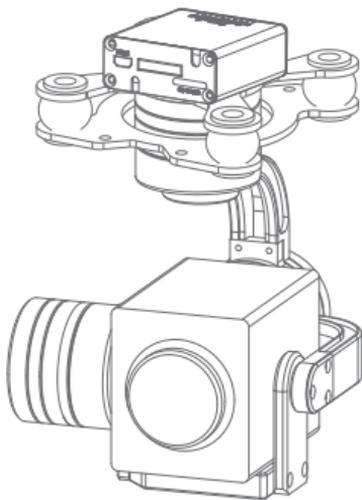




## User manual

### **Z 10F**

10x Optical Zoom Camera Gimbal



Images are for reference only, please subject to the actual product.

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## Z10F Pinpoint-precision Gimbal

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## Z10F Zoom Camera

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## Gimbal Introduction

Z10F is a pinpoint-precision professional 3-axis gimbal with a 10x optical zoom camera which features high stability, small size, light weight and low power consumption. The 3-axis gimbal based on FOC motor control technology, adopts pinpoint-precision encoder in each motor. The speed of Z10F gimbal is adjustable, LOW speed mode is used for large zoom range, the control will be more accurate; Fast speed mode is used for small zooming range, 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.

Z10F can be applied in various fields like military reconnaissance, public security surveillance, traffic monitoring, fire fighting, wildlife spotting, disaster management and rescue etc.

## Object Tracking Function

### 1. Function description

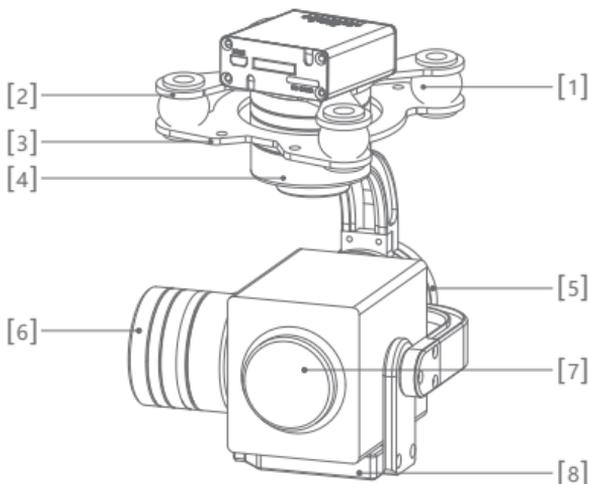
Build-in normalization, cross-correlation and tracking algorithm, combining with object missing recapture algorithm, achieve stable track of the target.

Support custom characters of user OSD, adaptive gate, cross cursor, tracking information display.

### 2. Tracking Performance

- 1)Update rate of deviation pixel 50Hz
- 2)Output delay of deviation pixel <15ms
- 3)Minimum object contrast 5%
- 4)The minimal signal-to-noise ratio (SNR) 4
- 5)Minimum object size 16\*16 pixel
- 6)Maximum object size 160\*160 pixel
- 7)Tracking speed 32 pixel/frame
- 8)The mean square root values of pulse noise in the object position<0.5 pixel

## Gimbal Description



[1] Damping balls

[2] Upper damping board

[3] Lower damping board

[4] YAW axis motor

[5] Roll axis motor

[6] Pitch axis motor

[7] HD zoom camera

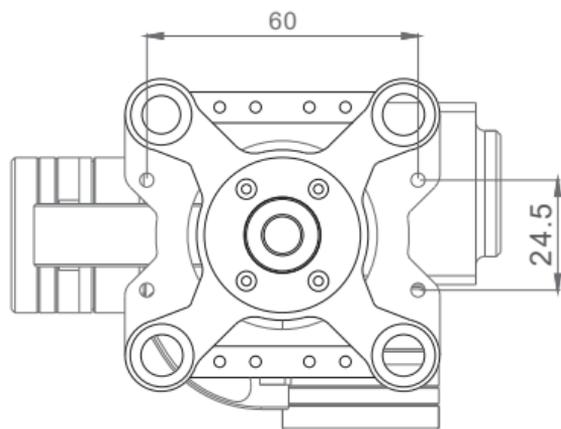
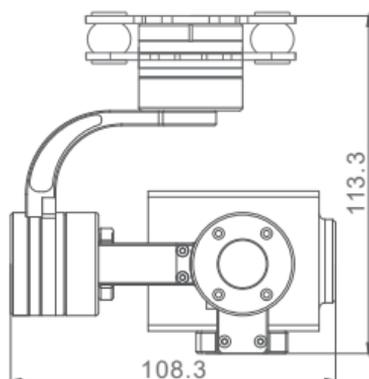
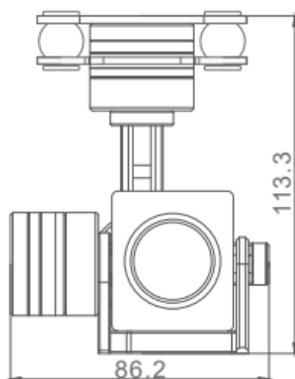
[8] Camera mounting based



