



User Manual

Mini Z10TIR

10x Zoom Thermal Imager Object Tracking Gimbal Camera

Compatible with DJI M200/M210/M210RTK



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Camera Introduction

Mini Z10TIR 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, thermal imager and so on. The speed of Mini Z10TIR 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.

Camera Description



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.

Mechanics@Electronic Characteristics

Input voltage	4S ~ 6S	Idle current	450mA@12V
Dynamic current	550mA@12V	Working environment temperature	- 40°C ~ + 60°C
Size	118*109*120mm	Weight	469g

Pitch/Tilt: Pitch angle range of action: $\pm 90^\circ$
Roll: Roll angle range of action: $\pm 85^\circ$
Yaw/Pan: Yaw angle range of action: $\pm 360^\circ$
Vibration angle: Pitch/Roll: $\pm 0.01^\circ$, Yaw: $\pm 0.01^\circ$

Application Description

DJI Pilot

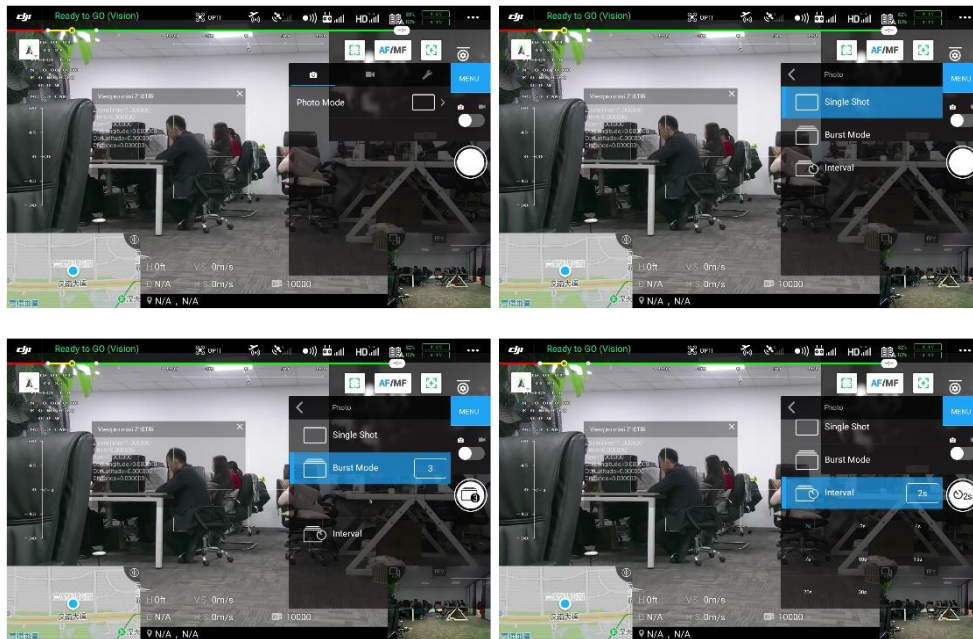
After mounting Mini Z10TIR on DJI drone and connecting with remote control, you can operate the gimbal camera via APP DJI Pilot. The gimbal attitude angles (tilt and pan) can be controlled by DJI remote control. Control method please refer to DJI related user manual.

