0]=5 in this example ("ABCDE" has a total of 5 bytes)
{
    Reserve[i] = Buff[i+1]; // Reserve[] is the actual received "ABCDE"
}
```

Usage 3: SCM sends, wireless serial port module receives



When the MCU sends, you need to set Buff[0] to the total number of bytes transmitted this time. Buff[0] for 1 byte is "0x01", and Buff[0] for 31 bytes is "0x1F". The MCU sends "ABCDE" and the wireless serial port module receives the C language example.

```
// "ABCDE" has a total of 5 bytes, so Send[0]=5;
Unsigned char Send[32] ={'A','B','C','D','E',...};
NRF24L01_TxPacket (Send);
```

2. Module Baud Rate

Optional baud rate: 4800, 9600, 14400, 19200, 38400, 57600, 115200. Cover common baud rate, (factory default baud rate is 9600)

Baud rate modification command: Send ASCII code [AT+BAUD=n] (n is 1, 2, 3, 4, 5, 6, 7 respectively corresponding to 4800, 9600, 14400, 19200, 38400, 115200 baud rate)

For example: modify the baud rate to 115200, then the serial debugging assistant sends ASCII code [AT+BAUD=7], the system replies:

```
The communication baud rate is set successfully!!
Baud rate: 115200
```

At this time, the baud rate is 115200, and the serial debugging assistant needs to switch to 115200 to communicate with the module.

Note: Command letters must be all uppercase!

3. Transmission Rate of nRF24L01 Module

Optional rate: 250Kbps, 1Mbps, 2Mbps (factory default 2Mbps)

Transmission rate setting command: Send ASCII code [AT+RATE=n] (n is 1, 2, 3 respectively corresponding to 250Kbps, 1Mbps, 2Mbps transmission rate) For example: modify the transmission rate to 250Kbps, then the serial debugging assistant sends ASCII code [AT+RATE=1], the system replies:

```
The transmission rate is set successfully!!
Transmission power: 0dBm
Transmission rate: 250Kbps
Low Noise Amplification Gain: On
```




Theoretically, the communication distance of 250Kbps is the largest.

4. nRF24L01 module address setting

5-bit address (fixed length), target address and local receiving address 0 (factory defaults are 0xFF, 0xFF, 0xFF, 0xFF, 0xFF)

Address setting command:

① Set local receiving address 0: Send ASCII code [AT+RXA=0x??,0x??,0x??,0x??,0x??]

(0x?? is the address to be set: a ", " (comma), **must be a comma in English**)

For example: modify the address to 0xAA, 0xBB, 0xCC, 0xDD, 0xEE, then the serial debugging assistant will send the ASCII code [AT+RXA=0xAA, 0xBB, 0xCC, 0xDD, 0xEE], and the system will reply:

```
The address is set successfully!!  
Local receiving address 0: 0xAA, 0xBB, 0xCC, 0xDD, 0xEE
```

② Set target board address: send ASCII code [AT+TXA=0x??,0x??,0x??,0x??,0x??]

(0x?? is the address to be set: a ", " (comma), must be a comma in English)

For example: modify the address to 0x11, 0x22, 0x33, 0x44, 0x55, then the serial debugging assistant will send ASCII code [AT+TXA=0x11,0x22,0x33,0x44,0x55], the system replies:

```
The address is set successfully!  
Destination address: 0x11, 0x22, 0x33, 0x44, 0x55
```

5. Communication frequency setting

Range: 2.400GHz~2.525GHz (factory default 2.4GHz)

Communication frequency setting command, send ASCII code [AT+FREQ=2.xxxG], 2.xxx is the frequency to be set, the range is 2.400GHz~2.525GHz, beyond the range is invalid, there are three digits after the decimal point, less than three digits need to be filled with zeros, the capital letter "G" after the command is indispensable.

For example: modify the communication frequency to 2.424Ghz, then the serial debugging assistant will send the ASCII code [AT+FREQ=2.424G], and the system will reply:

```
The communication frequency is set successfully!!  
Communication frequency: 2.424GHz
```

6. CRC check setting

8-bit or 16-bit CRC check (factory default 16-bit CRC check mode)

CRC check setting command: [AT+CRC=n] (n is equal to 8 or 16) For example: set the check mode to 8-digit CRC check, then the serial port debugging assistant will send ASCII code [AT+CRC=8], and the system will reply:

```
The CRC check mode is set successfully!!  
Check mode: 8-bit CRC check
```



7. System information query

Query command: send ASCII code [AT?], the system replies:

```
OK
system message:
Baud rate: 9600
Destination address: 0xFF, 0xFF, 0xFF, 0xFF, 0xFF
Local receiving address 0: 0xFF, 0xFF, 0xFF, 0xFF, 0xFF
Communication frequency: 2.400GHz
Check method: 16-bit CRC check
Transmission power: 0dBm
Air transmission rate: 2Mbps
Low Noise Amplification Gain: On
```

5. PC software use



This host computer software is mainly used to quickly configure module parameters, and there are some simple remote control functions for users to learn and use.
Open the software as shown on the right:

1. Select the port number of the USB to nRF24L01+ module
2. Select the baud rate of the USB to nRF24L01+ module (default 9600)
3. Click the Open button to open the serial port



4. Click module configuration to enter the module quick configuration page, as shown on the right:



5. Restore factory settings: After clicking the button, all parameters of the USB to nRF24L01+ module can be restored to the factory state.
6. Clear: Press the button to clear all the numbers in the input box for easy re-input.
7. Read configuration: Click the read configuration button to read the parameter configuration of the current USB to nRF24L01+ module.
8. Application: After inputting various parameters, press the button to configure the parameters into the USB to nRF24L01+ module.

6. Hardware reset to factory settings

Hardware factory reset steps

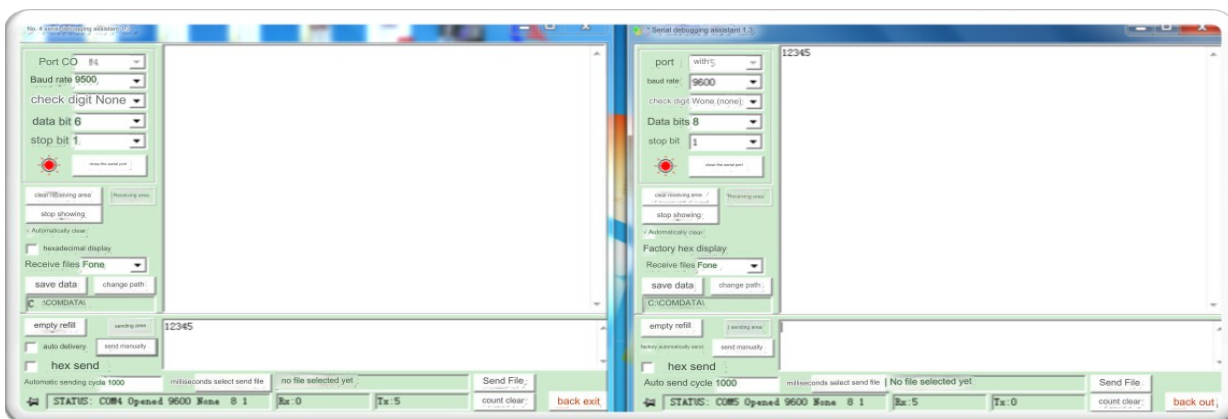


1. Short circuit ①② two pins. Do not touch any other pins. To avoid damage
2. Plug in the USB port and turn on the power to restore the factory settings instantly.
3. Unplug the module from the USB port. Just disconnect the ①② pins.

Note: Be sure to follow this sequence. Otherwise, the factory reset cannot be achieved

7. Start the communication experiment

According to the above method, insert the two serial port modules into the USB ports of the computer, open the two serial port debugging assistants, select the corresponding serial port number, select the serial port baud rate as 9600, and input data in one of the serial port debugging assistants, such as [12345], click send, and [12345] will be displayed in the receiving column of another serial port debugging assistant.





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The two LED lights of the module are the power indicator light - red (always on when powered on), and the NRF24L01 status indicator light - Green (flashing when the detection module is normal)

If the nRF24L01 module is normal, if it cannot communicate normally, please read the third section carefully.
Thank you for using the nRF24L01+ wireless serial port module produced by Shanghai Baozai Electronics!

Message from the seller:

Dear, if our products satisfy you, please give us a favorable comment, in case.

Don't give neutral or negative comments if you don't agree with your relatives, please contact our customer service.

We will give you a satisfactory solution! Thanks!