QDrone 2 – Hardware Test

Optical Flow

What to expect in the Optical Flow Tests?

QDrone 2 has a downward-facing PMW3901 optical flow sensor that will be able to measure the relative movement of the drone based on pixel counts. This document will guide you through running the tests and confirm the results.

Optical Flow Sensor

QDrone 2 has an optical flow sensor on the underside of the drone (figure 1), this is able to measure the movement of the drone based on the patterns in the environment around it.

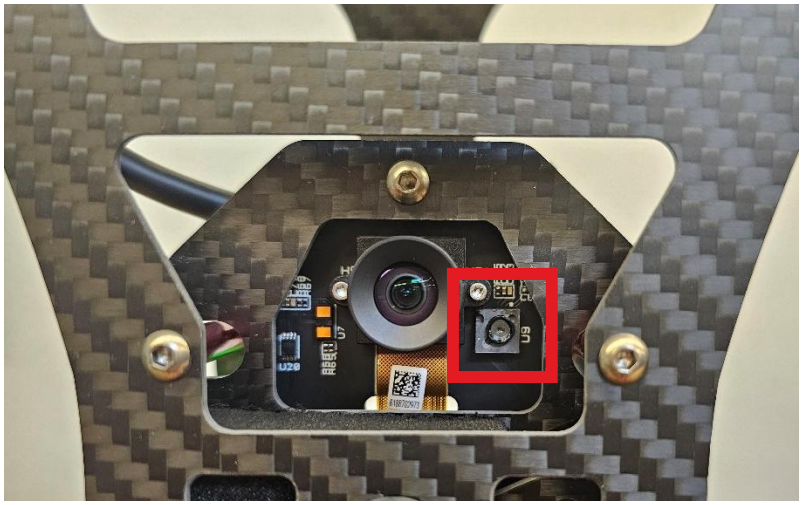

Figure 1. Location of optical flow sensor

Optical Flow – MATLAB/Simulink

Open the QD2_opticalflow_2021a.slx file from the same folder containing this file.

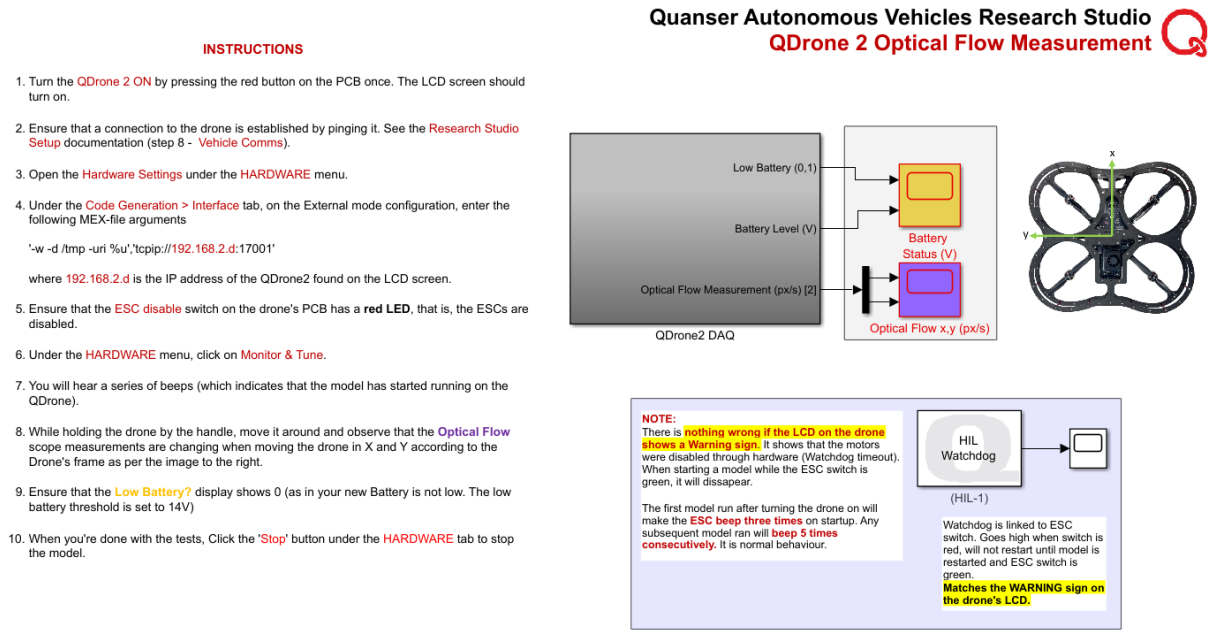

Figure 2. Optical Flow Measurement model

Follow the instructions on the left of the the Simulink model (figure 2). Open the Optical Flow scope and lift the drone by the handle. Move the drone in X and Y direction based on the image of the reference frame at the right of the model. The top part of the scope (figure 3) should show you translation in X and the bottom part of the scope shows translations in Y. If the surface the drone is seeing does not have many features the changes might not be too noticeable. Try to find something where there are features such as different colors or textures on front of the sensor.

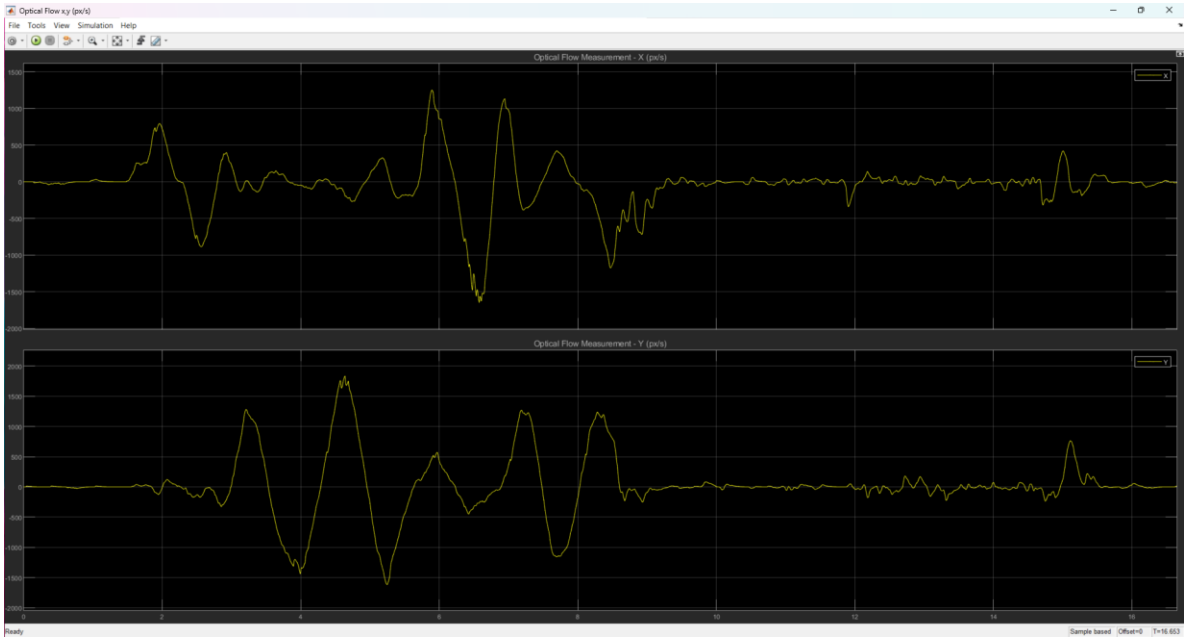

Figure 3. Optical flow sensor output with movement in X and Y