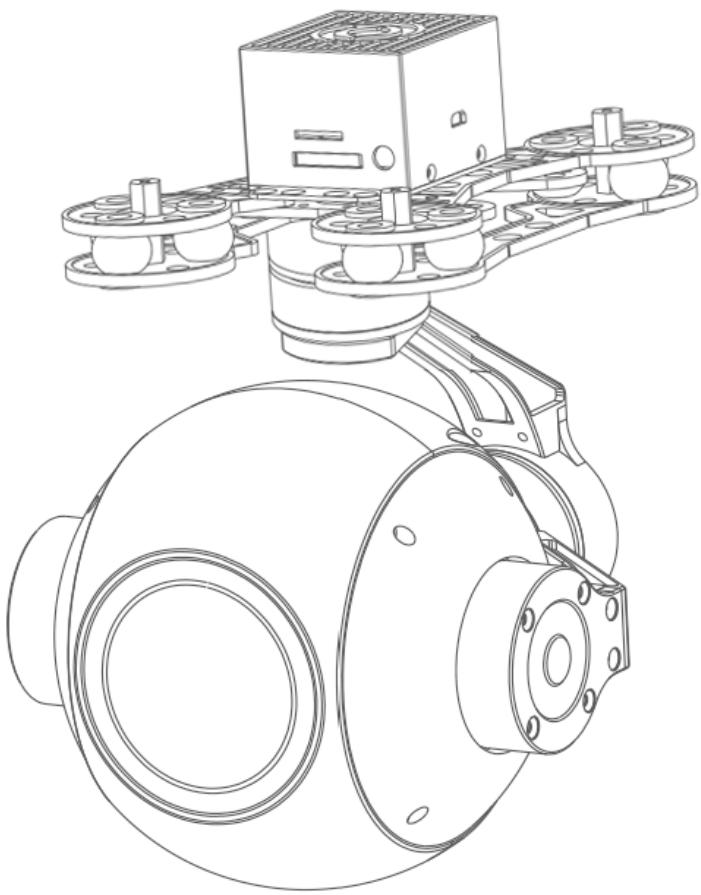
FOXTECH SEEKER-30 TR 30X Optical Zoom Camera with 3-axis Gimbal

User manual



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SEEKER-30 TR High-precision 3-axis Gimbal

30X Optical Zoom Camera

3-axis Gimbal Introduction

FOXTECH SEEKER-30 TR is a high-precision professional 3-axis gimbal with a 30X 1080P Optical Zoom Camera which features high stability,small size and light weight. The 3-axis gimbal adopts high-precision encoder in each motor, based on FOC motor control technology.

SEEKER-30 TR is equipped with an Auto Object Track Module(AOTM), which will enable to track both static and moving objects very easily. The speed of the gimbal is ajustable, LOW speed mode is used for large zoom range, so 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 returning to initial position automatically and rapidly.

