Linear Calibration

Calibration to improve accuracy may be desired. In receiver mode, where bit 0 is set, the overall accuracy may be lacking. Clearing this bit, will improve accuracy, but will reduce precision. So Hexamite provides calibration suggestion below.

The output data from the hx19, is nominally in terms of millimeters, for very accurate and precise measurement, temperature compensation may be required. In some cases, precision can go down to a fraction of a millimeter, and minute spatial shifts can be detected. If the objective is to monitor such shifts only, then there may be no need for calibration.

Otherwise:

Linear calibration first order relationship may be adequate for many applications.

Xactual=K*Xmeasured+KK should suffice for many applications.

Please be aware that K and KK are not the same for high or low mode bit 0. Calibration must take place separately for each of the two conditions.

If accuracy is very important, the calibration could be taken for each 1m increment in distance or less. In most cases only two points will suffice.

Procedure Linear Calibration:

Step 1.

Clear the mode bit of the calibration receiver, (any receiver can be used as a calibration receiver). Then place a calibration tag, somewhere with in range of a receiver; the distance between tag and receiver isn't critical, we suggest approximately 1-meter.

Step 2.

Log down the distance the hx19 is reporting, and call it Xmeasured. Then get a tape measure, and measure the distance from the receiver sensor head, to the transmitter sensor head, and call this distance Xactual.

Step 3.

Move the calibration tag, from the initial nominal 1meter point, to say 6 meters, or as far as you have precise reliable readings, and repeat step 2.

You should now have

Xmeasured @ 1m	call this value Xm1
Xmeasured @ 6m	call this value Xm2
Xactual @ 1m	call this value Xa1
Xactual @ 6m	call this value Xa2

The value for K and KK needs to be determined.

K= (Xa2-Xa1)/(Xm2-Xm1)

Knowing K, therefore KK must be

KK=Xa1-K*Xm1 or KK=Xa2-K*Xm2

Here you can set your receiver mode bit high, and repeat the calibration to match the new condition.