

# Wireless Data Radio Modem

(RS232 Output/485 Output)

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902~928MHz 0.5W and 2W Multi-point Transceiver

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*Model: RD-232HI-9MW5*

*Model: RD-232HI-9M2W*



## Version History

Version	Date	Changes
V1.00	Mar.22, 2013	1 <sup>st</sup> . Edition

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## Important Event

- This product is in general use for the equipment on the premise of the development, design, manufacture. Do not use that require high security purposes, such as machinery or medical, aviation equipment, machinery and transport-related deaths are directly or indirectly related to the system.
- This product should be in this brochure by the instructions of the types and rated voltage power under the current proper use. If violation of this statement by the safety records of the supply operation, I am afraid our company cannot afford any of the responsibility.
- Do not self-decomposition, alteration, repair of the products also will cause fire, electric shock, fault, and dangerous. In addition, their decomposition, alteration, and repair the product, failure is not within the scope of warranty.
- The products are not waterproof, so please do not use and touch water. Take off and on also please note. Rain, spray, drinks, steam, sweat may be a failure.
- Use of this product, please be sure to use according to the statement recorded by the use of methods to operate. Please do not violate particular attention to the matter reminded to use.
- Please respect this statement recorded by the note. When consumers in contravention of this statement recorded note of the operation, I am afraid our company could not shoulder any responsibility.
- Products are defective, the Company will be responsible for free to amend the flaws, or to the same flawless product or its equivalent products in exchange. However, the Company does not assume based on the requirements of the flaw and loss responsibility.
- The Company reserves the right to retain without notice to users of the cases, the product of hardware / software (version upgrade) is with the right to edit.

### Declaration

This product provides different frequency for user selection to meet different telecommunication regulation and FCC/CE on different countries.

### Warranty

The warranty time is within one year from purchased date. The warranty scope are used in normal situation and none vandalism. (Some function harmful out of warranty scope and Vandalism are Un-warranty).

### Un-warranty Scope Description

- Because the natural disaster, accident or human factor to cause the bad damage.
- Violate the product instruction manual to cause the damage of the products.
- The improper assemble causes damage.
- The products used the unsanctioned accessory to cause damaged.
- Overstep the allowed used environment to cause the products damaged.

### Contact Us

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## Key Feature

- 902~928MHz
- UHF Band Wireless Data Transceiver
- RF Output Power up to 0.5W and 2W
- Sensitivity up to -126dBm (2Kbps)
- RS232、RS485 Interface
- Transceiver Data Rate 1.8Kbps~172.8Kbps

## Application

- Wireless Network
- Multi-Channel Home Automation Standard
- Wireless RS232
- Active RFID Base Station Transceiver

## Characteristic

Parameter	Min	Type	Max	Unit	Condition
<b>Operating Condition</b>					
Operating Temperature Range	-10		+70	°C	
Operating Supply Voltage	9	12	18	V	
<b>Current Consumption</b>					
RX Mode		37		mA	DC 12V
TX Mode (RD232HI0.5W)		200		mA	DC 12V Peak
TX Mode (RD232HI2W)		800		mA	DC 12V Peak
<b>RF Characteristic</b>					
Frequency Range	902	925	928	MHz	
Data Rate	1.8		172.8	Kbps	GFSK
TX Output Power (RD232HI0.5W)		27.5	28	dBm	
TX Output Power (RD232HI2W)		33	33.2	dBm	
RX Sensitivity		-126	-124	dBm	
Modulation		GFSK			
<b>Other</b>					
ESD			2000	V	
Interface Data Rate	1.2		115.2	Kbps	

View



## General Operation

### Stand-by Installation Mode

- **Set up key**

1. Press set up key shortly to view the internal parameters. It will return to stand-by mode automatically if there is no further set-up procedures done in 3 seconds.
2. Press set up key for more than 3 seconds to enter set-up mode.
3. Press set up key one-time shortly to exit RSSI monitoring mode.

- **Next key**

1. Press next key shortly to examine the present RSSI value. It will return to stand-by mode automatically if there is no further set-up procedures done in 3 seconds.
2. Press next key for more than 3 seconds to enter RSSI monitoring mode. This mode sees RSSI as the priority mode, there will be incomplete reception when receiving data at this mode.

### Set up Installation Mode

- **Set up key**

1. Press set up key shortly to switch desired adjustment modes.
2. Press set up key for more than 3 seconds to enter next menu item.

- **Next key**

1. Press next key button to modify the parameters on marked item.
2. Press next key for more than 3 seconds to save current settings and exit set-up mode.

