

# HR-1024 Low Power RF Module

## User Manual



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Before using HR-1024 Module, please carefully read the user manual of HR-1024 Module, any question in technical, you can contact us. Tel: 86 755 86003361      Cell: 86 15813856667

#### Application field:

1. AMR system about the water, gas, electric and central heating
2. Industry remote control system and so on.
3. Data collecting system

4. Data transmission system in the railway station, oil field, dock, army field etc.
5. Medical treatment and electric meter remote control system.
6. Home and building automation system, street lamp wireless control system.
7. Orienting steel wheel system
8. Wireless intellectual over-weight detecting system
9. Queue management system in the bank, hospital, hall etc

## Introduce:

Wireless transceiver module HR-1024 can be used in any standard or nonstandard user protocol

The module has highly be avoided disturbance ability, long transmission range, the distance can extend to 3000m (4800bps, use acetabula antenna) in open field.

Low power consumption, transmitting current 450-550mA, Receiving current 32-38mA, sleeping current 5uA

The frequency is 433Mhz or 868Mhz

User can order the channel, we can supply 8 channels normally, as the user needs we can design 16 or 32 channels too.

The module has TTL/RS232/RS485 interface, 7E1, 8N1, 7E2, 8E1, 8O1, 9N1 verify

We can supply the 1200bps/2400bps/4800bps/9600bps baud rate, user can choose one of the baud rate as you want

The user can also choose any antenna to match the modules

## I 、 Working qualification:

| Parameter            | Minimum value | Max value | remark  |
|----------------------|---------------|-----------|---|
| Temperature          | -20℃          | 70℃       | If user need work on -40~85℃, need order before we produce. |
| Working voltage      | 4.5V          | 5.5V      |   |
| Power supply current | >1A           | ~         |   |
| Working humidity     | 10%           | 90%       |   |

## II 、 Technical specification of HR-1024

| item                     | Parameter  | Memo                                     |
|--------------------------|--|--|
| Modulation mode          | GFSK/FSK   |  |
| Work frequency           | 433MHz/868MHz                                      |  |
| Transmission power       | 27dbm (0.5W)                                       |  |
| Receiving sensitivity    | -119dbm(433Mhz/2400bps)<br>-116dbm(868Mhz/2400bps) |  |
| Channel amount           | 8channel   | User can order                           |
| Bandwidth of the channel | 12.5K  | 1200~4800bps                             |
| Carrier frequency error  | 5K   | -20~70℃                                  |
| Transmitting current     | 450~550mA  | Different antenna different current      |
| Receiving current        | 32~38mA  |  |
| Sleeping current         | 5uA  |  |
| Baud rate                | 1200/2400/4800/9600/19200bps                       | User can choose one of them before order |
| Interface mode           | UART TTL/RS-232/RS-485                             | 19200bps is inapplicability              |
| Dimension                | 53mm×38mm×10mm                                     |  |
| Transmit distance        | 4500m  | antenna(5.5dbi)<br>4800bps               |

### III、Interface definition:

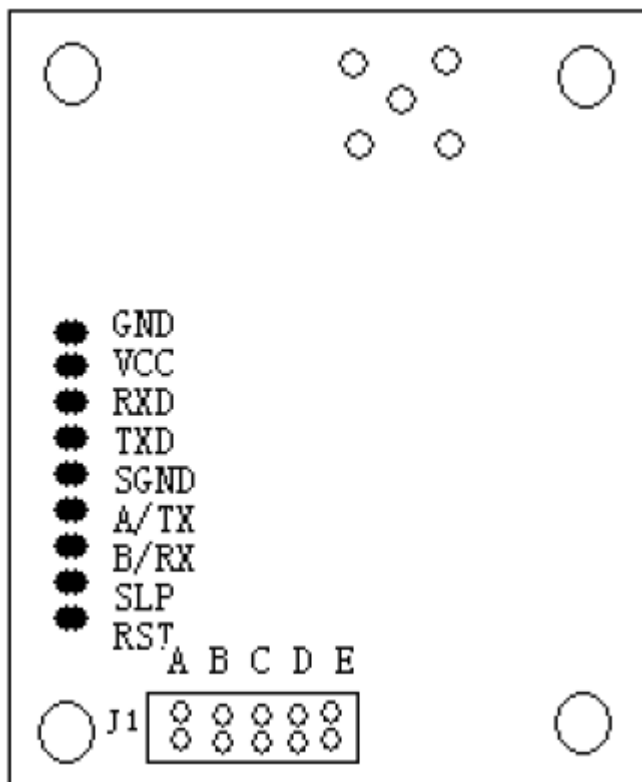
HR-1024 (V1.1) module can supply a 9-pin connector (CON1), and its definitions as well as connection method for terminals are following show:

| HR-1024 pin | Description                        | level         | Connect To the terminal | Memo                         |
|-------------|------------------------------------|---------------|-------------------------|------------------------------|
| GND         | ground                             |               | ground                  |                              |
| VCC         | Power supply DC                    | +4.5~<br>5.5V |                         |                              |
| RXD         | Serial data receiving interface    | TTL           | TXD                     |                              |
| TXD         | Serial data transmitting interface | TTL           | RXD                     |                              |
| GND         | Grounding of the signal            |               |                         |                              |
| A/TX        | A of RS-485<br>Or TX of RS-232     |               | A/RX                    |                              |
| B/RX        | B of RS-485 or RX of RS-232        |               | B/TX                    |                              |
| SLP         | Sleep control (Input)              | TTL           | Sleep signal            | Low efficiency<br>$t > 15ms$ |
| RST         | Reset control (input)              | TTL           | Reset signal            | Negative pulse<br>reset 1ms  |

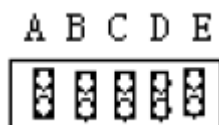
#### IV、 Setting of the channel, interface, data rate and data format:

**4.1. Before using HR-1024, you have to make simple configuration of your system parameter such as interface and data format.**

There is one group of 5-bit short-circuit wire(J1) on the bottom left corner of HR-1024, defined as A, B, C, D, E respectively, assuming the open circuit wire (with short circuit) is mode 0

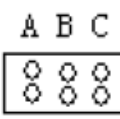
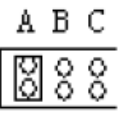
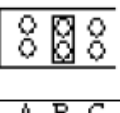
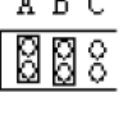




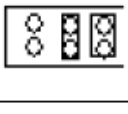
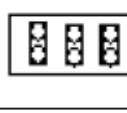
Above figure is do not input the jumper, input jumper means make the two points join together as the following show:



#### 4.2 Channel configuration:

ABC jumper wires of J1 provide 8 options and you can choose 0-7 channels (ABC jumper wire mode is the same), you can transmit data between each module, but keep in mind at the same time only one modules is in TX mode.

| JUMPER<br>ABC   | Channel<br>number         | 433MHz     | 868MHz     |
|---|---------------------------|------------|------------|
|  | 0(ABC<br>NO<br>SHORT<br>) | 433.850MHz | 869.430MHz |
|  | 1                         | 432.100MHz | 869.490MHz |
|  | 2                         | 433.200MHz | 869.560MHz |
|  | 3                         | 433.250MHz | 869.620MHz |

