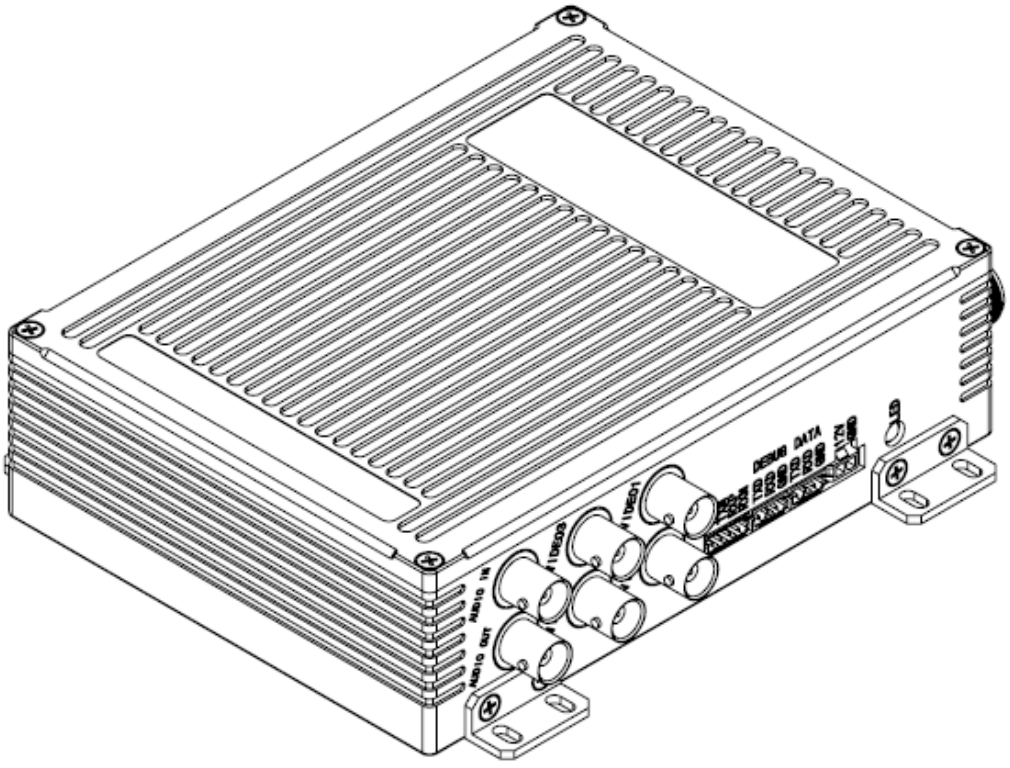
Product specification

4 channel HD bidirectional data integrated transmitter



Version V1.0

Contents

1.Product Specification 3
1.1 Product Introduction 3
1.2 Function Introduction 3
1.3 Equipment Dimension （Unit mm） 4
2.Instructions for use 5
2.1 Notes 5
2.2 Instructions for use 5
2.3 Indicator Status Definition 6
2.4 Embedded WEB UI 7
2.4.1. WEB UI Load on 7
2.4.2. Basic Parameter Setting 8
2.4.3. Video Channel Switching 9
2.4.4. OSD Setting 10
2.4.5. Data transmission parameter setting 11
2.4.6. System advanced parameter setting 12
2.4.7. System upgrade 12
2.4.8. Video loop mode 13
2.5 Serial port setting software 13
3. Device Interface 14
3.1 Interface Diagram 14
3.2 Interface Description 15
4. Equipment Technical Index 16
4.1 Figure transmission and launch system technical index. 16
4.2 Data transmission system technical Index 17
4.3 Electrical Index 18
4.4 Structural Parameter Index 18
4.5 Environmental Index 18
5. Simple Problem Solving 19

1.Product Specification

1.1 Product Introduction

It is a wireless HD transmitter device with two-way communication. This device uses COFDM multi-carrier wideband modulation technology and narrowband GFSK modulation demodulation technology. The maximum transmitting power is 4W, and the transmitting frequency point can be customized. Support video image and transmission, two-way data transmission, two-way audio transmission, OSD stack screen and other functions.