1. Menu instruction

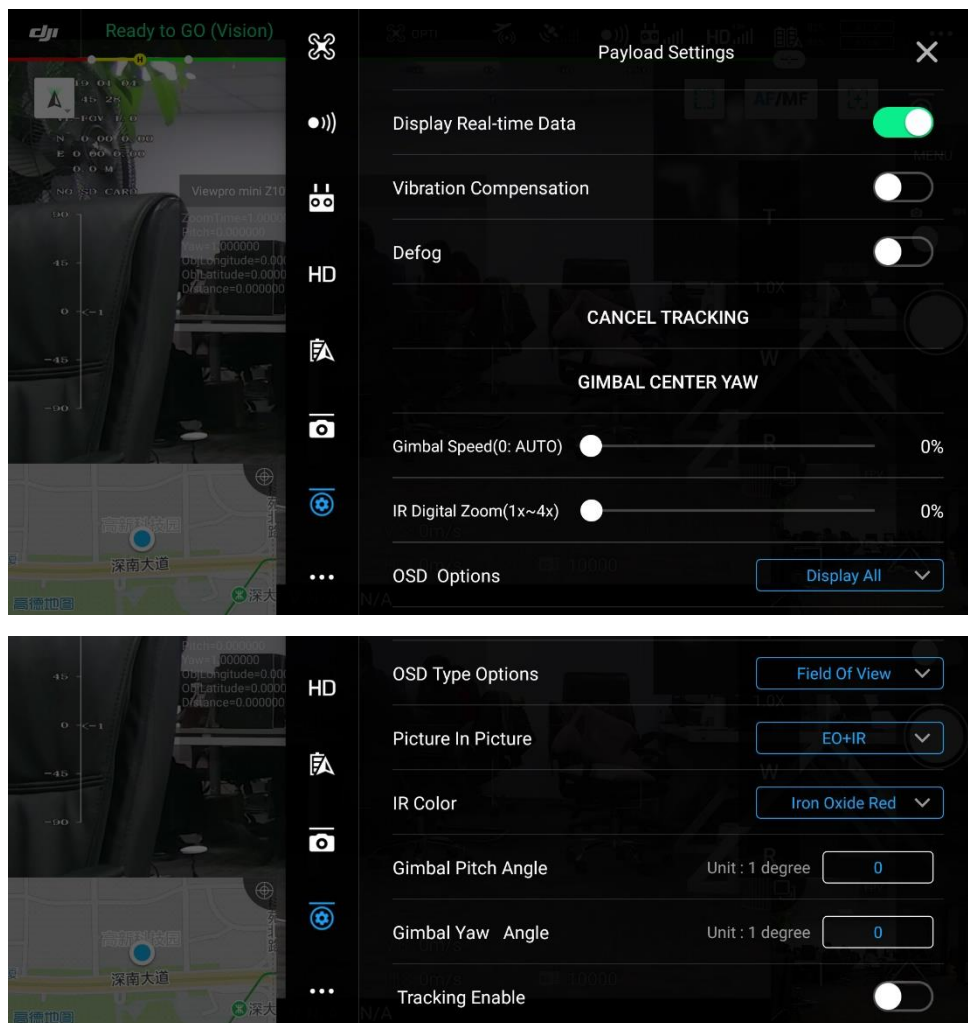
The image shows the DJI Pilot app interface with various controls and data points labeled. The interface includes a top status bar with battery and signal indicators, a central camera view, and a bottom status bar with flight data. Labels on the left side point to various data fields: FOV/Zoom times, GPS co-ordinate, UAV height, Record status, Real-time Data, Gimbal attitude angles, and UAV direction. Labels on the right side point to various controls: Auto Focus / Manual Focus, Payload settings, Camera settings, Picture and record switch, Zoom times, Shutter button, and Return to 1.0x zoom.

