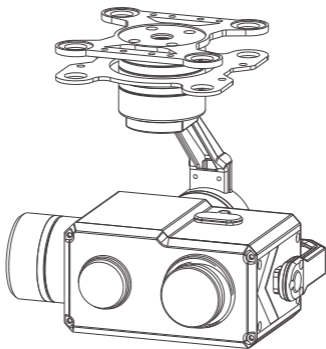




FH310-TIR MINI 10X Optical Zoom Camera with 3-axis Gimbal



*10X Optical Zoom
4.08 MP HD Camera

*19mm 640*480 Thermal Camera

*Target Tracking

*490g

*Size: 118mm*109mm*116.5mm

*Max 128G SD Card Storage

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3-Axis Gimbal

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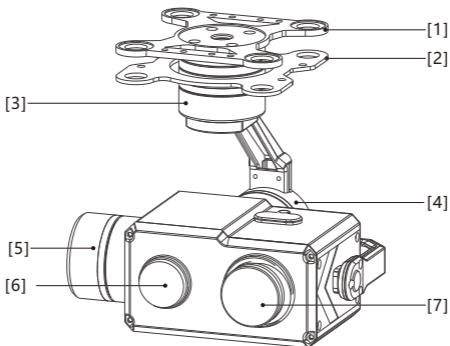
Gimbal Brief Introduction

FH310-TIR MINI high-precision 3-axis gimbal is developed based on FOC technology, features high stability, small volume and low power consumption. The gimbal offers 2 smart speed modes: FAST speed and LOW speed. Fast speed mode is used for small zooming range, low speed mode is used for large zooming range. Also the gimbal supports one-key back to center. The gimbal supports PWM,S.BUS control and serial command control.

Target Tracking Function

FH310-TIR MINI also has the target tracking function, with which you will never lose the object. Just zoom in and put the object you want to track in the screen, move the cursor to the object and lock it via controller, and then the camera will track it automatically.

Gimbal Description



[1]Upper Damper Board

[5]Pitch axis motor

[2]Lower Damper Board

[6]10X mini HD Camera

[3]Yaw axis motor

[7]19mm640 Thermal Camera

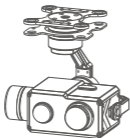
[4]Roll axis motor



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

M3*5mm
half round inner six angle
screw*4

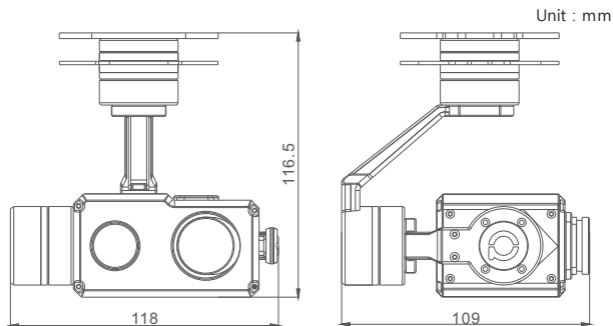
Copper pillar*4



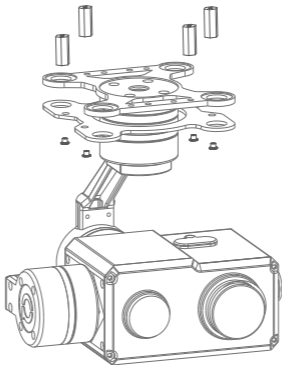
Damper*4



Loading Board Drawing



Install



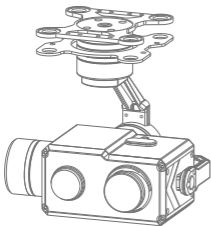
Mechanical@electronic Characteristics

voltage	3S~4S	IDDQ	450mA@12V	IDDT	550mA@12V
Environment	-10°C~+60°C	Weight	502g	Temperature	-30°C~+80°C
Size	L118mm*W109mm*H116.5mm				

Working Characteristics

Pitch: -90°~+90° Roll:-85°~+85°
Yaw: -170°~+170°
Precision: Pitch & Roll: ± 0.01° Yaw:± 0.01°

Gimbal Signal Wire Connection Diagram

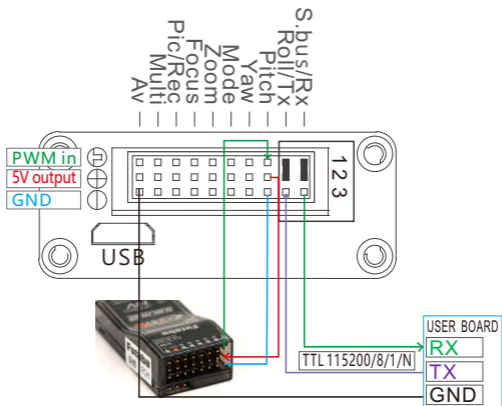


HDMI : micro HDMI OUTPUT
1080P 60fps default

SD card: max 128G ,class10
FAT32 or exFAT format

HDMI : HDMI 输出, micro HDMI 接口
高清输出 1080P 60fps

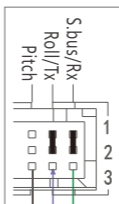
SD card: 最大支持128G 卡, class10 高速卡
格式化为FAT32 or exFAT 格式



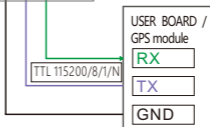
S.bus/Rx:connect to Rx2 for track function. (S.bus/Rx 用户不可用，默认出厂与RX2连接，用做跟踪功能)

Roll/ Tx:connect to Tx2 for track function. (Roll/ Tx 用户不可用，默认出厂与TX2连接，用做跟踪功能)

Pitch:PWM in, pitch control (俯仰控制，PWM 输入)



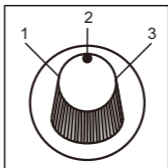
We have protocol for control the gimbal and camera, please contact our technical support for detail doc.