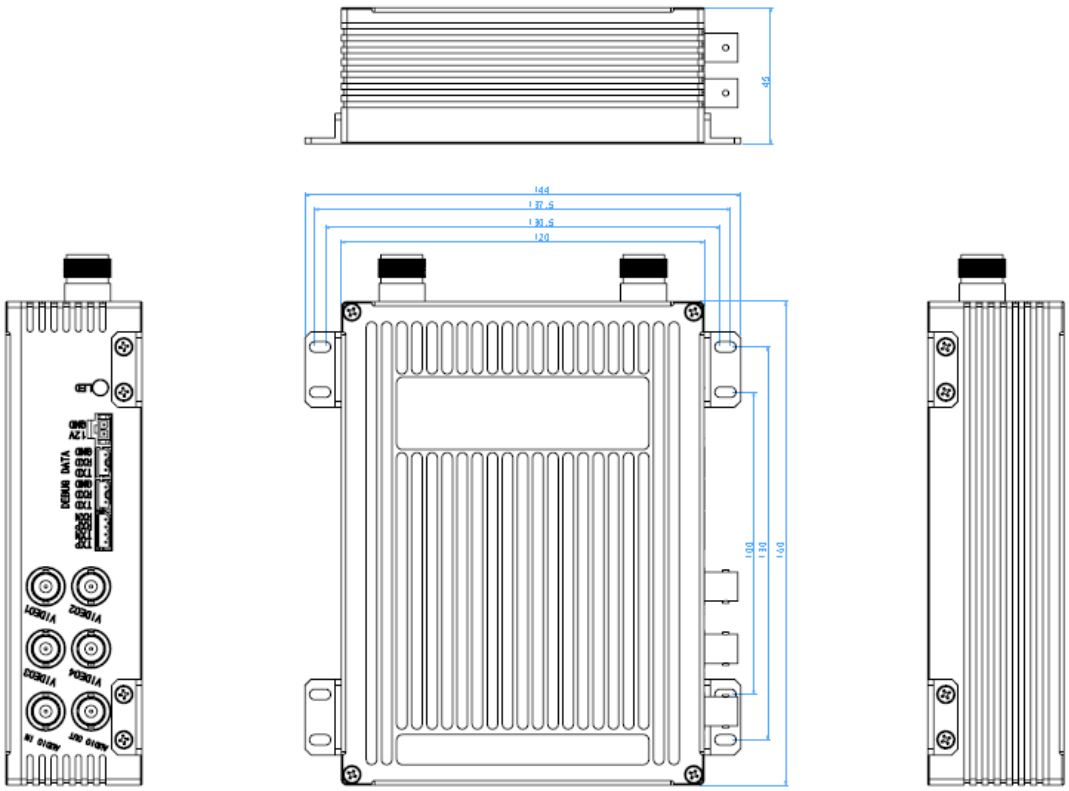
The device supports 720P/1080P in 4-channel AHD format and is compatible with PAL/NTSC analog video signals; FPGA is used for video merging, which has a variety of merging modes, low delay, and good image quality. With OSD function, you can overlay any character on the image.

1.2 Function Introduction

- Supports access to four-channel video, supports AHD HD video 576P/720P/1080P, compatible with PAL/NTSC analog video.
- With a variety of video combined mode, OSD function.
- Two-way data transmission, RS232/RS485 interface can be customized.
- With analog audio acquisition and playback functions.
- The bandwidth can be adjusted in the range of 2M to 8M, and the transmitting power is up to 4W.

- Working frequency points can be customized.
- Using COFDM modulation technology and GFSK modulation technology, it has strong anti-interference and is suitable for use in complex environments.
- Embedded WEB UI for device parameter configuration.

1.3 Equipment Dimension （Unit mm）



2.Instructions for use

2.1 Notes

Please ensure that the supply voltage is within the specified voltage range, otherwise it will cause circuit damage.

Be sure to use the specified type of antenna to ensure that the frequency band, impedance, and other parameters are matched.

The system will be subjected to external environment and electromagnetic interference during use. Before use, the surrounding electromagnetic environment should be tested to avoid the same frequency interference.

The antenna provided by our company is a full-line antenna. During use, the antenna must be perpendicular to the ground, or the transmission distance will be affected. Keep a certain distance between the antenna and the ground. The farther the antenna is from the ground, the longer the transmission distance. Try to choose in the open to the highest point, transmission and reception do not have obvious shelter, otherwise affect the transmission distance.

This equipment can only be used by our matching receiver.

2.2 Instructions for use

Before starting the device, check whether the antenna and connection cable are properly connected. Install the image transmission antenna (different frequency bands of customized devices) in the VIDEO position and install the DATA

transmission antenna (902 MHZ to 928Mhz) in the data position.

