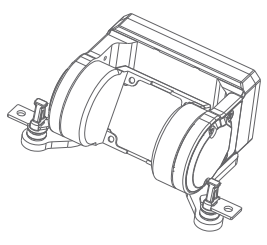
AVATAR GM1 V2-19

QUICK START GUIDE

V1.2



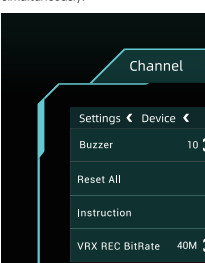
Introduction

This product is a mechanical stabilization gimbal designed to provide real-time image stabilization and camera angle adjustment. It is compatible with Walksnail Avatar/ Ascent series cameras with a mounting width of 19mm. The gimbal supports stabilization and adjustment along the pitch, roll, and yaw axes. Users need to design their own mounting holes on the vehicle to fit the gimbal mounting bracket. The gimbal can automatically recognize upright and inverted installations.

Product Precautions

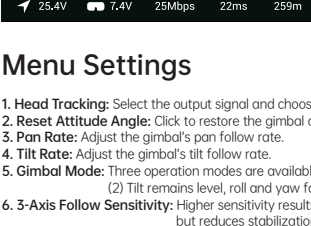
1.Ensure the external power supply to the gimbal is within the specified range (9~25.2V DC, 3S–6S LiPo battery). Operating outside this range may cause malfunction or damage.
2.Do not short-circuit the power and GND wires, as this will damage the device.
3.Make sure the coaxial cable connected to the gimbal is not fastened too tightly. Leave enough slack to allow free movement during the gimbal's damping and operation. The gimbal must not collide or interfere with other objects during self-check or movement after powering on.
4.When using the gimbal with the Moonlight camera, it must be paired with the Moonlight VTX.
5.When using the gimbal head-tracking feature, some Avatar/Ascent VTX units may not support it. Please refer to the corresponding VTX product manual for details.
6.The gimbal bracket must be securely mounted to the vehicle using the included damping balls or compatible third-party damping balls. Ensure the installation is stable.
7.The head-tracking UART cannot be controlled simultaneously by other protocols.

Camera Installation



1.Use a Phillips screwdriver to remove the back cover of the camera.
2.Use tweezers to disconnect the coaxial cables from both sides of the camera's coaxial interface.
3.Connect the gimbal's coaxial cables to the camera.
4.Mount the camera onto the gimbal, rotating the cable outlet on the back cover of the camera by 90 degrees to align with the cable outlet direction of the gimbal. Make sure not to leave excessive length of the coaxial cable to avoid compressing it.
5.Secure the four screws and check whether the camera can smoothly rotate to its maximum pitch angle. If there is noticeable resistance, please reinstall the camera.
6.Installation is complete.

Installation Dimensions

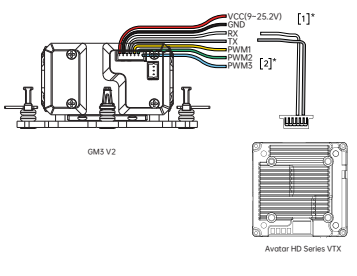


Unit: mm

Connection and Use

To enable the head-tracking feature, connect the gimbal to the USB port of the Avatar V2 VTX and use it together with Avatar Goggles that support head tracking.

[2]



PWM1
The channel is used to select the gimbal's working mode. There are three modes available:
1.Translation Mode: Pitch and roll remain level, while the yaw axis follows.
2.Translation Roll Mode: Pitch remains level, while roll and yaw axes follow.
3.Three-Axis Follow Mode: Pitch, roll, and yaw axes all follow.

PWM2
The channel is used to adjust the gimbal follow sensitivity, controlling how fast or slow the gimbal responds. Please use the dial channel on the remote controller to make the adjustments.

PWM3
This channel controls the gimbal's pitch axis. Please use the dial switch on the remote controller to operate it. You can adjust the gimbal's rotation angle range by modifying the channel travel settings on the remote controller.

PWM4
This channel controls the gimbal's yaw axis. Please use the dial switch on the remote controller to operate it. You can adjust the gimbal's rotation angle range by modifying the channel travel settings on the remote controller.

It is also possible to control the gimbal via a third-party head-tracking module by assigning the control channels to PWM3 and PWM4, enabling head-tracking control of the gimbal.

