WENSHING®©

LoRa Hi-Power Wireless Transceiver

(RS-485 Output / TTL Output)

434MHz 500mW Multi-point Transceiver

Model: RD232-LORA434-RS485 **Model: RD232-LORA434-TTL**

Version History

Version	Date	Changes
V0.01	July.25, 2018	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 it nearby water source. Take off and on also please note that 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.
- We reserve 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 is 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

WENSHING ELECTRONICS CO., LTD.
No.82, Chong De St. 11054 Shin Yi Dist, Taipei, Taiwan
Tel: +886-2-27353055
Fax: +886-2-27328813

➢Application

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

➢Key Feature

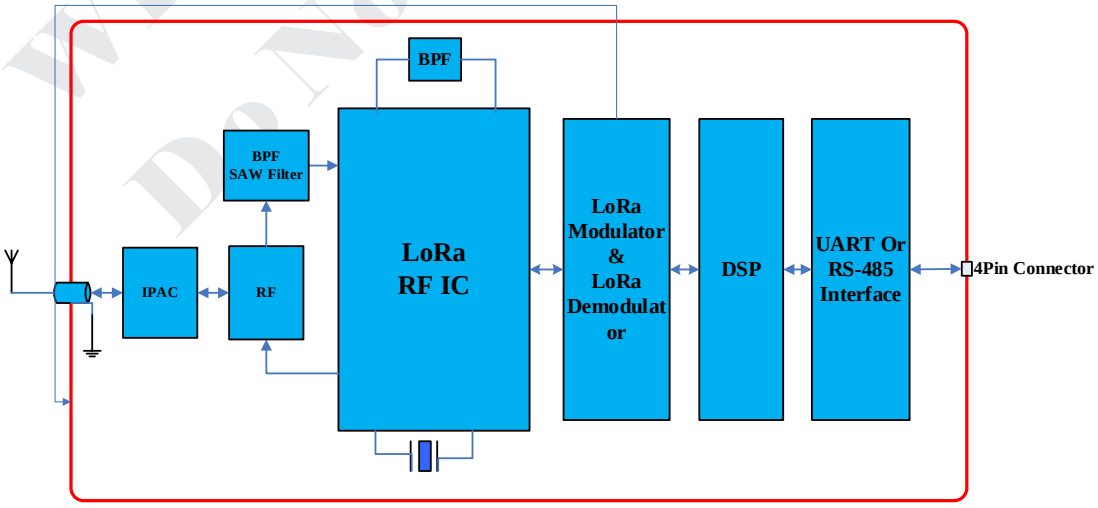
- UHF Band Wireless Data Transceiver
- RF Output Power up to 500mW
- Sensitivity up to -145dBm
- RS485 or TTL Interface
- Transceiver Data Rate 73Hz~18Kbps

➢Characteristic

Parameter	Min.	Type	Max.	Unit	Condition
Operating Condition					
Operating Temperature Range	-10		+70	℃	
Operating Supply Voltage	10	12	13	V	
Current Consumption					
RX Mode (TTL 3V)		33		mA	
TX Mode (TTL 3V)			400	mA	Peak
RX Mode (RS485)		33		mA	
TX Mode (RS485)			400	mA	Peak
RF Characteristic					
Frequency Range	432	434	436	MHz	
Data Rate	73		18K	bps	LoRa
TX Output Power		27	27.5	dBm	
RX Sensitivity			-145	dBm	
Modulation		LoRa			
Other					
ESD			2000	V	
Interface Data Rate	1.2		115.2	Kbps	

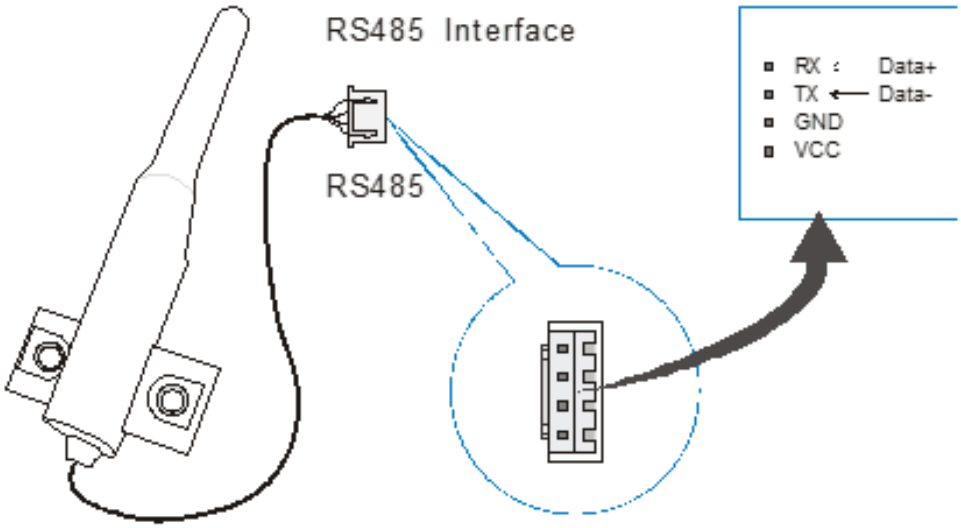
➢Diagram (unit：mm)