1.1 Camera settings – Photo mode settings

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

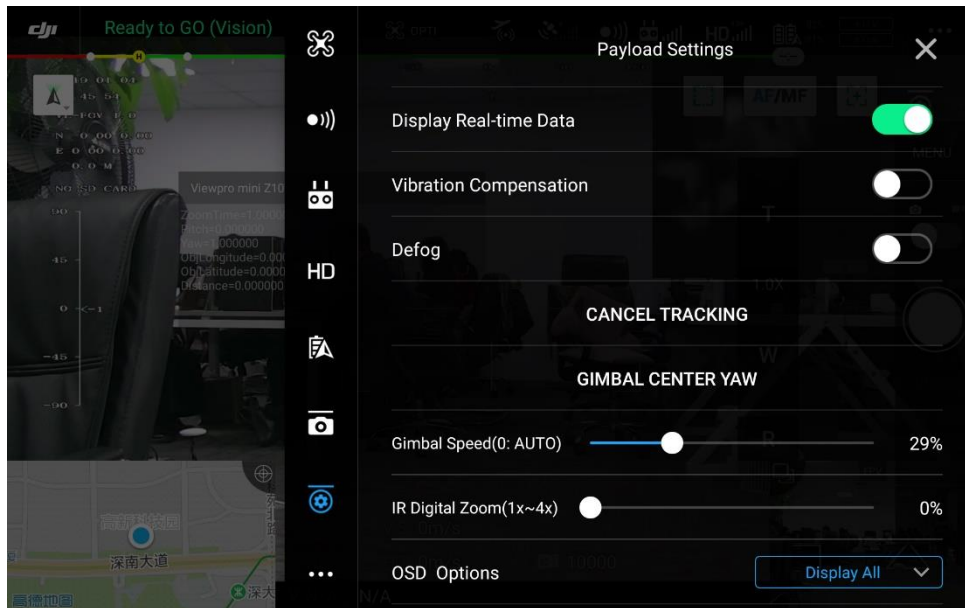


1.2 Payload Settings



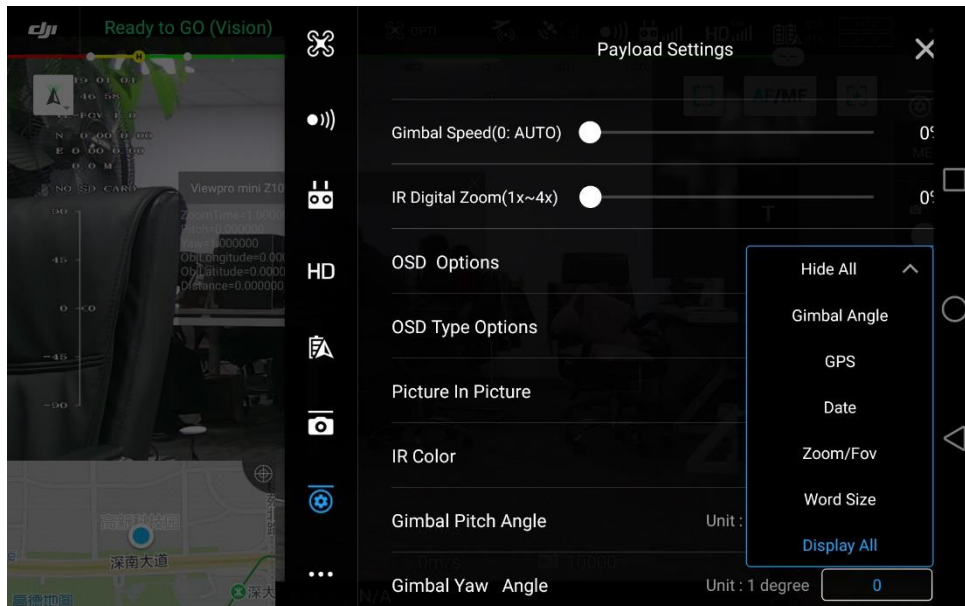
Gimbal Speed:

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.



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.

