PMW optical flow sensor notes

How to adjust the surface quality of the optical flow sensors:

In line 47 `boolean surface_quality` is the global variable which enables the Serial port print of both sensors Surface quality register (SQUAL) value.

If `boolean surface_quality = 0` SQUAL values won't be displayed on the serial port.

If `boolean surface_quality = 1` SQUAL values will be displayed on the serial port.

When both SQUAL values are displayed move the optical flow sensors horizontally to match the maximum value (SQUAL > 40 should be good).

USB optical mouse HID output and gain:

In line 79 `int g` is the variable that is multiplied by the USB optical mouse coordinates.

In lines 59-61, the three variables: `x_front, y_front` and `x_lateral` are the relative displacements of each axis of the optical flow sensors (`y_lateral` is unused because it is redundant).

You can use any of the three to be sent as "optical mouse commands" using the method: `Mouse.move(g*x_front, g*x_lateral);` present in line 130. Could be for instance: `Mouse.move(g*x_front, g*y_lateral);` or any other combination you want.

Optical flow sensor internal units to cm:

This needs to be calibrated.

Upload firmware with `boolean surface_quality = 1.`

Move the optical flow sensors to get SQUAL on optimal values.

Stick some tape on the holder and on the ball in a way they are not in the way of the sensor so the change of surface will add some error to the measurements.

Upload firmware with `boolean surface_quality = 0.`

Compressed air ON and no friction.

Open the serial port and summatory values of the three coordinates will be displayed.

The idea is to rotate as fast as approximately the mouse would rotate the ball and stop where the two pieces of tape are coincident multiple times so you can calculate an approximate value of units per revolution.

In line 73 `int ppr` is the variable to store the optical flow sensor pulses per revolution or units per revolution.

Then you will be able to scale the DAC output to have one revolution coincident with the DAC dynamic range.