

# HR-1028 (868MHz) Low Power Wireless Module

## User's Manual



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Before using the product, please carefully read the user's manual. Any question in technical, you can contact us. Tel: +86-755-81782516

### About HR-1028

HR-1028, the Low power wireless module, is used as the wireless data transmission in short distance.

With the small size, weight and power consumption and good stability and reliability, it has the function of bi-directional data sign transmission, test and control.

It is used for Wireless meter reading, such as water meter, electric meter and gas meter, parking meter, intellectual card, electronic weighing apparatus, meter for checking on work attendance, queue wireless meter,

building control, shipping company control, alarm system, intelligent equipment, Automatic data collecting system; Industrial remote control and remote test building automation, safety and security, powerhouse equipment wireless monitor, entrance control system, etc. It provide the USB power interface to be convenient for the mini computer and PC users if necessary.

## **HR-1028 Feature**

### **1.Ultra low power transmission**

Transmission power: 500mW, high receiving sensitivity: -123dbm,

Size: 63mm\*43mm\*15mm

### **2. Low power consumption**

Receiving current<45mA, transmission current<360Ma, sleeping current <1mA.

### **3. Saving power model**

HR-1028 have three saving power models: awoken from Hardware, awoken from COM Port, awoken from Air;

### **4. ISM frequency band, not requiring on application of frequency point**

Carrier frequency of 433/868/915MHz.

### **5. High anti-interference and low BER (Bit error Rate)**

Based on the GFSK modulation mode, it adopts the efficient communication protocol. The actual bit error rate of  $10^{-5}$  ~  $10^{-6}$  can be achieved when channel bit error rate is

### **6. Long transmission distance**

Within the range of visibility, the reliable transmission distance is (BER= $10^{-3}/1200\text{bps}$ ) >3000m when the antenna height is greater than 3m (BER= $10^{-3}/9600\text{bps}$ ).

### **7. Transparent data transmission**

Transparent data interface is offered to suit any standard or nonstandard user protocol. Any false data generated in the air can be filtrated automatically (What has been received is exactly what has been transmitted). The charge time for receiving and sending <10ms

### **8. Multi-channel and speed**

The standard HR-1028 configuration provides 16 channels. to meet the multiple communication combination mode of the users. It has baud rate to be chosen such as 1200bps、2400bps、4800bps、9600bps、19200bps、38400bps. The wireless transmission rate is direct ratio with baud rate of interface to meet user's equipment requirement.

### **9. High speed wireless communication and Large data buffer**

When the speed rate in the air is quicker than interface's, allowing to transmit unlimited length data at one time, when the speed rate is slower or equal the interface's, allowing the transmission of 255 Bytes long data frames at one time for more flexible programming by users.

### **10. Intelligent data control and the user doesn't need to prepare excessive programs**

Even for semi duplex communication, the user doesn't need to prepare excessive programs, only receiving/transmitting the data from the interface. HR-1028 will automatically complete the other operations, such as transmission/receiving conversion in the air, control, etc.

### **11. High reliability, small and light**

Single chip radio- frequency integrated circuit and single chip MCU are used for lessened peripheral circuits, high reliability, and low failure rate.

