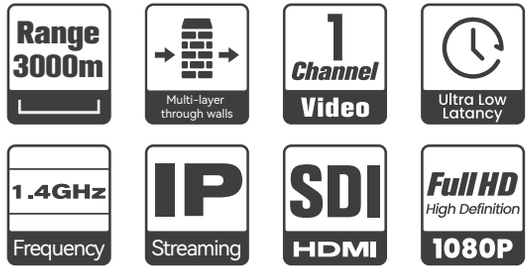
Dragon Fire
VL-9000 1.4G 3000M
Single Channel
Wireless Video Transmission System

User Manual



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1. About this user manual + Product Overview + Product List

About this user manual

This user manual introduces VL-3000T full function wireless video transmission specifications、instructions、 attentions and troubleshooting.

Before using this product, please carefully read this manual. If you have any doubts or troubles while using this product, please contact us or our dealers.

Product introduction:

VL-9000 is an innovative product that transmits and receives full HD audio and video wireless transmission. This system supports the highest video resolution of 1080P/60HZ, and is based on 1.4G low-frequency wireless network technology for transmission. It has stronger penetration and can easily pass through multiple buildings or 4-5 floors. Using H.265 codec technology for image processing, the image is clearer and the delay is lower. It supports HDMI/SDI/422 network port input and output, and can be adapted to various types of cameras, pan/tilts, cutter stations and other equipment to meet the needs of video live broadcast, multi-screen monitoring, etc. It is a good companion for team directors to shoot live broadcasts.

Product List

1.Receiverx1 2.1.4G antennax4 3.Network cable x1 4.SDI Cable x2
5.Transmitterx1 6.422 network cable x1 (optional)
7.Receiver power adapterx1 8.Double ball head magic armx1

2. Product Features

■ **Through-wall and non-line-of-sight transmission characteristics**

This product is designed based on 1.4Ghz wireless network technology. The lower frequency makes it have better penetration characteristics and can transmit under non-line-of-sight conditions, and this frequency operation is not easily interfered by the external environment.

■ **High quality and low latency**

This product supports HD-SDI&3G-SDI input and output ,supports HDMI Full HD input and output,the best resolution is 1080P/60HZ.It adopts H.265 encoding and decoding technology with high compression rate and high video quality ,the latency as low as 70ms.

■ **Optional video quality**

3 different video quality to select, easy to deal with bad wireless environment.

■ **2X2 MIMO**

Combined with 2x2 MIMO technology, this product has superior transmission distance and image bit rate than other WIFI products on the market.potential. Beamforming technology makes wireless signals more concentrated and stronger in the direction from transmission to reception, so that wireless signals can transmit farther and is less susceptible to interference from other signals, making it more stable.

■ **RS422，RS232 transparent transmission**

This product supports RS422, RS232 transparent transmission, which is convenient for the device connected to receiver to transmit control commands to camera, such as the pan-tilt-zoom(PTZ) camera.

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■ **Support point-to-point and RTSP streaming mode**

This product supports both point-to-point and RTSP streaming mode. In point-to-point mode, the product supports one transmit one receive and the video output port is HDMI or SDI. In RTSP streaming mode, the product supports one transmit one receive, and the video stream port is RJ45 network port. There are more choices for different applications.