Object Tracking Function

1、Function description

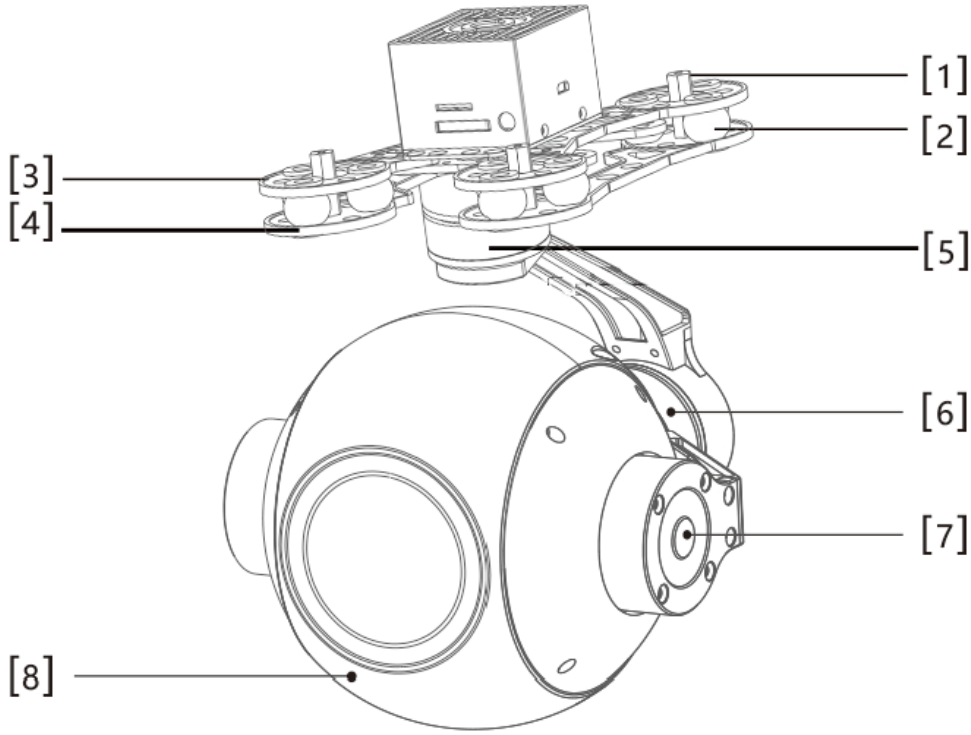
Build-in normalization ,cross-correlation and tracking algorithm, combining with object missing recapture algorithm, achieve stable track of the target.

Support custom characters of user OSD, adaptive gate, cross cursor, trace information display.

2、Tracking performance

1)Update rate of deviation pixel 50Hz
2)Output delay of deviation pixel <15ms
3)Minimum target contrast 5%
4)the minimal signal-to-noise ratio (SNR) 4
5)Minimum target size 16*16 pixel
6)Maximum target size 160*160 pixel
7)Tracking speed 32 pixel/frame
8)The mean square root values of pulse noise in the target position<0.5 pixel

Gimbal Description



[1]Gimbal fixed copper pillar

[2]Damper

[3]Upper plate of gimbal board

[4]Under plate of gimbal board

[5]YAW axis motor

[6]Roll axis motor

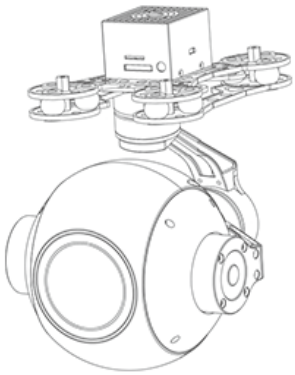
[7]Pitch axis motor

[8]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

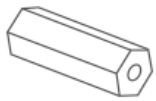
Gimbal with Camera*1



Screw pack*1

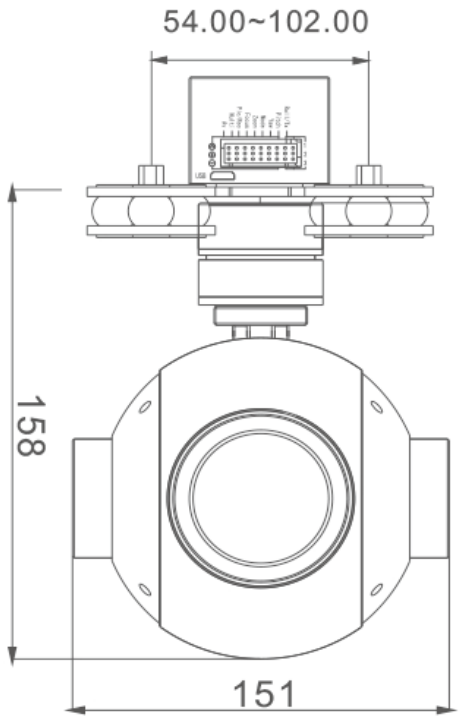
M3*5mm half round inner six angle screw*12
(fixed copper pillar and damping plate)

