

VDC-7/VDC-15

Long Range Video/Data/RC Transmission System

User Manual

V1.0

2019.06



FOXTECH

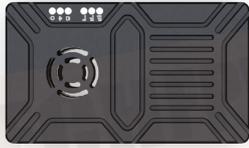
Contents

Note	3
Packing List	4
Important Notice	5
Product Introduction	6
Installation	7
Air Unit Interface Definition	8
Ground Unit Interface	10
HDMI Image Output Usage	12
Network Port Video Output Usage	13
Data Transission Usage	15
Device Parameter Setting	16
Wireless Signal Bandwidth Configuration Function	19
FAQ	20

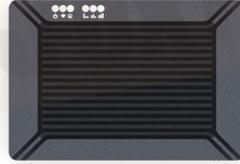
Note

- Please read this user manual carefully before use. Once used, it is considered as acceptance of the entire contents of this statement.
- Please ensure that the product is used in accordance with local laws and regulations, and strictly observe the radio frequency management regulations of the region, use the specified frequency band, and comply with the restrictions on power and radiation.
- Please strictly follow the installation steps in the manual to operate and use the product. FOXTECH Technology Co., Ltd. and its affiliates will not take any legal responsibility for any equipment loss or personal safety damage caused by improper use, installation, modification, etc.
- This user manual is copyrighted by FOXTECH Technology Co., Ltd. and may not be reproduced in any form without permission.

Packing List

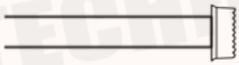


Air unit



Ground unit

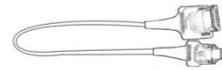
Accessories



Power/Data Cable x2



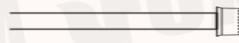
Antenna x2



HDMI A to D 1



Glassfiber Antenna + magnetic chassis x2



SBUS cable x2



MMCX to SMA cable x4

Important Notice

This product belongs to wireless transmission equipment, please read the following notes carefully:

Installation Notes

1. Before use, please make sure that the device and the antenna are connected reliably, otherwise the device will be damaged.
2. Please ensure that the power supply voltage of the equipment is within the rated voltage range of the equipment, otherwise it will cause equipment damage.
3. Please ensure that the antenna of the sky end is facing vertically downward and there is no obstacles, otherwise the communication distance will be affected by the blocking.
4. The antenna should be installed as far as possible from other large metal parts, and at least 20 cm clearance should be guaranteed around the antenna.
5. Be sure to use the antenna of the manufacturer's specified model to ensure that the frequency band, impedance and other parameters match.
6. Please pay attention to the proper distance between the electronic devices when installing the equipment to ensure that the electromagnetic interference between the devices is minimized.

Using Notes

1. Make sure all cables are properly connected and secure.
2. Make sure there is no foreign matter entering inside the device (eg liquid, sand, etc.).
3. After the device is powered on, it takes about 15s to start. After the startup is completed, data transmission can be performed.
4. Please ensure that the surrounding environment of the device is not interfered by the high-power wireless transmitting device of the same frequency, otherwise the receiver may not receive the image normally.
5. In the case where the ground-end receiver signal is not good, try to improve by changing the direction of the receiver antenna tilt.
6. For the matching network cable, display and other components, try to use products with better electromagnetic shielding performance.

Product Introduction

VDC is a highly integrated data transmission system which has RC, datalink and videolink built inside. It adopts H.265 video codec and OFDM modulation technology to provide a transmission experience with lower delay and longer distance. It is suitable for applications such as drones that require both image transmission and data transmission.

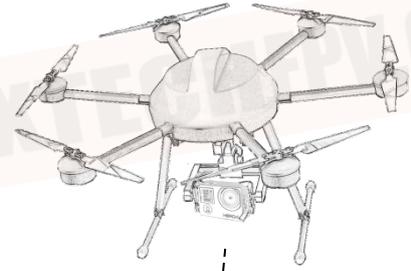
Features

- Both Video and Data Transmission
- Support UART/SBUS/CAN port It can transmit multiplex data simultaneously;
- Support HDMI/CVBS video input adopts H.265 codec resolution 1080P60
- Long transmission range, has 7km and 15km version
- Can modify the product configuration by serial port, you can modify the module's wireless frequency band / output power;
- With bandwidth switching function
- Support USB video record.

