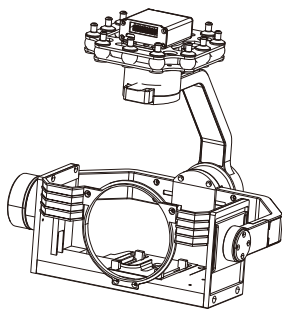# Viewpro

Z-A7 SONY Alpha 7R Series Gimbal User Manual
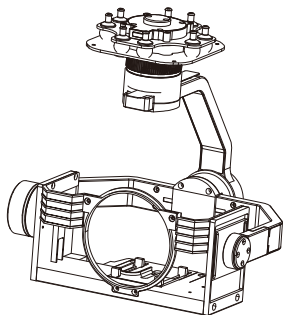
| User Manual | 使用说明 |

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
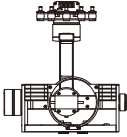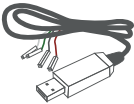
⚠
Important Note

1.Product Introduction
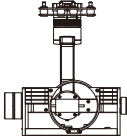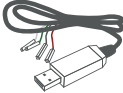
1.1 Introduction
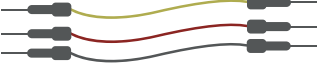
Z-A7 is a pinpoint-precision professional 3-axis gimbal which features high stability and low power consumption. It's designed specially for SONY Interchangeable Lens digital Cameras, can be integrate with SONY a7R Ⅱ / Ⅲ / Ⅳ camera（FE 24-105mm f/4 G OSS、E 55~210mm) for powering the cameras, fulfill functions of record, shutter, zoom, camera on/off etc. Z-A7 can take 90°downward ortho image and video as well. The HDMI cable is led to the top of gimbal from bottom inside which makes the gimbal compact. The speed of Z-A7 gimbal is adjustable, LOW speed in tele end, the control will be more accurate; Fast speed in wide end, which makes the gimbal control sensitive and quick. Also the one-key to center function will allow the gimbal return to initial position automatically and rapidly.

Z-A7 is widely used in UAV industries of electrical industry, transmission towers, electric substations, zoom aerial photography and other industrial applications.

1.

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			
Thumb screw 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		
Thumb screw x 1 pc		

2. Installation Instruction

2.1 Overview
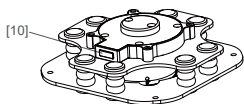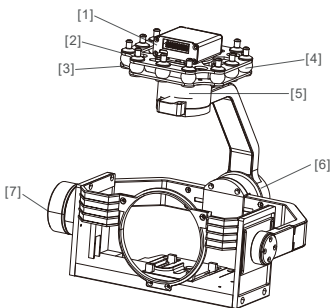
Viewport
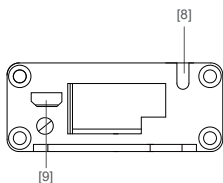
Control Box Back Side
(Standard Version)

(Viewport Version)

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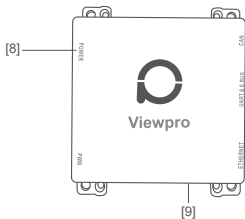
[1] Control box	[6] Roll axis motor
[2] Upper damping board	[7] Pitch axis motor
[3] Lower damping board	[8] 3-6S power interface
[4] Damping ball	[9] HDMI interface
[5] Yaw axis motor	[10] Viewport unlock button

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

2.2.1 Control Box Printing (Standard Version)
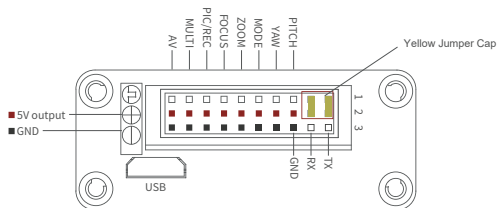
- The input voltage cannot be higher than 6S.
- The pin insertion interface cannot be connected with power supply.
- The yellow jumper cap cannot be removed

2.2.2 Control Box Printing (Viewport Version)

Front Side
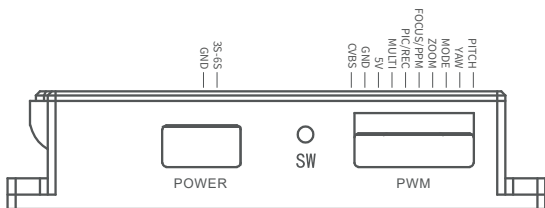
Left Side

Right Side

5.
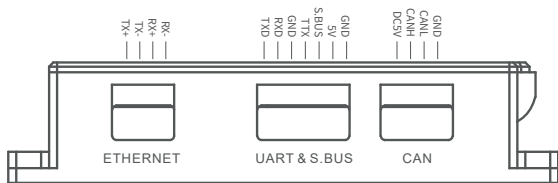
2.3 Device Dimensions (Standard Version)

