OPERATION & CALIBRATION MANUAL

PA SERIES

D.W. MILLER

OHIO SEMITRONICS INCORPORATED

1.   Equipment Required

      (1)   Frequency Counter
            Range 10.000KHz +/- 1Hz Resolution

      (2)   Stable DC source, capable of applying the input signal to
            your unit 0 to 1mA DC, 0 to 10 volts DC, 4-20mA etc.

      (3)   Stop watch

2.   Circuit Board Removal

      Remove 5 screws, 4 from lid and one on bottom side. Pull the
      lid and circuit board away from can, leaving counter connected.

3.   Instrument Power

      115V AC is applied directly to the circuit board thru the ter-
      minal strip. Isolated that part of the board by taping over
      with electrical tape before you applied 115V AC instrument
      power.

4.   Count Rate

      If you are not changing the "C/H" counts per hour go to step 5.
      If you are changing the count rate, you'll have to make a jumper
      change on the board. Refer to the chart provided for standard
      count per hour C/H.

      For instance, if you want 1K C/H, than you would run a jumper
      from pin 3 of the CD4020 to pin 5 of SN74121.

      If however the count rate desired is not listed on the chart
      than you can calculate the proper level.

      To do this, you need to know three things. First the count rate
      "C/H", second the logic level. "Pick C/H standard closest to
      your C/H" and next the VFC frequency. We will calculate by using
      the formula

$$VFC = \frac{\text{Logic Level Times Count Rate C/H}}{3600}$$

      For instance if you wanted 1250 counts per hour "C/H" use the
      column from the chart closest to 1250 which is 1K and the logic
      is 16384. Now apply it to the formula

$$VFC = \frac{16384 \times 1250}{3600}$$

$$\text{or} \qquad VFC = 5689Hz$$

      So now you know the C/H, logic level and the VFC frequency of
      5689. Make the jumper from pin 3 of CD4020 to pin 5 of SN74121.

5.   Zeroing

      Connect the frequency counter to pin 3 of the LM331 and to com-
      mon. Apply instrument power.

      Apply a zero (short), 1.00V or 4.00mA input signal, which ever
      applied to the input under test.

      Adjust "P1" trimpot until you have a reading of 10 hertz on the
      frequency counter. Now back the trimpot adjustment off until
      the frequency counter reads zero.

6.   FS Calibration

      Apply the full scale stable input of either 1mA, 10 volts, 20mA
      etc to the input terminals 1 & 2. Adjust "P2" coarse and "P3"
      fine to obtain the correct "VFC" frequency calculated or shown
      in the table for C/H.

      Now reduce the input signal down to 10% of its full scale. Ad-
      just "P1" trimpot to read the correct VFC frequency at 10% of
      its full scale reading. Repeat the full scale calibration.

7.   LCD Counter

      Check the correlation between the input and the output LCD Coun-
      ter. For instance, if a full scale input signal should accumu-
      late 1000 counts on the LCD counter per hour, than by timing a
      full scale input for 6 minutes you should readout 100 +/- 2
      counts on the counter.

      If you are off by a factor of two than the logic jumper is in
      the wrong place. If it is less than that then the VFC frequency
      was set wrong. Please check your figures.

8.   Check linearity as required.

9.   Battery Replacement

      Units which have the 8 digit counter do not require a battery
      replaced. Replace counter if LCD becomes dim.

      Units which have the 6 digit counter (Red Loin) batteries can
      be replaced. See directions, do not force batteries in holder.

10.   After calibration is complete remove the instrument power and
      tape. Slided the unit back in the can and attach the lid with
      the 4 screws. Don't forget the grounding screw on the bottom
      of the can.

C/H	LOGIC	PIN CD4020	VFC	PIN4024
100K	128	6	3556	
50K	256	13	3556	
40K	512	12	5689	
30K	512	12	4267	
20K	1024	14	5689	
15K	1024	14	4267	
12K	1024	14	3413	
10K	2048	15	5689	
9K	2048	15	5120	
8K	2048	15	4551	
7K	2048	15	3982	
6K	2048	15	3413	
5K	4096	1	5689	
4K	4096	1	4551	
3K	4096	1	3413	
2K	8192	2	4551	
1K	16384	3	4551	
500	16384	3	2276	
250	65536	—	4551	5
200	65536	—	3641	5
150	131072	—	5461	4
100	131072	—	3641	4
50	262144		3641	3

* NOTE (C/H) Counts per hour are shown at the full scale input.

$$VFC = \frac{LOGIC \times C/H}{3600}$$