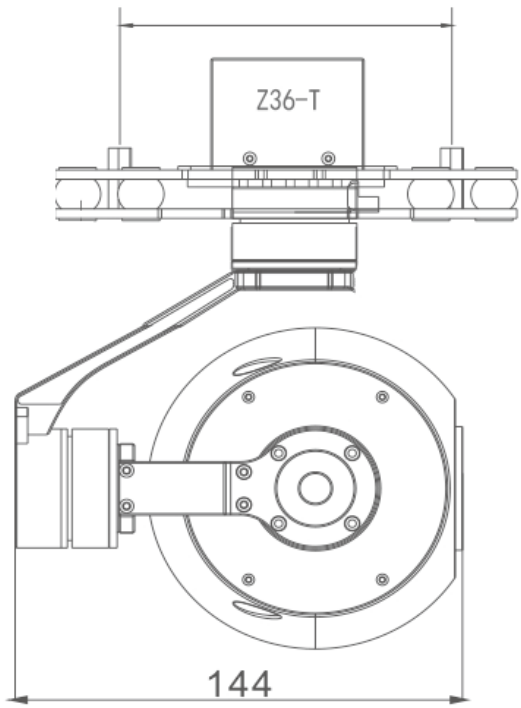
Copper pillar*4



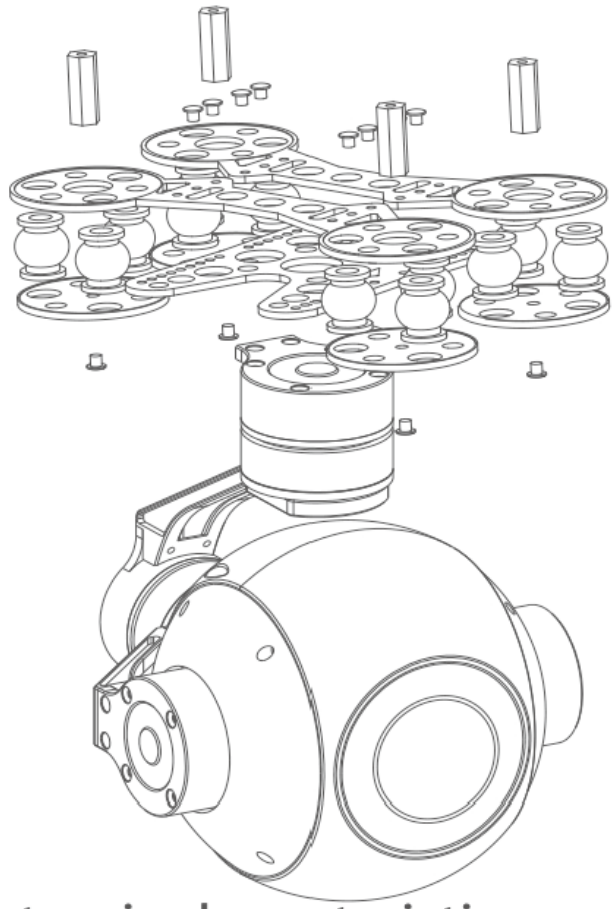
Damper*12

DIMENSIONS





Installing



Mechanics@Electronic characteristics

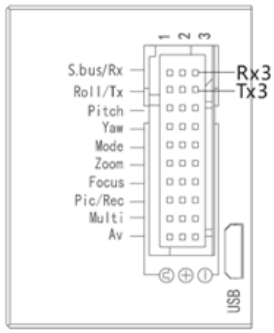
Voltage	3S~6S(12V)	Quiescent current	330mA@12V
Working current	450mA@12V	Work environment	-20°~+80°
Size	L144*W151*H158mm	Weight	720g

Working characteristics

Pitch angle range of action:-90°~+90°
Roll angle range of action:-85°~+85°
Yaw angle range of action:-150°~+150°
Angle jitter:pitch and roll direction±0.02° ,horizontal direction ±0.03°