Unit: mm
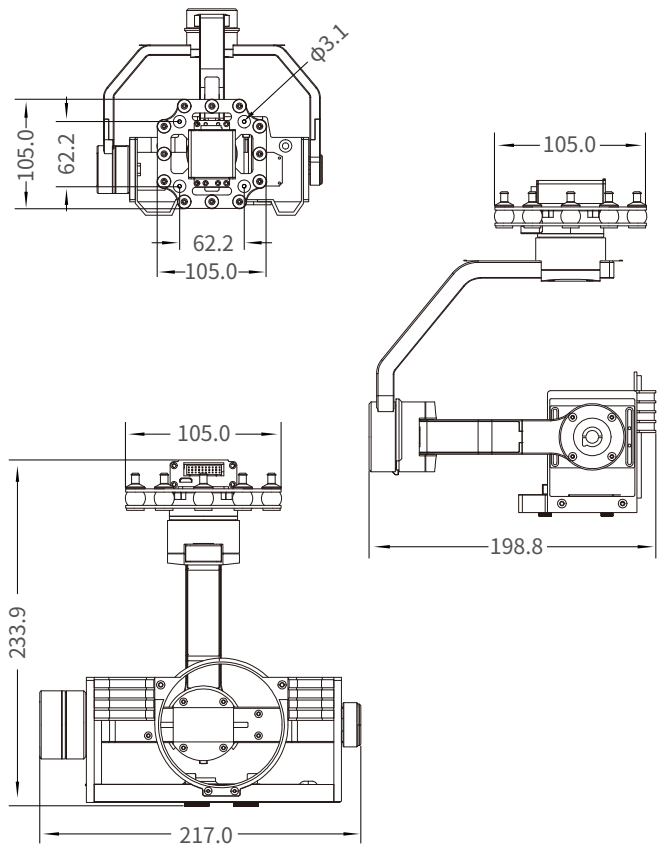
2.3 Device Dimensions (Viewport Version)

Unit: mm

φ3.1

100.0
78.0

78.0
100.0

68.4

63.4

Control Box

100.0

239.9

217.0

100.0

198.8

7.
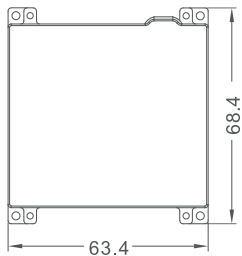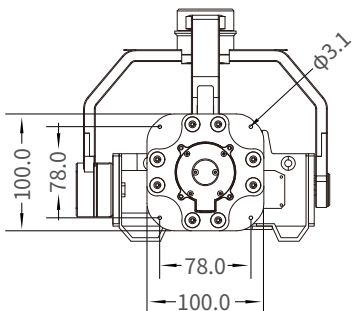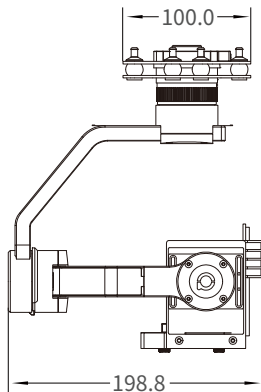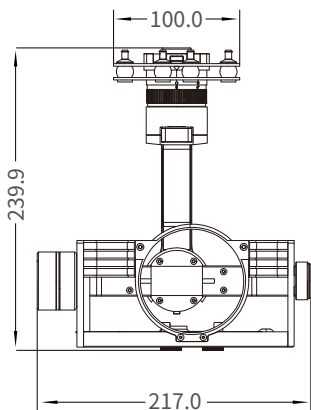
2.4 Install Mounting Part

(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).
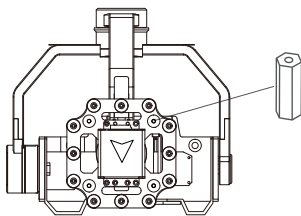
Front

