WENSHING®©

Wireless Data Radio Modem

(RS232 Output/485 Output)

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

Model: RD-232HI-9MW5

Model: RD-232HI-9M2W

Version History

Version	Date	Changes
V1.00	Mar.22, 2013	1st. Edition

Content

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.	Typ.	Max.	Unit	Condition
Operating Condition					
Operating Temperature Range	-10		+70	℃	
Operating Supply Voltage	9	12	18	V	
Current Consumption					
RX Mode		37		mA	DC 12V
TX Mode (RD232HI0.5W)		200		mA	DC 12V Peak
TX Mode (RD232HI2W)		800		mA	DC 12V Peak
RF Characteristic					
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			
Other					
ESD			2000	V	
Interface Data Rate	1.2		115.2	Kbps	

View


Antenna Port
RS-232 Port
Power Port
RS-485 Port
Antenna
OLED Display
Setup Key
Selection Key

Transformer wiring

Please cut off the transformer plug，the Positive is connected to the V+、Negative connection to G (as following red frame)：

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

Command Communication Mode

Modifying internal parameters through RS-485 or RS-232 interface

- **Enter set-up mode**

Transmit value =0x01+0x02+～+7E+0x7F, altogether 127 bytes
Receive value=0x01+0x02+～+7E+0x7F, altogether 127bytes

- ✧ It is only allowed at set-up mode to read or modify all parameters.

- **Exit set-up mode**

Transmit value=0xFF FF FF 55 CC
Receiver value=0xFF FF FF 55 CC

- ✧ It is only allowed to exit set-up mode to transmit or receive data.

- **Read product name and version**

Transmit value=0xFF FF FF 55 AA BB FD
Receive value for output power at 0.5W (character)= WS-9MW5V100
Receive value for output power at 2W (character)=WS-9M2WV100

- ✧ There will be altogether 11 bytes, the former 6 character stands for product name, while the latter 4 characters stands for firmware version.

- **Restore to default parameter**

Transmit value=0xFF FF FF 55 AA BB FF
Receive value=N/A

- ✧ It is to delete previous setting parameters in order to return to original default values.

- **Read internal parameter**

Transmit value=0xFF FF FF 55 AA BB FE
Receive value=0x03 00 00 00 00 05 0E 1D 48 07 00 00 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF (This is original default value)

- ✧ There will be altogether 31 bytes, showing the current internal parameters.

- **Setup internal parameters**

Transit value=0xFE 03 00 00 00 00 05 0E 1D 48 07 00 00 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF，altogether transmitting 32 Bytes
Receive value=0xFD 03 00 00 00 00 05 0E 1D 48 07 00 00 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF，altogether receiving 32 Bytes. The first byte shows FD standing for completed the setting; while it shows FE standing for the same value as internal parameter.

- ✧ There are altogether 31 bytes allowing the modification of all parameters.
- ✧ 1st byte: The starting character, fixed value=0xFE

✧ 2nd byte: checksum, stop bits, interface speed rate, set up ranged 00 ~ 07; the default rate: 9600bps

Bit 7: 0~ 8bits format (8,1,N/7,1,O/7,1,E/7,2,N)
1~9 bit format (8,1,O/8,1,E/8,1,S/8,2,N(8,1,M)
Remark: N/O/E/M/S stands for None check (None), Odd parity check (Odd), Even parity check (Even), 1 check (Mark) and 0 check (Space)

Bit6~5 : 00 None check/1 check (Mark)
01 Odd parity check
10 Even parity check
11 0 check (Space)

Bit 4~3: fixed as 0

Bit2 ~0: interface rate

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

✧ 3rd ~ 4th Byte: group ID (GID), set-up range: 0000～FFFF

✧ 5th Byte: Equipment ID (SID), set-up range: 00～FE

✧ 6th Byte: invalid character, fixed as 0x00

✧ 7th 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

✧ 8th ~ 10th 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 8th Byte, fill in 1D at 9th Byte, fill in 48 at 10th Byte. When it is at 924.5MHz working frequency, 924.5*1000=924500=0x0E 1B 54924.5*1000=924500=0x0E 1B 54, then to fill in 0E at 8th Byte, fill in 1B at 9th Byte, fill in 54 at 10th Byte.

✧ 11th 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 13th byte to 32nd 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.

- ✧ 12th Byte: Invalid character, fixed as 0X00
- ✧ 13th to 32nd Byte: Pre-saved path, it only activates in mode 4 (saved ID data mode).
- ✧ 13th Byte: It stands for the valid data among 14~32 bytes.
- ✧ 14th ~32nd Bytes format of path:
  - ◆ Example 1: 04 FF 12 34 55 11 22 33 44～00
    The 13th 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 13th 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 13th 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 13th 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.