GPS data overlay and serial port wiring diagram

GPS Baud rate:115200,8,1,null

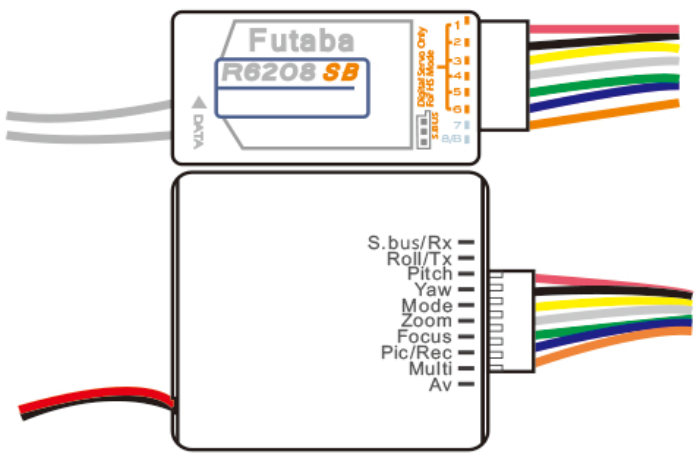


Serial ports will be needed(marked by the black box,see photo above), please connect RX1 and RX2, TX1 and TX2, with wire jumper. TX and RX from external serial cable connect to TX3 and RX3 respectively. GND from external serial cable connect to GND of the wiring hub.

Notice : DO NOT connect 5V and GND to the ports marked by the black box.

Connection of control box and wiring instructions

1、Camera control line Zoom: camera zoom control line, connect PWM receiver on 3-position switch , or stick. Focus: camera manual focus control line, connect receiver on 3-position switch , or stick. If not connect, the camera will focus automatically after zooming. Pic/Rec: photography/video, mode switching, video and photography control, connect receiver on 3-position switch . Switch from middle to high: photography/video mode switching Switch from middle to low:



(1)In the video mode : if video record is stop , video record starts ,if video record is starting , switch from middle to low again, the video record will stop;
(2)In the photo mode: take a pictures

Multi : Multi control channel for other function, such as tracking, laser light. IR cut , etc
AV: analog output signal

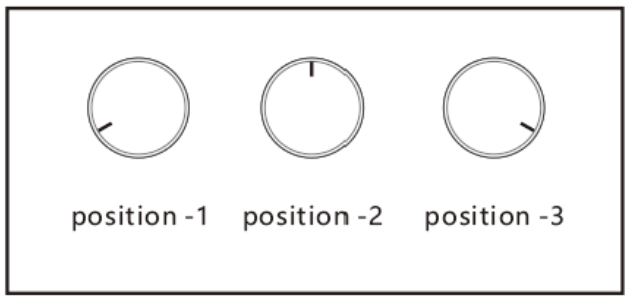
Gimbal PWM signal instructions:

YAW directional channel: speed mode ,connect stick channel, (or 3-position switch channel, stopping need 3-position switch to middle position.)

PITCH Pitch channel: speed mode ,connect stick channel, (or 3-position switch switch channel, stopping need 3-position switch to middle position.)

MODE gimbal one button back and speed adjustment:angle mode, A knob or a 3-position switch channel.

Functional descriptions of mode (regard the third switch channel mode as the example)



Turn the knob to the three position: Low speed & not follow yaw mode, at this moment, the joystick controls YAW and PITCH, pod has the lowest speed of movement, its yaw does not follow the rotation of the aircraft;

Turn the knob to any position above three： variable speed & following mode, at this moment, the joystick controls YAW and PITCH, The movement speed of pod rises(Speed varies with position) ,pod works in follow yaw mode.

Turn the knob to the one position : high speed following mode.

Toggle switches one time between position -2 and -1 rapidly, pod returns to the home position;

Toggle switches two times between position -2 and -1, pod use speed mode (profile 1)

Toggle switches three times between position -2 and -1, pod use angle mode (profile 2);

Toggle switches four times between position -2 and -1, calibrate the accelerator.

Toggle switches five times between position -2 and -1, calibrate the gyroscope

Note: pod turns on in the static state, and the gyroscope is automatically calibrated ;The working mode of pod at the next boot time is the mode used last time, factory mode is speed mode.

30X Optical Zoom Camera

The 30X Optical Zoom Camera, supports 30X optical autofocus. The zooming function makes it possible to see objects in detail over distance. The SEEKER-30 TR offers 1080p FULL HD video recording onboard and 1080p HDMI output for HD video transmission back to the ground. FOX-TECH SEEKER-30 TR supports both PWM control and serial command control, suitable for close range remote control or remote data command control.