2.5 Viewport Release Instruction
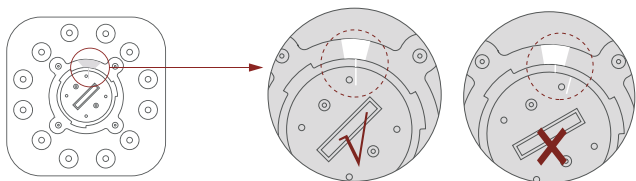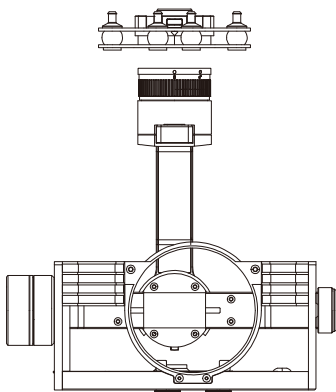
1. Make sure the two white stripes indicated in above picture are aligned with each other. (If the stripes are not aligned to each other, please pinch the connector part and turn it to left manually)
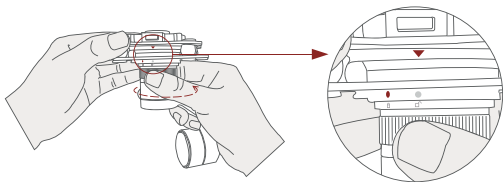
2. Align the white dot (unlock icon) to the red triangle (below unlock button), push the gimbal into the Viewport completely and then rotate the gimbal camera anticlockwise.
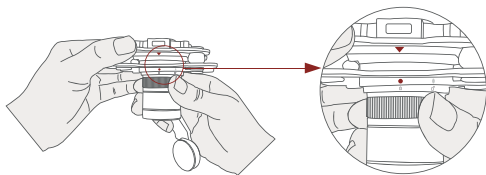
3. When you hear "click" sound (when red dot is aligned to the red triangle) means the gimbal camera and Viewport has been locked.
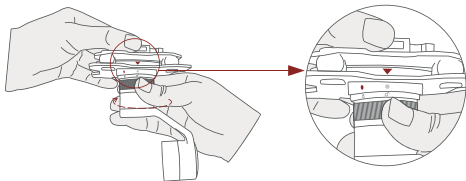
4. To unlock the Viewport, you need to press on unlock button and rotate the gimbal camera clockwise till the white dot align to the red triangle. Then pull the gimbal out from the Viewport.

2.6 Image Output Interface

HDMI: micro HDMI interface, HD output 1080P;

AV: no AV 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)
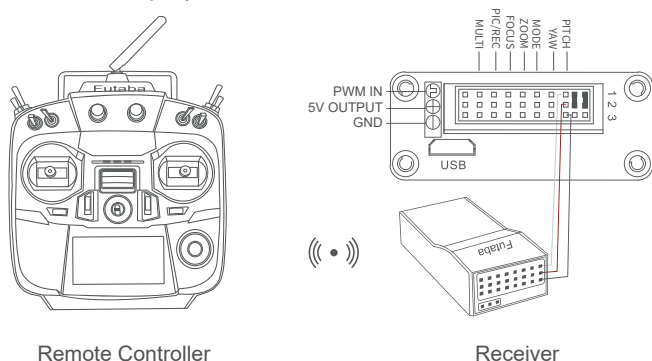
Remote Controller

Receiver

Connection Diagram
(Standard Version)
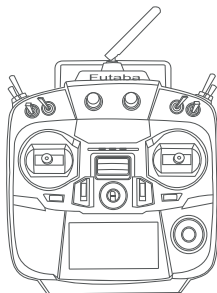
Remote Controller
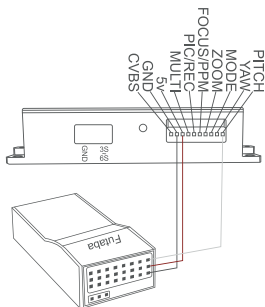
Receiver

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	Position 2	Position 3
Low Gear Yaw Left	Middle Gear Yaw Stop	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	Position 2	Position 3
Low Gear	Middle Gear	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	Position 2	Position 3
Low Gear	Middle Gear	High Gear
Zoom Out	Stop Zoom	Zoom In

5) Focus (PWM Focus channel in to control Manual Focus, rotary knob or 3-gear switch on remote control are optional. 3-gear switch as example).

Position 1	Position 2	Position 3
Low Gear	Middle Gear	High Gear
Focus Tele	Stop Focus	Focus Near

14.

Switch from Position 2 to 1: Focus Tele.
Switch from Position 2 to 3: Focus Near.

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	Position 2	Position 3
Low Gear	Middle Gear	High Gear

Switch from Position 2 to 1: Take a picture

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

7) Multi: (On/off camera, rotary knob or 3-gear switch on remote control are optional. 3-gear switch as example.)

Position 1	Position 2	Position 3
Low Gear	Middle Gear	High Gear

Switch from Position 2 to 1: Turn off camera, the OSD display "No signal", repeat operation to turn on camera.

Switch from Position 2 to 3: Take a picture

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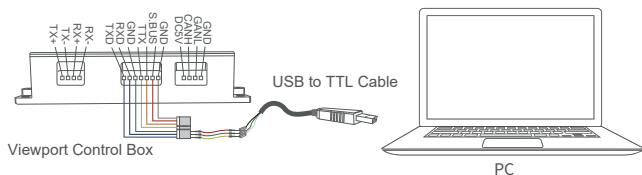
TTL communication requirements: TTL signal is 3.3V, baud rate: 115200, data bit 8, stop bit 1, no parity, HEX send and receive.

