

Gremsy and Pixhawk communication

1. Introduction

The Gremsy's Gimbal that can communicate with Ardupilot (Copter) using Mavlink

NOTE: Support for this Gimbal is include in Copter 3.3 (or higher) for gimbals running

- T1: gremsyT1_v605 or above
- T3: gremsyT3_v605 or above
- S1: gremsyS1_v605 or above
- Pixy: gremsyF_v605 or above
- [gTuneDesktop](#): gTuneDesktop_v135_Beta or above

2. What's New

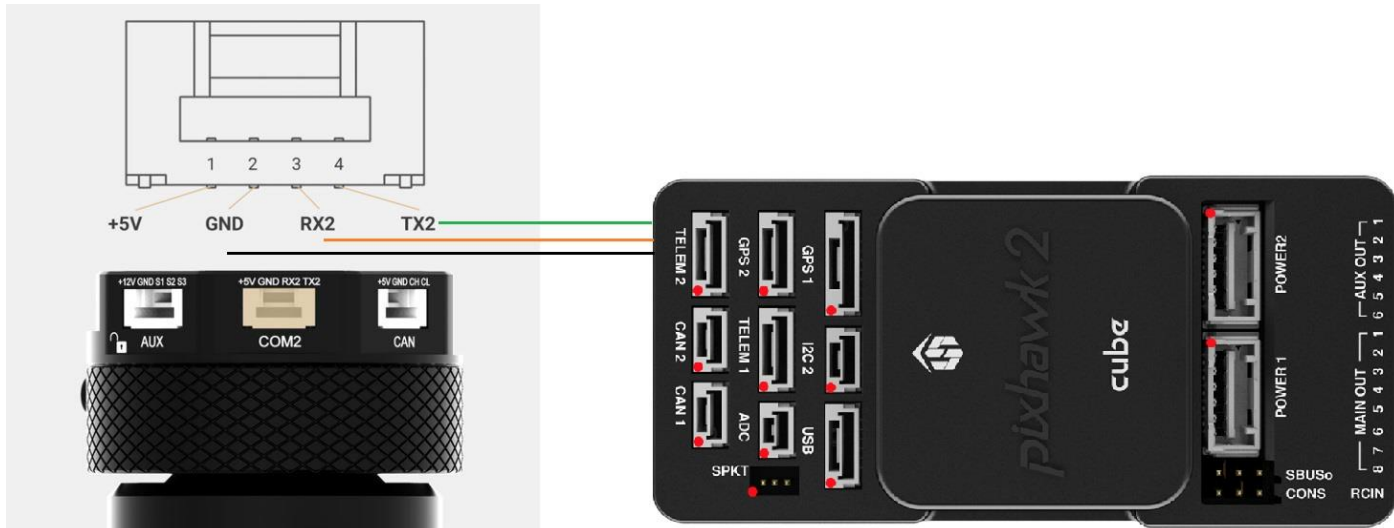
- Support Ardupilot (Copter) remote in Single mode
- Support the advance features like automated aiming of the camera at a Region of Interest (ROI).
- Support DO_MOUNT_CONTROL (Ardupilot will send angle requests to gimbal)
- Drift free horizon
- Gimbal (or mount) send a [HEARTBEAT](#) (e.g. every second) just like any other MAVLink component. Additionally, it can send feedback about the angles it's pointing using the message [MOUNT_ORIENTATION](#).

3. Connecting the gimbal to the Pixhawk

Connect cable from COM2 port on Hyper Quick release to Telem2 or Telem1 on Pixhawk.

Baurate on Pixhawk should be set at :

- 115200bps,
- 8 Data bits
- No Parity,
- 1 Stop Bit (8N1)



NOTE: *The remaining 3 pins (VCC, RTS, CTS) of the cable should not be connected*

4. Set-up through the Mission Planner (Mavlink protocol)

Through your GCS (i.e MP's Full Param List or Tree) set the following parameters:

- ❖ Using Telem 2
 - SERIAL2_BAUD 115
 - SERIAL2_PROTOCOL 2
- ❖ Set up MNT parameter

