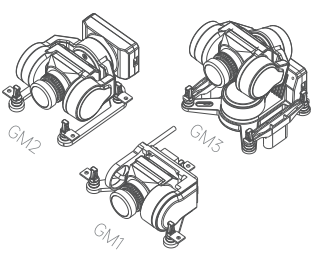
AVATAR GM SERIES

QUICK START GUIDE

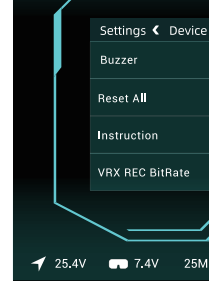
V1.2



Introduction

This product is a mechanical anti-shake gimbal that can achieve real-time anti-shake of camera images and camera angle adjustment. It is suitable for Walksnail Avatar HD system cameras with a mounting width of 19mm. GM1 can achieve anti-shake and adjustment of camera pitch angle; GM2 can achieve anti-shake and adjustment of camera pitch angle and roll angle; GM3 can achieve anti-shake and adjustment of camera pitch angle, roll angle and azimuth angle. Users need to design the mounting holes of the vehicle by themselves and adapt them to the gimbal mounting bracket.The gimbal can automatically identify upright and inverted installations.

Camera Installation



1、Use a Phillips screwdriver to remove the camera cover.

2、Use tweezers to remove the coaxial cable from both sides of the coaxial cable interface.

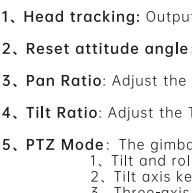
3、Install the gimbal's coaxial cable to the camera

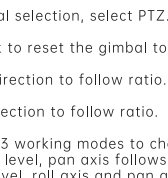
4、Install the camera on the gimbal, note that the coaxial cable needs to be placed in the internal groove

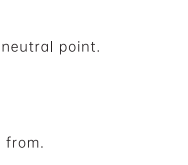
5、Tighten the four screws and check whether the camera can rotate smoothly to the maximum tilt angle. If there is obvious resistance, reinstall the camera.

6、The installation is complete

Installation Dimensions



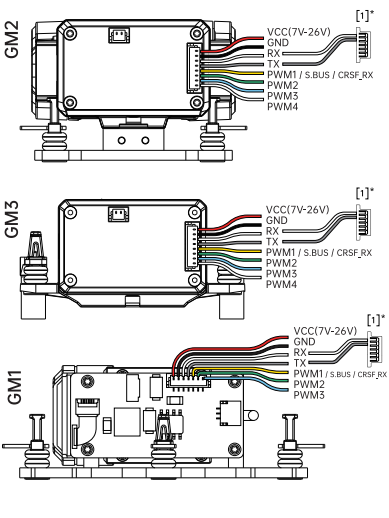




Unit: mm

Connection and Use

Connect to the USB port of Avatar V2 VTX, and need to use Avatar Goggles that support head tracking to realize wireless head tracking function.



PWM1

The channel is for gimbal working mode selection, there are three working modes in total.
1: Pitch and roll keep level, yaw axis follows.
2: Pitch axis keeps level, roll axis and yaw axis follow.
3: Three-axis follow.

To use S.BUS / CRSF control, you need to upgrade the gimbal to V3.4 or above. connect PWM1 to the S.BUS or CRSF_Tx of the receiver, Channel mapping can be done in the GimbalConfig software.

PWM2

The channel is for gimbal follow sensitivity settings. Adjust the response speed of the gimbal follow. Please use the knob channel on the remote control to control.

PWM3

The channel is the gimbal pitch axis control channel. Please use the rotary switch on the remote controller to control it. The gimbal rotation angle range can be changed by modifying the channel range of the remote control.

PWM4

The channel is the gimbal yaw control channel. Please use the wave wheel switch on the remote control to control it. The gimbal rotation angle range can be changed by modifying the channel range of the remote control.

Head tracking function

The gimbal supports Uart and PWM control protocols to achieve head tracking function: Uart requires Avatar V2 (Dual) VTX, Avatar V2 VTX, Moonlight VTX and goggles that support Avatar head tracking function; PWM requires a third-party head tracking module, and connects the gimbal PWM3 and PWM4 channels to the head tracking receiver pitch and direction channels. The following introduces the head tracking function settings with Avatar V2 VTX:

1. Upgrade Avatar goggles and V2 VTX to version 38.43.4 or above, and connect the serial port cable of the gimbal and Avatar V2 VTX according to the wiring diagram.

