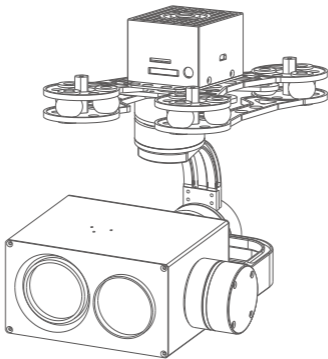




## User manual

### Z30TL

30x Zoom Laser Night Vision Object Tracking Camera Gimbal



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

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## 30x Starlight HD Zoom Camera

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## Gimbal Introduction

Z30TL is a pinpoint-precision professional 3-axis gimbal with a 30x 1080P starlight night vision network 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. Z30TL can be applied in various fields like public security surveillance, fire fighting, electric power etc.

The speed of Z30TL 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.

Z30TL supports PWM and serial command control, suitable for close range remote control or remote data command control.

## Object Tracking Function

### 1. Function description

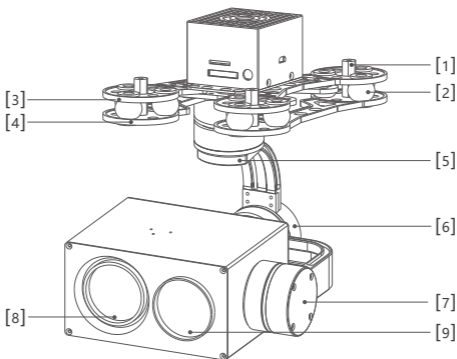
Build-in normalization, cross-correlation and tracking algorithm, combining with object missing recapture algorithm, achieve stable track of the target.

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] Gimbal fixed copper cylinder

[2] Damping balls

[3] Upper damping board

[4] Lower damping board

[5] YAW axis motor

[6] Roll axis motor

[7] Pitch axis motor

[8] Light supplement

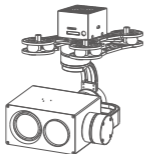
[9] HD zoom camera



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.

## Packing list

Gimbal\*1



Screw pack\*1

Screw pack\*1  
(M3\*5mm button head hexagon screw\*12)

Copper cylinders\*4

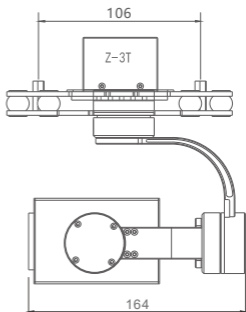
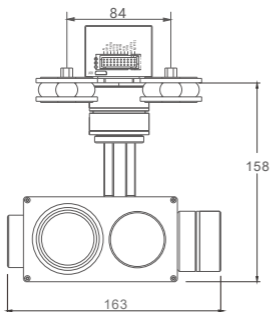


Damping balls\*12

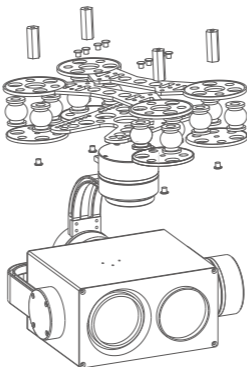


## Gimbal Dimension

Unit : mm



## Installing



### Mechanics@Electronic Characteristics

Input voltage	3S~ 4S	Idle current	800mA@12V
Dynamic current	1000mA@12V	Working environment temp	-20 C ~ +80 C
Size	L163*W 164*H158mm	Weight	1265g

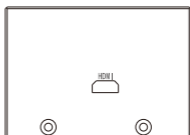
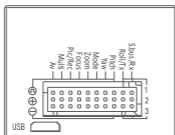
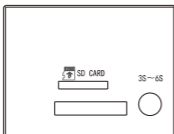
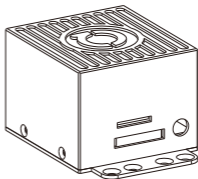
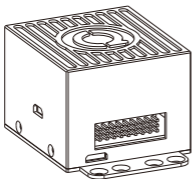
### Working Characteristics

Pitch/Tilt: Pitch angle range of action : $\pm 90$
Roll: Roll angle range of action : $\pm 85^{\circ}$
Yaw/Pan: Yaw angle range of action : $\pm 150^{\circ}$
Vibration angle: Pitch/Roll: $\pm 0.02^{\circ}$ , Yaw: $\pm 0.03^{\circ}$

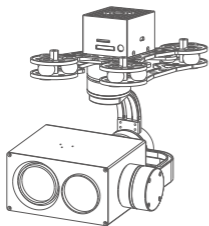
# Gimbal's Signal Wire Box

Size:49\*45.4\*35.7

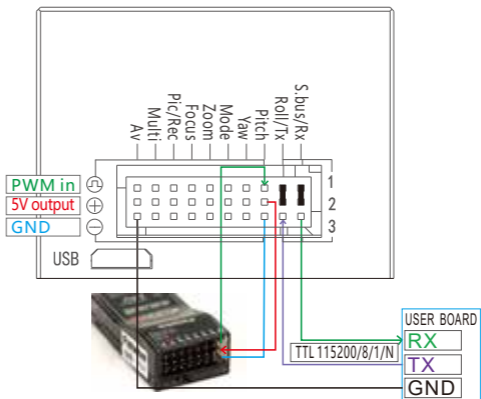
Unit : mm



## Connection of Control Box and Wiring Instruction



HDMI: micro HDMI OUTPUT  
1080P 60fps default  
SD card: max 128G, class10  
FAT32 or exFAT format

