Contents

Camera Operation

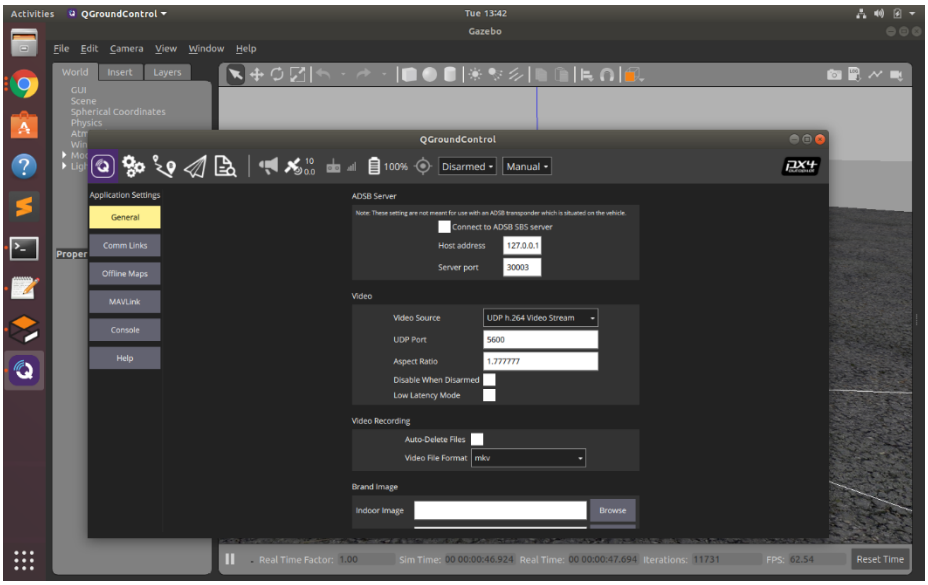
To enable the camera, several changes were made to the operating system, QGroundControl, and roslaunch command.

Camera Settings

1. Update Gstreamer:
    a. sudo apt install libgstreamer1.0-dev
    b. sudo apt install gstreamer1.0-plugins-good
    c. sudo apt install gstreamer1.0-plugins-bad
    d. sudo apt install gstreamer1.0-plugins-ugly

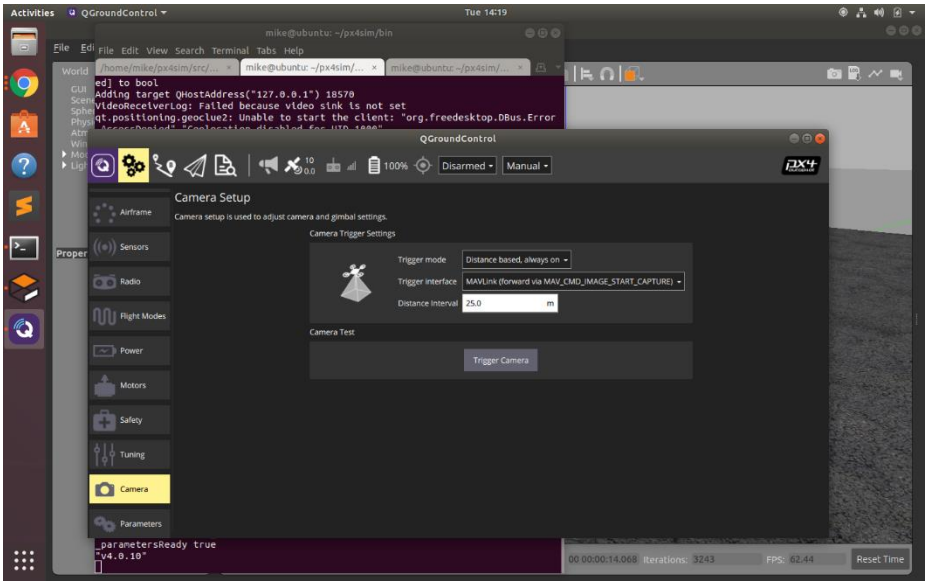
    e. The first three were reported as already installed. The ugly plugins appear to install something new.