Specification			
Frequency	800MHz/1.4GHz/2.4GHz	Modulation	OFDM
Bandwidth	10MHz/20MHz	Output Power	Max. 25 dBm
Video input	HDMI/CVBS	Data input	UART/SBUS/CAN
Video Output	HDMI/RJ45	Data Output	UART/SBUS
Encoded/Decoded	H.265/H.264	Video resolution	1080p60
Video bitrate	2 ~ 12Mbps	HDMIinterface	Type A
voltage	9 ~ 28V	Antenna interface	MMCX
Size	93.5X54.5X15.5mm (air)	weight	98.5g (air)
	93.5X63.5X18mm (ground)		121.4g (ground)

Installation

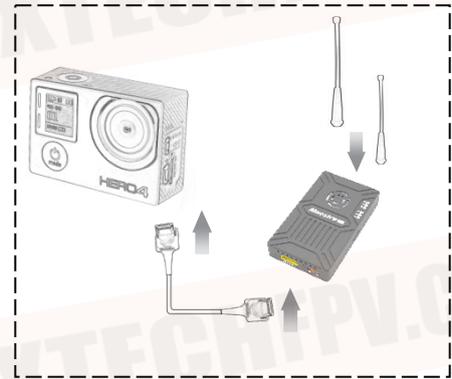
Take a multirotor as an example:



Air Unit Video Input

Fixed the air unit on the proper place of the drone,
Fix the antenna the antenna facing vertically downward
Connet the camera and transmitter use an HDMI cable
then power on.

💡 please make sure that the transmitter and the antenna are connected reliably, then power on, otherwise the transmitter will be damaged.



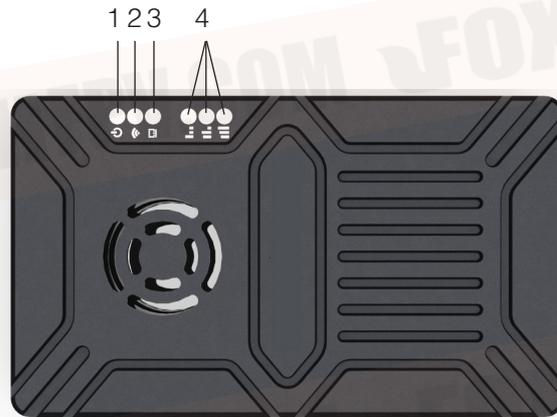
Video Receiving on the Ground

Connect the HDMI interface of ground unit to monitor with HDMI cable connect the receiver antenna reliably then power on.

- 💡
1. While installing, please check if each interface connect tightly to avoid the aircraft shake which will damage the equipment and accessories;
 2. The position of the transmitter antenna has a great influence on the image transmission distance. So must avoid any metal parts of the aircraft close to the antenna, while keeping the antenna away from any obstructions within 20cm to ensure the effective transmission of signals;
 3. Reasonably plan the frequency of all wireless devices on the drone to avoid the equipment being unable to be used normally or accidents due to improper frequency planning.



Air Unit Interface Definition



- 1 Power indicator.
- 2 Established connection Indicator.
- 3 Status indicator flash 3 seconds if the power-on initialization is successful flash 3 seconds if mode switching is successful.
- 4 WIFI Signal Strength indicator 3 are all on-strong signal, 2 are on- moderate signal, 1 is on-weak signal.