2. Open the goggles menu and select "Gimbal" for head tracking, Settings > Head Tracking > Gimbal, after the settings are completed, the gimbal will follow the goggles' posture movements, and quickly click the return key 3 times to return the gimbal to the center.

Menu Settings

1、**Head tracking:** Output signal selection, select PTZ.

2、**Reset attitude angle**: Click to reset the gimbal to the neutral point.

3、**Pan Ratio**: Adjust the pan direction to follow ratio.

4、**Tilt Ratio**: Adjust the Tilt direction to follow ratio.

5、**PTZ Mode**: The gimbal has 3 working modes to choose from.
1、Tilt and roll keep level, pan axis follows.
2、Tilt axis keeps level, roll axis and pan axis follow.
3、Three-axis follow.

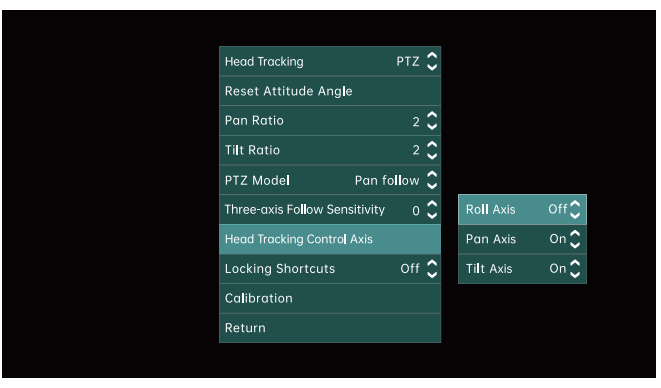
6、**Three-axis Follow Sensitivity**:
The higher the sensitivity is, the quicker the response of the gimbal to follow the motion of the carrier, but the less it eliminates the carrier's wobble. Only effective in three-axis follow mode.

7、**Head Tracking Control Axis**: The head tracking channel for the roll axis, pan axis, and Tilt axis can be turned on or off individually.

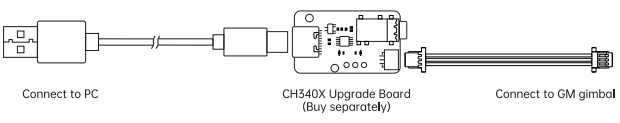
8、**Locking Shortcuts**: To use this function, you need to upgrade the gimbal to V3.6 or above, and use GimbalConfig software to set the gimbal preset MODE to M0 and SENS to 1.
When the menu is closed, double-click the down button of the 5D button to turn on/off the gimbal lock function. After the gimbal is locked, the stabilization function will be lost. It is suitable for use when the drone takes off or lands.

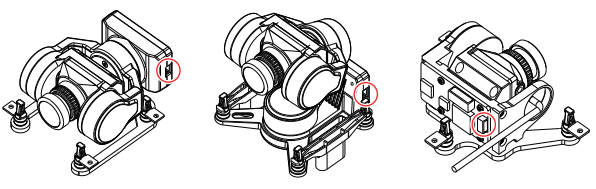
9、**calibration**: Do not perform calibration under normal circumstances. If the gimbal has an angle deviation for a long time, please complete the calibration of the gyroscope, accelerometer, and magnetometer according to the prompts.

10、**Return**: Exit the head tracking menu.



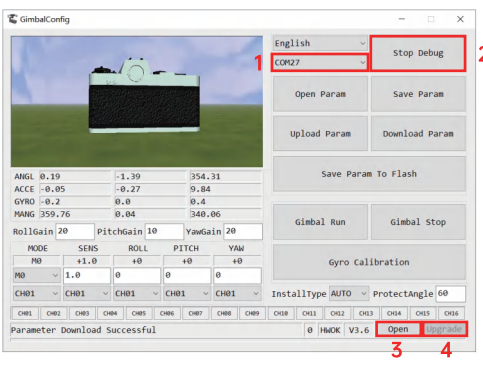
Upgrade





1、Use the CH340X upgrade board to connect the upgrade port, connect the other end to the PC, and go to www.caddxfpv.com to download the GimbalConfig.exe software.

2、Open the GimbalConfig software and power on the GM gimbal.



3、Select the correct COM port, click Open Port, and click Open Firmware.