Parameter index

-30X Optical zoom lens

-1/2.8” 2.13 Megapixels CMOS sensor

-1920*1080P@30fps video output resolution

-Zoom focal length f=4.3~129mm

-Low illumination: Colour: 0.01 lx(F1.6,AGC on,1/30s)

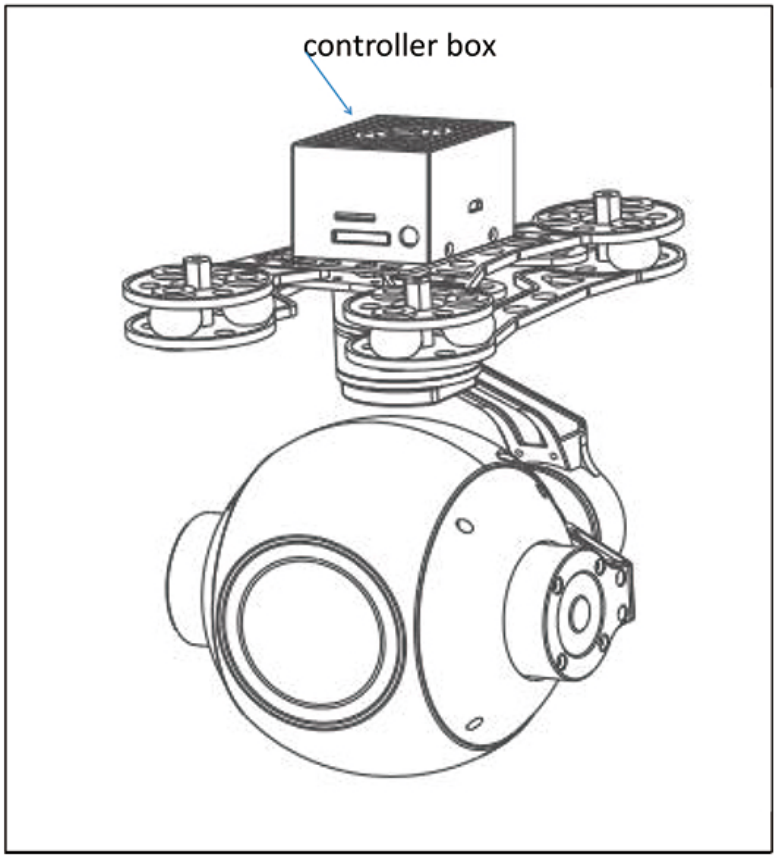
-Auto object tracking

-Automatic white balance: support

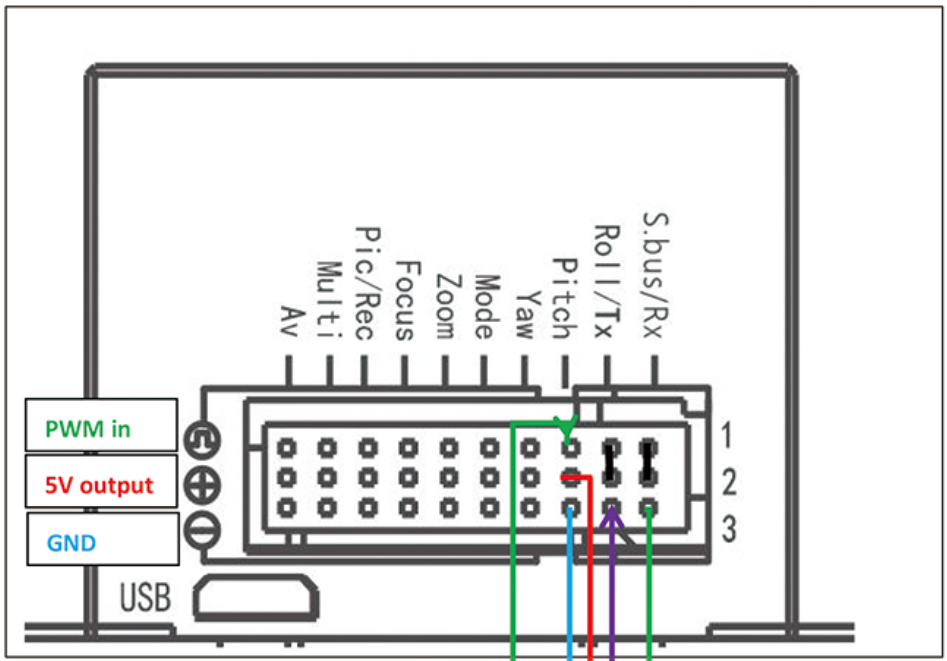
-Auto gain control: support

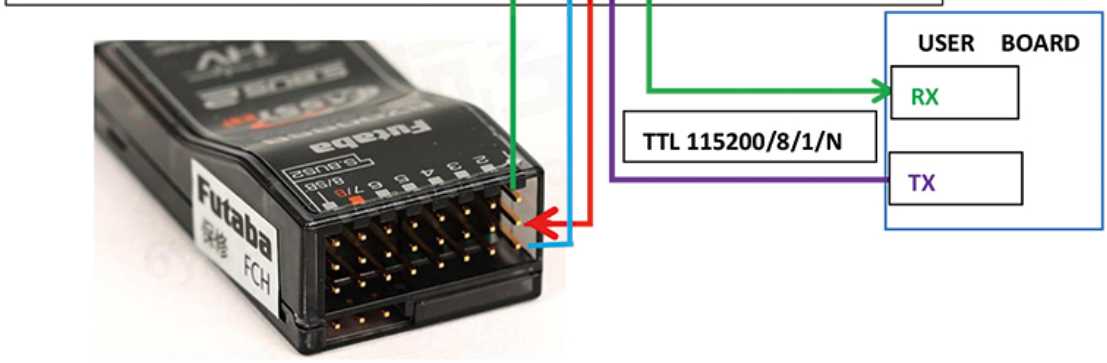
Imager sensor	1/2.8-type Exmor R CMOS
Lens	30x
Picture quality	Full HD 1080p (1920 x 1080)
Minimum illumination*	Colour: 0.01 lx(F1.6, AGC on, 1/30 s)
