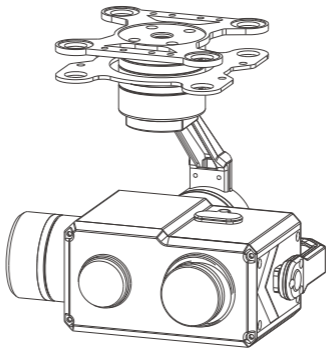




User manual

MINI Z10TIR

10x Zoom EO + IR Dual Sensor Object Tracking Camera Gimbal



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

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Mini Z10TIR Pinpoint-precision Gimbal

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Gimbal Introduction

MINI 10TIR is a pinpoint-precision professional 3-axis gimbal 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 MINI 10TIR 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.

MINI Z10TIR supports PWM, S.BUS and serial command control, suitable for close range remote control or remote data command control.

Object Tracking Function

1. Function description

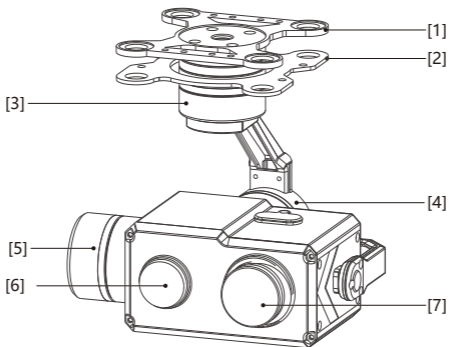
Build-in normalization, cross-correlation and tracking algorithm, combining with object missing recapture algorithm, achieve stable track of the target.

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
- 9) Object memory time 100 frames

Gimbal Description



[1] Upper damping board

[5] Pitch axis motor

[2] Lower damping board

[6] 10x HD zoom camera

[3] YAW axis motor

[7] 19mm 640 thermal infrared camera

[4] Roll axis motor



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*4)

Copper cylinders*4

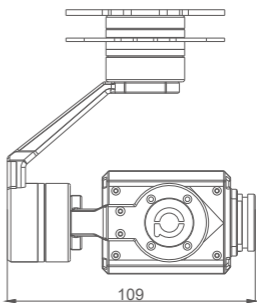
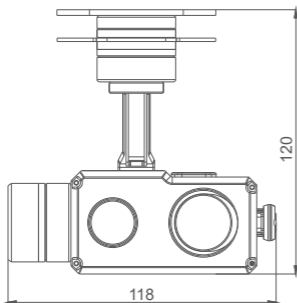


Damping balls*4

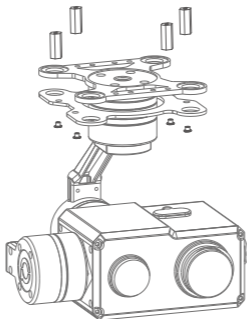


Gimbal Dimension

Unit : mm



Installing



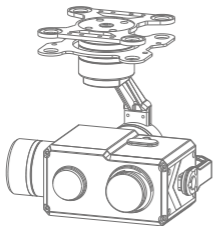
Mechanics@Electronic Characteristics

Input voltage	3S~ 4S	Idle current	450mA@12V
Dynamic current	500mA@12V	Working environment temp	-10°C ~ +60°C
Temp	-30°C~+80°C	Weight	490g
Size	L118 *W 109*H120mm		

Working Characteristics

Pitch/Tilt: Pitch angle range of action : ± 90
Roll: Roll angle range of action : $\pm 85^{\circ}$
Yaw/Pan: Yaw angle range of action : $\pm 170^{\circ}$
Vibration angle: Pitch/Roll: $\pm 0.01^{\circ}$, Yaw: $\pm 0.01^{\circ}$

Connection of Control Box and Wiring Instruction

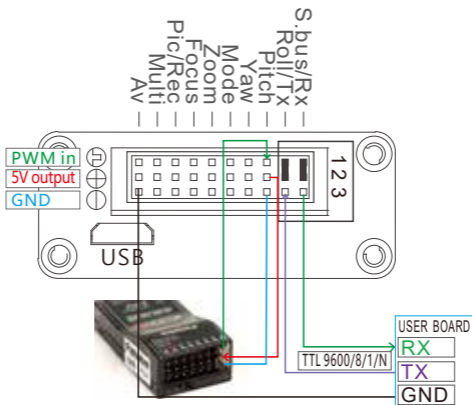


HDMI: micro HDMI OUTPUT

1080P 60fps default

SD card: max 128G, class10

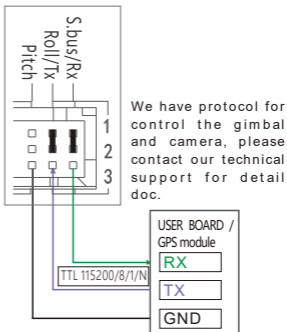
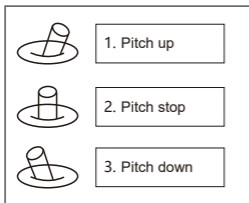
FAT32 or exFAT format