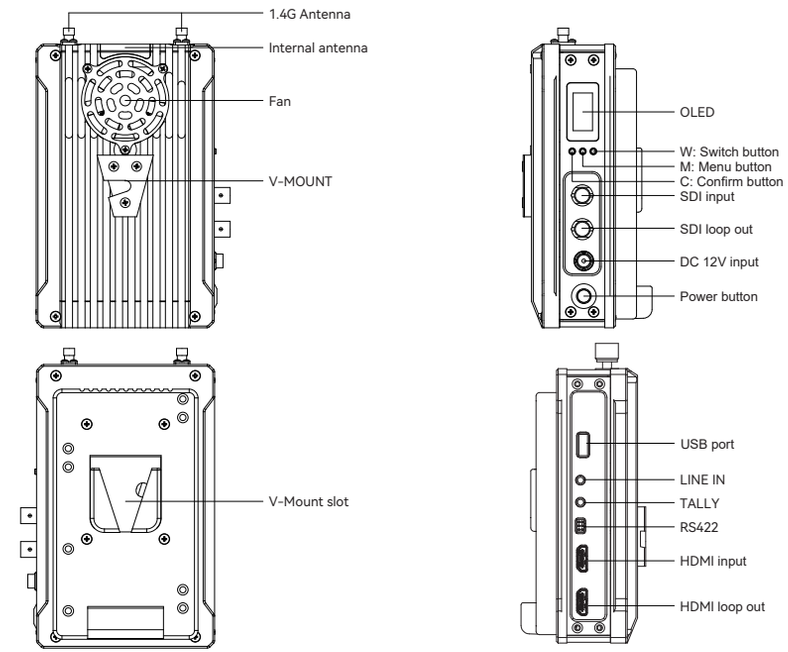
3. Product Specification

Working Frequency	CH1 5180, CH2 5200, CH3 5220, CH4 5240, CH5 5745, CH6 5765, CH7 5785, CH8 5805, CH9 5825
Antenna Mode	Transmitter 2X2 MIMO External antenna, Receiver 4X4 External antenna
Modulation Mode	OFDM
Transmitting Power	33dbm
EVM	≤-28dB
Receiving Sensitivity	≤-80dBm
Channel Bandwidth	20MHz
Wireless Standard	1.4G
Network Encryption	ON
Network Mode	Point-to-Point private protocol, RTSP protocol
Transmission Distance	3000m (each channel video bitrate is 8 Mbps)
Transmission Delay	70ms (min)
Bind Function	Support
HDMI Protocol	Support HDMI1.4
Video Resolution	**SDI:** SMPTE 296M 720p50,720p59.94,720p60, SMPTE 274M 1080i50,1080i59.94,1080i60,1080p23.98,1080p24, 1080p25,1080p29.97,1080p30 SMPTE424M 1080p50,1080p59.94,1080p60 **HDMI:** 720p50,720p59.94,720p60, 1080i50,1080i59.94,1080i60,1080p23.98,1080p24, 1080p25,1080p29.97, 1080p30,1080p50,1080p59.94,1080p60
Audio Format	SDI or HDMI embedded audio Video transmission audio: PCM sampling rate 48KHz 16bits
Video Compression Format	H.265 encode/decode
Remote Control	RS422default

User Manual Dragon Fire VL-9000 1.4G Single channel Wireless Video Transmission System

Interface	**Transmitter** SDI input X1; SDI loop out X1 HDMI input X1; HDMI loop out X1 SMA 1.4G antenna connector X2 Built-in Tally X1 External 3.5mm Tally input X1 DV port X1 F970 battery slot X1 V-mount port slot X1 FanX1 422 interface X1 LINE IN port X1	**Receiver** SDI output X1; HDMI output x1; DB9 (Tally input) X1; SMA 1.4G antenna connector X2; XLR power chargerX1 Metal power switchX1 RTSP interface X1 ; RS-422 interface X1; OLED screen X1; Button X3; V-mount slot X1;
Power Consumption	26W	16W
Working power	DC 12V/2A	DC 12V/2A
Temperature Range	-10°C - 50°C (Operating temperature) ; -40°C - 80°C (Storage Temperature)	
Operating Voltage Range	7-18.6V	