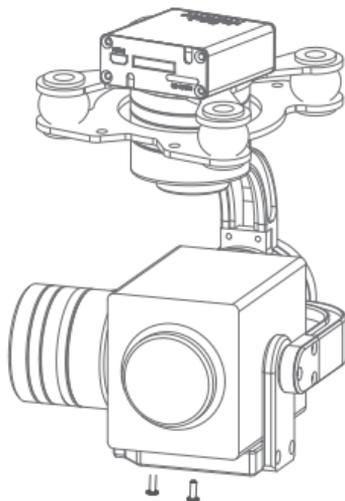
Please make sure that the motor is not stopped by any object during the rotation, if the gimbal is blocked during rotation, please remove the obstruction immediately.

## Gimal Dimension

Unit: mm



## Installing



### Mechanics@Electronic Characteristics

Input voltage	3S~ 4S	Idle current	240mA@12V
Dynamic current	320mA@12V	Working environment temp	-10°~+50°
Size	L108*W86.2*H113.3mm	Weight	395g

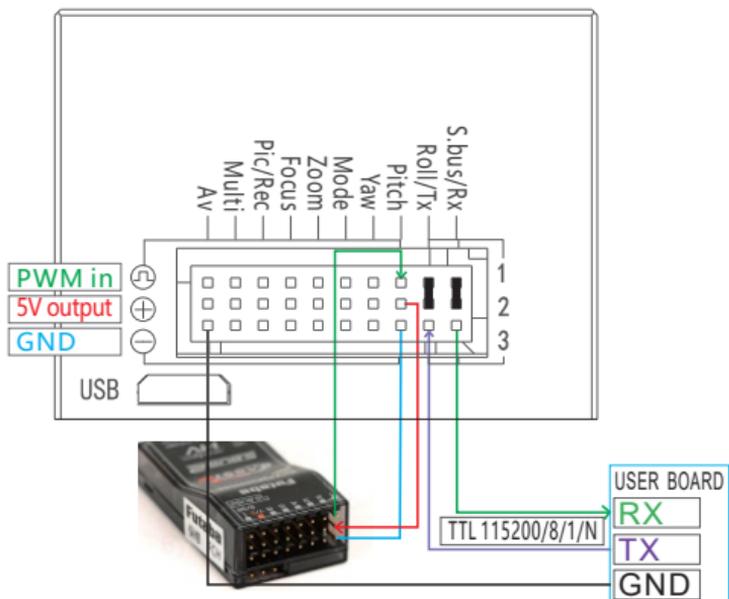
### Working Characteristics

Pitch angle range of action: -90°~+90°
Roll angle range of action: -45°~+45°
Yaw angle range of action:- 150°~+150° Non-polar rotation
Vibration angle: Pitch/Roll: $\pm 0.02^\circ$ , Yaw: $\pm 0.03^\circ$

## Connection of Control Box and Wiring Instruction



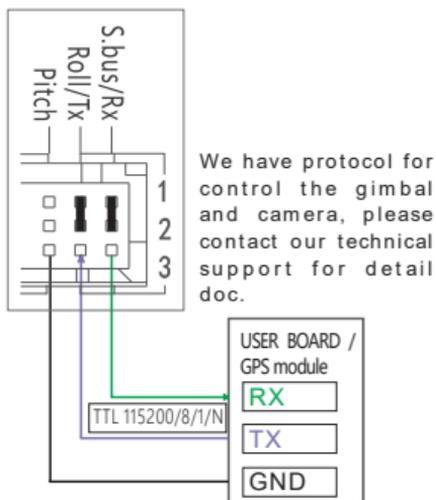
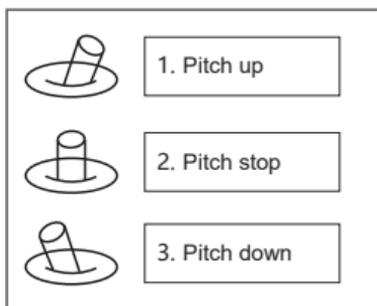
HDMI: micro HDMI OUTPUT  
1080P 60fps default  
SD card: max 32G, class10  
FAT32 or format



S.bus/Rx: connect to Rx2 for track function.