Image sensor(Number of effective pixels)	Approx.2.13 Megapixels
Signal system	1080p/59.94,1080p/50,1080p/60, 1080p/30,1080p/29.97,1080p/25, 1080i/59.94,1080i/50,1080i/60, 1080i/30,720p/59.94,720p/50, 720p/60, 720p/30, 720p/29.97, 720p/25, NTSC*1, PAL*1
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)

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
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)



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

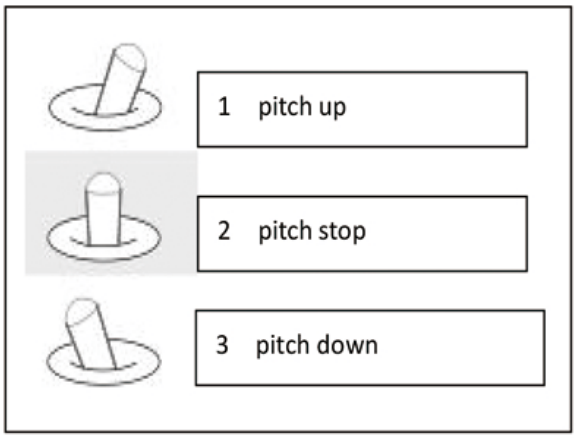


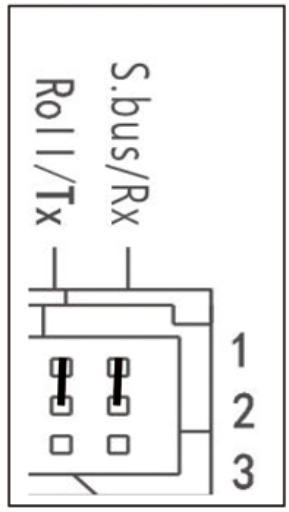


S.bus/Rx ： connect to Rx2 for track function.

