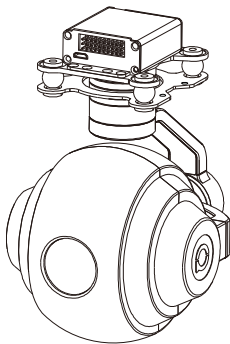




## Q20K 20x Optical Zoom 4K Output Gimbal Camera

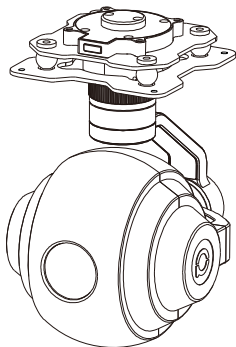
User Manual

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](http://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

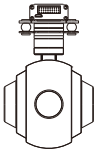
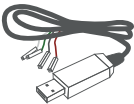



### 1.1 Introduction

Q20K is a high-precision 3-axis gimbal integrated with a 20x optical zoom 4K SONY camera. It supports visible optical zoom, photographing. It features aluminum alloy housing and anti-interference. 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.


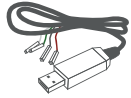




Q20K is widely used in UAV industries of public security, zoom aerial photography and real time broadcasting.


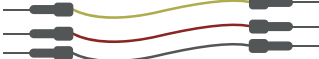
## 1.2 In the Box

### 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			

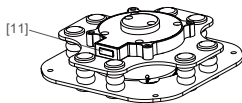
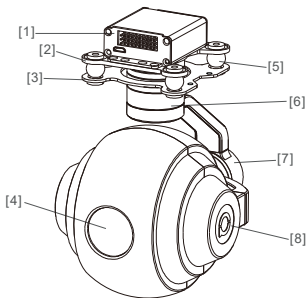
### B. Viewport Version

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			

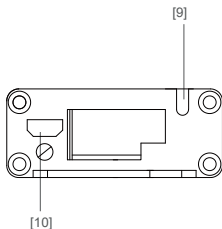
TTL / S.BUS Control Cable x 1 pc	
TTL Connect Cable x 3 pcs	

## 2. Installation Instruction

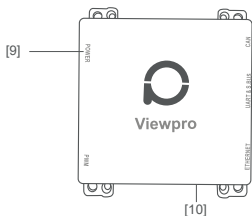
### 2.1 Overview



Viewport



Control Box Back Side  
(Standard Version)



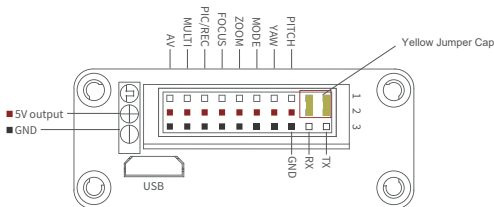
(Viewport Version)

- |                         |                             |
|-------------------------|-----------------------------|
| [1] Control box         | [7] Roll axis motor         |
| [2] Upper damping board | [8] Pitch axis motor        |
| [3] Lower damping board | [9] 3-6S power interface    |
| [4] 4K zoom camera      | [10] Micro HDMI interface   |
| [5] Damping ball        | [11] Viewport unlock button |
| [6] Yaw axis motor      |                             |



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

## 2.2.1 Control Box Printing (Standard Version)

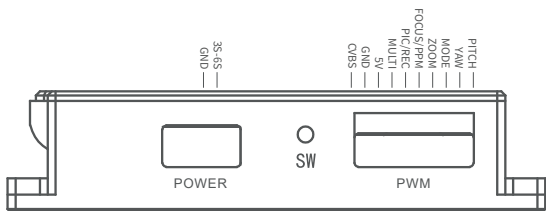


- The input voltage cannot be higher than 6S.
- The pin insertion interface cannot be connected with power supply.
- The yellow jumper cap cannot be removed

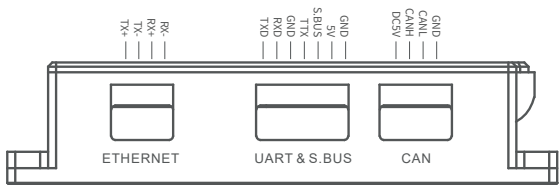
## 2.2.2 Control Box Printing (Viewport Version)