Control Method

Gimbal supports the following four control methods: direct head-tracking connection/ S.BUS/ CRSF control, PWM control, and Mavlink control. The priority of these control methods decreases in the order listed.。

Head Tracking Function

The gimbal supports head-tracking functionality via both UART and PPM control protocols.

Direct Head Tracking Connection (UART)

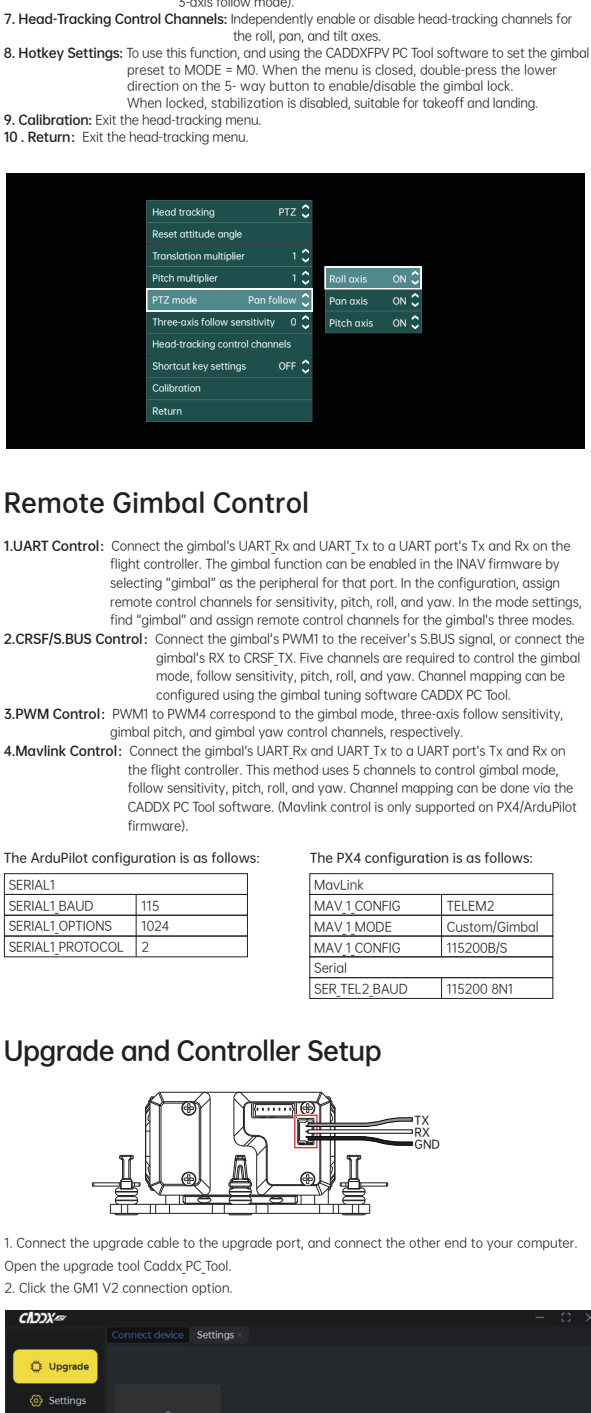
1.Upgrade the Avatar goggles and V2 VTX to version 38.43.14 or above. Connect the gimbal and Avatar V2 VTX UART cable according to the wiring diagram.
2.Open the goggles menu and select "Gimbal" for head-tracking: Settings > Head Tracking > Gimbal. After setup, the gimbal will follow the movements of the goggles. Quickly press the return button three times to center the gimbal.

PPM Control Protocol

1.Use a 5-pin to 2-pin AV cable: connect the 5-pin end to the Goggles' AV IN port and the 2-pin end to the remote controller's DSC port. Solder the gimbal's Rx wire to the CRSF receiver's Tx pin (for SBUS receivers, solder the signal wire to the gimbal's PWM1 signal input). Set the PPM channels on the goggles accordingly. In the remote controller's mixing settings, enable the corresponding TR channels (for example, if the PPM channels are CH5 and CH6, assign two switches mapped as TR5 and TR6).

2.The host controller connects to the gimbal and assigns remote control channels for gimbal mode and sensitivity settings.

3.The PPM protocol can only control any two axes, and head tracking cannot output all three axes simultaneously.



