

Calibrating a HiQ-119 Meter

Step 1:

The old calibration information needs to be cleared out of the meter so that we can recalibrate for the new scale, in this example 0-10VDC = 0-20.00 on the display and 0-5V on the DAC output.

Clearing old calibration:

```
s01gaco11 //factory calibration command not in manual works like scale
s01ofco10 //factory calibration command not in manual works like offset
s01scale11 //sets scale factor for stream 1 to 1
s01offset11 //sets offset for stream 1 to 1
```

Step 2

We now need to calibrate the unit for its new input of 0-10VDC. The calibration uses the linear equation $Y=mX+b$ or in our case:

$$(\text{output on display}) = \text{gaco} * (\text{uncalibrated data}) + \text{ofco}$$

For the initial calibration we want this to be a 1 to 1 ratio so that 1 volt in = 1.00 being displayed.

Set your input to 10VDC let the unit sit for ~30 seconds to let the input stabilize and the averaging to reach its maximum value. Type in the command

```
s01str1
```

this gives you 1 analog reading and puts it out the serial port. The reading will be something close to 0.4444 record this value, we will need 4 numbers after the decimal. We now need to calculate what times the recorded value will give us 10 on the display so we divide 10 by .4444 and get:

$$10/.4444 = 22.5023$$

once again extending the calculation to 4 places after the decimal to keep precision.

The next command we enter next should scale the unit at 10VDC input to read 10.00 on the display.

```
s01gaco122.5021 //this sets the gaco(gain coefficient) for stream 1 to 22.5021
```

Step 3:

We now need to calibrate to your engineering units, this again uses the equation $Y=mX+b$ but this time $(\text{output on display}) = \text{scale} * (\text{VDC in}) + \text{offset}$. Since we want to read 20 on the display at 10VDC the scale factor is 2, which we find by $20/10$. The next command to issue is:

s01scale12

The unit should now be calibrated. The scale factor or gaco can be tweaked slightly if the reading is a little hi or low.

Step 4:

The dac should already be calibrated because we are still using the same display range as previously however if the dac needs to be recalibrated it uses the same equation $Y=mX+b$ where (output voltage) = $dscale(reading)+doffset$.

So for the range of 0-20 on the display the dscale value would be .25 thus $20*.25 = 5VDC$ full scale. The command to do this would be

S01dscale1.25

The HIQ should now be fully calibrated if the external display (small otek) isn't exact then the zero and span pots on the unit can be used for its final calibration.