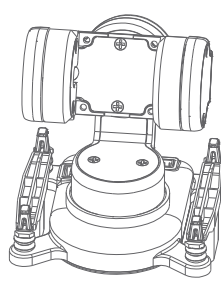
CADDX GM3 V2-20

QUICK START GUIDE

V1.2



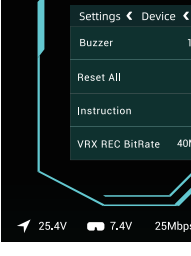
Introduction

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 20mm. 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

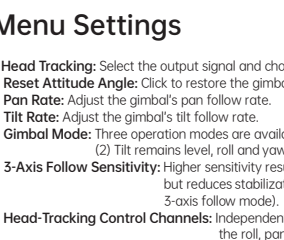
1.Ensure the external power supply to the gimbal is within the specified range (9~25.2V DC, 3S-6S LiPo battery). Operating outside this range may cause malfunction or damage.
2.Do not short-circuit the power and GND wires, as this will damage the device.
3.Make sure the coaxial cable connected to the 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



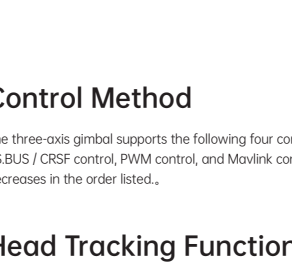
Unit: mm

Connection and Use

[1]

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

The three-axis 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

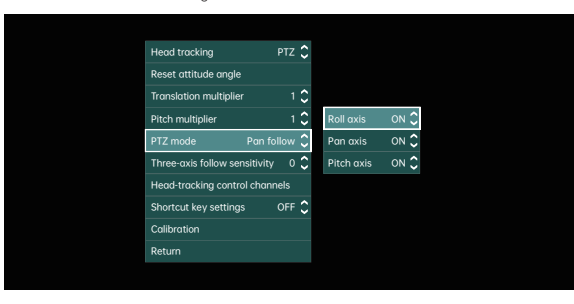
1.Use a 5-pin to 2-pin AV cable: connect the 5-pin end to the Goggles' AV IN port and the 2-pin end to the remote controller's DSC port. Solder the gimbal's Rx wire to the CRSF receiver's Tx pin (for SBUS receivers, solder the signal wire to the gimbal's PWM1 signal input). Set the PPM channels on the 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: This function requires upgrading the gimbal to firmware V3.6 or above and using the GimbalConfig software to set the gimbal preset to MODE = M0 and SENS = 1. 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 gimbalSetting.
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 GimBalSetting software. (Mavlink control is only supported on PX4/ArduPilot firmware).

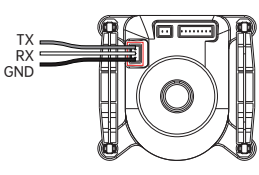
The ArduPilot configuration is as follows:

SERIAL1	
SERIAL1_BAUD	115
SERIAL1_OPTIONS	1024
SERIAL1_PROTOCOL	2

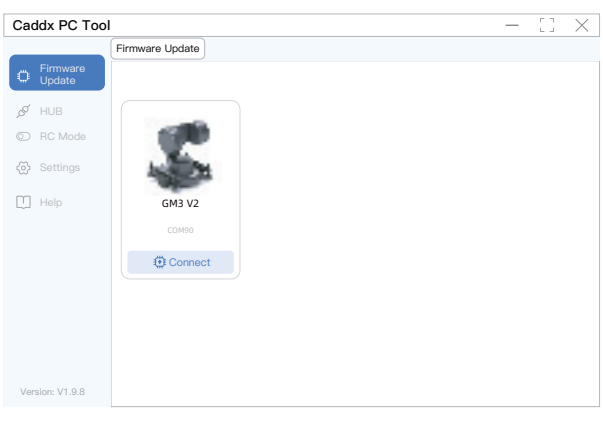
The PX4 configuration is as follows:

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

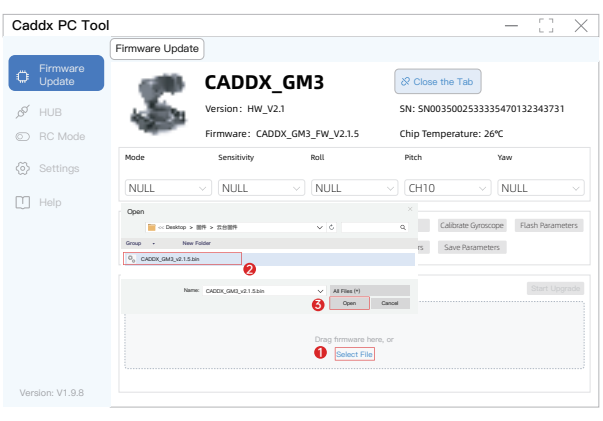
Upgrade and Controller Setup



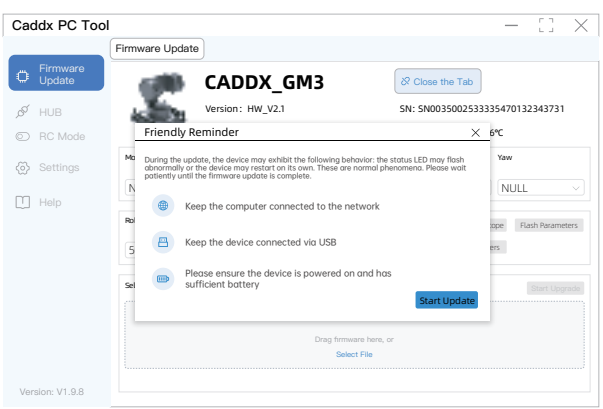
1. Connect the upgrade cable to the upgrade port, and connect the other end to your computer. Open the upgrade tool Caddx_PC_Tool.
2. Click the GM3 V2 connection option.



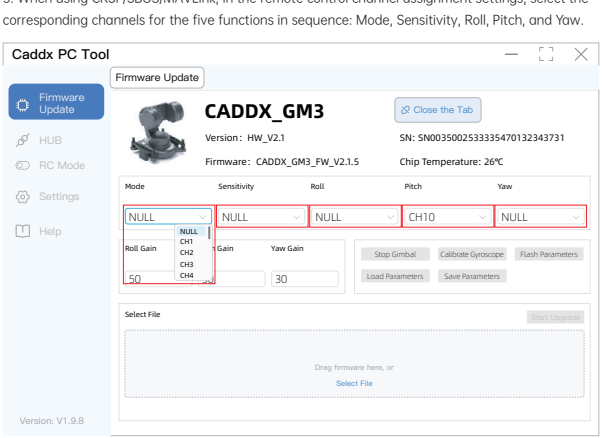
3. Follow the order shown in the view, select the corresponding version of the firmware to upgrade.



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	GM3 V2-20
Camera Compatibility	Avatar/Ascent Series 19/20mm Camera
Stabilization Accuracy	±0.005°
Maximum Controllable Speed	±1500°/s
Controllable Rotation Range	Yaw：±160° Pitch: ±120° Roll：±60°
Control Method	Uart/ S.bus/ Crsf/ Mavlink/ PWM
Head Tracking Control	Supports
Static Power	1.6W
Stall Power	18W
Dimensions	61.5x47x46mm
Weight	48g

CADDXFPV SUPPORT
email: support@caddxfpv.com