Menu Settings

1. Head Tracking: Select the output signal and choose the gimbal.
2. Reset Attitude Angle: Click to restore the gimbal orientation to its default neutral position.
3. Pan Rate: Adjust the gimbal's pan follow rate.
4. Tilt Rate: Adjust the gimbal's tilt follow rate.
5. Gimbal Mode: Three operation modes are available: (1) Tilt and roll remain level, yaw follows; (2) Tilt remains level, roll and yaw follow; (3) All three axes follow.
6. 3-Axis Follow Sensitivity: Higher sensitivity results in faster gimbal response to aircraft movement but reduces stabilization against aircraft vibration (effective only in 3-axis follow mode).
7. Head-Tracking Control Channels: Independently enable or disable head-tracking channels for the roll, pan, and tilt axes.
8. Hotkey Settings: To use this function, and using the CADDXFPV PC Tool software to set the gimbal preset to MODE = M0. When the menu is closed, double-press the lower direction on the 5- way button to enable/disable the gimbal lock. When locked, stabilization is disabled, suitable for takeoff and landing.
9. Calibration: Exit the head-tracking menu.
10 . Return: Exit the head-tracking menu.

Remote Gimbal Control

1.UART Control: Connect the gimbal's UART_Rx and UART_Tx to a UART port's Tx and Rx on the flight controller. The gimbal function can be enabled in the INAV firmware by selecting "gimbal" as the peripheral for that port. In the configuration, assign remote control channels for sensitivity, pitch, roll, and yaw. In the mode settings, find "gimbal" and assign remote control channels for the gimbal's three modes.
2.CRSF/S.BUS Control: Connect the gimbal's PWM1 to the receiver's S.BUS signal, or connect the gimbal's RX to CRSF_TX. Five channels are required to control the gimbal mode, follow sensitivity, pitch, roll, and yaw. Channel mapping can be configured using the gimbal tuning software CADDX PC Tool.
3.PWM Control: PWM1 to PWM4 correspond to the gimbal mode, three-axis follow sensitivity, gimbal pitch, and gimbal yaw control channels, respectively.
4.Mavlink Control: Connect the gimbal's UART_Rx and UART_Tx to a UART port's Tx and Rx on the flight controller. This method uses 5 channels to control gimbal mode, follow sensitivity, pitch, roll, and yaw. Channel mapping can be done via the CADDX PC Tool software. (Mavlink control is only supported on PX4/ArduPilot firmware).

The ArduPilot configuration is as follows:

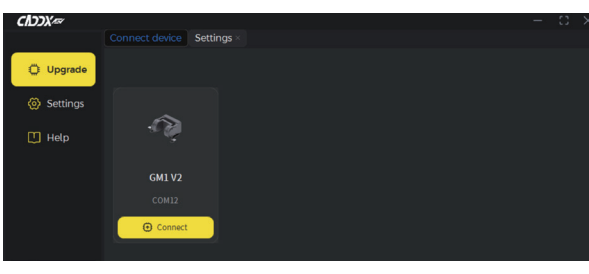
SERIAL1	
SERIAL1_BAUD	115
SERIAL1_OPTIONS	1024
SERIAL1_PROTOCOL	2

The PX4 configuration is as follows:

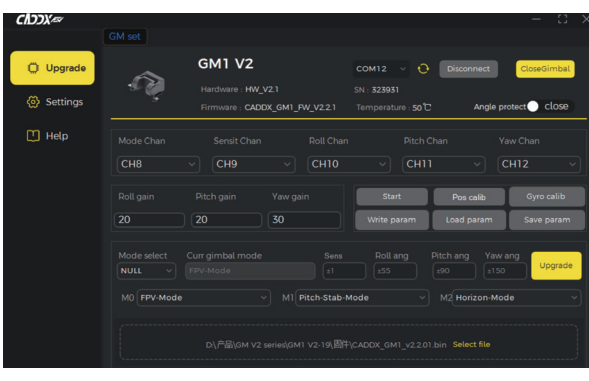
MavLink	
MAV_1_CONFIG	TELEM2
MAV_1_MODE	Custom/Gimbal
MAV_1_CONFIG	115200B/S
Serial	
SER_TEL2_BAUD	115200 8N1

Upgrade and Controller Setup

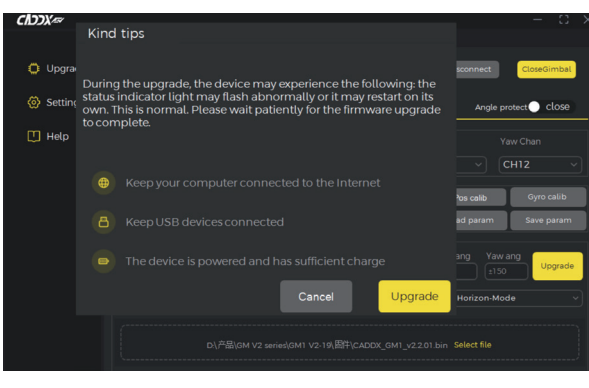
1. Connect the upgrade cable to the upgrade port, and connect the other end to your computer. Open the upgrade tool Caddx_PC_Tool.
2. Click the GM1 V2 connection option.