2. Camera Settings in QGroundControl:
    a. Under the Application Settings > General (the Q logo):
        i. Video
            1. Video Source: UDP h.264 Video Stream
            2. UDP Port: 5600
            3. Aspect Ratio: 1.777777
            4. Disable When Disarmed: unchecked
            5. Low Latency Mode: unchecked



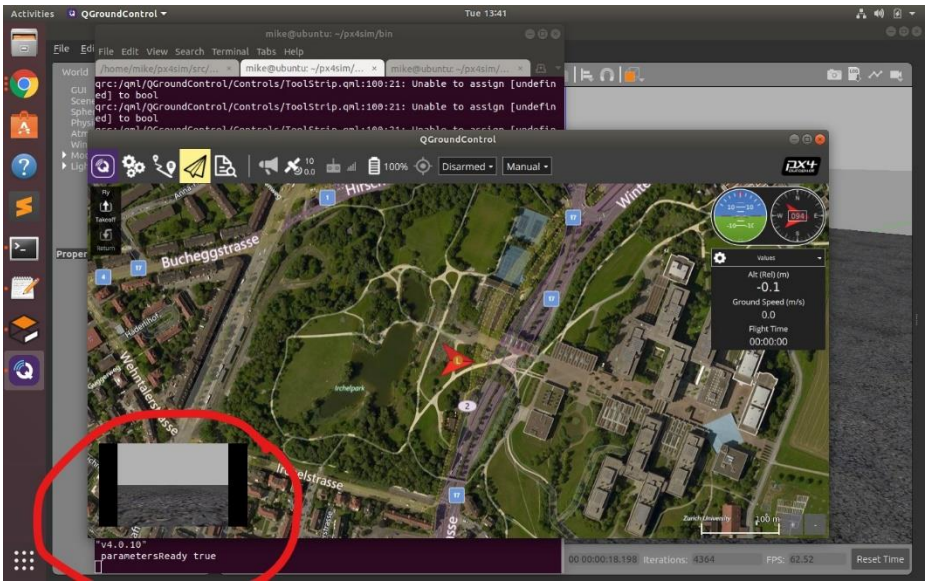
QGroundControl General Settings (for video)

b. Under the Vehicle Setup > Camera (the gears logo):
    i. Camera Trigger Settings
        1. Trigger Mode: Distance Based, always on
        2. Trigger Interface: MAVLink (forward via MAV_CMD_IMAGE_START_CAPTURE)
        3. Distance Interval: 25.0 m



QGroundControl Camera Settings

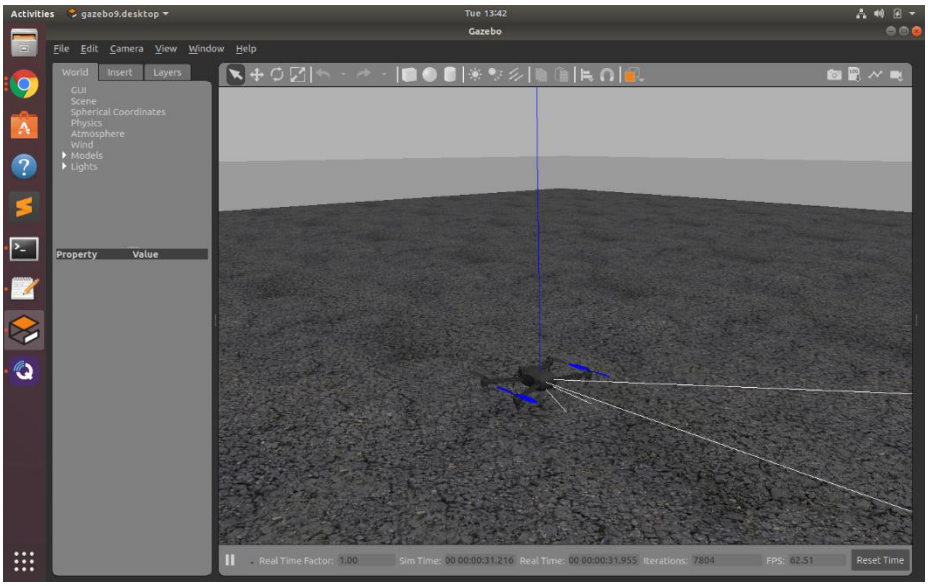
c. When you resume flight control (the paper airplane logo), the camera view should appear in the lower left box.
    i. The Gazebo simulation has to be running with a camera on the drone - so check out the next instruction on how to do that.