Front Side



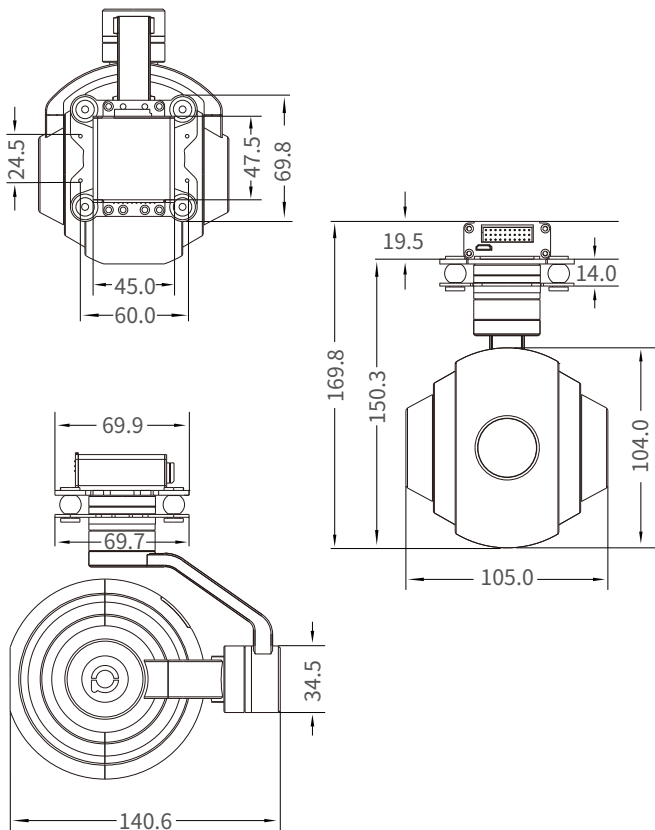
Left Side



Right Side

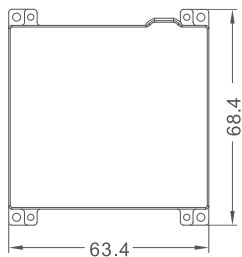
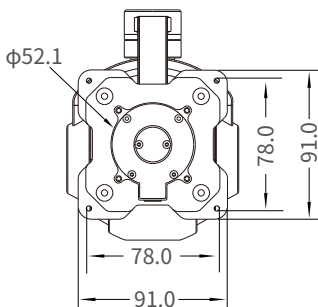
## 2.3 Device Dimensions (Standard Version)

Unit: mm

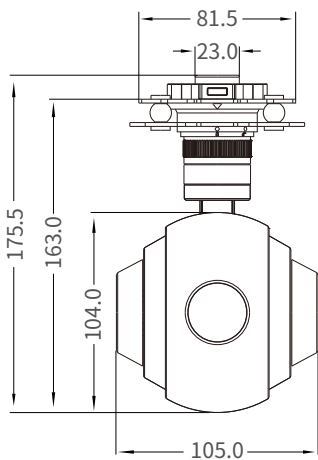
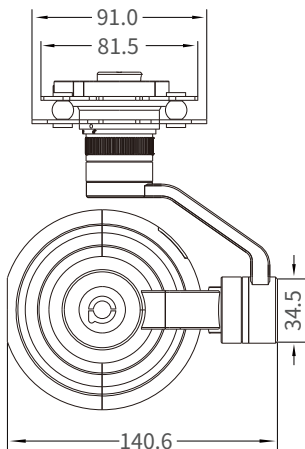


## 2.3 Device Dimensions (Viewport Version)

Unit: mm



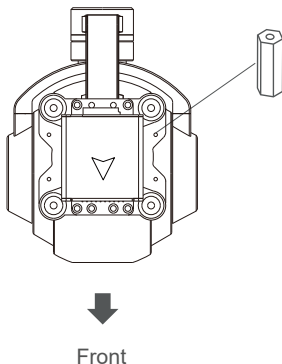
Control Box



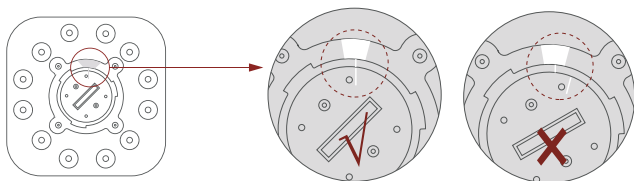
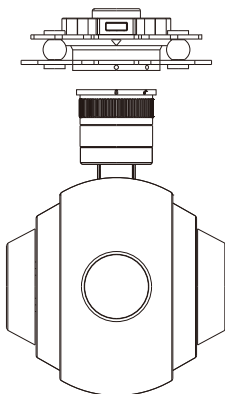


## 2.4 Install Mounting Part

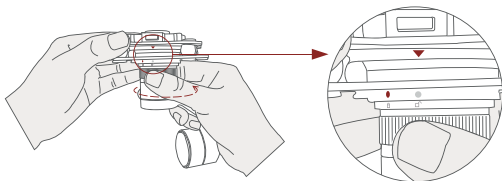
- (1) Find out the arrow on the gimbal which indicating the yaw heading of the payload (i.e. the lens direction when the camera power on), and synchronize with the direction specified by the UAV.
- (2) Fix one end of the copper cylinder on the screw hole of lower damping board, and use M3 screw to fasten 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).