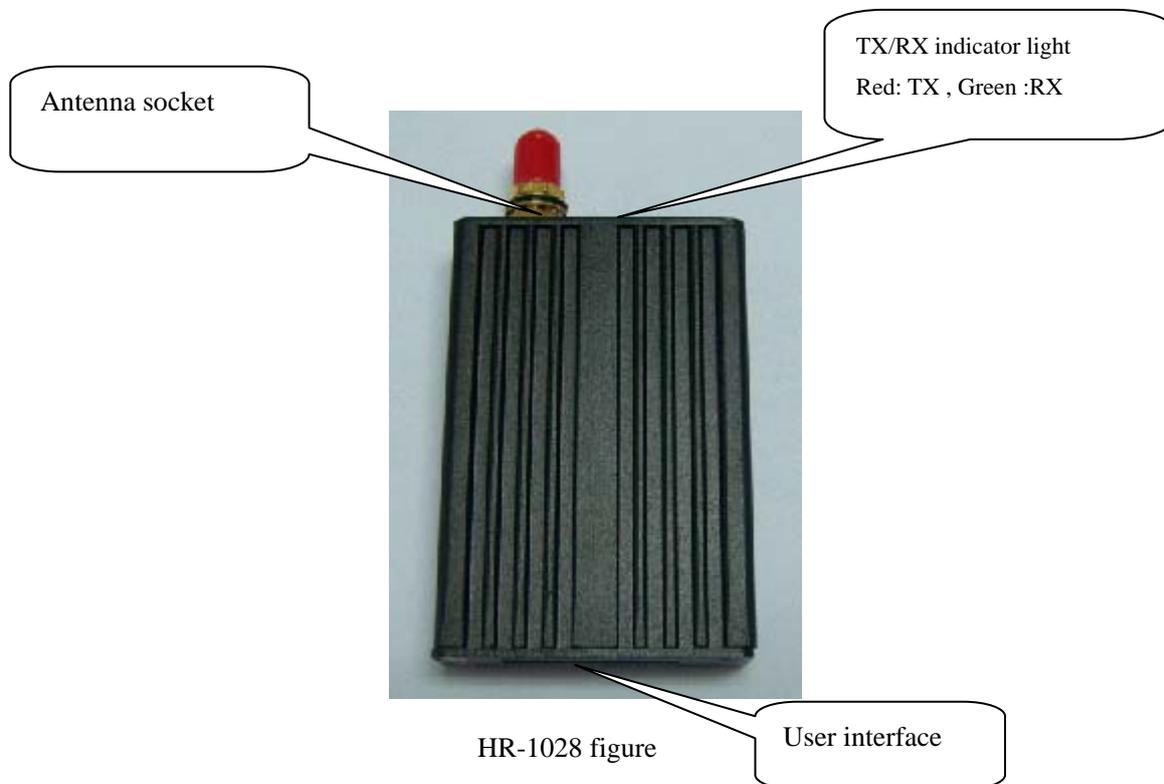
### **12. Watchdog monitor**

Watchdog monitors the inner function, so it can change the traditional product structure and improve the

product reliability.

## Application of HR-1028

### 1. Appearance figure



### 2. HR-1028 interface definition

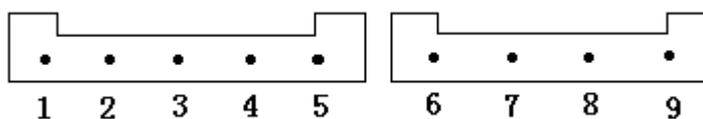


#### 1) User's interface

HR-1028 have one interface of TTL/RS232/RS485, user can choose one .

HR-1028 standard interface: when the antenna upward, the plastic socket gap upward, from left to right,1-9

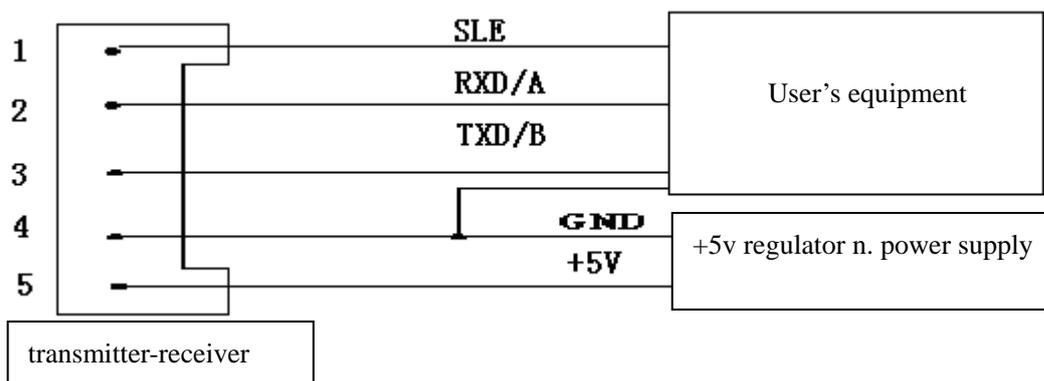
pin in turn, as follows:



(Remarks: Jack space between is 2.0 mm.)

**Definition of connecting pins and connection method:**

Item no	PIN	Description	Level	User terminal	Remarks
1	SLE	Sleep control (input) end	Connected to the terminal		Low level to sleep, High level awake
2	TXD/ (RS-485) A	Serial data transmitting end		RXD/ A (RS-485)	
3	RXD/ (RS-485) B	Serial data receiving end		TXD/ B (RS-485)	
4	GND	Power supply/Ground		DGND/AGND	
5	VCC	+5 ± 0.5V		+5 ± 0.5V	TTL 3V user's choose
6	I <sub>2</sub>	No use		retain	
7	I <sub>1</sub>	No use		retain	
8	O <sub>2</sub>	No use		retain	
9	O <sub>1</sub>	No use		retain	



**Remarks:**

To avoid to connect the interface reversely and can not communicate, please check and assure the voltage of 2 and 3 pin is existing by using multimeter. If there is one pin that has the voltage, another has not voltage, which means the interface is connected reversely, pls. Change the connection wires between pin 2 and 3

**2) Power supply**

HR-1028 uses DC power supply with voltage of +5V.