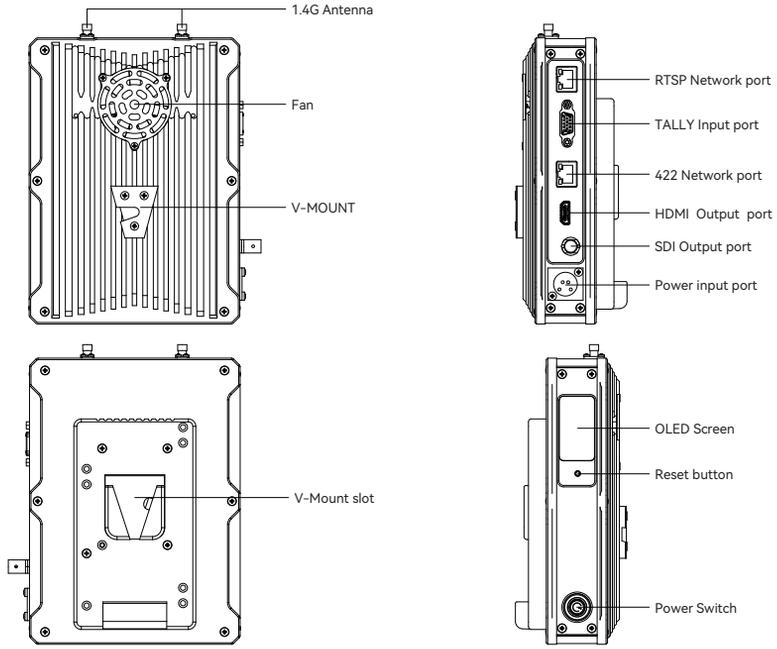
4. Transmitter three side diagram and button definition



Button	Operation	Description
C	Short press	Confirmation for menu
M	Short press	After a short press, the menu will cycle and enter different menus. There are a total of 4 pages of menus, namely 1. Initial information page 2. RTSP setting page 3. 422 baud rate setting page 4. Image quality selection page These four pages
W	Short press	Switch button: Select menu options

12.7V

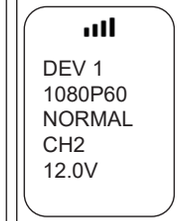
5. Receiver three side diagram and button definition



Button	Operation	Instruction
Freq button	Short press	Can control the system to switch wireless communication frequency points

6. Transmitter and receiver initial information description

Transmitter initial information definition



- The first line is signal strength status;
- “DEV”: the number of the transmitter; “1”: the transmitter is number 1. Because the system is one-to-one video transmission, there is only transmitter-1.
- “1080P 60”: the current video input resolution is 1080P 60 frames. If there’s no video source signal input, the line will display “NONE” .
- “NORMAL”: the transmitter is operating in normal mode not RTSP mode. If the transmitter is operating in RTSP mode, the line will show “RTSP”;
- “CH2”: the current working channel is channel 2.
- “12.0V”: the current input voltage is 12.0V

Receiver initial information definition

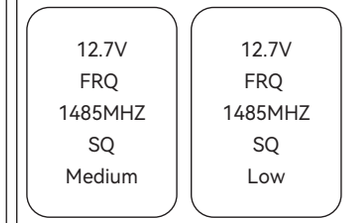


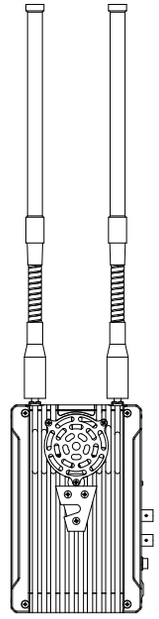
Image1 Image2

12.7V is the current voltage of the receiver, FRQ represents the current frequency point, and SQ represents the current code rate. There are three levels: high, medium and low.

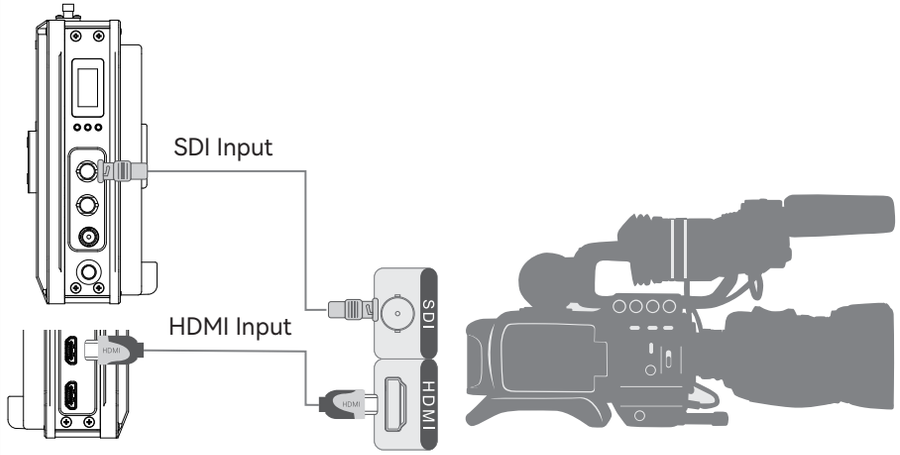
7. Installation method and instructions for usage