The VIDEO1 to 4 interface Connects to the video source (AHD/ analog video), the AUDIO interface connects to the audio source, and the DATA interface connects to the serial data transmission line.

The power supply must be greater than 12V 3A. After the device is powered on, the indicator is steady yellow. After 20 seconds, it indicates that the device starts to work.

Ensure that the transmitter and receiver work at the same frequency point: Frequency inconsistency will cause the graph transmission cannot be connected.

Ensure that the data transmission ID of the transmitter and receiver are consistent: If the ID is inconsistent, data transmission cannot be connected.

When there is a bad signal at either end, it can be improved by raising the antenna height and choosing the unobstructed terrain.

You can query and set parameters by using the built-in WEB UI or serial port setting software.

2.3 Indicator Status Definition

Indicator status	**Indicative meaning**
Yellow light on	System starting
Red light on	System exception, out of order
Red light flashing slowly	The system works properly: video signal and data transmission are not connected

Red light flashing fast	The system works properly: The video signal is connected, but data transmission is not connected
Green light flashing slowly	The system works properly: The video signal is not connected, but data transmission is connected
Green light flashing fast	The system works properly: video signal and data transmission are connected

2.4 Embedded WEB UI

The device allows you to query, set, and upgrade parameters on the embedded WEB page.

2.4.1. WEB UI Load on

Initial IP address of the device:192.168.1.20.

When the PC is connected to the network port of the device, the IP address of the PC is set to manual. The IP address is set to be in the same network segment 192.168.1. X as the IP address of the device, for example, 192.168.1.2; Open a browser（Internet Explorer and Google Chrome are recommended）, Enter the URL：192.168.1.20;

Initial account number：admin　Password：123456

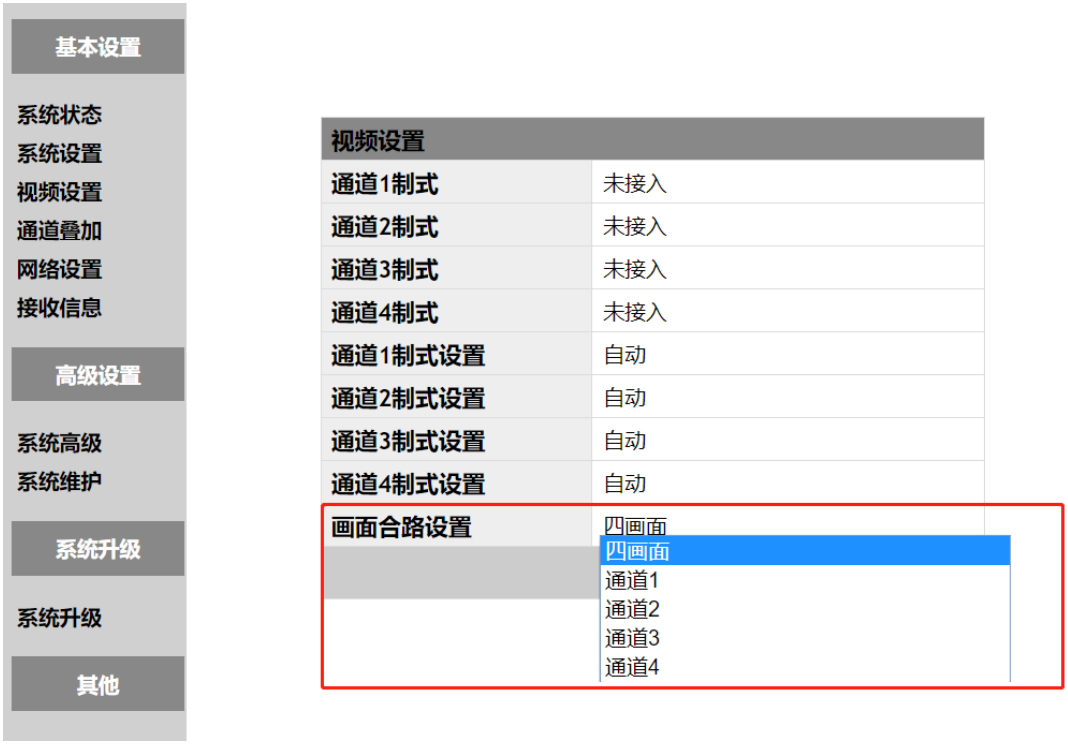
2.4.2. Basic Parameter Setting

Set the frequency point (the specific frequency point is determined by the device) The frequency point of the transmitter and receiver must be consistent in order to communicate; Range of transmitting power 20~36dBm.