### Menu Items

- **Connect Port Set-up**

1. Baud rate : Default 9600bps , Range 1200~115200bps
2. Port set : Default 8,1,0

- **GID Set-up**

Default 0000, Range 0000~FFFF

- **SID Set-up**

Default 00, Range 00~FE

- **RF rate**

Default 57.6K, Range 1.8K~172.8K

- **Frequency**

Default 925.000M, Range 922.000M~928.000M

- **TX Power**

Default 27dBm, Range 8~27dBm

- **Mode**

Default Mode1, Range 1~4

- **Default Value**

Yes : Restore to default settings      NO : Return to Menu



Value	0	1	2	3	4	5	6	7
Rate(bps)	1200	2400	4800	9600	19.2K	38.4K	57.6K	115.2K

- ✧ 3<sup>rd</sup> ~ 4<sup>th</sup> Byte: group ID (GID), set-up range: 0000~FFFF
- ✧ 5<sup>th</sup> Byte: Equipment ID (SID), set-up range: 00~FE
- ✧ 6<sup>th</sup> Byte: invalid character, fixed as 0x00
- ✧ 7<sup>th</sup> Byte: transmitting rate range: 00 ~ 07. Generally, the RF transmitting rate should be greater than interface rate to avoid data error.

Value	0	1	2	3	4	5	6	7
Rate(bps)	1800	3600	7200	14.4K	28.8K	57.6K	84K	172.8K

- ✧ 8<sup>th</sup> ~ 10<sup>th</sup> Byte: Working frequency calculation: MHz\*1000=KHz and then transfer to Hexadecimal System.

Example:

When it is at 925MHz working frequency,  $925*1000=925000=0x0E\ 1D\ 48$ , then to fill in 0E at 8<sup>th</sup> Byte, fill in 1D at 9<sup>th</sup> Byte, fill in 48 at 10<sup>th</sup> Byte. When it is at 924.5MHz working frequency,  $924.5*1000=924500=0x0E\ 1B\ 54$ , then to fill in 0E at 8<sup>th</sup> Byte, fill in 1B at 9<sup>th</sup> Byte, fill in 54 at 10<sup>th</sup> Byte.

- ✧ 11<sup>th</sup> Byte:

**Bit0~Bit2:** output power range: 0 ~ 7

Output Power (0.5W)		
dBm	Set Value	Hex (Bit0~Bit2)
8	0	000
15	1	001
18	2	010
21	3	011
22	4	100
23	5	101
26	6	110
27	7	111

**Bit0~Bit2:** output power range: 0 ~ 7

Output Power (2W)		
dBm	Set Value	Hex (Bit0~Bit2)
24	0	000
27	1	001
28	2	010
29	3	011
30	4	100
31	5	101
32	6	110
33	7	111



**Bit3 ~Bit5:** Invalid character, fixed as 000.

**Bit6~Bit7:** Device working in 4 modes as stating below:

- **Mode 1 (Long-figure data mode: setup value 00)**

In this mode, all devices with same GID value can receive data. It can employ in the situation where data capacity greater than 127Bytes.

- **Mode 2 (ID data mode 1: setup value 01)**

In this mode, all devices with the same GID value could transmit signal to specified SID to achieve one-to-multiple-transmission, but the single data should not exceed 127Bytes.

Example:

SID value is 55 from device A, SID value is 88 from device B and both of them have the same GID. During mode 2, device A is going to transmit a 5-byte data 0x1234567890 to B so A sends a 6-byte data 0x881234567890, and then B receives a 6-byte data 0x551234567890, where the first byte stands for SID of A.

- **Mode 3 (ID data mode 2: setup value 10)**

In this mode, it is allowed to transmit data to specified GID and SID device, in order to achieve one-to-multiple-transmission, but the single data including specified GID and SID should not exceed 127Bytes.

Way of transmission:

The data will be transmitted through the order of 13<sup>th</sup> byte to 32<sup>nd</sup> byte.

Example:

Device A shows GID=AAA, SID=55, device B shows GID=BBBB, SID=88, device C shows GID=CCCC, SID=99.

Device A is going to transmit a 5-byte data 0x1234567890 to B so A sends a 10-byte data 0x04FFBBBB881234567890, and then B receives a 5-byte data 0x1234567890.

Device A is going to transmit a 5-byte data 0x1234567890 to device C through device B, then device A sends a 14-byte data 0x08FFBBBB88FFCCCC991234567890, while device B will not receive anything, and then device C receives a 5-byte data 0x1234567890.

