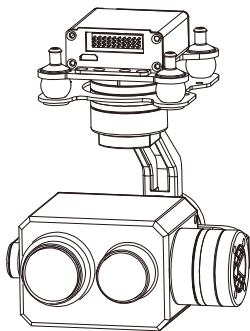




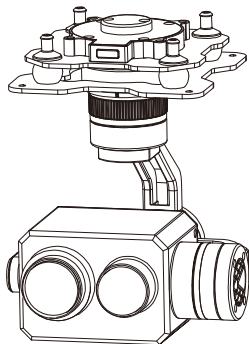
EO + IR Dual Sensor Fusion Gimbal Camera User Manual

User Manual

使用说明



Standard Version
标准版



Viewport Version
快拆版



For more details please scan the QR code
or visit our website:
www.viewprotech.com

Disclaimer and Warning

Congratulations on purchasing your new Viewpro product. Please read this entire document carefully. Failure to read or follow instructions and warnings in this document may result in damage to your Viewpro product. Disassemble the gimbal camera by user is not permitted, as which may cause the camera does not work normally. Viewpro accepts no liability for damage, injury or any legal responsibility incurred directly or indirectly from the use of this project. The user shall observe safe and lawful practices including, but no limited to, those set forth in the manual.

Legends



Warning



Important Note

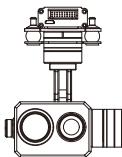
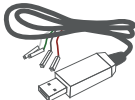



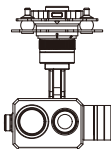
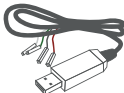




1.Product Introduction


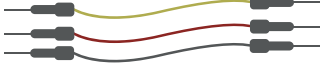

1.1 Introduction

Z-Fusion pro is a high-precision 3-axis gimbal integrated with a EO prime lens camera and a 19mm lens 640*480 IR thermal sensor with dual fusion technology. Combined with the advantages of infrared heat source detection and visible detail observation, it can quickly and accurately locate hot spots, hidden spots, etc. It supports IR thermal and visible PIP switch, IR color palette switch, thermal digital zoom, photographing and video. The 3 axis gimbal can achieve stabilization in yaw, roll and pitch. The integrated design of damping system and gimbal can greatly reduce mechanical vibration.

Z-Fusion pro is widely used in UAV industries of public security, electric power, fire fighting and other industrial applications.

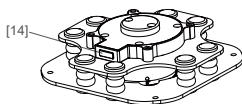
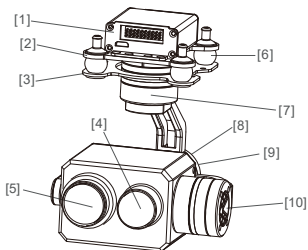
1.2 In the Box

A. Standard Version			
Gimbal Camera x 1 pc		USB to TTL Cable x 1 pc	
Copper Cylinder x 4 pcs		M3 Screw x 8 pcs	
Power Cable x 1 pc			
B. Viewport Version			
Gimbal Camera x 1 pc		USB to TTL Cable x 1 pc	
Copper Cylinder x 4 pcs		M3 Screw x 8 pcs	
Power Cable x 1 pc			
PWM Control Cable x 1 pc			

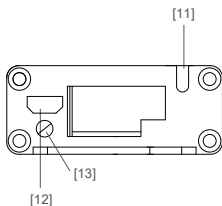
TTL / S.BUS Control Cable x 1 pc	
TTL Connect Cable x 3 pcs	
Ethernet Cable x 1 pc	

2. Installation Instruction

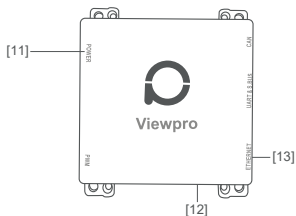
2.1 Overview



Viewport



Control Box Back Side
(Standard Version)



(Viewport Version)

- | | |
|-----------------------------|-----------------------------|
| [1] Control box | [8] TF card slot |
| [2] Upper damping board | [9] Roll axis motor |
| [3] Lower damping board | [10] Pitch axis motor |
| [4] EO prime lens camera | [11] 3-6S power interface |
| [5] Infrared thermal camera | [12] Micro HDMI interface |
| [6] Damping ball | [13] Ethernet interface |
| [7] Yaw axis motor | [14] Viewport unlock button |

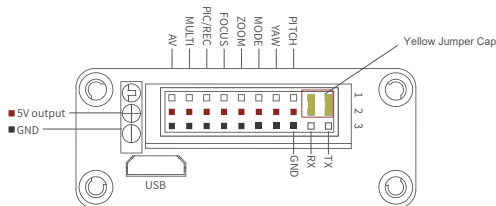


- Please ensure that there isn't any obstacle while the motor rotating.
- Please remove the obstacle immediately if gimbal camera is blocked during rotation.