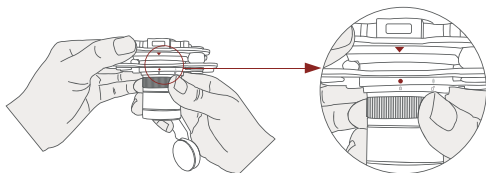
## 2.5 Viewport Release Instruction



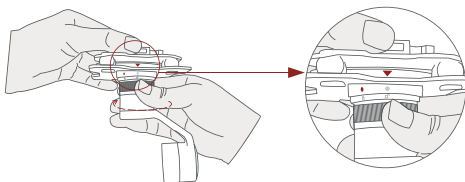
1. Make sure the two white stripes indicated in above picture are aligned with each other. (If the stripes are not aligned to each other, please pinch the connector part and turn it to left manually)



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.

## 2.7 Image Output Interface

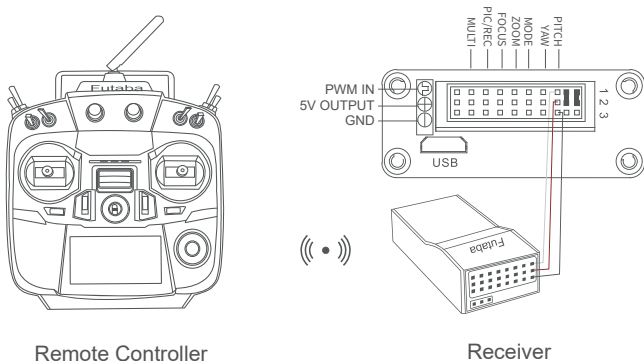
HDMI: micro HDMI 4K output.

## 3. Signal Control

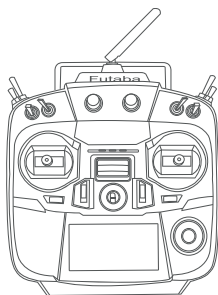
### 3.1 PWM Control

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.

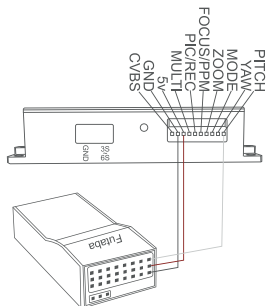
#### 3.1.1 PWM Connection Diagram (Connect pitch channel as example)



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

**5) Focus** ( not functional for this channel)

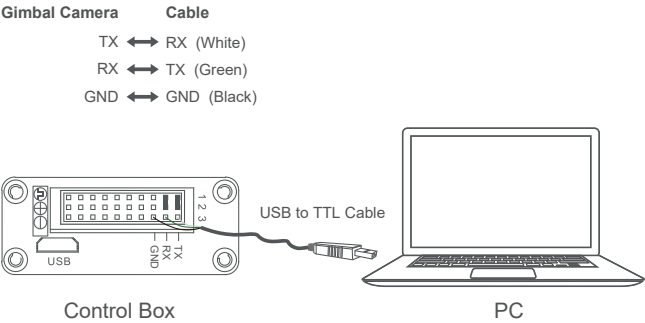
**6) Pic/Rec** ( not functional for this channel)

**7) Multi** ( not functional for this channel)

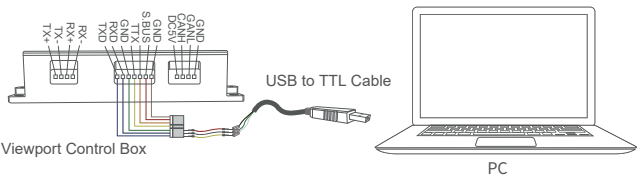
### 3.2 Serial Port / TTL Control

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](http://www.viewpro-tech.com)) or ask distributors for installation package.



- Connect serial port of gimbal to pins, DO NOT connect with power supply.