5 Power/Data interface

No.	Identifying	Signal	Direction
1	V+	+12V Power input	I
2	V+	+12V Power input	I
3	V-	Power GND	I
4	V-	Power GND	I
5	T	TXD	O
6	R	RXD	I
7	G	Singnal GND	I

6 CAN Interface

No.	Identifying	Signal	Direction
2	G	Power GND	O
3	L	CAN_L	O
4	H	CAN_H	O

7 USB Interface Micro USB Support OTG

8 CVBS Video Input Interface

No.	Identifying	Signal	Direction
1	G	Signal GND	I
2	S	AV input	I

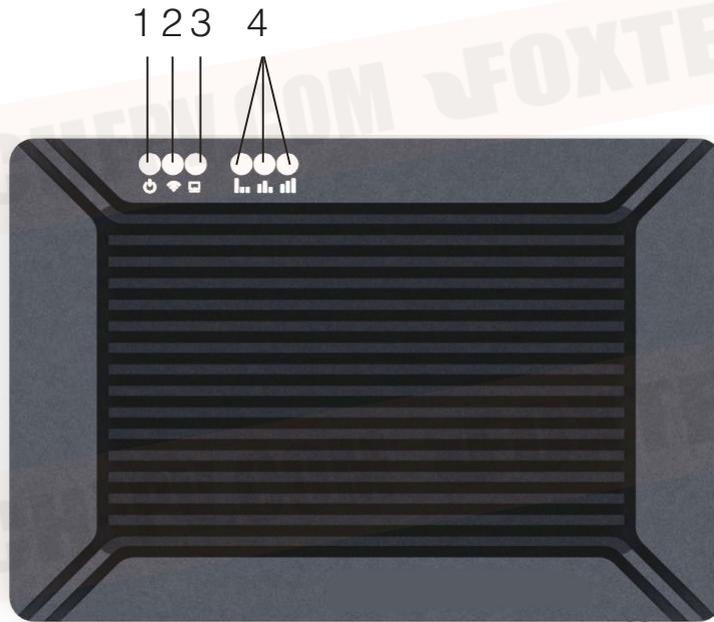
9 SBUS output interface

No.	Identifying	Signal	Direction
1	G	Signal GND	O
2	V	+5V Power Output	O
3	S	SBUS_OUT	O

10 HDMI Type A Video Input Interface

11 Mode Select Switch WB is wideband mode NB is Narrow-Band has the ability to resist interference in the same frequency band.

Ground Unit Interface



- 1 Power Indicator
- 2 Established connection Indicator
- 3 Status indicator flash 3 seconds if the power-on initialization is successful flash 3 seconds if mode switching is successful
- 4 WIFI Signal Strength indicator 3 are all on-strong signal, 2 are on-moderate signal, 1 is on-weak signal.



- 5 Ethernet RJ45 standard interface
- 6 USB Interface Type A used to connect USB memory storage
- 7 Power/Data Interface

No.	Identifying	Signal	Direction
1	V+	+12V Power Input	I
2	V+	+12V Power Input	I
3	V-	Power GND	I
4	V-	Power GND	I
5	T	TXD	O
6	R	RXD	I
7	G	Signal GND	I

8 SBUS Input interface

No.	Identifying	Signal	Direction
1	G	Signal GND	I
2	V	+5V Power Output	O
3	S	SBUS_IN	I

9 HDMI Type A Video Input Interface.

10 USB Interface Micro USB support OTG.

11 Mode select switch WB is wideband mode NB is Narrow-Band has the ability to resist interference in the same frequency band.

HDMI Image Output Usage

Step 1 Connect Device

Before the image is transmitted, make sure that the power cable, camera HDMI cable, monitor HDMI cable, and antenna of the air unit and ground unit are connected.

Step 2 Power on the Device

After the device is powered on, the power indicator is on and the device starts working. If there is any abnormality, please refer to the "Frequently Solved Problems" of this manual for processing.

Step 3 Establish Connection

About 15 seconds after the device is powered on, wireless connection is automatically established. The established connection indicator will be always on, indicating that the air unit and the ground unit have been successfully connected by the wireless network.

Step 4 Display the Image

After about 15 seconds, the receiver can output the video transmitted by the transmitter. If there is no video output, please refer to the "Frequently Solved Problems" of this manual for processing.

Network Port Video Output Usage

Step 1 Connect Device

Before the image is transmitted, make sure that the power cable, camera HDMI cable, PC network cable, and antenna of the air unit and ground unit are connected.