- Don't put the infrared thermal camera towards the sun in case any burn to the camera

2.2.1 Control Box Printing (Standard Version)

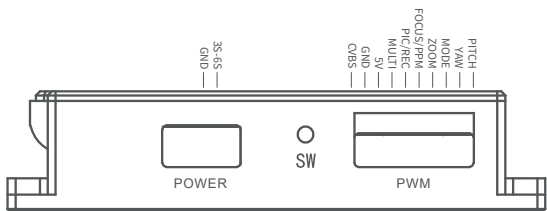


- The input voltage cannot be higher than 6S.
- The pin insertion interface cannot be connected with power supply.
- The yellow jumper cap cannot be removed

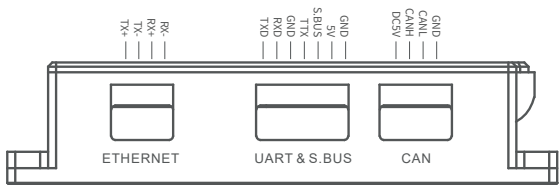
2.2.2 Control Box Printing (Viewport Version)



Front Side



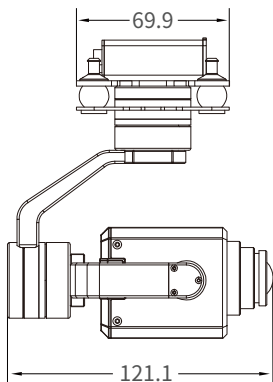
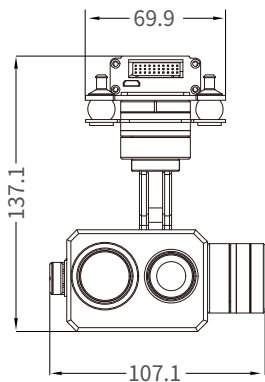
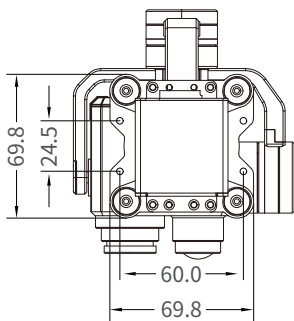
Left Side



Right Side

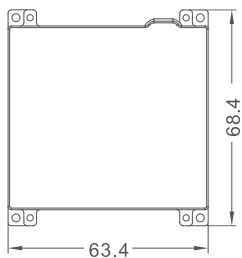
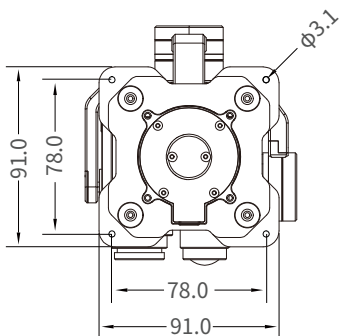
2.3 Device Dimensions (Standard Version)

Unit: mm

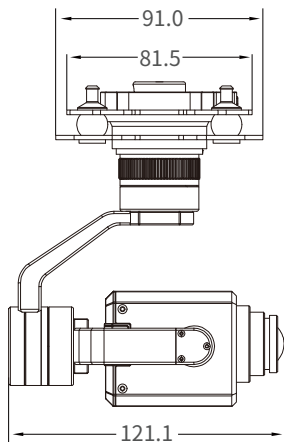
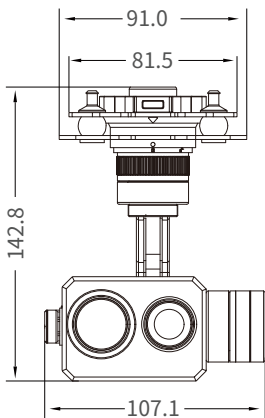