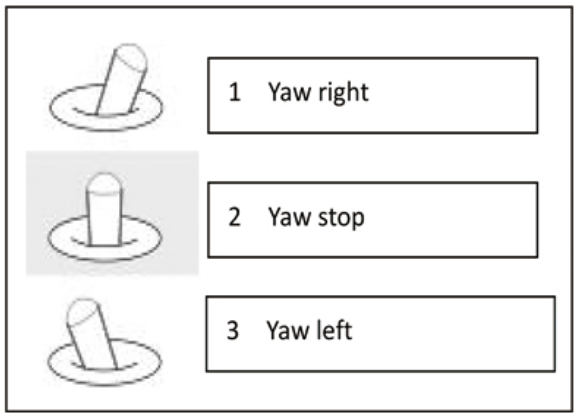
Roll/ Tx ： connect to Tx2 for track function.

Pitch: ： PWM in, pitch control

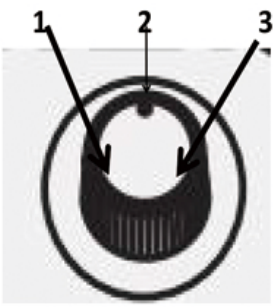




Yaw ： PWM in, Yaw control



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.

Click = from 2 to 3 and back to 2 quickly.

One click : home position

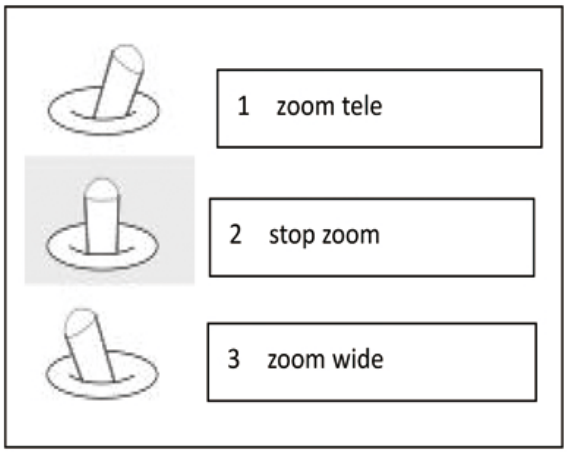
Two click: look down

Three click: Yaw not followed by frame

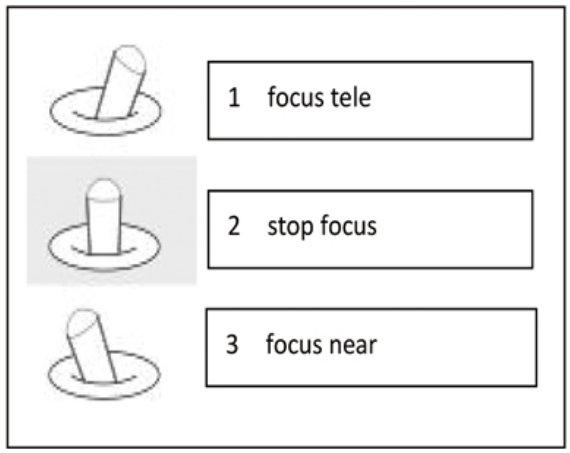
Four click : Yaw followed by frame

Five click : restore the factory settings

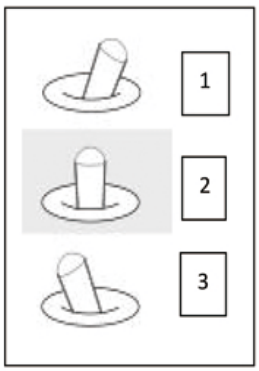
ZOOM: zoom the camera



focus : focus the camera



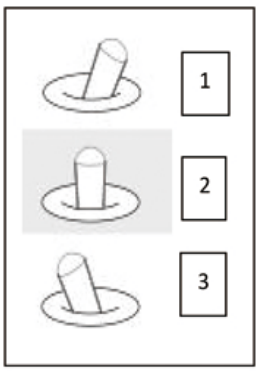
Pic/Rec : picture / start record， stop record



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。