4、Select the CwGimbalZGV2Main_VX.X.cahf firmware under the same file.

5、Click Start Upgrade and wait for the progress bar to complete.

⚠
- Goggles need to upgrade the head tracking firmware in the folder synchronously. Please refer to the manual of the corresponding product for upgrade operation.
- The CH340X upgrade board is sold separately. For some brands of dual Type-Ccables, there may be cases where the computer cannot recognize the CH340X. Please try replacing it with a Type-A to Type-C cable.

Parameter Configuration Basic Operation

1、After the gimbal is connected to the GimbalConfig software, the software will automatically download the parameter from the gimbal, or you can click "Download Param" to perform the download operation.

2、Click "Save Param" to save the current displayed parameter as a local file.
Click "Open Param" to read a locally saved parameter file.

3、After selecting a new option in the drop-down box, the parameter will be automatically uploaded to the gimbal and take effect. After entering a new parameter in the parameter frame, press Enter key or click "Upload Param" to upload the parameter.

4、After the parameter is uploaded, click "Save Param To Flash" to finalize itinto the gimbal.

⚠ • The gimbal sensitivity only applies to the axes that follow the motion ofthe carrier.

Gimbal Presets(Headtracker direct,S.BUS/CRSF & MAVLink control

1、The gimbal works in accordance with the preset values when there is no signal input or no mapped channel assigned. After the signal input is restored, the gimbal exits the preset state. The gimbal presets are invalid in MAVLink control.

2、Preset gimbal mode: M0- FPV mode, M1- Pitch-lock mode; M2- Horizon mode.

3、Preset gimbal sensitivity: setting range -1.0~1.0, with a resolution of 0.1.

4、Preset roll, pitch and yaw angle: setting range -180° ~180° , with a resolution of 1°.

⚠ • The actual effective preset angles are based on the maximum rotationrange of the gimbal.

• Ifyou want to always use the preset values for some channels, map thecorresponding channels to NULL.

Channel Mapping(Headtracker direct, S.BUS/CRSF & MAVLink control)

Select the channels corresponding to gimbal mode, gimbal sensitivity, roll, pitch and yaw respectively. For Headtracker direct control (through datalink or Air Unit), all channels should be mapped to CH01.

Mounting Type

The mounting type of the gimbal is AUTo by default, and the gimbal will automatically switch to DOWN/UP mode according to its attitude at power-on. The mounting type can also be manually set as DOWN or UP mode.

⚠ • For tail-sitter VTOL aircrafts, it should place the fuselage in a level flight attitude and power up, or manually set the mounting type of the gimbal.

• After the mounting type is set manually, make sure that the actual mounting type is consistent with the setting, otherwise the gimbal will enter the protection state.

Tilt Protection (Pitch-lock & Horizon mode

1、When the tilt of the mounting plane of the gimbal exceeds the protect angle, the gimbal will enter the protection state, at this time the gimbal will be neutralized and uncontrollable. When the tilt of the mounting plane is smaller than the protect angle, the gimbal will automatically exit the protection state.Tilt protection is effective in Pitch-lock mode and Horizon mode, not in FPV mode.

2、The protection angle can be modified according to the actual use. The setting range is 0°~90° with a resolution of1°.≤ 15° means disabling the tiltprotection.

⚠ • After disabling the tilt protection, the gimbal may work abnormallywhen the attitude angle of the carrier is large.

Parameter Tuning

For cameras with larger moment of inertia, mounting them on the gimbal may result in gimbal shaking. In such cases, increasing the gain value can enhance stabilization effects.

⚠ • It is strongly recommended to use the default gain parameters ifunnecessary.

Calibrating & Firmware Upgrading

1、To calibrate the gimbal. Keep the gimbal static. Click "Gyro Calibration" and wait for the calibration to complete.

2、To upgrade the firmware. Click "Open Firmware". Select the firmware file.
Click "Start Upgrade" and wait for the upgrade to complete.

⚠ • If the attitude of the gimbal tilts or drifting slowing when no control signal input, it is necessary to calibrate the gimbal.