2.3 Device Dimensions (Viewport Version)

Unit: mm

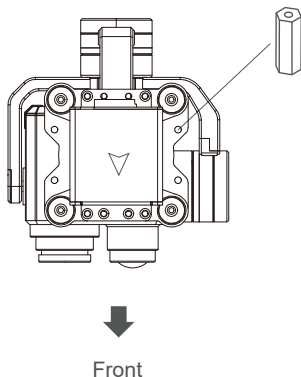


Control Box

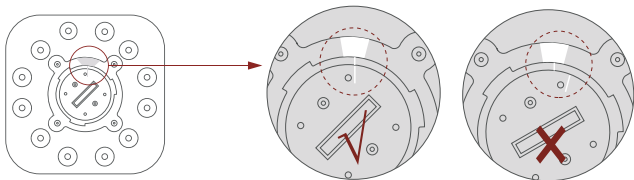
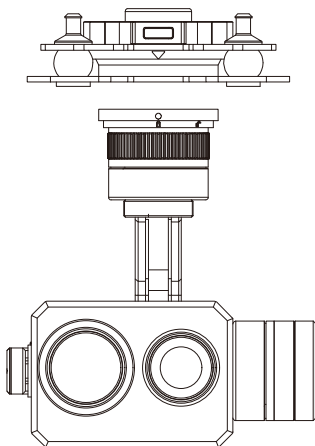


2.4 Install Mounting Part

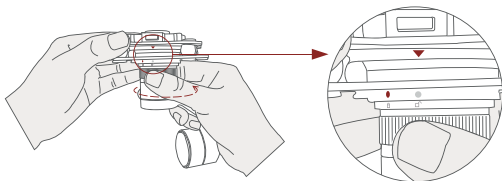
- (1) Find out the arrow on the gimbal which indicating the yaw heading of the payload (i.e. the lens direction when the camera power on), and synchronize with the direction specified by the UAV.
- (2) Fix one end of the copper cylinder on the screw hole of lower damping board, and use M3 screw to fasten it.
- (3) According to the provided screw hole dimension you can make suitable mounting holes on the UAV mounting board, and fixes the other end of the copper cylinder on the mounting board of the UAV (Viewport version is the same).



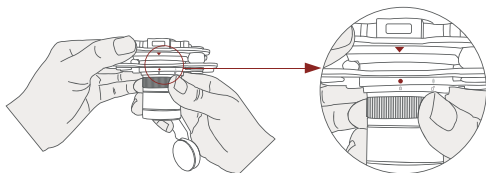
2.5 Viewport Release Instruction



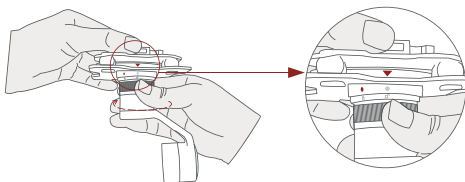
1. Make sure the two white stripes indicated in above picture are aligned with each other. (If the stripes are not aligned to each other, please pinch the connector part and turn it to left manually)



2. Align the white dot (unlock icon) to the red triangle (below unlock button), push the gimbal into the Viewport completely and then rotate the gimbal camera anticlockwise.



3. When you hear "click" sound (when red dot is aligned to the red triangle) means the gimbal camera and Viewport has been locked.



4. To unlock the Viewport, you need to press on unlock button and rotate the gimbal camera clockwise till the white dot align to the red triangle. Then pull the gimbal out from the Viewport.

2.6 Install TF Card

TF (Micro SD card): Install the TF card to the card slot (Re. 2.1 Overview). Support max 128GB. Request Class 10 (10m/s) transmission speed or higher and FAT32 or exFAT format.



- Make sure device is power off when inserting the TF card, hot plugging is not supported.
-

2.7 Image Output Interface

HDMI: micro HDMI output, HD 1080P 30fps (Optional)

Network: Ethernet output interface, support RTSP video streaming.
IP address: rtsp://192.168.1.100:554/majorAV, output resolution: 1080p, frame rate: 30fps, bit rate: 4M. (Optional)

AV: CVBS Analog signal output, connect with pins AV and GND. (Optional)

-
- Above output mode is optional, HDMI and AV output cannot coexist at the same time. Please subject to your actual product.