MNT			
MNT_ANGMAX_PAN	15000	Centi-De...	-18000 17999
MNT_ANGMAX_ROL	15000	Centi-De...	-18000 17999
MNT_ANGMAX_TIL	15000	Centi-De...	-18000 17999
MNT_ANGMIN_PAN	-4500	Centi-De...	-18000 17999
MNT_ANGMIN_ROL	-4500	Centi-De...	-18000 17999
MNT_ANGMIN_TIL	-4500	Centi-De...	-18000 17999
MNT_DEFLT_MODE	4		0:Retracted 1:Neutral 2:MavLink Targeting 3:RC Targeting 4:GPS Poin
MNT_JSTICK_SPD	0		0 100
MNT_LEAD_PTCH	0	Seconds	0.0 0.2
MNT_LEAD_RLL	0	Seconds	0.0 0.2
MNT_NEUTRAL_X	0	Degrees	-180.00 179.99
MNT_NEUTRAL_Y	0	Degrees	-180.00 179.99
MNT_NEUTRAL_Z	0	Degrees	-180.00 179.99
MNT_RC_IN_PAN	0		0:Disabled 5:RC5 6:RC6 7:RC7 8:RC8 9:RC9 10:RC10 11:RC11 12:RC12
MNT_RC_IN_ROLL	0		0:Disabled 5:RC5 6:RC6 7:RC7 8:RC8 9:RC9 10:RC10 11:RC11 12:RC12
MNT_RC_IN_TILT	6		0:Disabled 5:RC5 6:RC6 7:RC7 8:RC8 9:RC9 10:RC10 11:RC11 12:RC12
MNT_RETRACT_X	0	Degrees	-180.00 179.99
MNT_RETRACT_Y	0	Degrees	-180.00 179.99
MNT_RETRACT_Z	0	Degrees	-180.00 179.99
MNT_STAB_PAN	0		0:Disabled 1:Enabled
MNT_STAB_ROLL	0		0:Disabled 1:Enabled
MNT_STAB_TILT	0		0:Disabled 1:Enabled
MNT_TYPE	4		0:None 1:Servo 2:3DR Solo 3:Alexmos Serial 4:SToRM32 MAVLink 5:SToRM32 Serial

- Set “**MNT_TYPE**” to “**4**” to enable the Mavlink protocol
- Set “**MNT_RC_IN_TILT**” to “**6**” if you wish to control the gimbal’s tilt (aka pitch angle) with your transmitter ch6 tuning knob (Single Mode).
- Set the **MNT_ANGMAX_PAN**, **MNT_ANGMAX_ROLL**, **MNT_ANGMAX_TILT** and **MNT_ANGMIN_PAN**, **MNT_ANGMIN_ROLL**, **MNT_ANGMIN_TILT** to match the range of gimbal (S1, T1, T3). For example, the screenshot below shows setup in which the gimbal S1 has:
 - PAN axis control: **MNT_ANGMIN_PAN** = -160 to **MNT_ANGMAX_PAN** = +160.

- TILT axis control: MNT_ANGMIN_TILT = -135 to MNT_ANGMAX_TILT = +90
- ROLL axis control: MNT_ANGMIN_ROLL = -45 to MNT_ANGMAX_ROLL = +45