MAVLink Configuration

ArduPilot

SERIAL1	
SERIAL1_BAUD	115
SERIAL1_OPTIONS	1024
SERIAL1_PROTOCOL	2
SR1	
SR1_ADSB	0 Hz
SR1_EXIT_STAT	0 Hz
SR1_EXTRA1	0 Hz
SR1_EXTRA2	0 Hz
SR1_EXTRA3	0 Hz
SR1_PARAMS	0 Hz
SR1_POSITION	0 Hz
SR1_RAW_CTRL	0 Hz
SR1_RAW_SENS	0 Hz
SR1_RC_CHAN	0 Hz

⚠ • Serial port number can be changed according to the actual situation.

PX4

MAVLink	
MAV_1_CONFIG	TELEM2
MAV_1_MODE	Custom / Gimbal
MAV_1_RATE	115200 B/s
Serial	
SER_TEL2_BAUD	115200 8N1

⚠ • The MAV 1 MODE is recommended as Custom.

Precautions

1、Be careful not to fix the coaxial cable too tightly. Make sure that the coaxial cable can move freely within the gimbal's shock absorption range. The gimbal cannot collide or interfere with other objects when working.

2、When the gimbal is equipped with a Moonlight camera, it can only be used with the Moonlight VTX.

3、Using the gimbal UART head tracking function only supports Avatar V2 VTX, Avatar V2 (Dual) VTX, and Avatar Moonlight VTX.

4、The gimbal bracket must be fixed with the shock-absorbing ball and carrier provided in the package or by a third party, and ensure that it is firmly installed.

5、GM gimbal supports UART Head tracking control, S.BUS / CRSF control, PWM control and MAVLink control, with the priority of the four control methods above decreasing in order.

Specifications

Name	GM3
Camera compatibility	Avatar 19 mm camera
Image stabilization	±0.005°
Max controllable speed	±1500°/s
Max controlled rotational range	Yaw:±160° Pitch:±120° Roll:±60°
Size	46.8x46.4x53.4mm
Weight	46g
Control mode	V3.2 FM Version: PWM / UART V3.4 FM Version: PWM / UART / S.BUS / CRSF / MAVLink
Head tracking control	support
Voltage	7~26V
Static power dissipation	1.5W

Name	GM2
Camera compatibility	Avatar 19 mm camera
Image stabilization	±0.005°
Max controllable speed	±1500°/s
Max controlled rotational range	Pitch:±120° Roll:±60°
Size	46.7x41.2x26.5mm
Weight	30g
Control mode	V3.2 FM Version: PWM / UART V3.4 FM Version: PWM / UART / S.BUS / CRSF / MAVLink
Head tracking control	support
Voltage	7~26V
Static power dissipation	1.2W

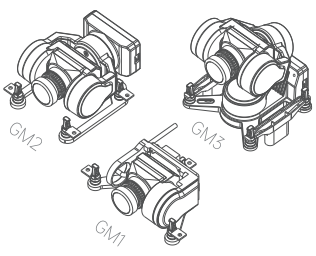
Name	GM1
Camera compatibility	Avatar 19 mm camera
Image stabilization	±0.005°
Max controllable speed	±1500°/s
Max controlled rotational range	Pitch:±120°
Size	32.2x38.1x20.5mm
Weight	16g
Control mode	V3.2 FM Version: PWM / UART V3.4 FM Version: PWM / UART / S.BUS / CRSF / MAVLink
Head tracking control	support
Voltage	7~26V
Static power dissipation	1.0W

CADDXFPV 技术支持
email: support@caddxfpv.com

AVATAR GM 系列

快速入门指南

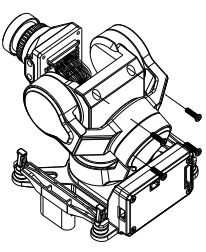
V1.2



简介

该产品为机械增稳云台，可实现相机画面实时防抖与相机角度调整，适配安装宽度为 19mm 的 Walksnail Avatar HD 系统相机，GM1 可实现相机俯仰角度的防抖与调整；GM2 可实现相机俯仰角度与横滚角度的防抖与调整；GM3 可实现相机俯仰角度、横滚角度、方向角度的防抖和调整。用户需自行设计载具的安装孔位，与云台安装支架做适配。云台可自动识别正装、倒置安装。