➢Block Diagram

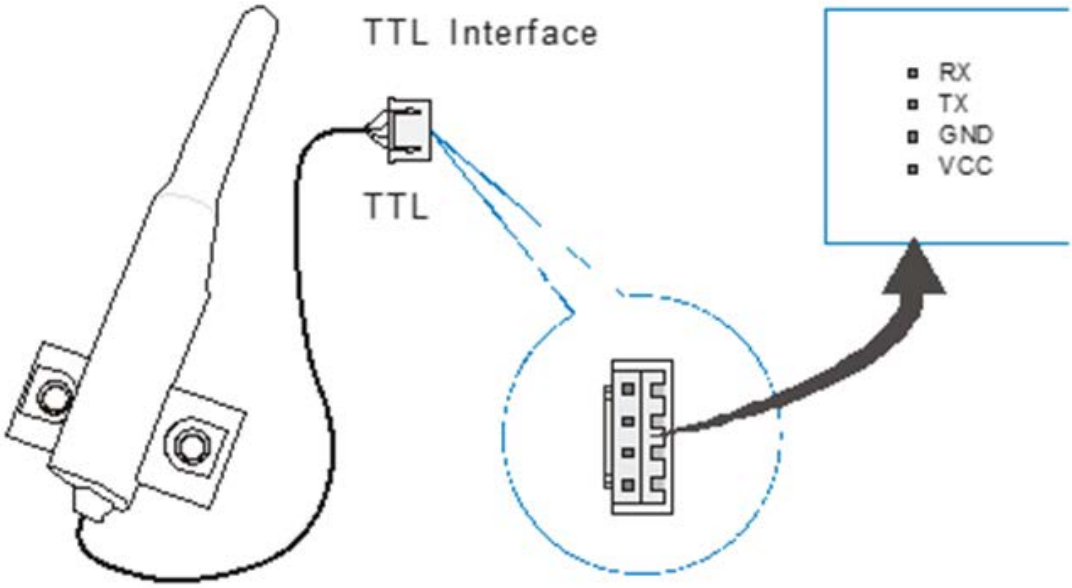


➢Pin Assignment

Model：RD232-LORA434-RS485



Model：RD232-LORA434-TTL



➢Instruction Mode

- **Enter setting mode (After power-on, it is valid for 30 seconds. It is not possible to enter the setup mode after more than 30 seconds.)**

Transmit value = 0x01+0x02+～+7E+0x7F, total = 127 Bytes

Receive value = 0x01+0x02+～+7E+0x7F, total = 127 Bytes. And it transits 0x53 hint notes every second to tell user that it is on instruction mode.

✧It needs to be in the set-up mode to read or amend any parameter.

- **Exit Code Mode**

Transmit value = 0xFF FF FF 55 CC

Receive value = None, it stops transit back 0x53 hint notes every second.

✧It needs to be in the set-up mode.

- **Read in Product Name and Model**

Transmit value = 0xFF FF FF 55 AA BB FD

Receive value (character)=LG_434_V200

✧It has information on total in 11 Bytes. That is product name, device frequency and firmware version respectively.

- **Recover Parameter**

Transmit value = 0xFF FF FF 55 AA BB FF

Receive value = None

✧Delete the original parameter and recover back to the new set code that is written in when it is out from factory.

- **Read in Inside Parameter**

Transmit value = 0xFF FF FF 55 AA BB FE

Receive value = 0xFE 03 00 00 00 80 05 06 9F 00 07 00 00 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF (Default)

✧It has information that totals in 32 Bytes, it is set inside parameter at present.

- **Set Inside Parameter**

Transmit value = 0xFE 03 00 00 00 80 05 06 9F 50 07 00 00 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF, it transits 32 Bytes in total.

Receive value = 0xFD 03 00 00 00 80 05 06 9F 50 07 00 00 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF, it transits back 32 Bytes in total. If the first byte is FD, the update is complete, and if the first byte is FE, it means the same as the internally stored setting.

✧It is 32 Bytes in total, change every parameter.

✧1st Byte: Starting parameter, fixed to 0xFE

✧2nd Byte: Interface rate, Set-up range 00～07, Beginning rate is 9600bps.

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

✧3th & 4th Byte: Group ID (GID), Set-up range 0000～FFFF

✧5th Byte: Instrument ID(SID) , Set-up range 00～FF

✧6th Byte: Fixed as 80

✧7th Byte: Transmit rate, Set-up range 00～07. Normally, the RF transmit rate must greater than interface speed rate when setting up, it prevents having the wrong information.