Step 2 Power on the Device

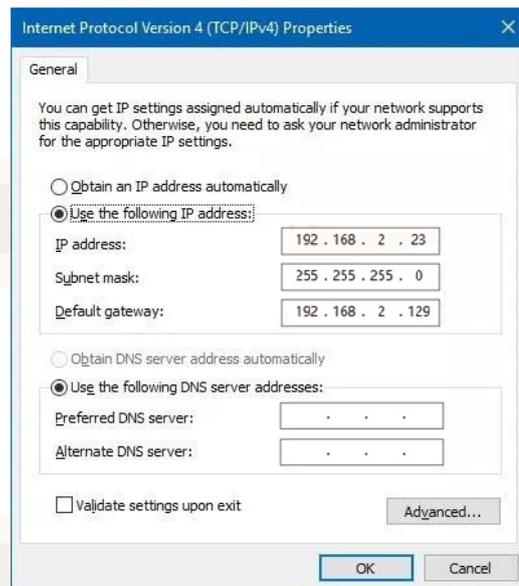
After the device is powered on, the power indicator is on and the device starts working. If there is any abnormality, please refer to the "Frequently Solved Problems" of this manual for processing.

Step 3 Establish Connection

About 15 seconds after the device is powered on, wireless connection is automatically established. The established connection indicator will be always on, indicating that the air unit and the ground unit have been successfully connected by the wireless network.

Step 4 Display the Image

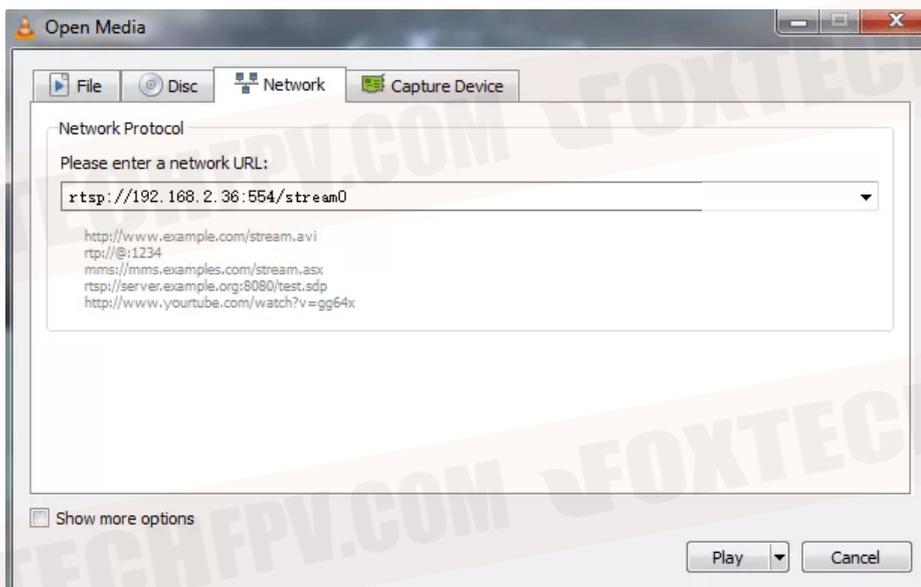
Configure the TCP/IPv4 attribute in the computer network connection, the IP address is "192.168.2.xxx" (xxx is the address value between 0 and 255, 192.168.2.36 and 192.168.2.129 addresses are reserved addresses), and the default gateway address is set to "192.168.2.129".



On the computer side video player software or video terminal software, enter the video stream address as follows:

rtsp://192.168.2.36:554/stream0

The video stream address setting is shown in the figure below.



After entering the correct video stream address URL, you can get the video image.

If there is no video output, please refer to the "Frequently Solved Problems" of this manual for processing.

Data Transission Usage

Step 1 Connect Device

Before data is transmitted, make sure that the power cable, serial port cable, and antenna are connected.

Step 2 Power on the Device

After the device is powered on, the power indicator is on and the device starts working. If there is any abnormality, please refer to the "Frequently Solved Problems" of this manual for processing.

