Reverse engineering the EDM and calculating distances

Captured output from EDM

TRA | json call result data: {"result":{"deviceId":"edm","timestamp":"0001-01-01T00:00:00Z","selectedCircleType":"SHOT","targetRadius":1.0675,"stationCoordinates":{"x":0,"y":0},"isCentreSet":false},"error":null,"callbackid":"main.App.GetCalibration-3948749126"}

0008390 1001021 3080834 83
0008390 1001021 3080834 83

TRA | json call result data: {"result":{"deviceId":"edm","timestamp":"2025-07-15T19:35:47.715074Z","selectedCircleType":"SHOT","targetRadius":1.0675,"stationCoordinates":{"x":-5.100402687628842,"y":6.494792357643899},"isCentreSet":true},"error":null,"callbackid":"main.App.SetCircleCentre-1938558870"}

Calculating distances for calibration and event calculation

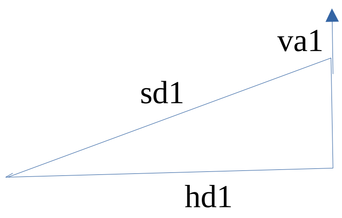
The key numbers here are:

Measurement 1: 0008390 1001021 3080834 83
Measurement 2: 0008613 0994619 2994316 83

Using measurement 1, the format of these is:

- 0008390 The sloping distance (sd1) in mm, so this is 8.39m.
- 1001021 The angle (va1) measured from vertically upwards in DDD MM SS (degrees, minutes, seconds). This is therefore 100° 10’ 21’’.
- 3080834 The horizontal angle measured from some internal direction in the same format. This is therefore 308° 8’ 34’’.

Calculation of horizontal distances (hd)

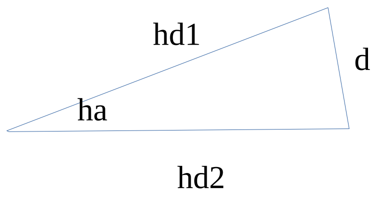


So $hd1 = sd1 \cos(90-va1)$.
Now we must convert the angle 1001021 to radians ready for the trigonometric functions of go. We do this by converting to degrees and then multiplying by pi/180. So 1001021 gives an angle in radians of $(100 + (10/60) + (21/3600)) * (\pi/180)$ for va1. We can then calculate hd1 as 8.258.

Similarly for the other measurement, the angle $va2 = (99 + (46/60) + (19/3600)) * (\pi/180)$ in radians. So $hd2 = sd2 \cos(90-va2) = 8.488$m.

The horizontal angle (ha) between the two measurements is 3080834 – 2994316. Converting first to degrees, this is (308 + (8/60) + (34/3600)) - (299 + (43/60) + (16/3600)) = 8.421666 degrees which we can convert to radians by * (pi/180).

We then have the geometry from above and this time we want the calibration distance d.



Using the cosine rule:

$d^2 = (hd1)^2 + (hd2)^2 – 2 (hd1)(hd2) \cos (ha)$

$d^2 = (8.258)^2 + (8.488)^2 – 2 (8.258)(8.488) \cos\ 8.421666*pi/180$

giving d = 1.25082m which is very close to the hand measured distance of 1.25m.