If the AES128 switch is enabled, the AES switch must be enabled on the receiver and the key must be the same.

The matching ID of the transmitter and receiver must also be consistent, and inconsistent image transmission will not be connected.

2.4.3. Video Channel Switching

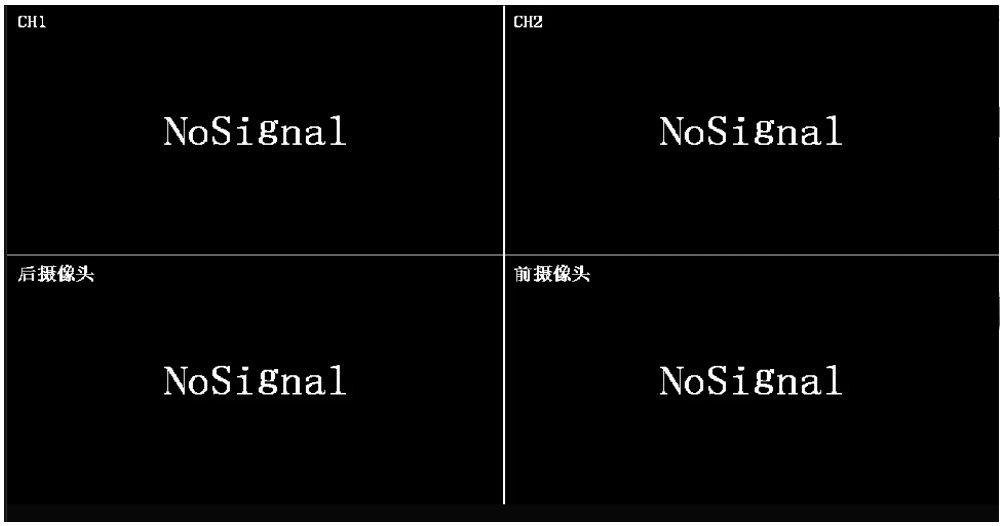


Check the camera access system, and switch between the single picture and the combined picture.

Merge mode is set in "Video Merge Mode" in "Advanced Settings".

2.4.4. OSD Setting

Set OSD channel overlay to support Chinese and English. The overlay effect is shown in the following figure:



2.4.5. Data transmission parameter setting

Data transmission parameters are viewed and set in this page, and "data transmission connection status" is viewed in this page.

The data transmission ID of transmitter and receiver must be set to be the same.

2.4.6. System advanced parameter setting

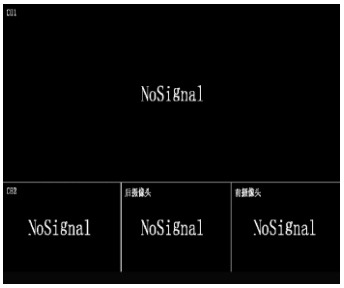
Set transmission channel bandwidth, through-transmission serial port baud rate, video combined-channel mode.

2.4.7. System upgrade

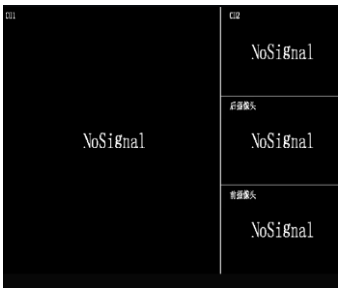
You can upgrade the system firmware on this page. During the upgrade, do not restart the system to avoid system damage.