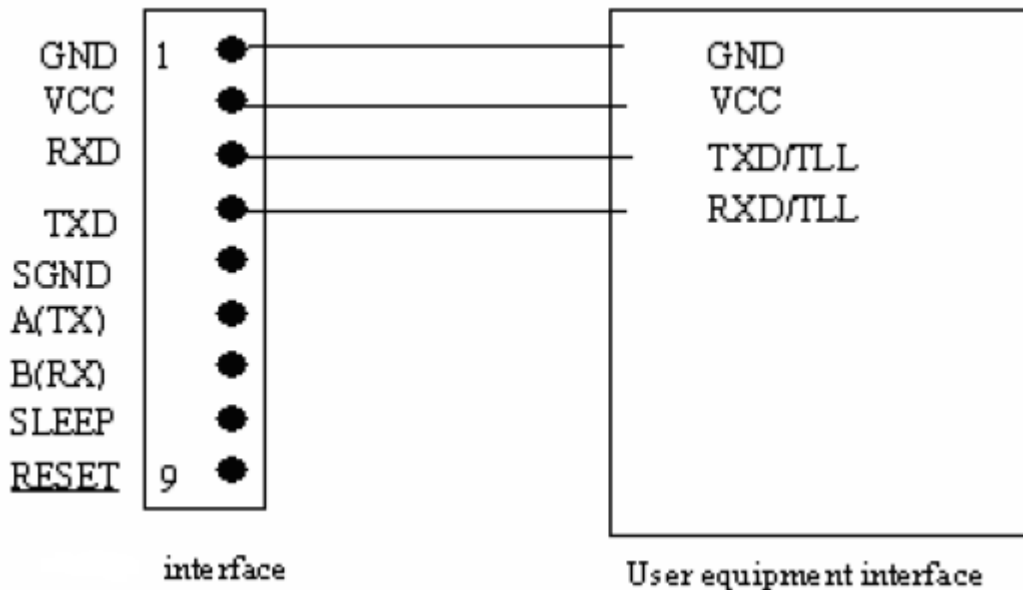
|   |                        |            |            |
|---|------------------------|------------|------------|
|  | 4                      | 434.000MHz | 867.800MHz |
|  | 5                      | 432.650MHz | 868.000MHz |
|  | 6                      | 433.400MHz | 868.200MHz |
|  | 7(ABC<br>all<br>short) | 432.600MHz | 868.400MHz |

#### 4.3. Selection of interface mode:

HR-1024 (V1.1) provides three types of interface mode, COM1 (Pin3 and Pin4 of CON1) is fixed as UART

Serial port of TTL level: COM2 (Pin6 and Pin7 of CON1) can choose interface mode (RS-232, RS485) through D of J1


##### (1). TTL interface connection application circuit

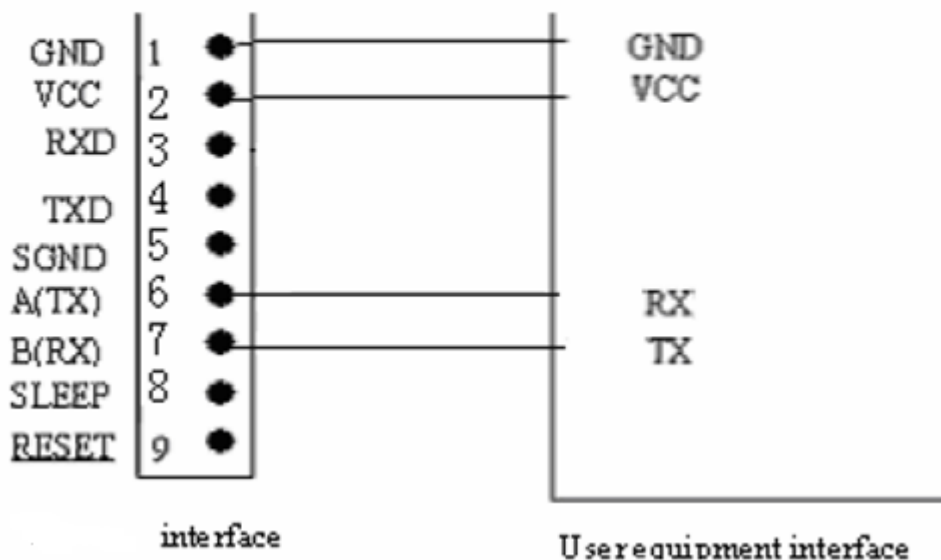


**Note: Please do not connect any wire on Pin6 and Pin7 and also if the other wire you do not use, please cut them down, or it will has interface.**

If you use the TTL only please make sure the D jumper of JP2 without jumper wire (D=0)