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

Gimbal Camera   **Cable**

TX ⟷ RX (White)

RX ⟷ TX (Green)

GND ⟷ GND (Black)
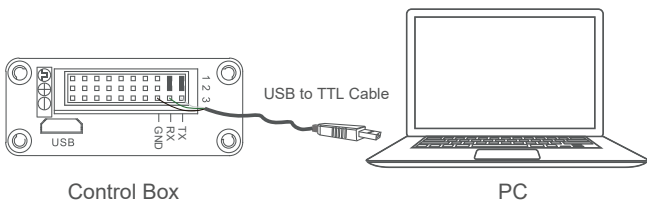
Connection Diagram Standard Version

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):

5V OUTPUT
GND
USB
S.BUS
1 2 3

Futaba

Remote Control

Receiver
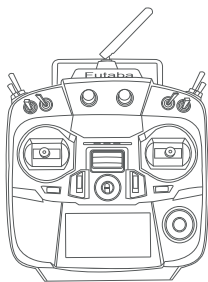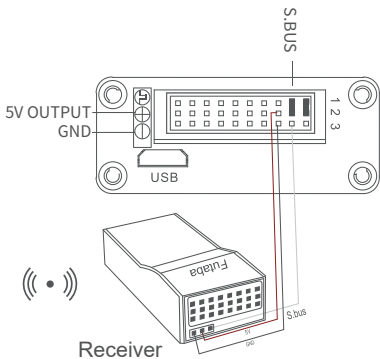
Wiring Diagram Standard Version

TXD
RXD
GND
5V
TTX
GND
S.BUS
GND

Futaba

Remote Control

Receiver

Wiring Diagram Viewport Version

18.

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

⚠

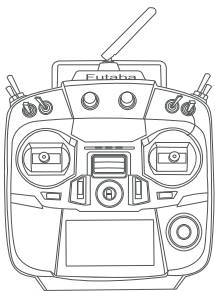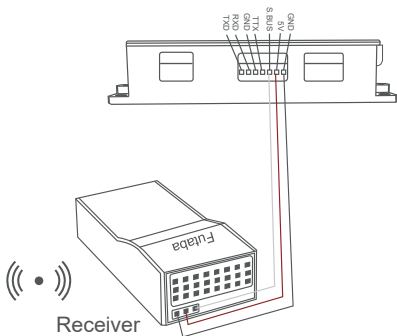• User can set the channels by setting serial command according to the actual requirement. The S.Bus channel position can be arranged in any sequence within channel 1-15 to connect with the flight controller or remote control.

• 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.)

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4. Specification

Hardware Parameter	
Working voltage	12V
Input voltage	3S ~ 6S
Idle current	250mA @ 12V(Only gimbal)
Working environment temp	-20℃ ~ +60℃
Output	micro HDMI(HD output 1080P 50/60fps) / AV
Control method	PWM / TTL / S.BUS
Gimbal Spec	
Angle scope of structure design	Pitch/Tilt: -45°～220°, Roll: ±45°, Yaw/Pan: ±300° / ±360°*N (AV output version)
Angle scope of software design	Pitch/Tilt: -45°～90°, Yaw/Pan: ±290° / ±360° *N (AV output version)
Vibration angle	Pitch/Roll: ±0.02°, Yaw: ±0.02°
One-key to center	√
Compatibility	
Compatible cameras	SONY a7R ll / lll / lV camera（FE 24-105mm f/4 G OSS、E 55~210mm）
Controlling	zoom, focus, record and photo shooting, camera on/off, object tracking (if applicable)

20.

Object Tracking (Optional)	
Update rate of deviation pixel	50Hz
Output delay of deviation pixel	5ms
Minimum object contrast	5%
SNR	4
Minimum object size	32*32 pixel
Maximum object size	128*128 pixel
Tracking speed	32 pixel/frame
Object memory time	100 frames (4s)
The mean square root values of pulse noise in the object position	< 0.5 pixel
Packing Information	
N.W.	1050g
Product meas.	220*199*214mm
Accessories	1pc gimbal camera device, screws, USB to TTL cable / box

5. FAQ

1. Z-A7 gimbal cannot trigger the camera?
A: The USB connector of the gimbal is poor contacted with the USB holder of the camera, plug it again.

1. Z-A7 gimbal HDMI imgae cannot be outputted?
A: The HDMI cable is directly connected to the CAMERA'S HDMI port and monitor, excluding possible issue of cable quality or compatibility.