Step 3 Establish Connection

About 15 seconds after the device is powered on, wireless connection is automatically established. The established connection indicator will be always on, indicating that the air unit and the ground unit have been successfully connected by the wireless network.

Step 4 Data Transmission

The devices at both ends are connected to the data terminals respectively, and data can be sent to each other at the same time.

If there is no data output, please refer to the "Frequently Solved Problems" of this manual for processing.

Device Parameter Setting

Step 1 Connect Device

Single air unit or ground unit can be configured via a serial port. Connect the power and serial port of the equipment.

Step 2 Power on the Device

After the device is powered on, the power indicator is on and the device starts working.

Step 3 Wait for device initialization

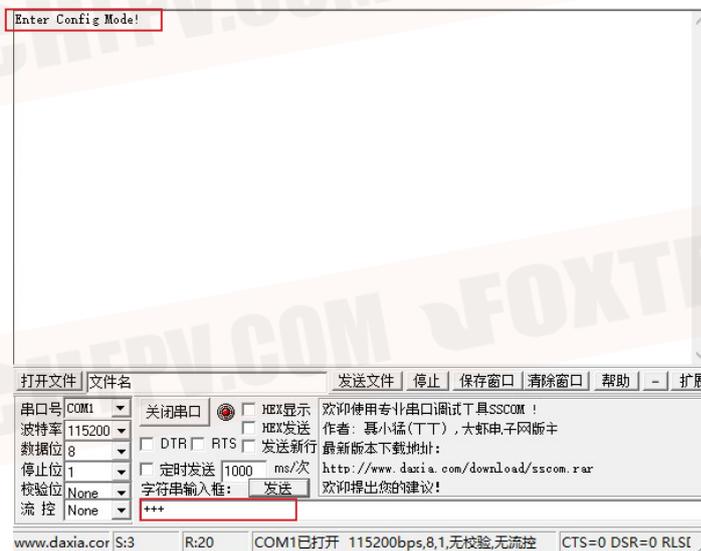
About 3 seconds after the device is powered on, the status indicator will flash for 3 times, indicating that the device is successfully initialized.

Step 4 Enter Serial Port Configuration Mode

The device connects to the computer through serial port, and the serial port tool is used on the computer. The baud rate is set to 115200bps, the data bit is 8, the stop bit is 1, and there is no check bit or flow control. After opening the serial port, enter the characters of "+++" in the serial port tool.

+++

And the terminal will display "Enter Config Mode!", indicating that the serial port configuration mode is entered, as shown in the figure below.



Step 5 Input configuration Command

Enter the corresponding configuration command and wait for the device to send back "OK", indicating that the command was sent successfully.

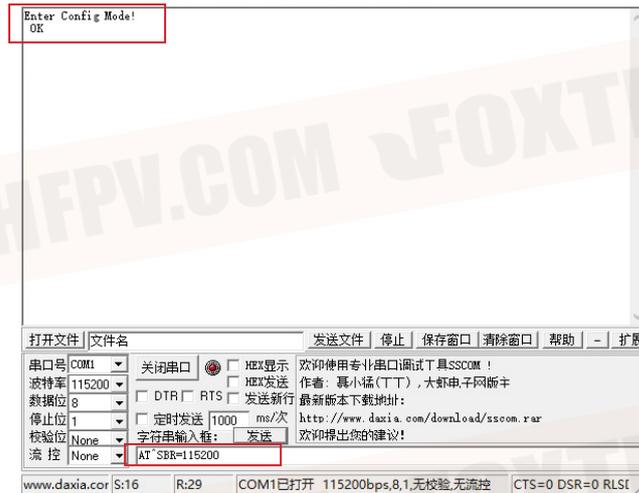
AT^SBR=115200

The device sent back "OK" to indicate that the modification was successful. If an "ERROR" is sent back, the command was entered incorrectly or the parameter was invalid.