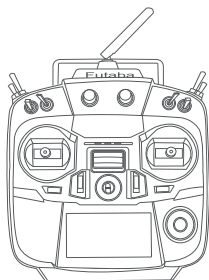


- The default baud rate of serial port is 115200, which can be changed according to the docking equipment.
- 

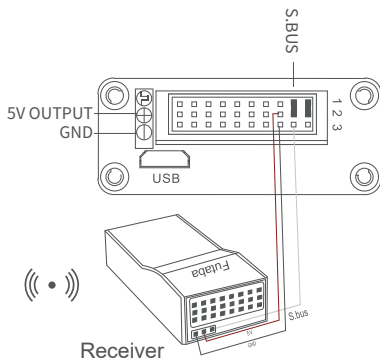
## 3.3 S.BUS Control

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.

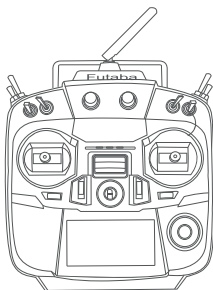
Wiring Diagram (Take Futaba remote control for example):



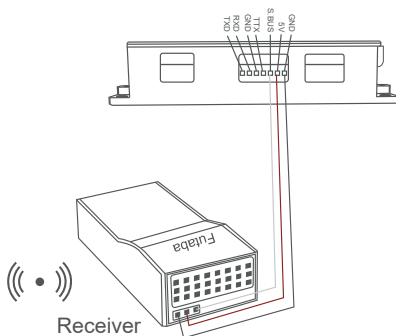
Remote Control



## 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(not support)

Channel 14: Pic/Rec Control(not support)

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	500mA @ 12V
Idle current	350mA @ 12V
Working environment temp	-20℃ ~ +60℃
Output	micro HDMI
Local-storage	None
Control method	PWM / TTL
<b>Gimbal Spec</b>	
Mechanical Range	Pitch/Tilt: -160° ~ 160°, Roll: ±60°, Yaw/Pan: ±300°
Controllable Range	Pitch/Tilt: -45° ~ 90°, Yaw/Pan: ±290°
Vibration angle	Pitch/Roll: ±0.02°, Yaw: ±0.02°
One-key to center	√
<b>Camera spec</b>	
Imager Sensor	SONY 1/2.5" "Exmor R" CMOS
Total pixel	8.51MP
Signal system	4K: 2160P/29.97, 2160P/25 FHD: 1080P/59.94, 1080P/50, 1080i/59.94, 1080i/50, 720P/59.94, 720P/50
Optical zoom	20x, F2.0 to F3.8
Digital zoom	12x (240x with optical zoom)

Min. working distance	80 mm (Wide end), 800 mm (Tele end)
Angle of view ( H )	70.2°(Wide end) ~ 4.1°(Tele end)
Sync system	Internal / External
S/N ratio	50dB
Recommended illumination	100 to 100000 lux
Min illumination	1.6 lux (1/30 sec, 50%, ICR off, High Sensitivity mode Off ) 0.4 lux (1/30 sec, 50%, ICR Off, High Sensitivity mode On) 0.21 lux (50%, ICR off, Slow Shutter 1/4s, High sensitivity off) 0.06 lux (50%, ICR off, Slow shutter 1/4s, High sensitivity on)
Back light compensation	On/Off
Gain	Auto
White balance	Auto / Manual
Electronic shutter speed	1/1 to 1/10000 sec. (22 steps)
Noise reduction	On/Off (level 5 to 1/ Off, 6 steps)
Defog mode	On/Off (Low, Mid, High)
Focus	Auto / Manual / One-time automatic focus
Focus speed	2s
Lens initialization	Built-in

User presetting bit	20 sets
Image rotation	180°, Horizontal/Vertical mirror image
OSD	Not support
<b>Packing Information</b>	
N.W.	681g
Product meas.	147*121*154.8mm
Accessories	1pc gimbal camera device, screws, copper cylinders, damping balls, damping boards, 1pc USB to TTL cable / Box
G.W.	2266g
Package meas.	260*180*280mm

## 5. FAQ

1. How to deal with whitening visible image of Q20K in foggy weather?

A: Enable defogging mode

2. How to change output frame rate of Q20K?

A: By sending serial command:

Set output to 4K 25fps: 81 01 04 24 72 01 0E FF

Set output to 4K 30fps: 81 01 04 24 72 01 0D FF

3. Does Q20K support TCP control?

A: Not support