CTC AppNotes

A series of technical documents written by members of the CTC community

Proximity Probe Field Calibration With CTC DT901-1A Field Calibration Unit.

CTC's line of PRO Proximity probes all come with a standardized calibration certificate which includes many data points and information that is important to the both the probe installation technician and to the vibration analyst who will be working with the probe to collect and analyze the data. This information may be verified in the field by using one fo our Field Calibration units, THE DT901-1A.

Field calibration requires a –24 volt power supply to power the probe driver, the field calibration unit and a digital volt meter, or multi-meter set to voltage output.

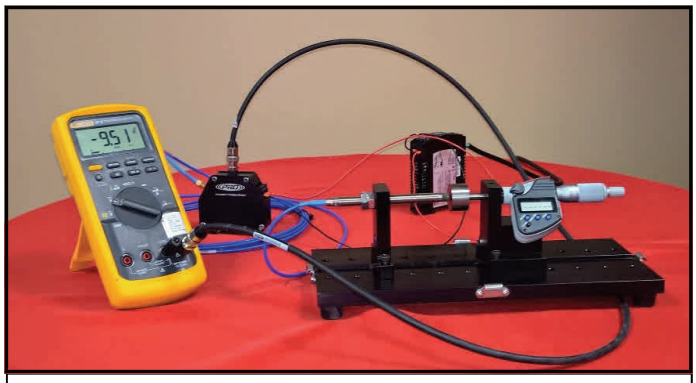

Figure 1— Items required- Volt meter, probe assembly, power supply, and field calibration unit.

To perform the field calibration, mount the probe in the bracket and advance the probe until it just touches the face of the calibration unit target. Zero out the reading on the digital micrometer. Back the target off 10 mils using the digital micrometer dial. Ten mils is the point at which the linear range of the probe begins. Record the reading. Repeatedly back the target away from the probe in fixed increments, recording the voltage at each step. (This can be done in any range from 1 mil to 10 mil increments.) By recording the data in a spreadsheet, a graph may be created and the DSL (deviation from straight line) value may be calculated. The minimum number of points required to generate an accurate DSL is 8. See figure 2.

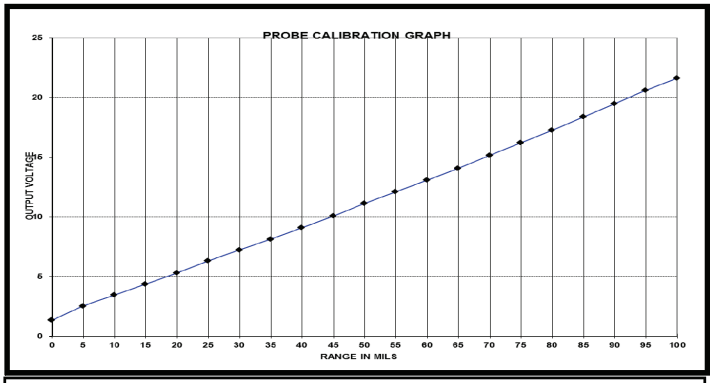

Figure 2– Typical voltage plot using 5 mil increments, the values can be entered into a spreadsheet and the plot can be automatically generated.

For a full probe calibration the average scale factor should also be calculated. The formula for calculating the ASF is Voltage at 90 mils minus the voltage @10 mils divided by the gap at 90 mils minus the gap at 10 mils (V_{90mil}-V_{10mil}/ Gap_{90mil}-Gap_{10mil})

Range in Mils	Voltage	Deviation from a Straight Line (-0.2 to 0.2)	5% of 200 mv/mil (.95 to 1.05)
0	1.35	N/Z	NA
5	2.54	-0.44	1.19
10	3.46	-0.36	0.92
15	4.38	-0.27	0.92
20	5.32	-0.21	0.94
25	6.32	-0.21	1.00
30	7.25	-0.13	0.93
35	8.15	-0.02	0.90
40	9.11	0.02	0.96
45	10.08	0.06	0.97
50	11.14	0.00	1.06
55	12.12	0.03	0.98
60	13.09	0.06	0.97
65	14.09	0.07	1.00
70	15.17	-0.01	1.08
75	16.22	-0.05	1.05
80	17.27	-0.10	1.05
85	18.39	-0.22	1.12
90	19.50	-0.32	1.11
95	20.63	-0.44	1.13
100	21.64	-0.45	1.01
SENSITIVITY		201	mV/mil

Figure 3– Manually calculating the DSL and average sensitivity in mV/mil.

If you have any questions or for further information please contact us via email, techsupport@ctconline.com or call 1-800-999-5290 in the US and Canada or +1-585-924-5900 internationally.

Quick tip—The initial gap for proximity probes can be set in the field with just a voltage meter. For 8 mm probes just mount the probe in its bracket and gradually tighten the probe until the voltage reads –10 volts. this puts the surface of the shaft at the midpoint of the probe's range.