QGroundControl with Camera Feed

3. The 3DR Iris that we launched earlier did not have a software model for a camera onboard. To launch an Iris with a camera, try this (a. is all one line):
    a. roslaunch px4 mavros_posix_sitl.launch sdf:=/home/<user>/px4sim/src/Firmware/Tools/sitl_gazebo/models/iris_fpv_cam/iris_fpv_cam.sdf
    b. Where <user> is your ubuntu account name.

    c. Passing the ROS argument, 'sdf', loads the specified model file into the gazebo simulation.
    d. In this case, the new model is a 3DR Iris with an FPV (first-person view) camera.
        i. If you look into the iris_fpv_cam.sdf file, you'll also see that the camera's mounting structure (a joint) is also included in the model.



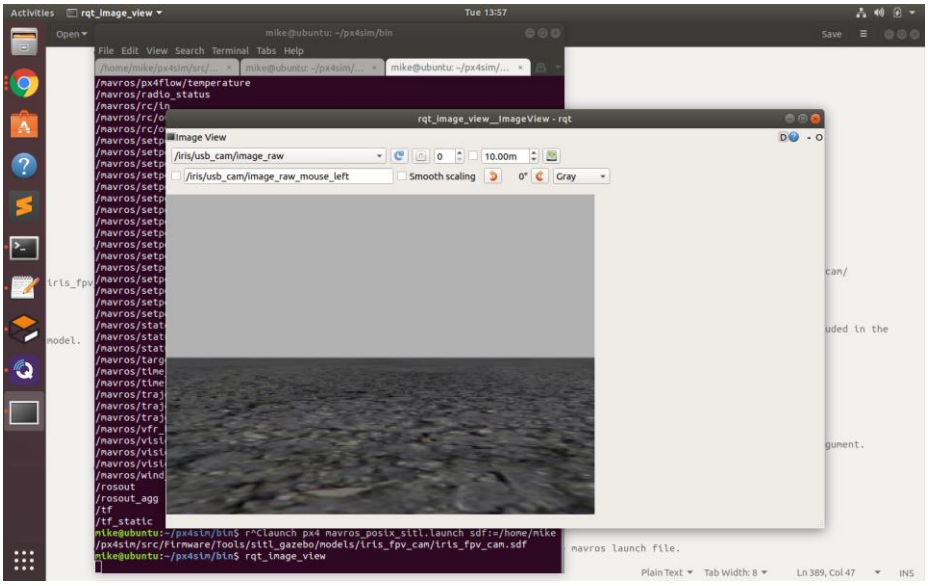
e. Note that the launch file does have a "vehicle" argument that can be passed in. This does not seem to work as of Feb-May, 2020, https://github.com/PX4/sitl_gazebo/issues/489
    i. When you pass, "vehicle:=iris_fpv_cam", it appears that ROS and Gazebo load properly.
    But PX4 exits in error that "iris_fpv_cam" model is not found.
    ii. Hence, the vehicle argument is left as the default, "iris", and the sdf file (the model file) is loaded with the new argument.

MAVROS and Camera Views

1. With Gazebo running, the QGroundControl station should be able to view the camera feed.
    a. If it does not appear, wait a couple minutes.
    b. If it does not appear after a few minutes, try to restart the application.

2. From here, you can resume 'manual' mode control, flip the arm button, and attempt to fly.
    a. You should notice propellers at the fringes of the camera view.

3. Note the numerous ROS topics (rostopic list) that are now available with the mavros launch file.
    a. You can also view the camera stream with ROS at the command line:
        i. rqt_image_view
        ii. And select from "/iris/usb_cam/image_raw" from the dropdown.



ROS view of camera imagery: rqt_image_view