Type	Command	Parameter value	Parameter Specification
set transmitter power	AT^SPWR=_	1	Low Power
		2	Medium power
		3	High Power
Set serial port baud rate	AT^SBR=_	9600	Baud rate 9600
		14400	Baud rate 14400
		19200	Baud rate 19200
		38400	Baud rate 38400
		56000	Baud rate 56000
		57600	Baud rate 57600
		115200	Baud rate 115200
		128000	Baud rate 128000

Enter the following command to query the current configuration settings of the device.

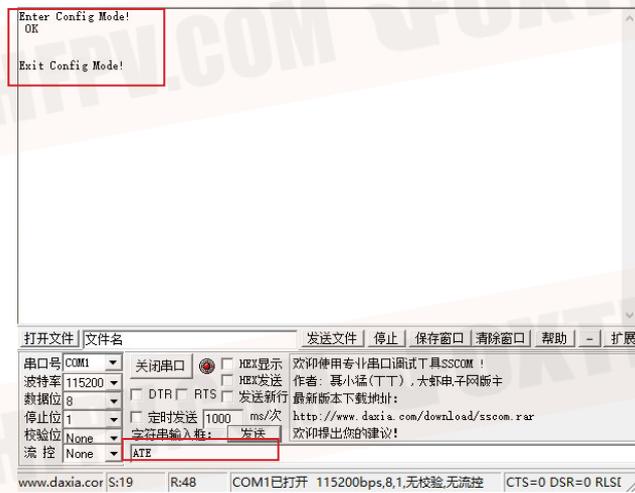
Type	Command	Return parameter	Parameter Specification
Query transmit power	AT^GPWR	1	Low Power
		2	Medium Power
		3	High Power
Query frequency band	AT^GCHN	800MHz	800MHz frequency band
		1.4GHz	1.4GHz frequency band
		2.4GHz	2.4GHz frequency band
Query serial port baud rate	AT^GBR	xxxxxx	Current baud rate value



Step 6: Exit Serial Port Configuration Mode
Enter "ATE" in the serial port tool.

ATE

Wait for the device to send back "Exit Config Mode!", indicating successfully exit from serial port configuration mode.



Wireless Signal Bandwidth Configuration Function

WB Mode

The wireless signal bandwidth is 20MHz, which has the highest air communication throughput rate, but it is susceptible to interference signals in the same frequency band.

NB Mode

The wireless signal bandwidth is 10MHz, the air communication throughput rate is lower than the WB broadband mode, but it has the frequency hopping anti-interference ability, can identify the interference signal in the same frequency band, and automatically switch the working frequency point to avoid the influence of the interference signal.

Toggle the bandwidth mode selection switch, after the status indicator blinks 3 times, the bandwidth configuration is successful. Otherwise, the bandwidth setting is unsuccessful, so need to toggle switch to reconfigure.



The bandwidth mode of air unit and ground unit must be configured to be consistent to achieve wireless link!

FAQ

1. The power indicator doesn't go on after the device is powered on

- Check if the power cable is damaged, the connection sequence is correct, and confirm that the power interface is connected correctly.
- Check the power supply range, whether it is within the range of the power supply voltage marked by the equipment;
- Check if the fan of the device is working or if other indicators are on;
- If the above steps are completed, the device power indicator is still not on. Please contact after-sales technical support.

2. After power on, established connection indicator is not on.

- Check if the antenna feeder is connected reliably to the interface of the device;
- Check if the antenna is damaged and the antenna cable is connected reliably;
- Check if the bandwidth mode switch of the air unit and ground unit is in the same mode;
- Place the air unit and the ground unit in a close range(no more than 50cm), and check if a wireless link can be established at this time;
- If the above steps are completed, the device established connection indicator is still not on. Please contact after-sales technical support.

3. The device can establish a wireless connection, but the HDMI interface has no image output.

- Check if the camera is working well, including but not limited to problems such as loose HDMI connector, broken HDMI cable, insufficient camera power, and camera HDMI output failure.
- Check if the display is working well, including but not limited to problems such as loose HDMI connector, broken HDMI cable, and display failure.
- Check whether the display is all blue or white on a black background.
- Connect the network port of the ground unit with a computer. The IP address of the computer is set to 192.168.2.xxx, and the default gateway is set to 192.168.2.129. Using your computer's Command Prompt tool, enter the following command

```
ping 192.168.2.36
```

```
ping 192.168.2.129
```

```
ping 192.168.1.1
```

```
ping 192.168.1.100
```

Confirm that each IP address can return the correct response value.