It can also share power with other equipment, however, the high quality power with desirable ripple

factor should be selected. In addition, the reliable grounding must be used if there is other device in the system equipment. In case of failure to connect with the earth, it can form its own grounding ,but it must be absolutely separated from the municipal electric supply.

### **3.Saving power model**

HR-1028 have three Power-Saving models: Awaken from Hardware, Awaken from COM Port, Awaken from Air. The model can be set by RF Module software. The user can choose Power-Saving model, the default model is “Awaken from Hardware”.

#### **1) Awaken from Hardware:**

In this model, the current is under 100uA.

Sleeping status: when you input low level at NO. 5 pin, HR-1028 can sleep, but it can not transmit and receive data.

Normal work status: when you input High level at NO. 5 pin, HR-1028 turn into Normal work status, 10ms later, it can transmit and receive data.

**Remarks:** if you keep the NO. 5 pin untouched, then HR-1028 is in Normal work status.

#### **2) Awaken from COM Port:**

When HR-1028 in this model, the current is under 11mA.

When you input data with COM port, HR-1028 turn into Normal work status after 10mS and can transmit the data.

When HR-1028 not receive data in COM port in 20 seconds , HR-1028 will turn into sleep status.

#### **3) Awaken from Air:**

In this model, the current is under 20mA.

When in this status, HR-1028 works intermittently.

When HR-1028 received data from air, HR-1028 will turn into Normal work status after 10ms, It can receive data normally.

When HR-1028 not receive data from air in 20 seconds, It will turn into sleep. So when you choose Awaken from Air, you can transmit some useless data firstly.

## **HR-1028 parameters setting**

HR-1028 have one interface of TTL、RS232、RS485, You should say clearly which interface you need when place an order.

HR-1028 main parameters: COM baud rate and verify, RF baud rate, Channel and frequency.

You can change these parameters by our RF Module soft. When RF baud rate is faster than COM baud rate, One frame Can transmit limitless data. When RF baud rate is not faster than COM baud rate , One frame Can transmit 255 bytes most. You can set the rate according your need.

The general Power supply is 5V DC.

**Two HR-1028 communication must have condition as follow:**

1. Their channels (i.e. frequency) are the same.
2. Their RF rates are the same.
3. RF Module Com baud rate and verify is comply with its equipment or PC.

## **Parameters default value:**

**Channel: 5**

**Interface speed rate: 9600BPS**

**Interface verify: none**

**Speed rate in air: 9600BPS**

## Technical specification of HR-1028

Modulation mode: GFSK

Working frequency: 868MHZ

Transmission power: 500mW

Receiving sensitivity: -123dBm

Transmitting current: <360mA

Receiving current: <45mA

Sleeping current: < 1mA

Channel speed rate: 1200/2400/4800/9600/19200/38400Bit/s, user can Choose one

Interface speed rate: 1200/2400/4800/9600/19200/38400Bit/s, user can Choose one

Change time for receiving and sending: <10ms

Interface data format: 8E1/8N1/8O1

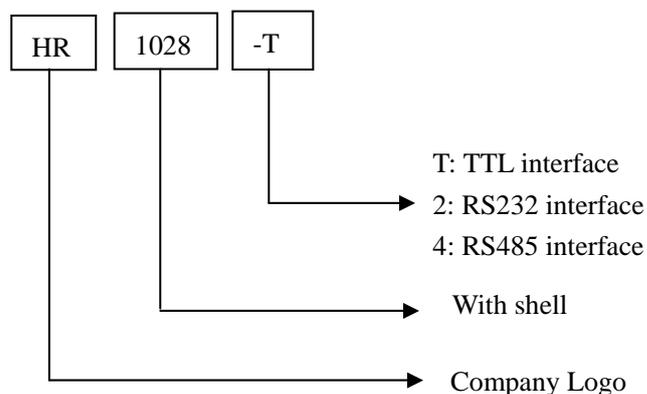
Power supply:  $5 \pm 0.5V$  DC

Working temperature:  $-20^{\circ}C \sim 85^{\circ}C$

Working humidity: 10% ~90% relative humidity without condensation

Dimension: 64mm\*43mm\*15mm

## Model and name



## Optional Antenna:



## Trouble and solve ways:

Item	Trouble	Trouble causes and solve ways
1	No shine of Indicator light	a、 Power Line badness touch . b、 Power is bad. c、 Power line meet in reverse, or diode of polarity protect is bad.
2	No transmitting or receiving	a、 Radio is badness touch with PC/terminal. b、 Radio with TTL/RS232/RS485 not match terminal. c、 RX frequency and TX frequency is not same.
3	High Bit error rate	a、 antenna not match, or touch bad; b、 RF baud rate is not right. c、 Power supply ripple is too great.
4	Indicator light twinkling	a、 Electromagnetism disturb in circumstance. b、 Same frequency disturb in the circumstance.