Transmitter

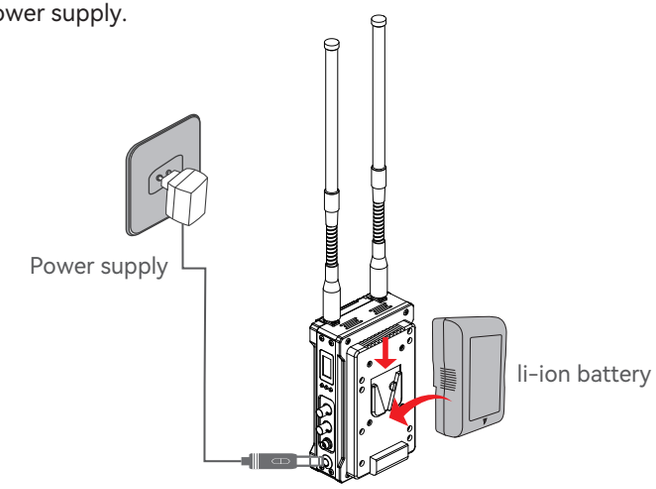
1. Connect two 1.4G long antennas to the SMA video signal antenna interface on the top and place them vertically



2. Connect the transmitter to the camera via HDMI cable or SDI cable.

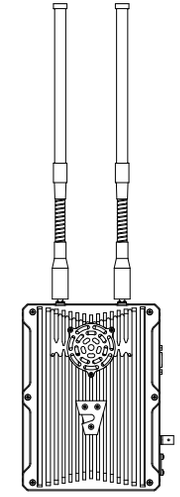


3. Please try to keep the transmitter at a height above 1.5 meters to ensure signal quality.
4. In order to obtain the best transmission signal quality, it is best to keep the distance between multiple transmitters at least 1.5-2 meters.
5. Power on the transmitter and connect it to a V-shaped external lithium battery or DC 12V power supply.

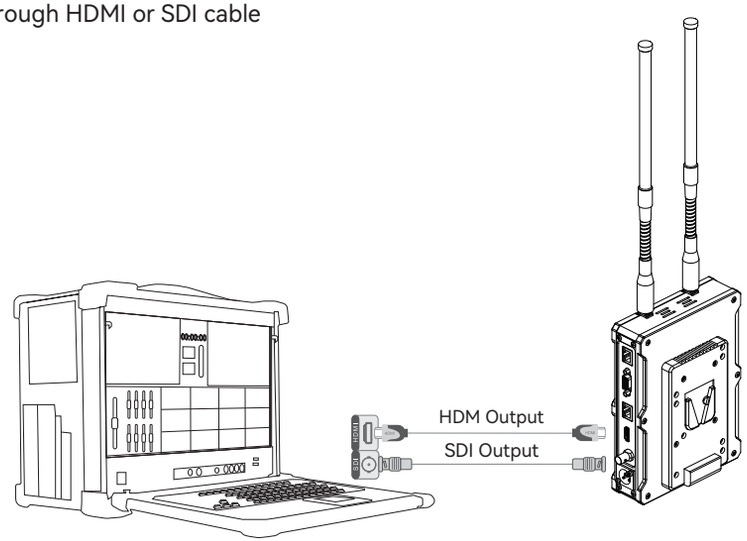


Receiver

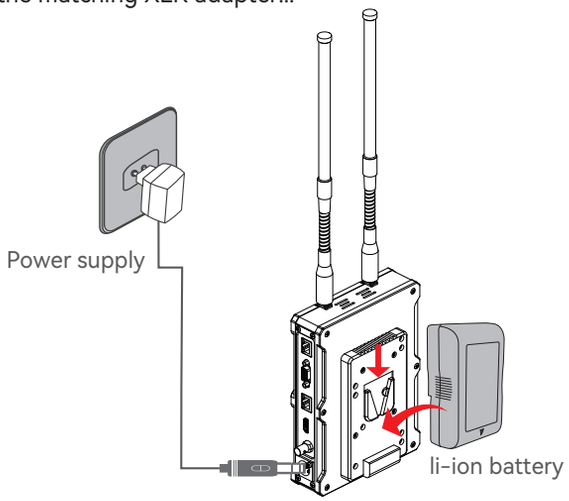
1. Connect two 1.4G antennas to the SMA video signal antenna interface on the top of the receiver and put them vertically



