

User Manual

Z10TIRM

10x Zoom Thermal Imager & Laser Rangefinder Object Tracking Gimbal Camera

Compatible with DJI M200/M210/M210RTK



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

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Camera Introduction

Z10TIRM is a high-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 high-precision encoder in each motor. It can be used on DJI drones M200 / M210 / M210RTK. Controlled by APP DJI PILOT it can meet many powerful functions, such as: photos or videos with 10 times optical zoom, object tracking, laser rangefinder, thermal imager and so on. The speed of Z10TIRM gimbal is adjustable, LOW speed mode for tele end, the control will be more accurate; Fast mode for wide end, which makes the gimbal control sensitive and quick. The one-key to center function will allow the gimbal return to initial position automatically and rapidly. You can input a degree in APP Payload Setting and get the gimbal attitude angles exactly.



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.

Camera Description

Mechanics@Electronic Characteristics

Input voltage	4S ~ 6S	Idle current	450mA@12V
Dynamic current	550mA@12V	Working environment temperature	− 20°C ~ + 60°C
Size	110.5*128*155.5mm	Weight	550g

Pitch/Tilt: Pitch angle range of action: ±90°
Roll: Roll angle range of action: ±85°
Yaw/Pan: Yaw angle range of action: ±360°*N
Vibration angle: Pitch/Roll: ±0.01°, Yaw: ±0.01°

Application Description

DJI Pilot

After mounting Z10TIRM on DJI drone and connecting with remote control, you can operate the gimbal camera via APP DJI Pilot. The gimbal attitude angles (tilt and pan) can be controlled by DJI remote control. Control method please refer to DJI related user manual.

1. Menu instruction



1.1 Camera settings – Photo mode settings

You can choose single shot, burst mode or interval mode.



1.2 Payload Settings

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Gimbal Speed:

Gimbal speed is adjustable. When it's 0%, the speed will adjust automatically, quick speed for wide end, slow speed for tele end. When you adjust it to 1% manually, the speed will be low even in wide end. The high the percentage is, the quicker the speed will be.

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OSD Display Options:

You can DIY you on-screen-display (OSD). Choose Hide ALL, or you can choose to display the items that you want only.

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Hide All



OSD Type Options:

You can choose to display FOV (Field of View) or Zoom times, GPS co-ordinate of UAV of the object.

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Picture In Picture:

There are 4 picture models, EO+IR, IR, IR+EO, EO. According to your choice, the screen will show different picture.



IR+EO



IR Color:

There are 5 color models for select, Gray Scale, Pseudo Color, Iron Oxide Red, Rainbow, Color. You can choose different model for different scene.

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Gimbal Pitch Angle/ Gimbal Yaw Angle:

Input the pitch / yaw angle degrees to get exact attitude angles directly.



Tracking Enable:

Turn on/ off the object tracking function.

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Drag Control:

Press on the screen then drag to control pan and tilt.



2. Main functions instruction

2.1 Thermal Imager

Integrated French ULIS high-precision uncooled long wave ($8\mu m \sim 14\mu m$) thermal image sensor, Z10TIRM can record and transmit thermal image and visible images at the same time. ULIS thermal sensors reveal details invisible to the naked eye by making subtle differences in temperature visible. This new view on the world can reveal when equipment or buildings are damaged, the location of lost people and much more.



2.2 Object Tracking

Start tracking: Enable tracking function, the single touch on the screen to pick tracking object. Stop tracking: Payload Settings – CANCEL TRACKING

*Note: the gimbal will follow the object automatically after object is chosen, to control the gimbal manually please cancel tracking first.



2.3 Laser Rangefinder

Z10TIRM build-in infrared (IR) laser rangefinder, can resolve the geo graphic position and distance of the object automatically after GPS signal is synced from the UAV. The target is the object in the middle point of the screen. When the object distance is less than 5 meters or bigger than 1500 meters, the distance will show 0.



Specification

	Hardware Parameter		
Working voltage	12V		
Input voltage	4S ~ 6S		
Output voltage	5V (connect with PWM)		
Dynamic current	550mA @ 12V		
Idle current	450mA @ 12V		
Power consumption	≤ 6.6W		
Working environment temp.	-20°C ~ +60°C		
Output	Skyport		
Local-storage	SD card (Up to 128G, class 10, FAT32 or ex FAT format)		
Control method	DJI Pilot		
	Gimbal Spec		
Pitch/Tilt	±90°		
Roll	±85°		
Yaw/Pan	±360°*N		
Vibration angle	Pitch/Roll: ±0.01°, Yaw: ±0.01°		
One-key to center	\checkmark		
Camera Spec			
Imager Sensor	1/3" CMOS		
Picture quality	Full HD 1080 (1920*1080)		
Effective pixel	4.08MP		
Lens optical zoom	10x, F=3.2~33.6mm		
Digital zoom	None		
Min object distance	10mm(wide end) to 800mm(tele end)		
Horizontal viewing angle	Wide 62° ~ Tele 6.5°		
Sync system	Progressive scanning		
S/N ratio	more than 52dB		
Min illumination	0.5lux@F1.8, 50%, 1/30s		
Illumination range	100 lx ~100,000 lx		
Gain	Auto/Manual		
White balance	ATW1 (Narrow), ATW2 (Wide), single touch, manual (B, R)		
Shutter speed	1/1s to 1/10,000s, 22 steps		
Exposure compensation	-12dB ~ +12dB (13steps in total)		
Backlight compensation	Yes		
Aperture control	16 steps		
OSD	Yes		

Camera Object Tracking			
Update rate of deviation pixel	50Hz		
Output delay of deviation pixel	<10ms		
Minimum object contrast	5%		
SNR	4		
Minimum object size	16*16 pixel		
Maximum object size	160*160 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		
	Thermal imager spec		
Lens size	19mm		
Horizontal FOV	32°		
Vertical FOV	24°		
Diagonal FOV	39.4°		
Detective Distance (Man: 1.8x0.5m)	559 meters		
Recognize Distance (Man: 1.8x0.5m)	140 meters		
Verified Distance (Man: 1.8x0.5m)	70 meters		
Detective Distance (Car: 4.2x1.8m)	1714 meters		
Recognize Distance (Car: 4.2x1.8m)	428 meters		
Verified Distance (Car: 4.2x1.8m)	214 meters		
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	White, iron red, pseudo color		
Auto Non-uniform correction	Yes (no shutter)		
Digital zoom	1x, 3x		
Sync correct time	Yes		
Temperature warning	0°C~100°C		

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)		
Laser Rangefinder			
Range	1500 meters		
Location Resolving	Latitude and longitude of target		
Ranefinder	Target distance measuring		
	Packing Information		
N.W.	550g		
Product meas.	110.5*128*155.5mm		
Accessories	1pc gimbal camera device / box		
G.W.	2732g		
Package meas.	360*300*250mm		