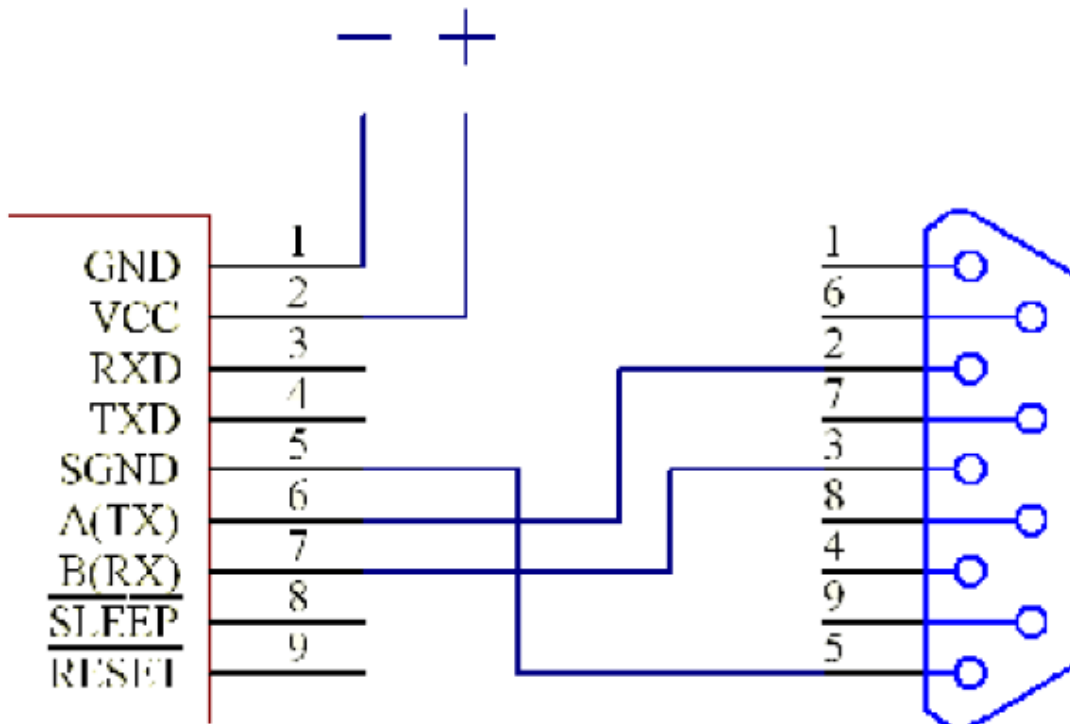
**(2). RS-232 interface connection application circuit**

D=1( with short jumper as  )



**Note: Do not connect other wires or it will has interface.**

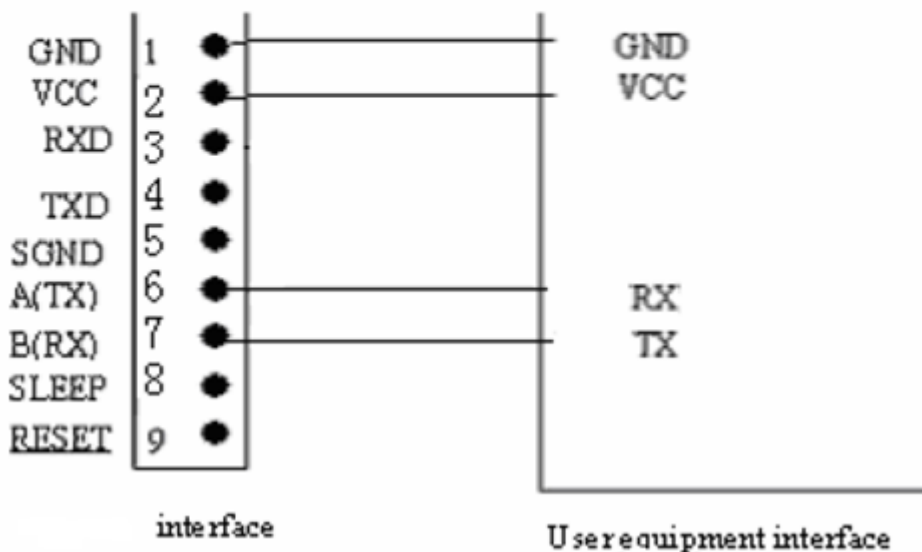
Module and computer DB9 connection figure:



**Note:** If the module and the equipment use different power supply, please make sure the two use the same GND (join the two`s GND together).