2.4.8. Video loop mode

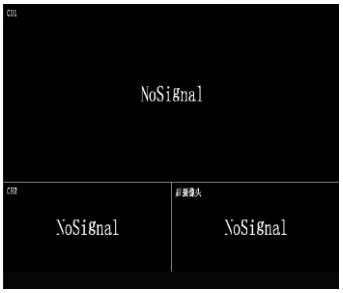
Four split screen mode



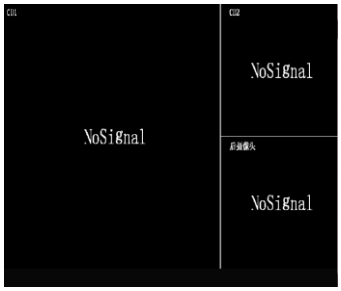
Four-way up and down mode



Four-way left and right mode

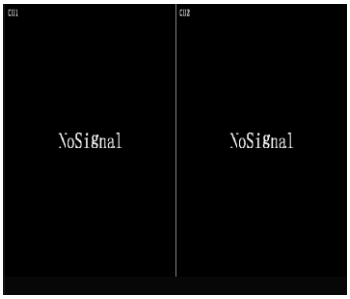


Three-way up and down mode



Three-way left and right mode

Two-way up and down mode



Two-way left and right mode

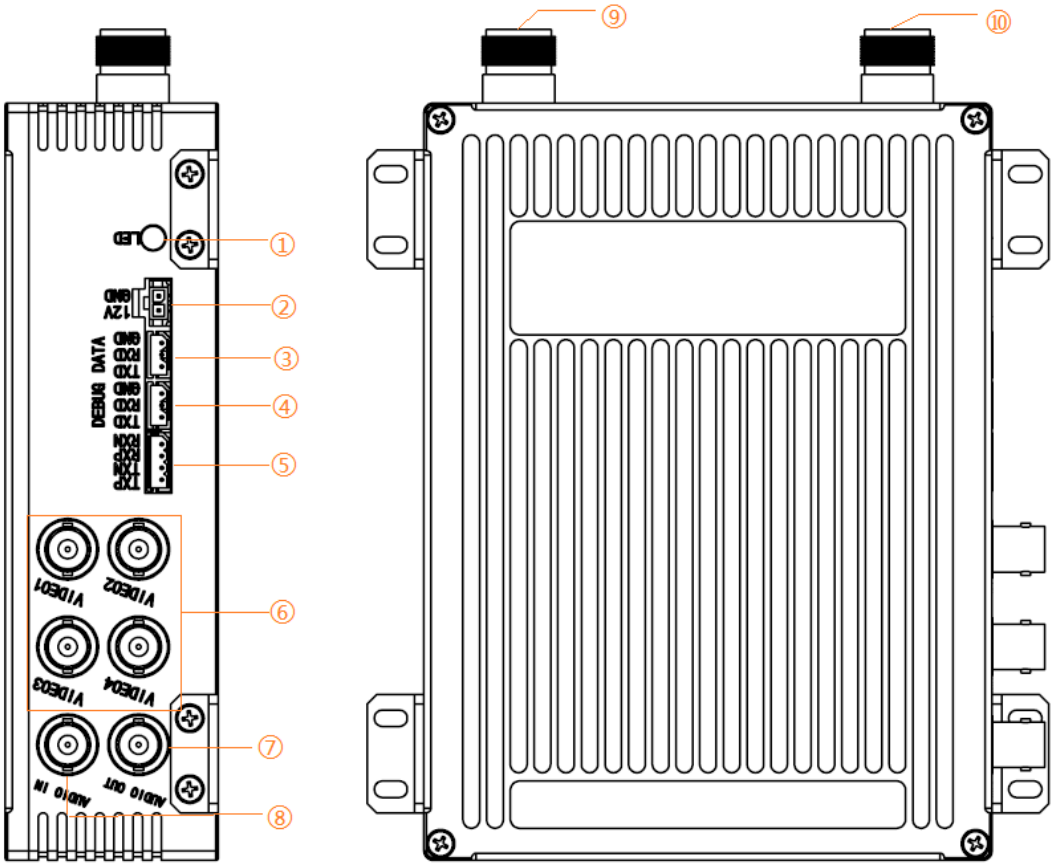
2.5 Serial port setting software

Our company provides serial port setting software, which can be used to query, set, and upgrade parameters.

The PC connects to the DEBUG port of the device through RS232 cables. The default baud rate is 115200.

