Gimbal MAVLink Integration Guide - V1.0

1) Supported Camera Types

`K11`

`G640T-V2`

`K40T`

2) Recommended Environment

QGroundControl (QGC) version - 5.0.8

MissionPlanner version - 1.3.83

ArduPilot (APM) version - 4.6.3

PX4 version - 1.17.0

Example flight controller - HEQ Flight Controller / CUAV V5+

Example data link - HEQ SCEPTER-15

3) Supported Functions

Function	PX4	APM
Gimbal control	**Supported**	**Supported (QGC recommended: tap-to-point on screen)**
SBUS to MAVLink gimbal control	**Supported**	**Supported**
Switch photo/video mode	**Supported**	~~*Not supported yet*~~
Take photo / record video	**Supported (some QGC versions)**	**Supported (MissionPlanner recommended)**
Tracking	**K11/K40T only**	**K11/K40T only**
Display SD card capacity	**Supported (QGC)**	~~*Not supported yet*~~
Format SD card	**Supported (QGC)**	**Supported (QGC)**

4) PX4 / ArduPilot (APM) Flight Controller Parameter Configuration

PX4

- Serial port side
  - Connect the gimbal payload to a TELEM port; the baud rate must match the payload (default `115200`)
  - Set the corresponding instance to Gimbal channel (the example below uses `MAV_X_*`):
    - `MAV_1_CONFIG = TELEMx` (set to match the actual wiring)
    - `MAV_1_MODE = Gimbal`
    - `MAV_1_FORWARD = Enabled`
    - `SER_TELx_BAUD = 115200`

Gimbal side

`_MODE_IN = 0/4` (Auto / MAVLink gimbal protocol v2); Auto recommended

`_MODE_OUT = 2` (MAVLink gimbal protocol v2)

`_MAV_COMPID = 154` (default gimbal component ID)

`_MAN_PITCH = AUX1`

`_MAN_YAW = AUX2`

`_RC_IN_MODE = Angular rate`

`MNT_RATE_PITCH = 30.00` (adjusts SBUS gimbal control speed)

`MNT_RATE_YAW = 30.00` (adjusts SBUS gimbal control speed)

RC transmitter side

Required when `MNT_MODE_IN = AUTO` is enabled; enables SBUS to MAVLink gimbal control

`RC_MAP_AUX1 = Channel14` (channel can be customized)

`RC_MAP_AUX2 = Channel15` (channel can be customized)

Important notes

Restart the flight controller after changing the parameters above.

Additional parameters only appear after `MNT_MODE_IN` has been modified first.

ArduPilot (APM)

- Serial port side
  - `SERIALx_PROTOCOL = MAVLink2`
  - `SERIALx_BAUD = 115`
- Mount/Camera side
  - `MNT1_TYPE = 6` (Gremsy)
  - `CAM1_TYPE = 6` (MAVLink Camera)
  - `RC14_OPTION = Mount1 Pitch` (channel can be customized)
  - `RC14_MAX = 1950` (set the actual value to match your transmitter)
  - `RC14_MIN = 1050` (set the actual value to match your transmitter)
  - `RC15_OPTION = Mount1 Yaw` (channel can be customized)
  - `RC15_MAX = 1950` (set the actual value to match your transmitter)
  - `RC15_MIN = 1050` (set the actual value to match your transmitter)
  - `RC12_OPTION = Retract Mount1` (channel can be customized; can be assigned to center-return or one-click-look-down; the two are mutually exclusive)
  - `RC12_MAX = 1950` (set the actual value to match your transmitter)
  - `RC12_MIN = 1050` (set the actual value to match your transmitter)
  - `MNT1_DEFLT_MODE = 4`
  - `MNT1_RC_RATE = 30` (0 = angle control; > 0 = speed control)