**(3). RS-485 interface connection application circuit**

D=0( without short jumper as  $\frac{D}{\text{---}}$  )



**Note:** Do not connect other wires or it will has interface



#### 4.4: Interface rate setting

The rate of HR-1024 is determined by hardware to make sure the module rate is suit to your system, we must tell your system`s rate.

#### 4.5: HR-1024 can support no parity and even parity mode of the serial communication

UART it can choose parity mode through E of J1

E=0 (without short circuit) parity 8E1 (even parity) 8O1/9N1/7E2

E=1 (with short circuit) parity 8N1 (no parity) 7E1

Note: channel setting COM2`s interface mode and parity mode is fixed after the power is on if you want to change the setting, you must reset the module or power on again.

### V、Indicator led function:

1. When power on the module, green led will flash one time, it means the module is now is now output an edition information, from the edition users can know HR-1024 (V111) C=00 (433), RS232/RS485, 8N1/9N1

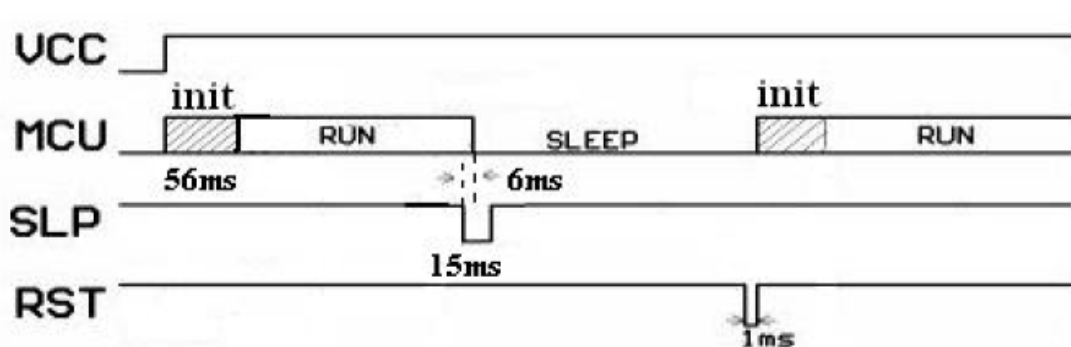
**Note:** HR-1024 means the module brand, (V111) means the module`s edition number.

“00” means channel number, RS485/RS232 is the interface choose 8N1/9N1 is the verify mode.

2. When the data need to transmit to the air, Red led will flash one time (when use RS232 or RS485 interface the light will not flash)
3. When the module receive the data from air, the Green led will flash again

### VI、Time diagram:

HR-1024 has sleeping mode, it is controlled by SLP pin, usually the SLP is in the high level mode (SLP=1), if you need the modules in the working mode, you need make the RST pin become high level, User can reset or repower on the module, the timing map as following show:

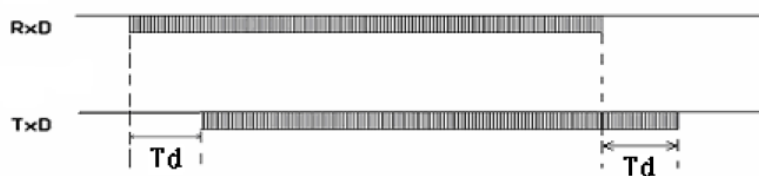


Time diagram

**Transmit timing delay**

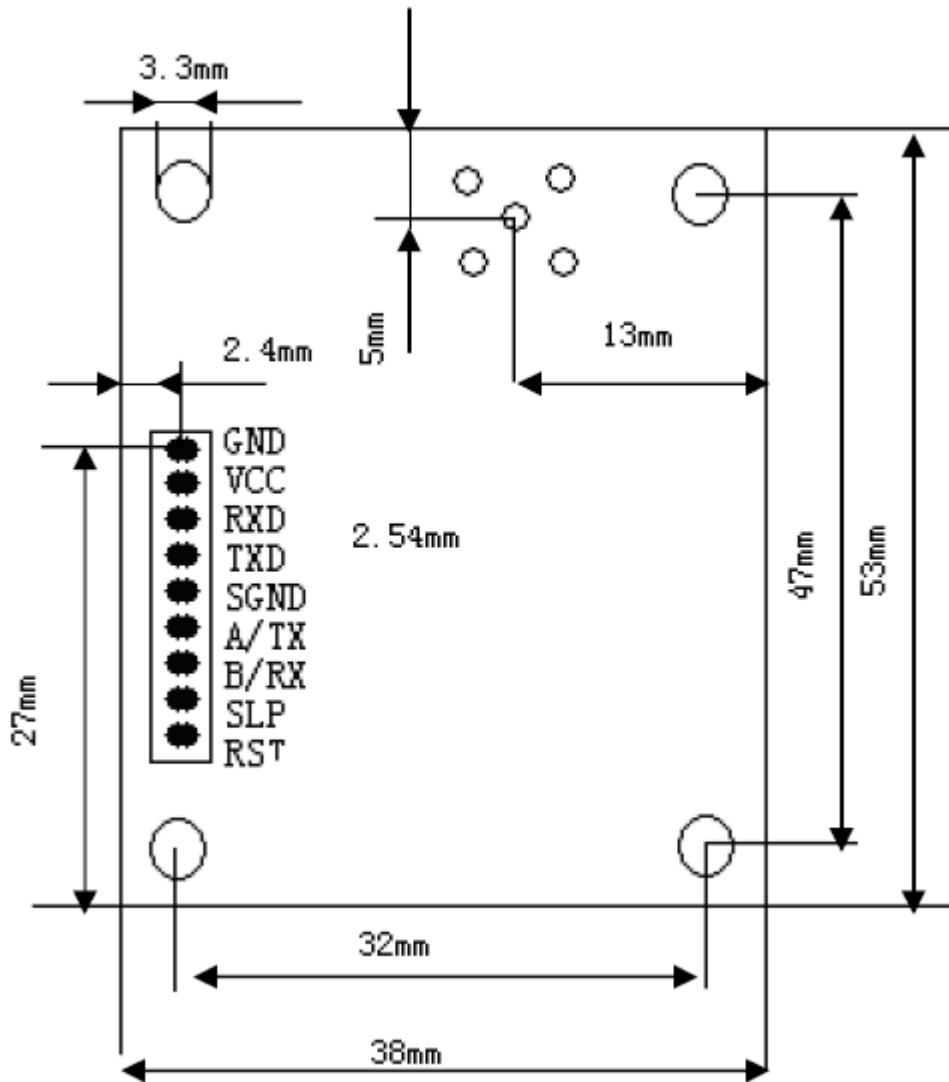
When the RXD of the HR-1024 (named A) receive data, then the modules send the data to modules B(HR-1023), then the TXD output the data, between those transmit it has a timing delay (Td), different baud rate has different delay time, example: when you choose 1200bps, you need add 122ms delay in your program.

| Baud rate (bps) | Time delay (Td/ms) |
|-----------------|--------------------|
| 1200            | 122ms              |
| 2400            | 58ms               |
| 4800            | 31ms               |
| 9600            | 16ms               |
| 19200           | 8ms                |



Transmit timing delay map

**VII、 Assembly drawing of structural size:**



### VIII、 Technology support and sold service:

We offer sufficient technology support for user use the module and further development for free, mending broken module one year for free, always offer after service, to adapt different user structure, we can develop smaller module or various size modules.