相机安装



1、使用十字螺丝刀拆卸相机后盖。

2、使用镊子从相机同轴线接口两侧取下同轴线。

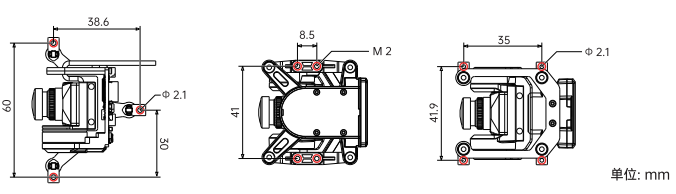
3、将云台的同轴线安装到相机上。

4、将相机安装到云台上，注意同轴线需要摆放到内部凹槽中。

5、锁上4颗螺丝，检查相机俯仰最大转动角度是否顺畅，如果转动有明显阻力请重新安装相机。

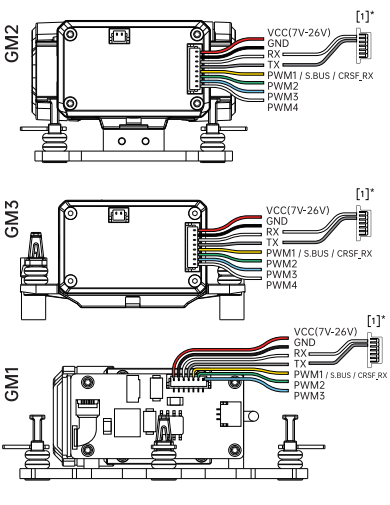
6、安装完成。

安装尺寸



单位: mm

连接及使用



[1]

连接到 Avatar V2 VTX 的 USB 端口，需要搭配支持头部跟踪的 Avatar Goggles，实现无线头部跟踪功能。

PWM1

通道为云台工作模式选择，共有三个工作模式。
1：俯仰及横滚保持水平，方向轴跟随
2：俯仰轴保持水平，横滚轴及方向轴跟随
3：三轴跟随

使用 S.BUS / CRSF 控制需要将云台升级到V3.4以上版本，将PWM1连接至接收机的 S.BUS 或 CRSF_Tx，可使用云台调试软件 GimbalConfig 进行通道映射。

PWM2

通道为云台跟随灵敏度设置，调整云台跟随的响应快慢，请使用遥控器上的旋钮通道来控制。

PWM3

通道为云台俯仰轴控制通道，请使用遥控器上的波轮开关控制，可通过修改遥控器通道行程来改变云台转动角度范围。

PWM4

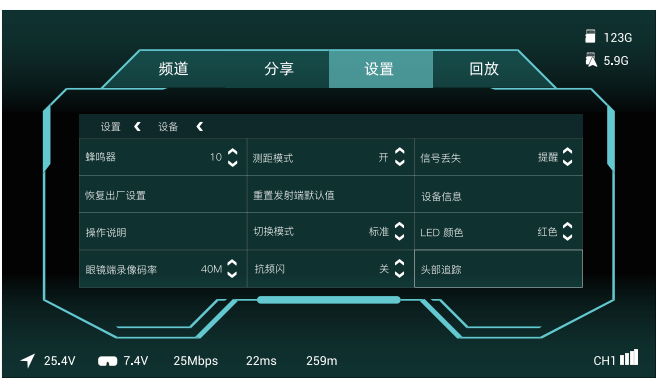
通道为云台方向轴控制通道，请使用遥控器上的波轮开关控制，可通过修改遥控器通道行程来改变云台转动角度范围。

头部跟踪功能

云台支持 Uart 和 PWM 两种控制协议实现头部跟踪功能，使用 Uart 需要搭配 Avatar V2(Dual) VTX、Avatar V2 VTX、Moonlight VTX 和支持 Avatar 头部跟踪功能眼镜实现，使用 PWM 需要搭配第三方头追模块，将云台 PWM3 和 PWM4 通道连接到头追接收机俯仰和方向通道，以下介绍搭配 Avatar V2 VTX 头部跟踪功能设置。