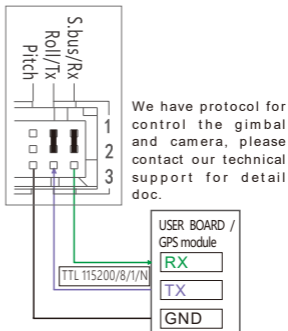
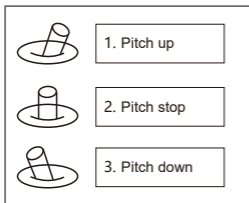




S.bus/Rx: connect to Rx2 for track function.

Roll/ Tx: connect to Tx2 for track function.

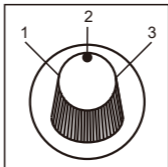
Pitch: PWM in, pitch control



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 Zoom laser light tele

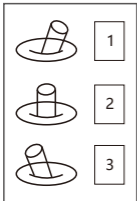


2 Stop zoom laser



3 Zoom laser light

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

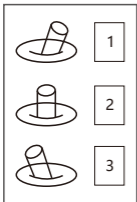


Switch 2 to 1: Start record / stop record.start record, the OSD display rec hh:mm:ss ;

Stop record, the OSD display STBY.

Switch 2 to 3: take a picture . OSD display'REC IMG' a second.

## Multi: Tracking control / camera ICR on, laser on/ camera ICR off, laser off



1. Tracking start

2. Stop tracking.

From 2 to 3: Camera ICR on, laser on.  
( ICR on = Camera night mode), use 'focus' can zoom laser.

From 2 to 3 again: Camera ICR off, laser off  
( ICR off = Camera day mode)

AV: NO AV output this model.

		<b>FCB-EV7520</b>
Imager sensor		1/2.8-type Exmor R CMOS
Lens		30x
Picture quality		Full HD 1080p (1920 x 1080)
Minimum illumination*		Colour: 0.01 lx (F1.6, AGC on, 1/30 s)
Digital zoom		12x (360x with optical zoom)
Defog		Yes
Image sensor		1/2.8-type Exmor R CMOS
Image sensor (Number of effective pixels)		Approx. 2.13 Megapixels
Signal system		1080p/59.94, 1080p/50, 1080p/60, 1080p/30, 1080p/29.97, 1080p/25, 1080i/59.94, 1080i/50, 1080i/60, 1080i/30, 720p/59.94, 720p/50, 720p/60, 720p/30, 720p/29.97, 720p/25, NTSC*1, PAL*1
Minimum illumination (50%)	High sensitivity mode	Colour: 0.01 lx (F1.6, AGC on, 1/30s)
	Normal mode	Colour: 0.1 lx (F1.6, AGC on, 1/30s)
S/N ratio		More than 50 dB
Gain		Auto/Manual 0 dB to 50.0dB (0 to 28 steps +2 step/ total 15 steps) Max. Gain Limit 10.7 dB to 50.0 dB (6 to 28 steps +2 tep/total 12 steps)

		<b>FCB-EV7520</b>
Shutter speed		1/1 s to 1/10,000 s, 22 steps
Sync system		Internal
Exposure control		Auto, Manual, Priority mode (shutter priority & iris priority), Bright, EV compensation, Slow AE
Backlight compensation		Yes
Aperture control		16 steps
White balance		Auto, ATW, Indoor, Outdoor, Outdoor Auto, Sodium Vapor Lamp (Fix/Auto/Outdoor Auto), One-push, Manual
Lens		30x optical zoom f = 4.3 mm (wide) to 129.0 mm (tele) F1.6 to F4.7
Digital zoom		12x (360x with optical zoom)
Focusing system		Auto (Sensitivity: normal, low), One-push AF, Manual, Interval AF, Zoom Trigger AF, Focus compensation in ICR on
Horizontal viewing angle	1080p mode	63.7° (wide end) to 2.3° (tele end)
	720p mode	63.7° (wide end) to 2.3° (tele end)
	SD	47.8° (wide end) to 1.7° (tele end)
Minimum object distance		10 mm (wide end) to 1200 mm (tele end) (Default: 300 mm)

## Light Supplement Characteristics

<b>Effective range</b>	More than 500 meters
<b>Light wave length</b>	850 ± 10nm (940nm, 980nm)
<b>Illumination angle</b>	Power zoom synchronously, 70°~2.0° adjustable
<b>Zoom time</b>	2s (wide end - tele end)
<b>Power consumption of laser chipset</b>	2 ± 0.2W
<b>Illumination range</b>	Tele end 2.0°: effective range 300 meters, spot diameter < 20 meters Wide end 70°: effective range > 40 meters
<b>Working voltage</b>	DC12V ± 10%
<b>Power consumption in total</b>	< 11W
<b>Control system</b>	PWM/TTL
<b>Communication system</b>	UART_TTL
<b>Communication protocol</b>	PELCO-D ( default baud rate 9600bps)
<b>Working temp</b>	-20℃~+80℃
<b>Environment temp</b>	-40℃~+80℃