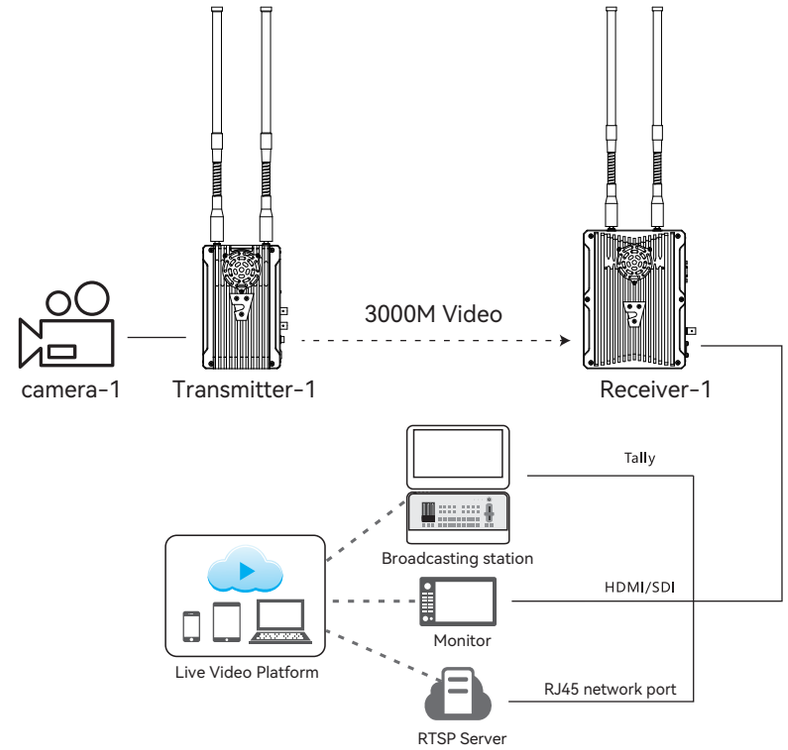
3. Connect the receiver to the broadcasting station or the interface between it through HDMI or SDI cable



4. Connect to the receiver power supply, you can use a V-shaped external lithium battery or the matching XLR adapter...

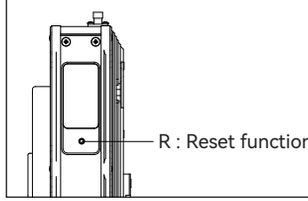


7.Product connection diagram



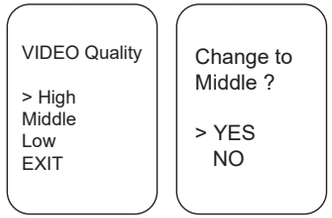
8. Reset function

Reset button: Long press to allow the system to reconfigure the frequency table.



9. How to switch video quality

Short press the M button on the transmitter to switch the transmitter menu to the video quality switching interface.



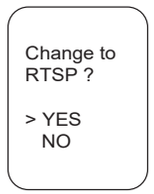
Press the W key to select the desired image quality, and press the C key to confirm. The LOW image quality can ensure that the signal works stably in a more intelligent environment.

10. How to switch RTSP, RTSP steaming instructions

RTSP streaming mode

In RTSP streaming mode, the video source transmits via HDMI or SDI to the transmitter, and the receiver gets RTSP network signal from the transmitter, monitors on the switch console via the network port to the router.