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

Roll/ Tx: connect to Tx2 for track function.

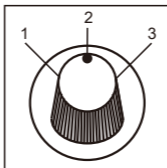
Pitch: PWM in, pitch control



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

Switch 2 to 1: IR color white hot, black hot, pseudo color



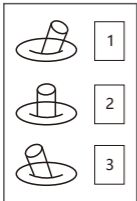
2



3

Switch 2 to 3: Picture in Picture. EO+IR, IR+EO, EO only, IR only.

Pic /Rec picture / Start record, stop record



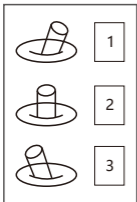
Switch 2 to 1:

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



Position 1 exit the tracking

Switch 1 to 2: Display the cross cursor. Adjust the object to the cross cursor.

Switch 2 to 3: Start tracking. Change the object during tracking.

Switch 3 to 2: Display the cross cursor, use Pitch/Yaw to adjust the cross cursor.

Switch 2 to 3: Start tracking.

AV: NO AV output this model.

640 25mm Thermal Imager Parameter

Horizontal FOV		32°
Vertical FOV		24°
Diagonal FOV		39.4°
Detective Distance(M an:1.8x0.5m)		559meters
Recognize Distance(M an:1.8x0.5m)		140meters
Verified Distance(M an:1.8x0.5m)		70meters
Detective Distance(Car:4.2x1.8m)		1714meters
Recognize Distance(Car:4.2x1.8m)		428 meters
Verified Distance(Car:4.2x1.8m)		214 meters
Thermal Imager Spec	Working mode	Uncooled long wave (8μm~14μm) thermal imager
	Detector pixel	640*480
	Pixel size	17μm
	Focusing method	Athermal prime lens
	Emissivity correction	0.01~1
	NETD	≤50mK (@25℃)
	MRTD	≤650mK (@characteristic frequency)
	Image enhancement	Auto adjust image brightness and contrast ratio
	Color palette	Black, white, pseudo color
	Auto Non-uniform correction	Yes (no shutter)
	Digital zoom	1x, 3x
	Sync correct time	Yes
	Temperature type	Temperature bar (pseudo color display) max temp, min temp, FOV center temp
Temperature warning	-20℃~120℃	
Thermal Object Tracking	Update rate of deviation pixel	25Hz
	Output delay of deviation pixel	<3ms
	Minimum object size	16*16 pixel
	Maximum object size	128*128 pixel
	Tracking speed	±32 pixel/frame
	Object memory time	100 frames (4s)

10x Visible Light Camera Specifications

Imager Sensor	1/3 type progressive scanning CMOS
Picture quality	Full HD 1080 (1920*1080)
Effective pixel	4.08MP
Video output	1080p/60, 1080p/50, 1080p/30, 1080p/25
Min illumination	0.5 lx (1/30s, F1.8, 50%)
Illumination range	100 lx ~100,000 lx
Gain	Auto / Manual
Shutter speed	1/1s to 1/10,000s
Sync system	Internal
Exposure compensation	-12dB ~+ 12dB
Backlight compensation	ON / OF
Gamma correction	standard
Aperture control	16 steps
White balance	ATW1 (Narrow), ATW2 (Wide), single touch, manual (B, R)
Ae	optical zoom10.5x
Lens (wide end ~ tele end)	F=3.2~33.6mm
	F1.8~3.4
	Automatic, manual, priority mode (shutter/aperture)
Horizontal viewing angle	62°(wide end) ~ 6.5°(tele end)
Zoom mode	Standard / Variable / Direct
Zoom movement time	1.5s
Focusing on the system	automatic, manual, single-touch, autofocus sensitivity
Min object distance	10mm(wide end) to 800mm(tele end)
Horizontal resolution	Above center 800TV line