3. Device Interface

3.1 Interface Diagram



3.2 Interface Description

No.	Interface identification	Interface Description	Interface
1	LED	For details about device status indicators, see 2.3	LED double color light
2	12V	The power supply voltage ranges from 9 to 15V. The typical value is 12V 3A	Molex3.0 2PIN
3	DATA	Data transmission interface, RS232/RS485 level, Default RS232 level, For transparent data transmission, support baud rate 115200/38400/19200/9600, default115200	Molex2.5 3PIN
4	DEBUG	Parameter setting port, RS232 level, You can use serial port setting software to query or set parameters. The default baud rate is 115200, see 2.5 for details	Molex2.5 3PIN
5	Ethernet	Network, our company has a transfer board which can be converted into normal RJ45 interface. It can be used to access the system WEB, see 2.4 for details, or connect our player to play the audio and video of the transmitter, also can be used for business development based on TCP/IP.	Molex2.5 4PIN
6	VIDEO1-4	Video interface, support four AHD/PAL/NTSC input	BNC
7	Audio OUT	Analog audio output interface, passive analog audio signal output, plus operation amplifier power amplifier needs to be customized	BNC
8	Audio IN	Analog audio input interface, active analog audio signal input by default	BNC
9	VIDEO ANT	Graph transmission antenna, frequency points according to the equipment frequency band changes	SMA
10	DATA ANT	Data transmission antenna, fixed frequency band 902~928	SMA

4. Equipment Technical Index

4.1 Figure transmission and launch system technical index.

Parameter	**Index Requirements**
Working frequency	330MHz ~ 360MHz, 420MHz ~ 450MHz 1427MHz ~ 1447MHz（Frequency band can be customized）
Carrier bandwidth	2 MHz,4MHz,8MHz
Maximum output power	≤36dBm(20dBm ~ 36dBm adjustable)
Video input format	4*AHD or CVBS, support 1080P,720P,576P, PAL adaptive
Audio input format	Active analog audio input
Audio output format	Passive analog audio output (audio op player needs to be customized)
Encryption mode	AES128
Modulation mode	COFDM
System delay	≤320ms
Constellation modulation	QPSK,16QAM,64QAM
Video codec	H.264
Immediate power rejection ratio	≤-35dBc/30kHz@8MHz
Port input level	≤10dBm
Input voltage standing wave ratio	≤2.0

4.2 Data transmission system technical Index

Parameter	**Index Requirements**
Working frequency	902MHz ~ 928MHz
Modulation mode	GMSK,2GFSK,4GFSK,QPSK
Carrier bandwidth	25KHz@19.2bps,400KHz@345Kbps,
Maximum output power	≤30dBm(20dBm ~ 30dBm adjustable)
Frequency setting	Frequency Hopping
Forward error correction mode	Hamming, BCH, Golay Reed-Solomon
Encryption mode	AES
Receiving sensitivity	-114 dBm @ 57.6 kbps -112 dBm @ 115.2 kbps -109 dBm @ 172.8 kbps -107 dBm @ 230.4 kbps
Transmission rate	57.6bps ~ 276kbps
Connection mode	Point-to-point, point-to-multipoint, Multipoint networking（MESH）

4.3 Electrical Index

Parameter	**Index Requirements**
Rated operating voltage	Typical value: DC+12V Limit value: DC9~15V
Rated working current	⩽2.5A @ DC12V @36dBm
Rf connector impedance	50Ω
Audio-video impedance	75Ω

4.4 Structural Parameter Index

Parameter	**Index Requirements**
Overall dimension	120m*160mm*45mm
Module weight	⩽850g
Structural material	Aluminum alloy 6061
Structure surface treatment	Internal anodized natural color, black shell spray paint

4.5 Environmental Index

Parameter	**Index Requirements**
Working temperature	-40℃ ~ +60℃
Storage temperature	-40℃ ~ +85℃
Relative humidity	95%（40℃）
Protection grade	IP31

5. Simple Problem Solving

No	Problem Description	Possible Solutions
1	The picture cannot be transmitted, and there is no image display at the receiving end	1. Check whether the transmitter is powered on and whether the transmitter and receiver indicators blink normally 2. Check whether the transmitter camera is connected 3.Check whether the frequency transmission points of the transmitter and receiver diagram are consistent 4. Check the diagram transmission antenna 5. Check whether AES encryption and matching ID are enabled
2	Digital impassability, the robot is out of control	1.Check the ID settings of the master and slave of data transmission 2.Check the data transmission antenna 3.Whether the RS232 line sequence is wrong 4. Whether the interface is correctly connected 5.Whether the baud rate is consistent
3	The receiver is too weak to pull far	1.Check the connection between the transmitter antenna and the relevant connection 2.Check the power supply of the transmitter 3.Check the transmitter transmission power
4	Distance is not far	1.Check whether there is any interference source such as power supply in the whole receiver, and adopt shielding or isolation treatment 2.Check the receiver bottom noise, change the working frequency point 3.Change the test location