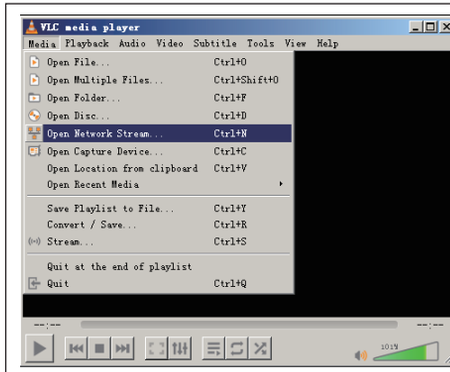
When using the RTSP mode, the transmitter needs to switch to RTSP mode.
Short press the M button on the transmitter to enter the RTSP mode, select RTSP, and then short press the C button to confirm.

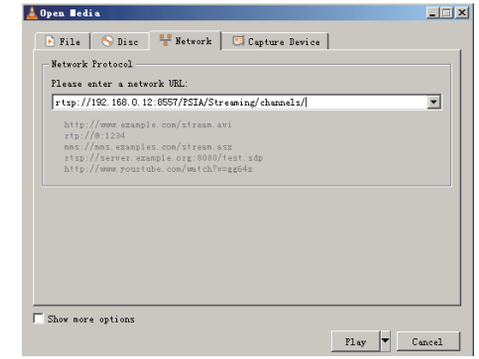


The OLED screen will return back to the initial info and show RTSP, indicating that this transmitter has been in RTSP streaming mode. In this mode, there is no video output from the receiver's SDI or HDMI.

The video signal needs to be transmitted to the streaming software via the LAN port of the receiver for decoding and monitor. Using RTSP streaming mode needs software to decode. There are many streaming software. The following description takes VLC media player for example. Once the transmitter and receiver are connected, the transmitter network indicator light is on, and the receiver network connection shows normally; The transmitter connects the video source via HDMI or SDI , and the receiver connects to RTSP streaming devices through a LAN port.

Take VLC on PC as an example, after opening VLC, select "Media" option, then select "Open Network Stream...",
Please enter a the network URL
rtsp://192.168.0.1X:8557/PSIA/Streaming/channels/, "X": the transmitter number. You can check the number on the initial info of the transmitter's OLED screen. If it is number 1, fill in 1. As below:
rtsp://192.168.0.11 :8557/PSIA/Streaming/channels/



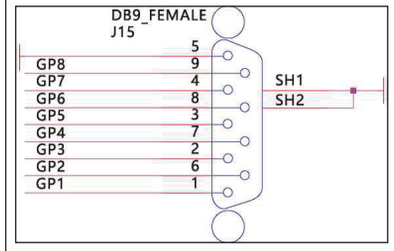


Click "play" to start RTSP streaming.
Attention: the transmitter must be connected to the video source, and the IP Address (e.g. the one used by the PC) of the RTSP streaming device must be on the same network segment as that of the encoding board. Otherwise, the RTSP streaming mode will not work.

11. About Tally

Tally function usage instructions:

First insert the tally light into the tally output interface of the transmitter, and then connect the switching station to the tally input interface of the receiver. Then you can control the tally light of the transmitter through the switching station. When the receiver is triggered by a low level, the transmitter tally light turns on.
The tally interface of the transmitter and receiver; the tally interface of the transmitter is a standard Φ3.5mm headphone interface; the tally interface of the receiver is a DB9 female interface;
The VL-9000 transmitter comes with a built-in TALLY light, and can also be connected to an external 3.5MM tally light. The Tally input interface DB9 head is defined as follows:
The VL-9000 transmitter comes with a built-in TALLY light, and can also be connected to an external 3.5MM tally light. The Tally input interface DB9 head is defined as follows:

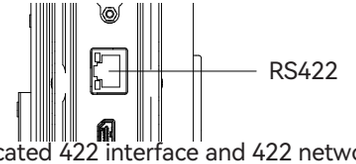


D89 pin	Tally definition	Description
1	1R	Camera-1 Red
6	1G	Camera-1 Green
2	2R	Camera-2 Red
7	2G	Camera-2 Green
3	3R	Camera-3 Red
8	3G	Camera-3 Green
4	4R	Camera-4 Red
9	4G	Camera-4 Green
5	GND	Ground

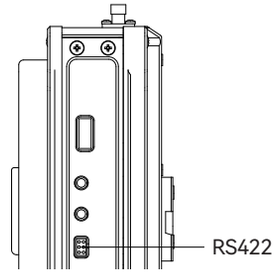
12. RS232/RS422 transparent transmission and PTZ control function

Attention: the connector is RS232 by default. If you need RS422, please contact the sales in advance!