Roll/ Tx: connect to Tx2 for track function.

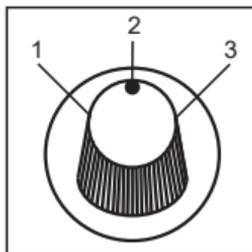
Pitch: PWM in, pitch control



Yaw:PWM in, Yaw control



Mode: Change the speed / home position



Position 1: Lowest speed for pitch and yaw.

Position 2: Middle speed for pitch and yaw.

Position 3: Highest speed for pitch and yaw. The speed is continuously quickly from 1 to 3.

One click: Home position.

Two click: Look down.

Three click: Yaw not followed by frame.

Four click: Yaw followed by frame.

Five click: Restore the factory settings.

(Click = from 2 to 3 and back to 2 quickly)

ZOOM: Zoom the camera

Focus: Focus the camera



1. Zoom tele



2. Stop zoom



3. Zoom wide



1 Focus tele

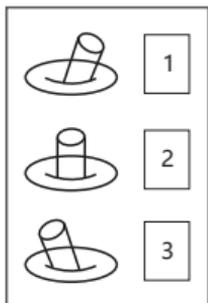


2 Stop focus



3 Focus near

## Pic /Rec picture / Start record, stop record



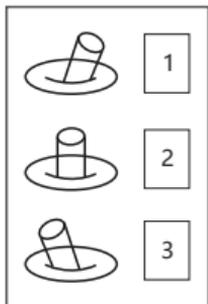
Switch 2 to 1: camera mode change.

Picture mode: the number is quantity of SD card can storage;

Record mode: the time is recording time from start record.

Switch 2 to 3: A) take a picture. B) Start record / stop record

## Multi: Backup PWM channel for customize



AV: AV output.

## Camera Introduction

Z10F has 4 mega effective pixel, supports 10x optical autofocus, possess HD 1080P video. There are two video streams in the camera, one is 1080P 30FPS, local H.264 compression, stored in the device SD card, another video output 1080p60FPS HDMI HD signal for the wireless transmission, according to the characteristics of UAV photography application, we design fast auto-focus speed, small size, and support PWM and serial command control.

## Parameter Index

1. Adopt 1/3 inch, 4 mega pixels CMOS SENSOR
2. The output resolution is 1920\*1080P/60 fps.
3. Lens imported from Japan, higher definition
4. 10x optical zoom lens, 5 mega HD lens.
5. Zoom focal length  $f=4.9\sim 49\text{mm}$ , aperture diameter 12.
6. AV analog output, 1080P30 video stream in local TF card storage.
7. Real time fast focus function, the focus time  $<1\text{s}$ .
8. Support flip vertically, horizontal mirror, stationary picture, automatic white balance, automatic gain, automatic color correction.
9. Wide temperature range, temperature range from  $-10\text{ }^{\circ}\text{C}\sim 55\text{ }^{\circ}\text{C}$ .
10. Support serial protocol control.
11. Horizontal observation range: from  $53.2^{\circ}$  (close focus) to  $5.65^{\circ}$  (far focus).  
Vertical observation range: from  $39.8^{\circ}$  (close focus) to  $4.2^{\circ}$  (far focus).  
Focusing observation range: from  $66.6^{\circ}$  (close focus) to  $7.2^{\circ}$  (far focus).

## Functional Characteristics

### Zoom Range

Zoom focal length  $f=4.9\sim 49\text{mm}$ , zoom ranges up to 10 times, exhibiting image detail Perfectly.

### The Speed of Focusing

Design for UAV aerial photography, according to aerial characteristics, using fast focus algorithm, focus time  $<1\text{s}$ .

### Wide Dynamic

Adopt 105dB wide dynamic range, in the presence of backlit or strong light. The view of the over bright and over dark regions can still be captured at the same time.

### Ultra Low Illumination

The device can still clearly display image features in Ultra low illumination or poor light environment.

### Output Interface

Machine core is simulated by CVBS, 1080P HDMI output, 1080P local storage H2.54 Compression storage

### Multiple Control Modes

Support PWM control and serial command control.  
(Any fly control channel can be used to control the ZOOM multiples).