- If the above steps are checked, the device HDMI still does not output images. Please contact after-sales technical support.

4. There was no live video displayed on the receiving end, with the word "Transmitter Loss" appearing on the screen with a black background and white text.

- The information indicates that the ground receiving end not found the wireless transmitting device.
- Check if the antenna end works well, including but not limited to loose antenna connectors, broken antenna cables, external radio interference, and restarting the air end etc.
- If the above steps are completed, the fault has not been eliminated. Please contact after-sales technical support.

5. There was no live video displayed on the receiving end, with the word " No Video Source Input " in white appearing on the screen with a black background.

- The message indicates that the wireless link has been established but the video source or video source device has not been found.

- Check if the camera is working well, including but not limited to problems such as loose HDMI connector, broken HDMI cable, insufficient camera power, and camera HDMI output failure.
- If the above steps are completed, the device still does not output images. Please contact after-sales technical support.

6. The device was able to establish a wireless connection, but data communication was not successful.

- Check if the serial port hardware is working properly, including but not limited to whether the TXD/RXD line sequence is correct, and whether the USB to UART device is used.
- Check if the baud rate setting of the serial port is correct.
- Check if the communication format setting of the serial port is correct: data bit 8, stop bit 1, no verification no flow control;
- If the above steps are completed, the device still fails to perform data communication. Please contact after-sales technical support.

7. During video transmission, the image appears stuck, mosaic etc.

- Check the antenna end, including but not limited to loose antenna connector, broken antenna cable, restart the sky end equipment, etc., whether the original antenna is used, whether there is a metal object near the antenna to affect the signal, etc.;
- Check the signal strength, whether the distance is too far or the signal strength caused by obstacle blocking is insufficient, resulting in unstable image;
- Check the HDMI connection, if there is any bad interface contact and cable damage;
- If the above steps are completed, the device still fails to perform data communication. Please contact after-sales technical support.

8. The bandwidth switching function does not work properly.

- Check the wireless pairing status, whether it is in the wireless unpaired state;
- Check if the status indicator flashes when toggle the bandwidth switch.

9. The receiver network port failed to get real-time video through RTSP.

- Check if the camera is working well;
- Check if the receiving end network port is well connected to the computer.
- Check whether the encoding/decoding format setting is correct, including encoding mode, CBR/VBR setting, code rate setting, etc.
- Connect the network port of the ground unit with a computer. The IP address of the computer is set to 192.168.2.xxx, and the default gateway is set to 192.168.2.129. Using your computer's Command Prompt tool, enter the following command:

ping 192.168.2.36

ping 192.168.2.129

ping 192.168.1.1

ping 192.168.1.100

10. The SBUS transmission was not successful.

- Check if the SBUS hardware is working properly, including but not limited to whether the line sequence is correct, whether it is short circuit/open circuit;
- Check if the interface speed setting of SBUS is correct.
- If the above steps are completed, the device still fails to perform data communication. Please contact after-sales technical support.

11. The serial port parameter configuration were not successful.

- Check whether the serial port hardware works normally, including but not limited to whether the line sequence is correct, and whether the cable is shorted/opened;
- Check if the baud rate and data format of the serial port are correct.
- Check whether the device has been powered on and initialized.
- If the above steps are completed, the device still fails to perform data communication. Please contact after-sales technical support.

This content is subject to change.

Download the latest version from

<https://www.foxtechfpv.com/vdc-long-range-video-data-radio-transmission-system.html>

For everyday updates, please follow

Foxtch Facebook page: <https://www.facebook.com/foxtechhobby>

YouTube Channel: https://www.youtube.com/user/foxtechonline/featured?view_as=subscriber