1.将 Avatar 眼镜和 V2 VTX 升级到 38.43.4 或以上版本，根据接线图连接云台和 Avatar V2 VTX 的串口线。

2.打开眼镜菜单将头部跟踪选择为"云台"，设置 > 头部追踪 > 云台，设置完成后云台将会跟随眼镜姿态动作，快速点击3次返回键可以使云台回中。



菜单设置

1、头部追踪：输出信号选择，选择云台。

2、复位姿态角：点击后可以使云台方向恢复默认中立点。

3、平移倍率：调整云台平移方向跟随倍率。

4、俯仰倍率：调整云台俯仰方向跟随倍率。

5、云台模式：云台共有三个工作模式选择，
1、俯仰及横滚保持水平，方向轴跟随
2、俯仰轴保持水平，横滚轴及方向轴跟随
3、三轴跟随

6、三轴跟随灵敏度：云台跟随灵敏度越大，云台跟随载机运动的响应越快，但消除载机晃动的幅度越小，（仅在三轴跟随模式生效）

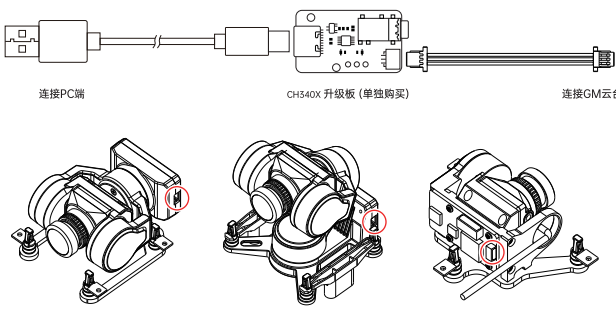
7、头追控制通道：可单独控制横滚轴、平移轴、俯仰轴的头追通道开启或关闭。

8、快捷键设置：使用此功能需要将云台升级到V3.6以上版本，并使用GimbalConfig 软件将云台预设MODE设置为M0，SENS设置为1。在关闭菜单的情况下双击五维按键的下键开启/关闭云台的锁定功能，云台锁定后将失去增稳功能，适合在无人机起飞或降落时使用。

9、校准：正常情况下请勿做校准操作，如果云台在长时间出现角度偏移，请根据提示完成陀螺仪、加速度计、磁强计的校准。

10、返回：退出头部追踪菜单。

升级



1、使用 CH340X 升级板连接升级口，另一端连接 PC 端，到 www.caddxfpv.com 官网下载 GimbalConfig.exe 软件。

2、打开 GimbalConfig 软件，GM 云台通电。

3、选择正确 COM 口，点击开始调试，点击打开固件。

4、选择同文件下的 CwGimbalZGV2Main_VX.X.cahf 固件。

5、点击开始升级，等待进度条完成后升级成功。

⚠ • 眼镜端需要同步升级文件夹内的头追固件，升级操作请浏览对应产品的说明书

• 调试模块非标配，需自行购买。对于某些品牌的双 Type-C数据线，可能存在电脑无法识别调试模块的情况，可尝试更换为Type-A 转 Type-C 接口的数据线。

参数配置基本操作

1、云台与调试软件连接成功后，软件会自动从云台下载参数，也可点击"下载参数"进行下载操作。

2、点击"保存参数"，可将软件当前显示的参数保存为本地的参数文件; 点击"打开参数"可读取本地保存的参数文件。

3、在下拉框中选择新的选项后，参数会自动上传至云台并生效;在参数框中输入新的参数后，需选下回车键或点击"上传参数"使之上传并生效。

4、传参数后，点击"烧写参数"将新参数固化进云台中。

⚠ • 参数上传后，如未点击"烧写参数"，上传的参数将会在云台断电后丢失。

云台预设(头追直连、S.BUS/CRSF 与 PWM 控制)

1、当无信号输入或未分配映射通道时，云台按照预设值工作，恢复信号输入后，云台退出预设状态。MAVLink 控制下云台预设无效。

2、预设云台模式:MO-FPV模式;M1-俯仰锁定模式;M2-地平线模式。

3、预设跟随灵敏度:设置范围为 -1.0~1.0，分辨率为 0.1。

4、预设滚转、俯仰、指向角度:设置范围为 -180°~180°，分辨率为 1°。

⚠ • 实际生效的预设角度以云台最大转动范围为准。
• 如果某些通道要始终使用预设值，可将该通道映射为 NULL。

通道映射(头追直连、S.BUS/CRSF 与 MAVLink 控制)

分别选择云台模式、跟随灵敏度、滚转、俯仰与指向所对应的通道号。对于头追直连控制(通过数传或图传)方式，需要将所有通道均映射为CH01。

安装方式

云台默认安装方式为自动，云台会根据上电时的姿态自动切换吊装/立装模式。也可手动设置为吊装或立装。

⚠ • 对于尾座式垂直起降飞行器，请将及机体置于平飞姿态上电，或在软件中手动设置安装方式。
• 手动设置安装方式后，需确保云台实际安装方式与设置一致，否则云台会进入保护状态。