The receiver has a built-in RJ45 network port. You can directly connect the switch console 422 network port signal to the receiver 422 network port.



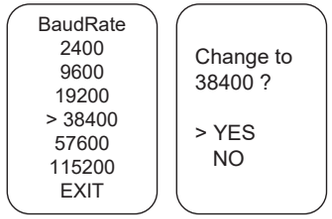
The transmitter has a dedicated 422 interface and 422 network port. Use the included 422 serial port conversion network port cable to connect to the network port of the gimbal camera to achieve the 422 transparent transmission function.



For different serial port baud rates of different gimbal cameras, you can refer to the next chapter to set the serial port baud rate chart.

13 .How to switch the 422 serial port baud rate to adapt to different PTZ control commands

When the transmitter OLED show the initial menu, press the M button to switch to the BaudRate page, press the W button to select the serial port baud rate you need, press the C button to confirm.



14. Troubleshooting

Problems	Solutions
If there is mosaic and lag	a) Please place the transmitter and the receiver at a height of 1.5-2 meters above the ground. b) Please arrange the antennas to be fan-shaped, and each has a clear line of sight. c) If the surrounding wireless environment is too complex or you need to the system go through more walls,You can try to set the “Video Quality” to “LOW” to reduce the bitstream and ensure the system works smoothly. When multiple transmitters are working at the same time, please make sure that the distance between each transmitter is at least 2 meters. d) If there is still mosaic or lag, you can try to switch frequency.。
If there is frame loss and image tail	Check the software version after changing the latency configuration, and contact technical personnel to confirm. If the software version is too low, you need to upgrade it.。
The transmitter & receiver are unable to establish a connection	a) After switching frequency, restart the transmitter and receiver; b) Try to re-bind.

15. Attentions

1. First, connect the transmitter to the video source with HDMI or SDI cable, then connect the receiver to the monitor, finally turn on the device.
2. If the receiver output is black screen after switching the video source resolution, please re-plug the HDMI/SDI cable of the transmitter or receiver. If the system cannot work normally after re-plug the HDMI/SDI cable, please power off and restart the transmitter and receiver.
3. When the transmitter and receiver cannot connect for a long time after switching frequency, please power off and restart the transmitter and receiver.
4. If bind fails, you can try to rebind. First set the transmitter in bind and then the receiver.
5. When the TX and RX connect normally, there is no output on the monitor or only OSD output no normal video output, please re-plug the HDMI/SDI cable connected to the receiver and check if the monitor is standby. When the above operation still cannot output normally, please try to replace the monitor.
6. If the video is stuck or mosaic when using the system, it is usually caused by network interference. Please try to switch the system frequency to avoid the interference. For frequency switch operations, refer to chapter 9.
7.Please install the antennas before powering on the system. Otherwise, it may cause damage to the system.
8.This product’s video signal can go through the wall. However, if you need to go through too many and too thick walls, it will affect the use effect. You can consider using LOW video quality options to increase the penetration ability.
9. When using the system, the surrounding environment may affect the wireless transmission quality. The poor wireless environment may lead to video and sound distortion, such as video pause, noise and so on. So please pay attention:

- Walls, large sheets of metal, and various instruments that affect wireless transmission. Try to avoid using this system in these environments.
- Using this system in crowded areas, please place the transmitter and the receiver at a height of 1.5-2 meters above the ground.
- If there are 1.4GHz wireless devices working nearby, these may also cause interference to the system. You can switch to a different frequency manually in this case.
- Please do not put this system in a metal container, because it will affect wireless transmission. If it is unavoidable, please ensure that each antenna has a clear line of sight.
- The transmitter and receiver are located at a height of 1.5-2 meters above the ground, please arrange the antennas to be fan-shaped, and ensure each has a clear line of sight.