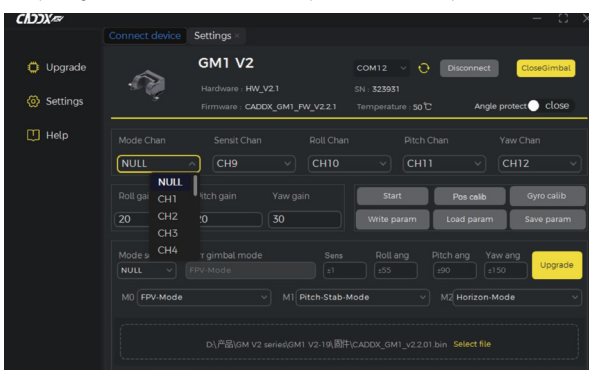
3. Follow the order shown in the view, select the corresponding version of the firmware to upgrade.



4. Click Start Upgrade and wait for the progress bar to finish. Upgrade completed successfully. (Do not restart or power off during the upgrade to avoid upgrade failure.)



5. When using CRSF/SBUS/MAVLink, in the remote control channel assignment settings, select the corresponding channels for the five functions in sequence: Mode, Sensitivity, Roll, Pitch, and Yaw.



6. Click Flash Parameters and wait for the progress bar to complete.

Specifications

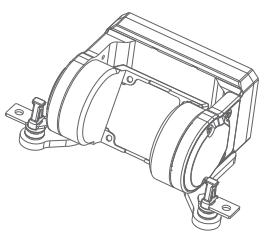
Model	GM1 V2-19
Camera Compatibility	Avatar/Ascent Series 19mm Camera
Stabilization Accuracy	±0.005°
Maximum Controllable Speed	±1500°/s
Controllable Rotation Range	Pitch: ±120°
Control Method	Uart/ S.bus/ Crsf/ Mavlink/ PWM
Head Tracking Control	Supports
Static Power	1W
Stall Power	7.5W
Dimensions	43x46.4x56.9mm
Weight	32g

CADDXFPV SUPPORT
email: support@caddxfpv.com

AVATAR GM1 V2-19

快速入门指南

V1.2



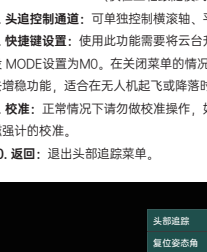
简介

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/ Ascent系列相机，可实现相机俯仰角度的防抖和调整。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。

产品注意事项

1. 确保云台的外接电源在规格范围内（9~25.2V DC，3S~6S 锂电池），否则可能导致设备工作异常或损坏。
2. 切勿短接电源及 GND 线，否则会导致设备损坏。
3. 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，云台通电自检与运动过程不能与其他物体产生碰撞或干涉。
4. 当云台安装月光Moonlight相机时，需搭配月光Moonlight VTX使用。
5. 使用云台头追功能时，个别 Avatar/ Ascent VTX 不支持，请查看对应 VTX产品说明书。
6. 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。
7. 头追uart与其他协议不能同时控制。

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，相机后盖出线口旋转90度对应云台出线方向，注意同轴线长不要留过多，避免挤压同轴线。
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



连接及使用



[1]

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

[2]

PWM1

通道为云台工作模式选择，共有三个工作模式
1.平移模式：俯仰横滚保持水平，方向轴跟随
2.平移横滚模式：俯仰保持水平，横滚方向轴跟随
3.三轴跟随模式:俯仰、横滚、方向轴跟随