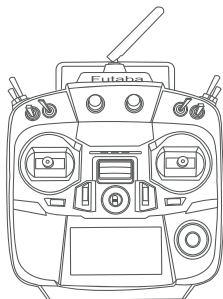
- When using user interface software Viewlink for network connection, the network of external device (computer) should be the IP address: 192.168.1.2 (choose the last byte among 2~254, can not be 100 same as the gimbal), subnet mask: 255.255.255.0, Default gateway: 192.168.1.1, and all firewalls of the computer must be closed. Then enter the IP address of the gimbal camera, Open Video, the video stream can be outputted.
-

3. Signal Control

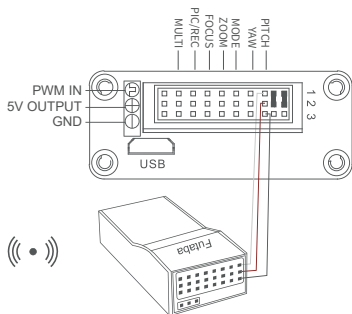
3.1 PWM Control

Control the gimbal camera functions by the multiplex pulse width modulation signal outputted by PWM channel of the remote control receiver. The camera needs up to 6 control channels of PWM (to expand tracking function use up to 7 PWM channels). You can choose needed functions according to actual usage to reduce the required number of PWM channels.

3.1.1 PWM Connection Diagram (Connect pitch channel as example)



Remote Controller

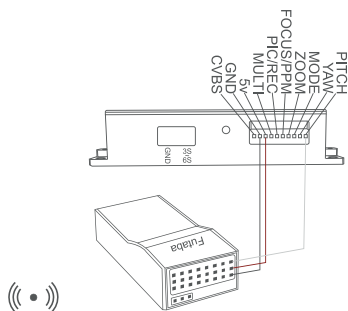


Receiver

Connection Diagram (Standard Version)



Remote Controller



Receiver

Connection Diagram (Viewport Version)

3.1.2 PWM Control Operation Instruction

1) Pitch (PWM Pitch channel in to control Pitch. Joystick, rotary knob or 3-gear switch on remote control are optional. 3-gear switch as example.)



Position 1

Low Gear
Pitch Up



Position 2

Middle Gear
Pitch Stop



Position 3

High Gear
Pitch Down

2) Yaw (PWM Yaw channel in to control Yaw. Joystick, rotary knob or 3-gear switch on remote control are optional. 3-gear switch as example.)



Position 1

Low Gear
Yaw Left



Position 2

Middle Gear
Yaw Stop



Position 3

High Gear
Yaw Right

3) Mode (PWM Mode channel in to adjust speed control/one key to Home position etc functions. Rotary knob or 3-gear switch on remote control are optional. 3-gear switch as example.)



Position 1

Low Gear



Position 2

Middle Gear



Position 3

High Gear

Position 1: Low speed mode, control pitch / yaw with this mode at lowest speed

Position 2: Middle speed mode, control pitch / yaw with this mode at middle speed

Position 3: High speed mode, control pitch / yaw with this mode at highest speed

(If it is controlled by rotary knob, the speed will change according to switch position)

Function of continuous switching:

3.1) Operate 1 time continuously and quickly, from position 2 - 3 - 2, to Home position.

3.2) Operate 2 times continuously and quickly, from position 2 - 3 - 2 - 3 - 2, the camera lens looks vertically down.

3.3) Operate 3 times continuously and quickly, from position 2 - 3 - 2 - 3 - 2 - 3 - 2, to disable Follow Yaw Mode (gimbal yaw not follows by frame)

3.4) Operate 4 times continuously and quickly, from position 2 - 3 - 2 - 3 - 2 - 3 - 2 - 3 - 2, to enable Follow Yaw Mode (gimbal yaw follows by frame)

4) Zoom (PWM Zoom channel in to control Zoom. Joystick, rotary knob or 3-gear switch on remote control are optional. 3-gear switch as example.)



Position 1

Low Gear
Zoom Out



Position 2

Middle Gear
Stop Zoom



Position 3

High Gear
Zoom In

Switch from Position 2 to 1: Picture in Picture, repeat operation for switching: PIP/PIP-A/PIP-B/VL/IR/FUSION-A/FUSION-B

Switch from Position 2 to 3: IR digital zoom, 1x~4x, repeat operation for switching. Dzoom is ineffective in PIP mode.

5) Focus (PWM Focus channel is to control IR color palette switch. 3-gear switch as example.)



Position 1

Low Gear
PIP switch



Position 2

Middle Gear
No control



Position 3

High Gear
IR color palette switch

Switch from Position 2 to 3: Multiple IR color palette, repeat operation for switching.