- **Mode 4 (saved ID data mode: setup value 11)**

During this mode it is allowed to pre-save the path of specified GID and SID. When sending signals the system will automatically follow the pre-saved value to transmit, it is up to 14 times of transmission and single data of pre-saved GID and SID should no greater than 127 Bytes.

- ✧ 12<sup>th</sup> Byte: Invalid character, fixed as 0X00
- ✧ 13<sup>th</sup> to 32<sup>nd</sup> Byte: Pre-saved path, it only activates in mode 4 (saved ID data mode).
- ✧ 13<sup>th</sup> Byte: It stands for the valid data among 14~32 bytes.
- ✧ 14<sup>th</sup> ~32<sup>nd</sup> Bytes format of path:

- ◆ Example 1: 04 FF 12 34 55 11 22 33 44~00

The 13<sup>th</sup> Byte shows the valid data is 4-Byte FF 12 34 55

FF 12 34 55, it stands for GID=1234, SID=55. This device will receive data from UR and automatically sends to device with GID=1234 and SID=55.

- ◆ Example 2: 05 FF 12 34 55 11 22 33 44~00  
The 13<sup>th</sup> Byte shows the valid data is 5-Byte FF 12 34 55 11  
FF 12 34 55 11, it stands for GID=1234, SID=55 and 11. This device  
will receive data from UR and automatically sends to  
The device with GID=1234 and SID=11.
- ◆ Example 3: 06 FF 12 34 55 11 22 33 44~00  
The 13<sup>th</sup> Byte shows the valid data is 6-Byte FF 12 34 55 11 22  
FF 12 34 55 11 22, it stands for GID=1234, SID=55, 11 and 22. This  
device will receive data from UR and automatically sends to  
The device with GID=1234 and SID=55 and transferring to the device  
with GID=1234, SID=22.
- ◆ Example 4: 08 FF 12 34 55 FF 45 67 88 44~00  
The 13<sup>th</sup> Byte shows the valid data is 8-Byte FF 12 34 55 FF 45 67 88, it  
stands for GID=1234, SID=55, GID=4567 and SID=88. This device will  
receive data from UR and automatically sends to device with GID=1234  
and SID=55 and transferring to the device with GID=4567 and SID=88.

## CE Caution Note (European Union)

Symbol of  it accords with EMC regulation (89/336 / EEC) to represent this device, and the low-voltage regulation of European Union (73/23/EEC). It represents to follow the following standard regulations of European Union (The bracket is a reciprocal international standard reciprocal international standard and regulation).

- EN 60950/A11: 1997/(IEC 60950/A4: 1996), The ones that includes information science and technology of apparatus of e-commerce safe.
- EN 55024: 1998 (IEC 1000-4-2, 1000-4-3, 1000-4-4, 1000-4-5, 1000-4-6, 1000-4-8, 1000-4-11) - ' scientific and technological apparatus of information - The characteristic of interfere avoided - Restrain and test method '
- Chapter 2 -Static release (ESD) Demand
- Chapter 3 -Radiate the static field demand
- Chapter 4 -The electron is transmitted / produced and washed (EFT) fast Demand.
- Chapter 5 -surge demand
- Chapter 6 -Resistance demand caused in field of wireless frequency.
- Chapter 8 -Magnetic field demand of electric frequency.
- Chapter 11 -Shortly cut off the demand of making a variation with the voltage transiently under the voltage.

EN 55022:1998/(CISPR 22:1997) ,Class B, ' "To assess information scientific and technological apparatus wireless restriction and way of interfering with the characteristic."

## FCC Consistent Declaration (U.S.A. Only)

Attention: FCC rule regulation, modified and changed must allowed by WENSHING Electronics company, otherwise that would make you operate this apparatus invalid. This apparatus adopted test, according to chapter 15 that FCC regulation, accord with Class B digital restrictions of device. These limits are designed to provide reasonable protection, avoid to having harmful interference at home's environment.

This device may have radiated wireless frequency energy. If don't allow the instruction manual, then may will interfere wireless communication. However, there is no any way to guarantee, it will not be interfered in particular installed. If this device really causes harmful interference, (It could be confirmed by turning on or off this device.) Advise you to try to use the following ways modifying the interference situation.

- Relocation receiving antenna or altering its direction.
- Increase the distance between device and receiver.
- Please connect this device to the outlet in the circuit different from the receiver.
- The following manuals is published by Federal Communications Commission, they must be helpful to all users.
- How to Identify and Resolve Radio-TV Interference Problems. (This manual can be obtained by relevant departments of publication of the U.S. government.)
- Government Printing Office, Washington D.C., 20402. Stock No. 004-00398-5