5. How to control gimbal

This introduction assume that gimbal have already been connected and configured

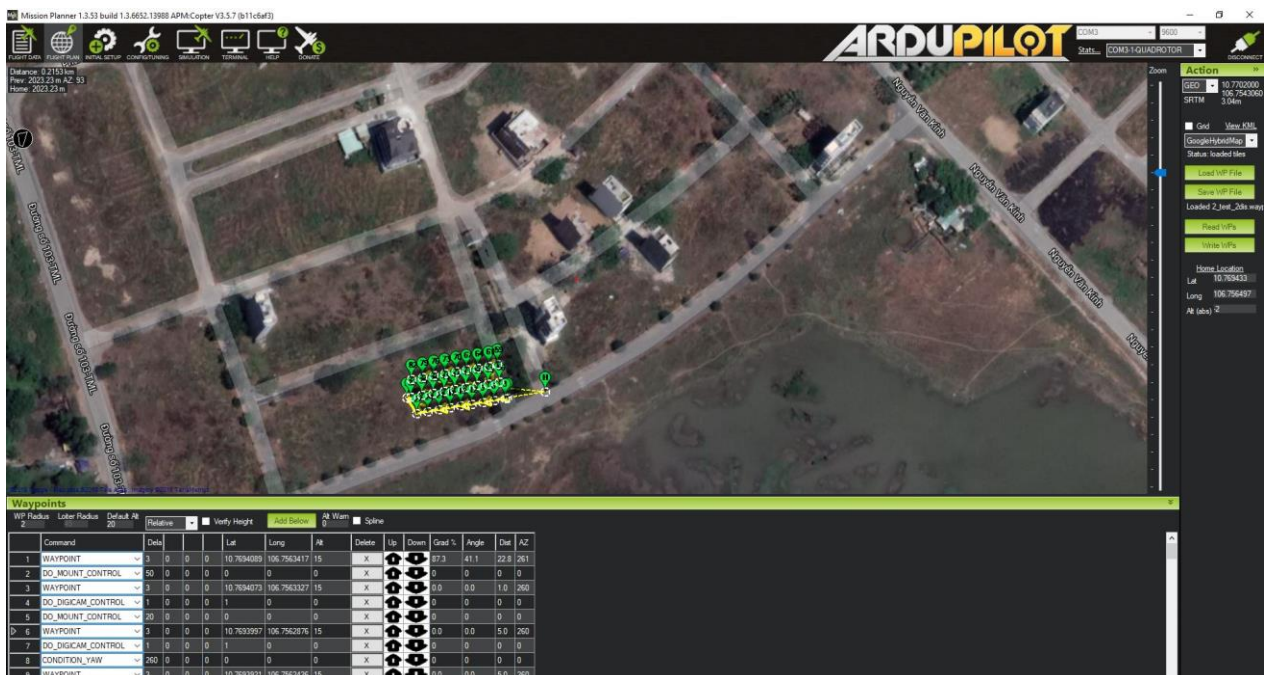
❖ In single mode

- Set “MNT_RC_IN_TILT” to “6” if you wish to control the gimbal’s tilt (aka pitch angle) with your transmitter ch6 tuning knob (Single Mode) or another channel.
- Set “MNT_DEFL_MODE” to “3” that is the RC targeting mode.

❖ In Mission Planner to define camera survey missions

If a camera gimbal is used, you can set the camera position (yaw, roll, titl) or aim it at specific region of interest (ROI).

- Set “MNT_DEFL_MODE” to “4” that is the Mavlink targeting mode.
- **DO_SET_ROI** – Target the camera towards a specified region of interest (Position, including altitude)
- **DO_MOUNT_CONTROL** – Position the gimbal with the specified roll, pitch, yaw



6. How to configure gimbal

❖ Smooth

- Smooth out the camera movement by adjusting this parameter. The higher the value is the smoother camera move but at the expense of more delay in following the movements

GTUNE → SETTINGS → CONTROLS → SBUS

Smooth value in range [0:100]

The screenshot displays the gTune v1.3.1 #private #firmware interface. At the top, three circular gauges show the current gimbal angles: TILT at -47.4, ROLL at -0.1, and PAN at 26.8. Below these is a 'SETTINGS' panel with tabs for STIFFNESS, FOLLOW, CONTROLS, IMU, CANLINK, and ROTATION. The 'CONTROLS' tab is active, showing sub-tabs for SYNC, SBUS, SPEKTRUM, PPM, JOYSTICK, and LIGHTBRIDGE 2. The 'SMOOTH' parameter is set to 80. Other settings include FASST (off), SFHSS (off), CHANNEL 2, DEAD ZONE 0, SPEED (off), ANGLE (off), REVERSE (off), and NORMAL (off). The bottom status bar shows 'MOTORS ON', 'MODE LOCK', 'RC SBUS', and indicators for TILT, ROLL, PAN, and IMU, all of which are green. A battery voltage of 11.86[V] is also displayed.

7. How to run application

- When the first turn on the motor, make sure the pan axis is aligned with the forward direction of the copter in order for the gimbal to calculate the attitude correctly.
- After turning on the motor, the LED status turns to the **blue color** indicating that connection between gimbal and flight controller has been established.

NOTE: To control gimbal should be switch gimbal to Lock Mode