Value	0	1	2	3	4	5	6	7
LoRa Rate(bps)	73	146	292	585	1074	2148	5208	10416

✧8th to 10th Byte: Working frequency, Method of calculation MHz*1000=KHz then transfer to 16 Bytes.

For example: If needs at 434MHz working frequency.

434*1000=434000=0x06 9F 50 in 8th Byte fill in 06 and 9th Byte fill in 9F and 10th Byte fill in 50.

If needs at 432.5MHz Working frequency. 432.5*1000=432500=0x06 99 74 in 8th Byte fill in 06 and 9th Byte fill in 99 and 10th Byte fill in 74。

✧11th Byte:

Bit0～Bit2: Transmit rate, Set-up range 0～7

Output Power		
dBm	**Set Value**	**Hex (Bit0～Bit2)**
5	0	000
12	1	001
17	2	010
21	3	011
24	4	100
25	5	101
26	6	110
27	7	111

Bit3～Bit5: Invalid parameter, fixed as 000

Bit6～Bit7: Instrument working mode, there are four mode in total.

- **Mode 1 (Long Data Mode: Set-up as 00)**

GID of every instrument can receive info at this mode, and it can specifically use on data info that is larger than 127 Bytes.

- **Mode 2 (ID Information Mode 1: Set-up as 01)**

Once GID can transmit to particular SID instrument under this mode, it is one to many; the single info must ≦58 Bytes.

Transmission: The Data 1st Byte is the SID of the receiver, and from the 2nd Byte, it becomes data.

For Example: The SID of device A is 55 and the SID of device B is 88. Both of them have the same GID. Under mode 2, device A is going to transmit data 0x1234567890, 5Bytes in total, to B device. Then A sends data 0x881234567890, 6 Bytes. And B will receive 0x551234567890, 6 Bytes in total. The First Byte is the SID of the transmitter.

- **Mode 3 (ID Information Mode 2: Set-up as 10)**

Once GID can transmit to particular SID instrument under this mode, it is one to many; the single info must ≦58 Bytes.

Transmission: Data shall be transmitted under the same rule of the 13th to 32nd Byte.

For Example: The GID of device A=AAAA SID=55. The GID of device B=BBBB SID = 88. The GID of device C=CCCC SID=99.

Device A is going to transmit 0x1234567890 to Device B, 5 Bytes in total，A then sends 0x04FFBBBB881234567890 to B, 10 Bytes in total. B will receive 0x1234567890, 5 Bytes in total.

Device A is going to transmit 0x1234567890, 5 Bytes in total, to Device B via Device C. A then sends 0x08FFBBBB88FFCCCC991234567890, 14 Bytes in total, C will receive 0x1234567890, 5 Bytes in total, but B will not receive any data.

- **Mode 4 (Memory ID Information Mode: Set-up as 11)**

It can set in advance to save particular GID and SID way, it will transmit it back referring to the track it is saved. It can forward the track up to fourteen times, the single info must ≦58 Bytes:

- ✧ 12th Byte: Invalid parameter, fixed as 0x00
- ✧ 13th to 32nd Byte: Pre-saved track, it only works under mode 4. (Memory ID data mode)
- ✧ 13th Byte: Represents how many valid data are available in 14th to 32nd Byte.
- ✧ The 14th to 32nd Byte routing formation.
  - ◆ **Example 1: 04 FF 12 34 55 11 22 33 44~00**

    From 13th Byte, it can be seen that the effective 4 Bytes data are FF 12 34 55.

    FF 12 34 55 represents GID=1234, SID=55. When this device receives data via UR, it will automatically transmit the data to GID=1234, SID=55.
  - ◆ **Example 2: 05 FF 12 34 55 11 22 33 44~00**

    From 13th Byte, it can be seen that the effective 5 Bytes data are FF 12 34 55 11.

    FF 12 34 55 11 represents GID=1234, SID=55 and 11. When this device receives data via UR, it can automatically transmit the data to GID=1234, SID=55 and then forward the data to GID=1234, SID=11.

- **Example 3: 06 FF 12 34 55 11 22 33 44~00**

  From 13th Byte, it can be seen that the effective 6 Bytes data are FF 12 34 55 11 22.

  FF 12 34 55 11 22 represents GID=1234, SID=55, 11 and 22.

  When this device receives data via UR, it will automatically transmit the data to GID=1234, SID=55, and forward the data to GID=1234, SID=11, and again forward the data to GID=1234, SID=22.

- **Example 4: 08 FF 12 34 55 FF 45 67 88 44~00**

  From 13th Byte, it can be seen that the 8 Bytes effective data are FF 12 34 55 FF 45 67 88.

  FF 12 34 55 FF 45 67 88 represents GID=1234, SID=55 and GID=4567, SID=88. When this device receives the data via UR, it will automatically transmit the data to GID=1234, SID=55, and then forward the data to GID=4567, SID=88.