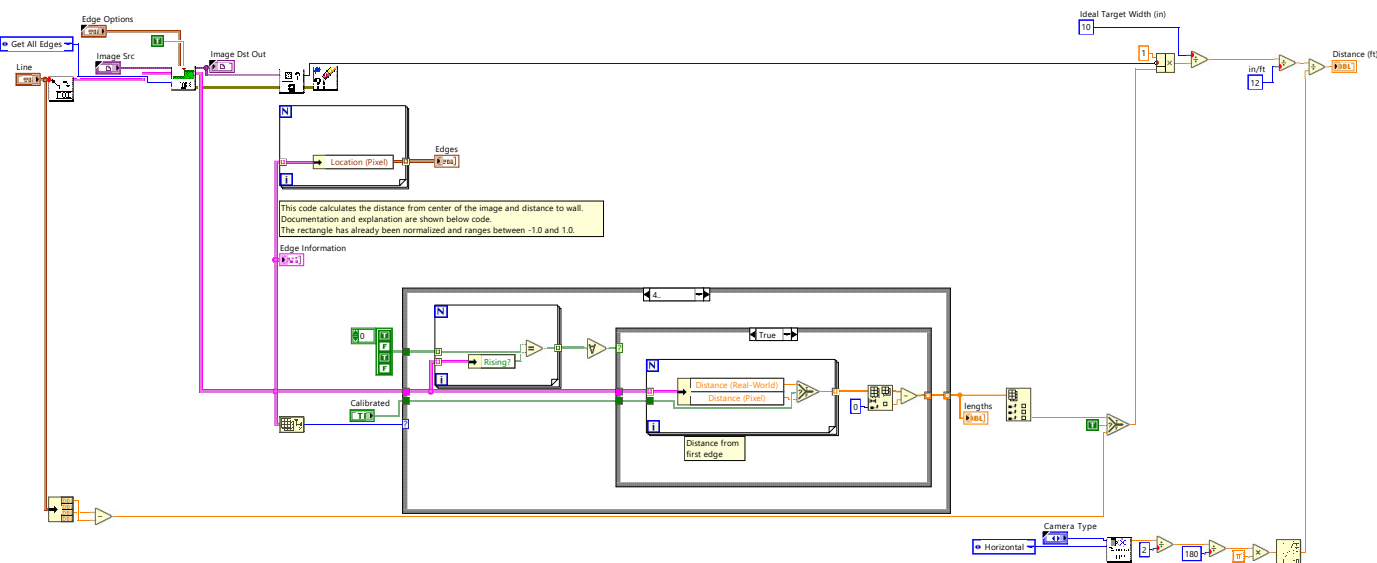


Compute DistanceToTarget2.vi

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Check to see that we find four edges going bright, dark, bright, dark. They should be approximately 2x, 2x, and x in length. Use the overall height to find the distance.

It would still be possible to estimate distance with fewer edges, if you have a good idea.

3D Drawing of a camera pointed at the alliance wall with target strips in view.

Calibration:
Ignoring lens distortion, we know ...
half of the View rect dimension / Distance to wall = tangent of alpha
By placing a yard stick or tape measure on the wall, placing the camera a known distance from the wall, and grabbing an image, we can solve for camera view angle (alpha).

Solving for Distance to wall:
We know that Strip width in inches / Strip width in pixels should be equal to View rect width in inches / View rect width in pixels. This is also true of all other objects in a plane that is parallel to the image sensor of the camera.

If the target strip is in the image, we can measure its width in pixels. We are given that the strip is 20" wide. The camera's resolution is the View rect width in pixels. This lets us determine the View rect width in inches.

Once we know the View rect width in inches, we can use trig to calculate the Distance to the wall in inches, then convert to feet.

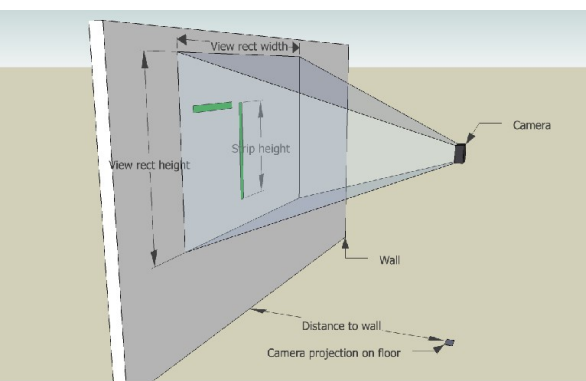
Simplified 2D view

View rect height
alpha
Distance to wall
Camera
Wall

It is also possible to estimate distance based on proportions of other measured values such as area, perimeter, height from floor, etc. The accuracy of the estimates will be affected by lens distortion, projection distortions, sensor noise, etc.

According to the datasheet -- TDS_LifeCamHD-3000.pdf

The field of view is 68.5° diagonal. Other camera measurements are based on datasheet as well.





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