Yaw:PWM in, Yaw control(指向控制，PWM 输入)



Mode:change the speed / home position (调整云台控制速度/一键回中)



Position 1: lowest speed for pitch and yaw.(云台低速)

Position 2: middle speed for pitch and yaw.(云台中速)

Position 3: highest speed for pitch and yaw. the speed is continuously quickly from 1 to 3. (云台高速)

Click = from 2 to 3 and back to 2 quickly. (切一次的动作是指 从中到高, 再快速回到中)

One click : home position(切1次回中)

Two click: look down(切2次俯仰垂直向下)

Three click: Yaw not followed by frame(切3次锁头模式, 飞机转, 云台不跟随)

Four click : Yaw followed by frame(切4次, 跟随模式, 云台指向跟随飞机转动而转动)

Five click : restore the factory settings(切5次, 恢复出厂设置)

ZOOM: zoom the camera
(放大, 缩小)



1 zoom tele 放大



2 stop zoom 停止



3 zoom wide 缩小

focus : focus the camera (手动
调焦, 默认自动对焦模式)



1 Switch 2 to 1: IR color, white hot, black hot, pseudo color.
(连续从2切到1, 热像仪色板 白热, 黑热, 铁红三种模式循环)

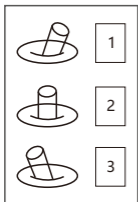


2 Switch 2 to 3: picture in Picture.
EO+IR, IR+EO, EO only, IR only.
(连续从2切到3, 画中画循环显示, 可见光+热红外, 热红外+可见光, 单可见光, 单热红外)



3

Pic/Rec: picture / start record, stop record (拍照, 开始录像, 停止录像)



Switch 2 to 1:

start record / stop record. (从2 切到 1, 开始录像, 再切一次, 停止录像)

start record, the OSD display rec hh:mm:ss; (录像开始后, 会显示录像时间)

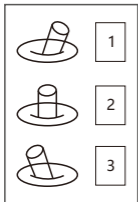
stop record, the OSD display STBY. (录像停止后, 显示STBY)

Switch 2 to 3:

take a picture. (从2 切到 3, 拍一张照片)

OSD display ' REC IMG ' a second. (拍照会显示 REC IMG 几秒钟)

Multi: tracking control (跟踪控制)



Position 1: exit the tracking (退出跟踪模式)

Switch 1 to 2: display the cross cursor. Adjust the object to the cross cursor. (调出十字标, 调整目标到十字)

Switch 2 to 3: start tracking. (开始跟踪, 右下角显示偏移量)

Change the object during tracking (二次跟踪: 跟踪过程中, 微调跟踪的目标)

Switch 3 to 2: display the cross cursor, use Pitch/Yaw to adjust the cross cursor. (调出十字标, 用俯仰, 航向通道调整十字标到新的目标位置)

Switch 2 to 3: start tracking. (开始跟踪, 右下角显示偏移量)

AV: NO AV output this model. (本型号没有AV 输出)

Thermal Camera	Working Form	8 μ m-14 μ m Uncooled Long Wave Infrared Camera
	Pixels	640x480
	Pixel Size	17 μ m
	Focus Mode	Athermalization Free Focus
	Emissivity Correction	Emissivity 0.01~1 adjustable
	NETD	$\leq 50\text{mK}(@25^{\circ}\text{C})$
	MRTD	$\leq 650\text{mK}$
	Image Enhancement	Automatically Adjusts Image Brightness and Contrast
	Color Palette	Black Hot White Hot Pseudo Color
	Automatic Nonuniformity Correction	Supported
	Digital Zoom	1X,3X
	Same Time Benchmark	Support
	Thermometry Type	Highest Temperature Lowest Temperature Center Temperature of FOV
Warning Temperature	$-20^{\circ}\text{C} \sim 120^{\circ}\text{C}$	
Tracking	Data Refresh Rate	25Hz
	Output Lag	< 3ms
	Tracking Velocity	$\pm 32 \text{ Pix/Frame}$
	Target Memory Time	4s
	Target Size	16x16 pixels - 128x128 pixels

10X White Light Camera

10X Zoom Camera Specification

Sensor	1/3 Progressive CMOS sensor
Effective Pixels	4.08 MP
Video Output (HD)	1080p/60, 1080p/50, 1080p/30, 1080p/25
LUX	0.5 lx (1/30sec, F1.8, 50%)
Illumination Range	100 lx ~ 100,000 lx
Gain	Auto/Manual
Shutter Speed	1/1 ~ 1/10,000 sec
Sync mode	Internal Concurrent
Exposure Compensation	-12dB ~ +12dB (
Backlight Compensation	ON / OFF
Gamma correction	Standard
Iris control	16 steps
white balance	ATW1 (Narrow) , ATW2 (Wide) , Single touching, Manual (B,R)
Automatic Exposure	optical zoom 10.5X
Lens (wide ~tele)	Auto, Manual, Priority mode(Shutter/aperture)
	f = 3.2 ~ 33.6 mm
	F1.8 ~ 3.4
Zoom Mode	Standard / Variable / Direct
Zoom move time	1.5s
focusing system	-Auto, Manual, single touching, Autofocus sensitivity
Horizontal View Angle	62 ~ 6.5°
Minimum photographic distance	10mm ~ 800mm
Horizontal definition	Above center 800TV Line