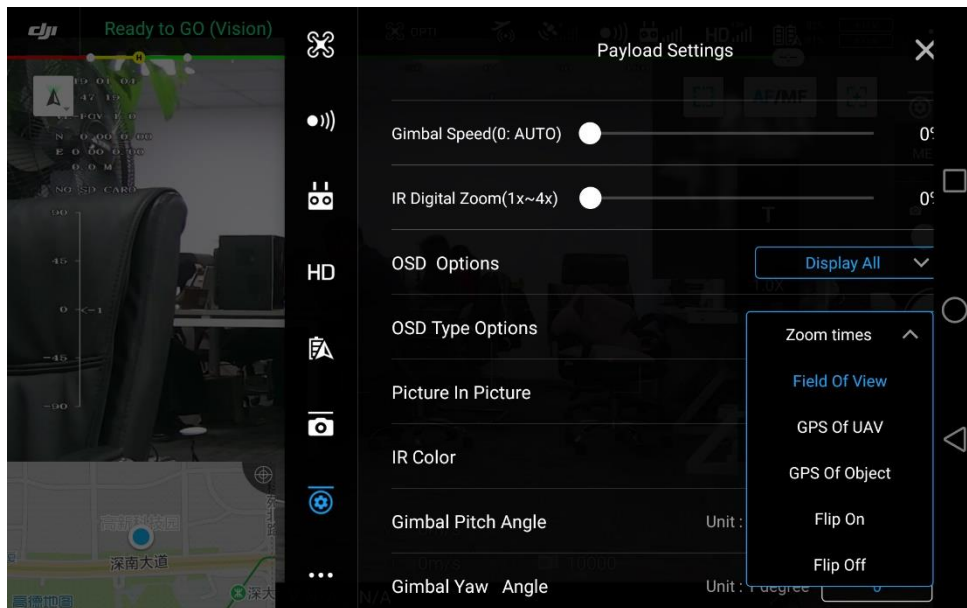


Hide All



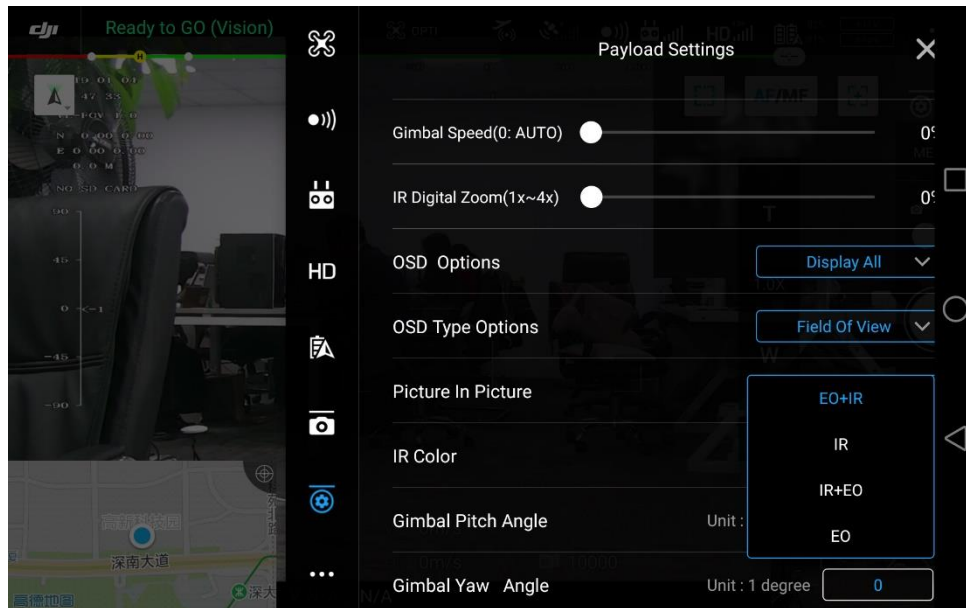
OSD Type Options:

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

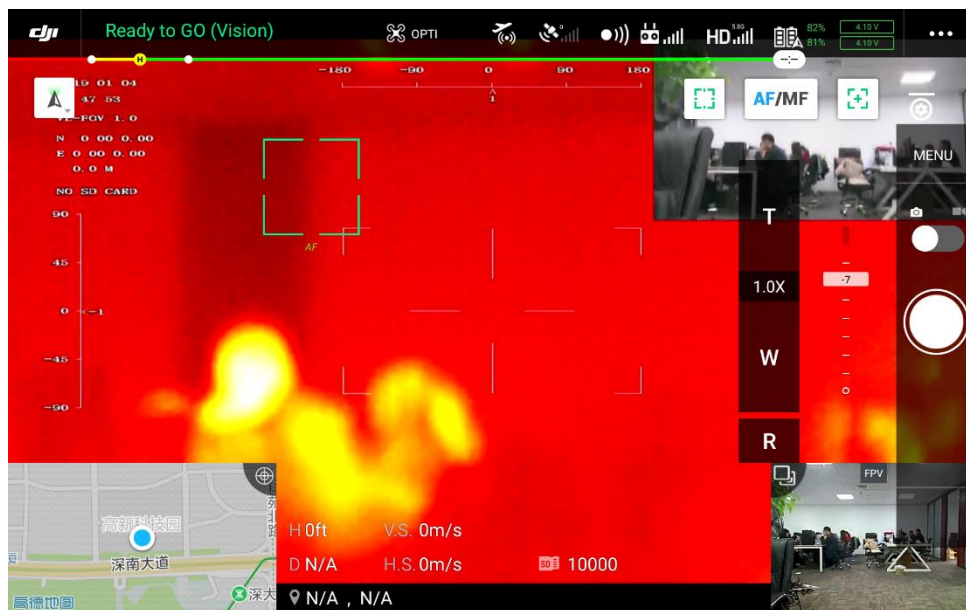


Picture In Picture:

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

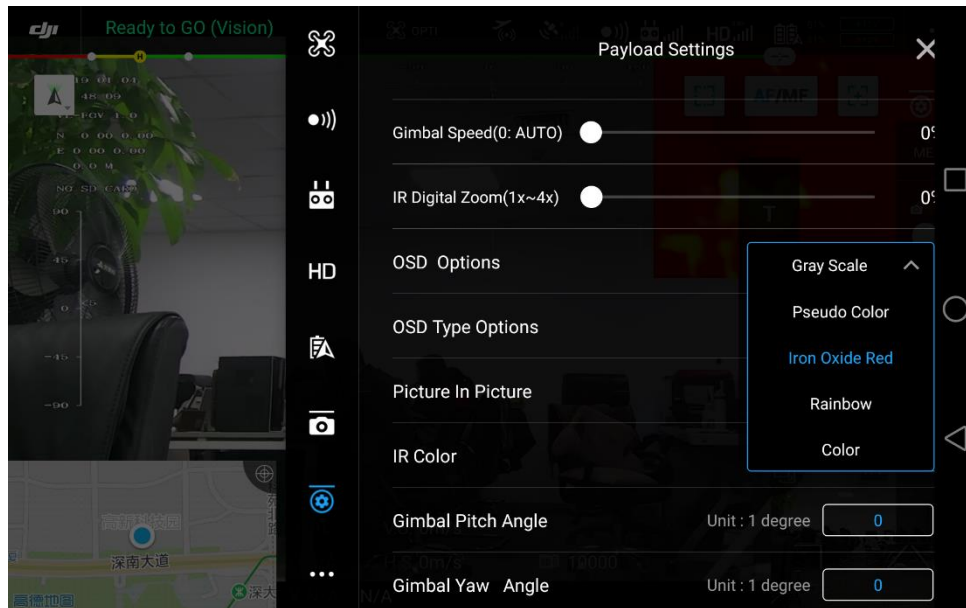


IR+EO



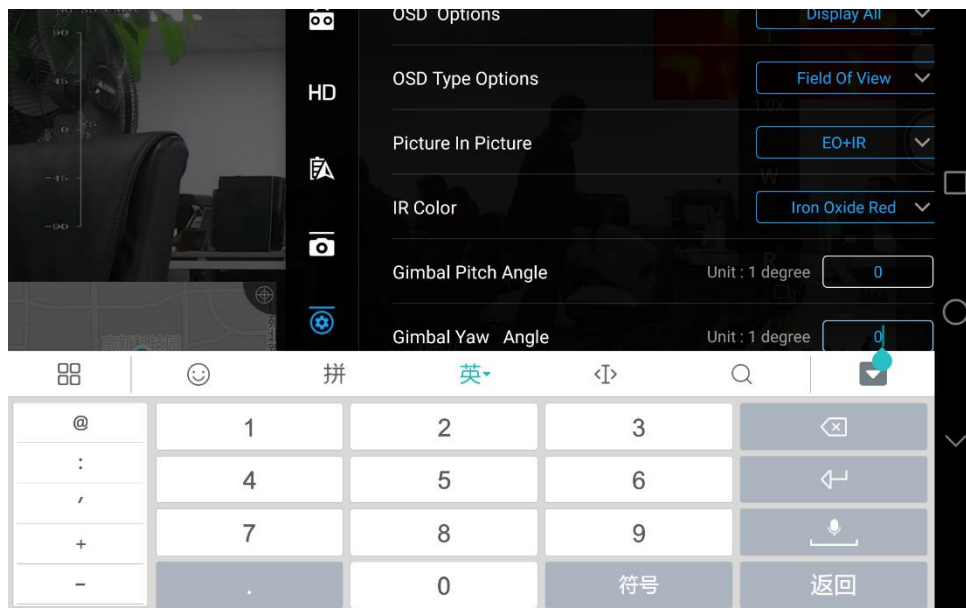
IR Color:

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



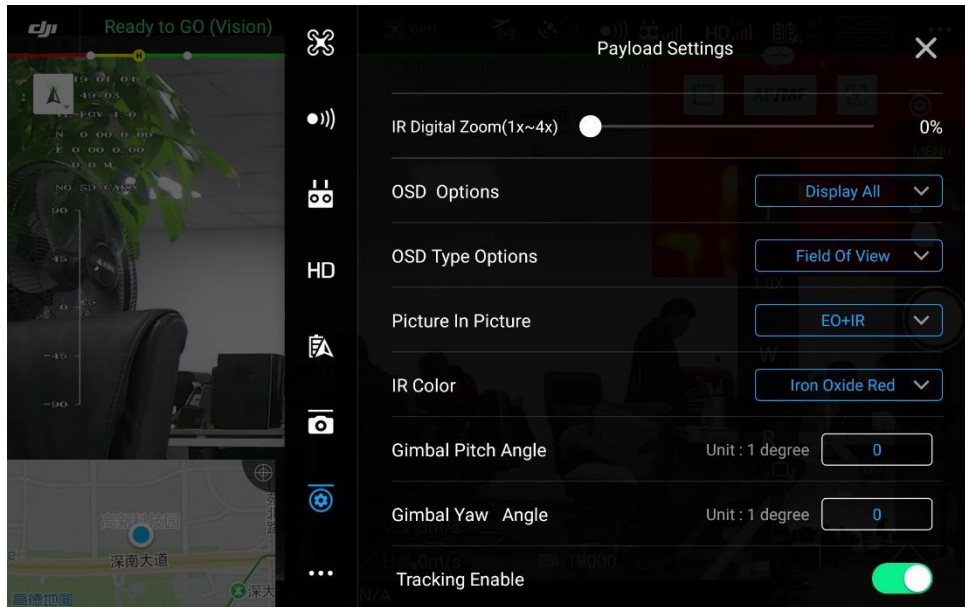
Gimbal Pitch Angle/ Gimbal Yaw Angle:

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



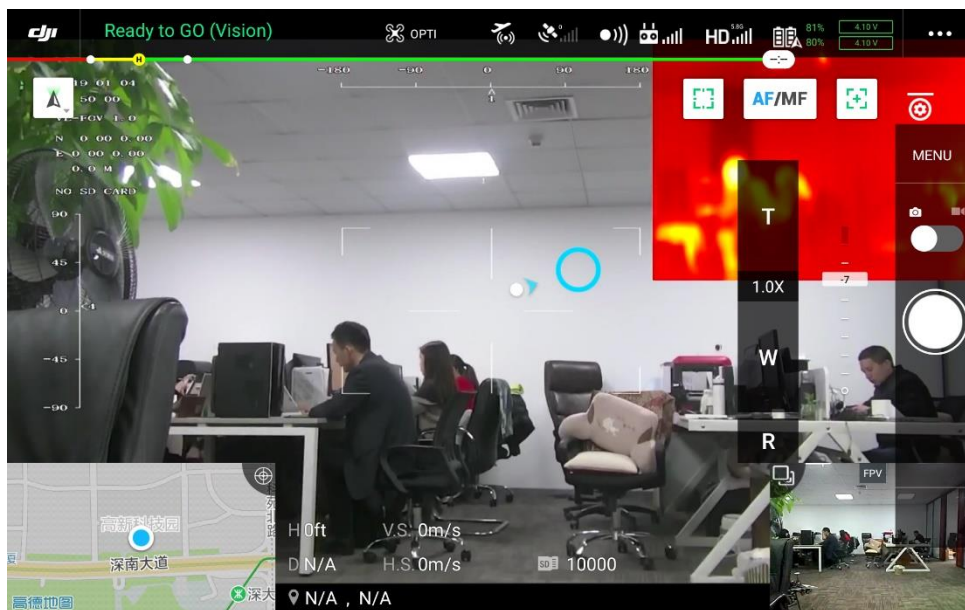
Tracking Enable:

Turn on/ off the object tracking function.