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

通道为云台云台俯仰轴通道，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

通道为云台云台方向轴通道，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。

也可以通过第三方头追模块，将控制通道对应至 PWM3 及 PWM4，可以实现通过头追的方式控制云台。

控制方式

支持以下四种控制方式：头追直连/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减小。

头部跟踪功能

云台支持Uart和PPM两种控制协议实现头部跟踪功能

头追直连（Uart）

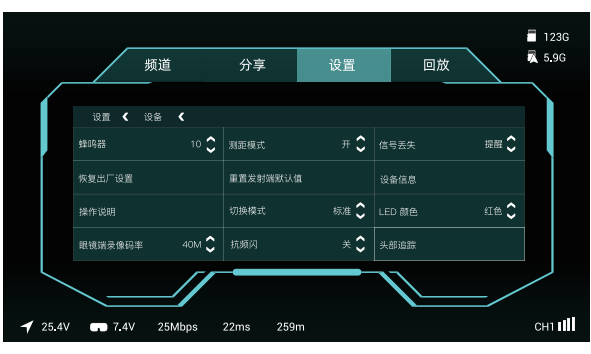
1.将Avartar眼镜和V2 VTX升级至38.43.14或以上版本，根据接线图连接云台和Avartar V2 VTX的串口线。
2.打开眼镜菜单将头追跟踪选择为“云台”，设置>头部跟踪>云台，设置完成后云台将会跟随眼镜姿态动作，快速按3次返回键可以使云台回中。

PPM协议

1.用5芯转2芯音视线，5pin连接Goggles眼镜av in端口，2pin连接遥控器DSC端口，云台Rx连接线焊接至CRSF接收机Tx上（SBUS接收机信号线需焊接至云台PWM1信号上），眼镜PPM频道设置通道，遥控混控中也要开启相对应的TR通道（例如PPM频道为CH5~CH6,遥控需要分配2个开关映射为TR5/TR6）。

2.上位机连接云台，为云台模式和灵敏度分配遥控通道。

3.PPM协议只能控制任意两个轴向，头追无法同时输出三轴。



菜单设置

1. 头部跟踪：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V2.2.4以上版本，并使用CADDXFPV PC TOOL 软件将云台预设 MODE设置为M0。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。

通过遥控器控制云台

1. Uart控制：云台 UART_Rx 与 UART_Tx 连接至飞控某一组串口的 Tx 与 Rx，可在inav固件中使用串口云台功能，端口外设选择gimbal，配置里找到串口云台，为灵敏度、俯仰、横滚与指向分配遥控通道，在模式里找到gimbal，为云台三个模式分配遥控通道。
2. CRSF/S.BUS控制：将云台的PWM1连接至接收机的S.BUS信号或者将云台的RX连接至CRSF_TX，需占用5个通道，分别控制云台模式、跟随灵敏度、俯仰、横滚与指向，可使用调试软件 CADDX PC Tool 进行通道映射。
3. PWM控制：PWM1~PWM4分别为云台模式、三轴跟随灵敏度、云台俯仰与云台指向控制通道。
4. Mavlink控制：云台 UART_Rx 与 UART_Tx 连接至飞控某一组串口的 Tx 与 Rx，需占用5个通道，分别控制云台模式、跟随灵敏度、俯仰、横滚与指向，可使用调试软件 CADDX PC Tool 进行通道映射。（Mavlink仅支持PX4/ardupilot固件）。

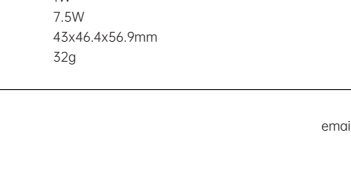
Ardupilot 配置如下：

SERIAL1	
SERIAL1_BAUD	115
SERIAL1_OPTIONS	1024
SERIAL1_PROTOCOL	2

PX4 配置如下：

MavLink	
MAV_1_CONFIG	TELEM2
MAV_1_MODE	Custom/Gimbal
MAV_1_CONFIG	115200B/S
Serial	
SER_TEL2_BAUD	115200 8N1

云台固件升级及遥控配置



1. 使用升级线连接升级口，另一端连接电脑端并打开升级工具Caddx_PC_Tool。
2. 点击GM1 V2连接选项。

3. 按照视图顺序操作，选择对应版本固件进行升级。

4. 点击开始升级，并等待进度条完成后升级成功 (升级过程中请勿重启或关闭电源，避免升级失败)。

5. 当使用CRSF/SBUS/Mavlink时，遥控控制分配控制通道设置，按顺序从模式，灵敏度，滚转，俯仰，指向分别五个功能中选择相对应通道。

6. 点击烧写参数，等待进度条完成后即可。

参数规格

名称	GM1 V2-19
相机兼容性	Avatar/Asent系列 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°
控制方式	Uart/ S.bus/ Crsf/ Mavlink/ PWM
头追控制	支持
静态功耗	1W
堵转功耗	7.5W
尺寸	43x46.4x56.9mm
重量	32g

CADDXFPV SUPPORT
email: support@caddxfpv.com