6) Pic/Rec (PWM Pic/Rec channel in to control take picture and record. Joystick, rotary knob or 3-gear switch on remote control are optional. 3-gear switch as example.)



Position 1

Low Gear



Position 2

Middle Gear



Position 3

High Gear

Switch from Position 2 to 1: Take a picture

- OSD display 'REC IMG' a second.

Switch from Position 2 to 3: Start record / repeat operation to stop record

- Start record, the OSD display rec hh:mm:ss.
- Stop record, the OSD display STBY.

7) Multi: Backup PWM channel, no control



Position 1

Low Gear



Position 2

Middle Gear



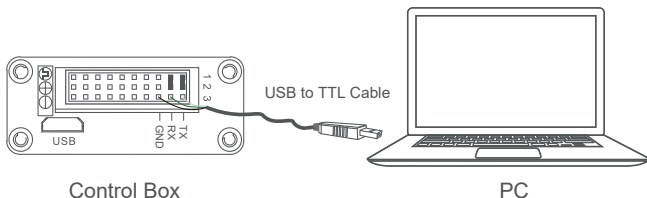
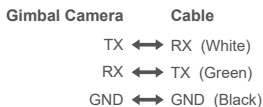
Position 3

High Gear

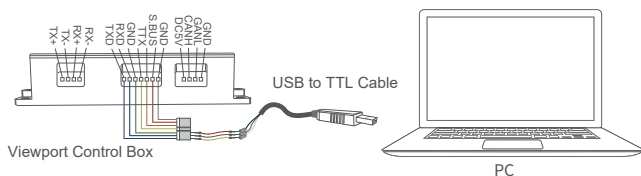
3.2 Serial Port / TTL Control

TTL communication requirements: TTL signal is 3.3V, baud rate: 115200, data bit 8, stop bit 1, no parity, HEX send and receive.

Connection Diagram (PC - USB to TTL Cable- Gimbal Camera as example):



Connection Diagram Standard Version



Connection Diagram Viewport Version

Diagram of USB to TTL Cable:

Connect the camera to the upper computer by USB to TTL cable (Adopt connection method of TX to RX, RX to TX, GNG to GND at Dupont ends of the provided USB to TTL cable, connect to the specified TTL of the gimbal, and the USB end of the cable connect to computer).

Install Viewlink control software to test the functions directly. Users may choose to develop their own software, please contact technical support for TTL control protocol file.

ViewLink is a user interface developed by Viewpro for Viewpro gimbal cameras, you can download it from Viewpro website (www.viewpro-tech.com) or ask distributors for installation package.

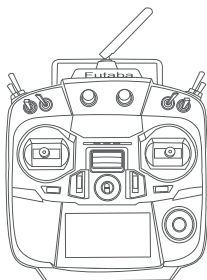


- Connect serial port of gimbal to pins, DO NOT connect with power supply.
 - The default baud rate of serial port is 115200, which can be changed according to the docking equipment.
-

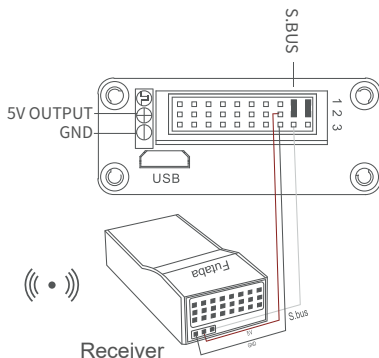
3.3 S.BUS Control

Control the gimbal camera functions by one combining signals. Connect the external S.Bus to S.Bus port on the control box, and the external S.bus signal GND connect to the GND interface of the control box.

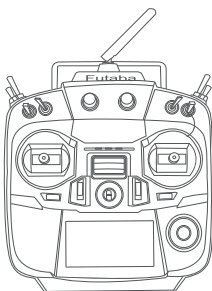
Wiring Diagram (Take Futaba remote control for example):



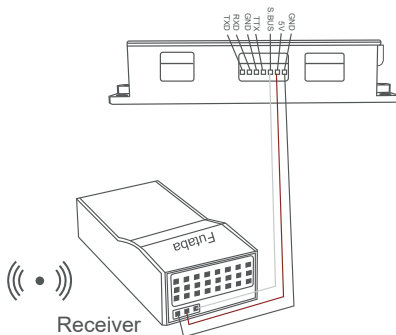
Remote Control



Wiring Diagram Standard Version



Remote Control



Wiring Diagram Viewport Version

S.Bus control mode: default S.Bus signal channel 9-15 to control gimbal camera functions (the function of channel is consistent with corresponding channel in PWM function description)

Channel 9: Yaw Control

Channel 10: Pitch Control

Channel 11: Mode Control

Channel 12: Zoom Control

Channel 13: Focus Control

Channel 14: Pic/Rec Control

Channel 15: Multi Backup



- User can set the channels by setting serial command according to the actual requirement. The S.Bus channel position can be arranged in any sequence within channel 1-15 to connect with the flight controller or remote control.