Drag Control:

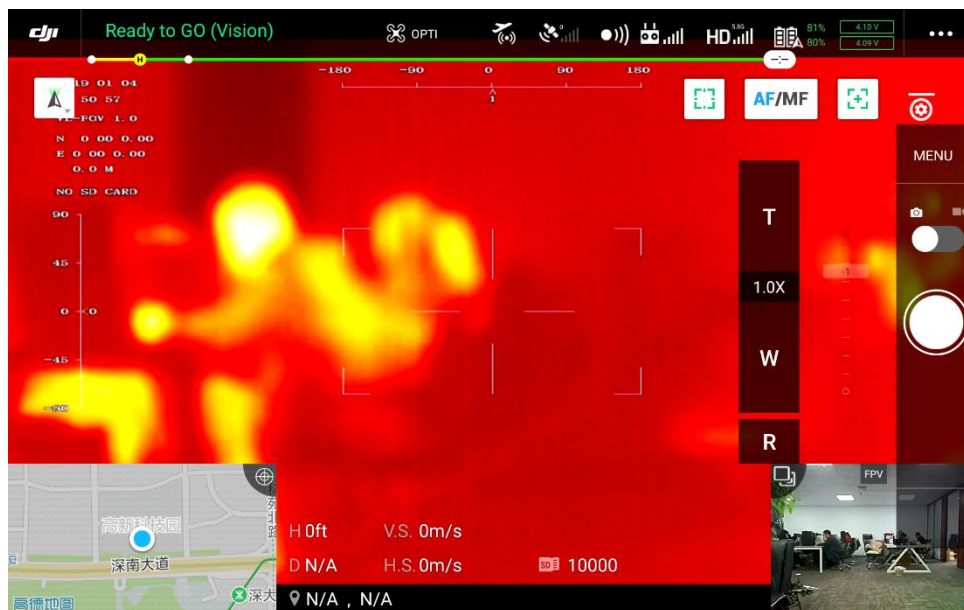
Press on the screen then drag to control pan and tilt.



2. Main functions instruction

2.1 Thermal Imager

Integrated French ULIS high-precision uncooled long wave ($8\mu\text{m} \sim 14\mu\text{m}$) thermal image sensor, Mini Z10TIR 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.



Specification

Hardware Parameter	
Working voltage	12V
Input voltage	4S ~ 6S
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°
Vibration angle	Pitch/Roll: ±0.01°, Yaw: ±0.01°
One-key to center	√
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	62°(wide end) ~ 6.5°(tele end)
Sync system	Internal
S/N ratio	more than 52dB
Min illumination	0.5 lx (1/30s, F1.8, 50%)
Gain	Auto / Manual
White balance	ATW1 (Narrow), ATW2 (Wide), single touch, manual (B, R)
Shutter speed	1/1s to 1/10,000s
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°C)
MRTD	≤650mK (@characteristic frequency)
Image enhancement	Auto adjust image brightness and contrast ratio
Color palette	Gray Scale, pseudo color, Iron Oxide Red, Rainbow, Color
Auto Non-uniform correction	Yes (no shutter)
Digital zoom	1x ~ 4x
Sync correct time	Yes
Thermometry type	Temperature bar (psudo color display) max temp, min temp, FOV center temp
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)
Packing Information	
N.W.	469g
Product meas.	118*109*120mm
Accessories	1pc gimbal camera device / High quality plastic box with foam cushion
G.W.	1579g
Package meas.	260*180*280mm