倾角保护(俯仰锁定与地平线模式)

1、当云台安装平面超过保护倾角时，云台将进入保护状态，此时云台回中且不可控。安装平面倾斜小于保护倾角时，云台自动退出保护状态。倾角保护在俯仰锁定式与地平线模式下有效，在 FPV 模式下无效。

2、可根据实际使用情况修改保护倾角，设置范围为 0°~90°，分辨率为1°。< 15°表示禁用倾角保护。

⚠ • 禁用倾角保护后，当载机姿态角较大时，云台可能工作异常。

调参

对于某些转动惯量较大的相机，安装在云台上后可能会造成云台抖动，可适当增大增益值，以获得更好的增稳效果。

⚠ • 如无必要，强烈建议使用默认增益参数。

校准与固件升级

1、若要校准云台，请保证云台处于静止状态，点击"陀螺仪校准"，等待软件提示校准成功。

2、若要升级固件，点击"打开固件"，选择固件文件后点击"开始升级"，等待软件提示升级完成。

⚠ • 无控制信号输入时，如云台姿态出现歪斜或缓慢漂移，需要进行云台校准。

MAVLink配置说明

ArduPilot

SERIAL1	
SERIAL1_BAUD	115
SERIAL1_OPTIONS	1024
SERIAL1_PROTOCOL	2
SR1	
SR1_ADSB	0 Hz
SR1_EXIT_STAT	0 Hz
SR1_EXTRA1	0 Hz
SR1_EXTRA2	0 Hz
SR1_EXTRA3	0 Hz
SR1_PARAMS	0 Hz
SR1_POSITION	0 Hz
SR1_RAW_CTRL	0 Hz
SR1_RAW_SENS	0 Hz
SR1_RC_CHAN	0 Hz

⚠ • 可根据实际情况更换串口号。

PX4

MAVLink	
MAV_1_CONFIG	TELEM2
MAV_1_MODE	Custom / Gimbal
MAV_1_RATE	115200 B/s
Serial	
SER_TEL2_BAUD	115200 8N1

⚠ • MAV_1_MODE推荐使用Custom。

注意事项

1、注意同轴线束与云台连接的部分不能固定过紧，要留有一定的活动长度，确保云台减震行程下线束都可以自由活动，云台运动时不能与其他物体产生碰撞或干涉。

2、当云台安装月光 Moonlight 相机时，仅支持搭配月光 Moonlight VTX 使用。

3、使用云台 UART 头追功能，仅支持Avatar V2 VTX、Avatar V2(Dual) VTX、Avatar Moonlight VTX。

4、云台支架必须使用包装附带或第三方减震球与载具固定，并确保安装牢固。

5、GM 云台支持 UART 头追控制、S.BUS / CRSF控制、PWM控制及MAVLink控制，以上四种控制方式的优先级依次递减。

参数规格

名称	GM3
相机兼容性	Avatar 19mm 相机
稳像精度	±0.005°
最大可控转速	±1500°/s
可控转动范围	偏航:±160° 俯仰:±120° 横滚:±60°
尺寸	46.8x46.4x53.4mm
重量	46g
控制方式	V3.2 固件版本: PWM / UART V3.4 固件版本: PWM / UART / S.BUS / CRSF / MAVLink
头追控制	支持
工作电压	7~26V
静态功耗	1.5W

名称	GM2
相机兼容性	Avatar 19mm 相机
稳像精度	±0.005°
最大可控转速	±1500°/s
可控转动范围	俯仰:±120°
尺寸	46.7x41.2x26.5mm
重量	30g
控制方式	V3.2 固件版本: PWM / UART V3.4 固件版本: PWM / UART / S.BUS / CRSF / MAVLink
头追控制	支持
工作电压	7~26V
静态功耗	1.2W

名称	GM1
相机兼容性	Avatar 19mm 相机
稳像精度	±0.005°
最大可控转速	±1500°/s
可控转动范围	俯仰:±120°
尺寸	32.2x38.1x20.5mm
重量	16g
控制方式	V3.2 固件版本: PWM / UART V3.4 固件版本: PWM / UART / S.BUS / CRSF / MAVLink
头追控制	支持
工作电压	7~26V
静态功耗	1.0W

CADDXFPV SUPPORT
email: support@caddxfpv.com