- TTL control and S.bus control cannot coexist at the same time for standard version. The default control is TTL if no requirement. The user can set to S.bus control if needed (please contact with our technical support for the setting instruction.)

4. Specification

Hardware Parameter	
Working voltage	12V
Input voltage	3S ~ 6S
Output voltage	5V (connect with PWM)
Dynamic current	550~700mA @ 12V
Idle current	550mA @ 12V
Working environment temp	-20℃ ~ +60℃
Output	micro HDMI(FHD output 1080P 30fps) / IP(1080P/720p 25/30fps)
PIP model	Support (PIP, PIP-A, PIP-B, Fusion-A, Fusion-B)
Local-storage	TF card (Up to 128G, class 10, FAT32 or ex FAT format)
Photo storage format	JPG(1920*1080)
Video storage format	AVI (1080P/720P 25fps/30fps)
Control method	PWM / TTL / S.BUS
Gimbal Spec	
Mechanical Range	Pitch/Tilt: $\pm 120^{\circ}$, Roll: $\pm 60^{\circ}$, Yaw/Pan: $\pm 300^{\circ}$ / $\pm 360^{\circ}$ *N (IP output version)

Controllable Range	Pitch/Tilt: $-45^{\circ} \sim 90^{\circ}$, Yaw/Pan: $\pm 290^{\circ} / \pm 360^{\circ}$ *N (IP output version)
Vibration angle	Pitch/Roll: $\pm 0.02^{\circ}$, Yaw: $\pm 0.02^{\circ}$
One-key to center	√
Camera spec	
Imager Sensor	SONY sensor 1/1.8" "Exmor R" CMOS
Effective pixel	5MP
Min illumination	0.05lux
Lens	8mm
viewing angle	$50.0^{\circ} \times 38.0^{\circ}$
Thermal imager spec	
Lens size	19mm
Horizontal FOV	32°
Vertical FOV	24.2°
Diagonal FOV	39.4°
Detective Distance (Man: 1.8x0.5m)	559 meters
Recognize Distance (Man: 1.8x0.5m)	140 meters
Verified Distance (Man: 1.8x0.5m)	70 meters

Detective Distance (Car: 4.2x1.8m)	1714 meters
Recognize Distance (Car: 4.2x1.8m)	428 meters
Verified Distance (Car: 4.2x1.8m)	214 meters
Working mode	Uncooled long wave (8μm~14μm) thermal imager
Detector pixel	640*480
Pixel size	17μm
Focusing method	prime lens
NETD	≤50mK (@30℃)
Color palette	Outline-drawing, white hot, black red, green blue yellow red, ect. 12 color palette
Digital zoom	1x ~ 4x
Thermometry type	max temp, min temp, FOV center temp, average temp (Optional)
Temperature warning	-20℃~180℃ (For thermometry version only)
Temp accuracy	±2℃/ 2% (For thermometry version only)
Packing Information	
N.W.	623g(Viewport Version)
Product meas.	107.1*121.1*141.8mm(Viewport Version)

Accessories	1pc gimbal camera device, screws, copper cylinders, damping balls, damping boards, 1pc USB to TTL cable / Box
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5. FAQ

1.How to set the storage format of Z-Fusion Pro?

A: When the IP output resolution is set to 1280*720, the storage resolution is 1280 * 720; Storage resolution is 1920 * 1080 when the IP output resolution is set to 1920*1080; The video frame rate saved in the TF card is the same with the one set during IP output. The frame rate is 25fps or 30fps for optional.

2. How to modify the network parameter of Z-Fusion Pro?

A: Login in default IP address with IE browser, user: "admin", password: "admin", and Enter setting interface, select the last option from the drop-down menu at the upper right corner, enter "Settings", modify IP address in "Network Parameters", and modify video resolution, frame rate and code stream in the main stream setting of "Coding Parameters".