APPENDIX 3: OPERATION WITH LOW SENSITIVITY SENSORS

In cases where very low sensitivity transducers are used, such as high g shock accelerometers, the sensitivity is often specified in microvolts per *g* but the 136 input parameters are limited to millivolts per engineering unit (g. psi, etc.). The user has to either round off the sensitivity, or perform some calculations to enter the precise values. This section covers the procedure for calculating the required output scaling for precise values.

Here are a few things to keep in mind:

- The 136 only recognizes entries in millivolts per engineering unit
- An engineering unit can be *g*'s, PSI, meters/seconds, etc.
- The Input Sensitivity and Output Scaling are determining the gain of the amplifier

The values below will be entered using the "Select Function" keys on the front panel. If the user is unfamiliar with the use of these keys, refer to Section 2.4.16 of this manual for details.

In the following step-by-step procedure, a model 727-2K piezoresistive accelerometer with a sensivity of 100μV/g is used as an example. An output voltage (from the 136) of 10 Volts peak (10,000mV) has been selected. A different output voltage may be selected, but 10 Volts peak is a common DAQ input voltage requirement,

Since an accelerometer is used in the example, EU will be equal *g*'s. To simplify the calculation, millivolts per 1,000 g's will be used.

Step 1: 100μV/g = 0.1mV/g

Step 2: Multiply numerator and denominator by 1000 to convert to mV/kg

$$\frac{1000}{1000} \times \frac{0.1mV}{g} = \frac{100mV}{1kg}$$

Step 3: Enter 100 as the input sensitivity

Step 4: Determine the output scaling (OS):

OS = desired output volts (mV) FS range in g's

For model 727-2K and 10V FS output selected:

$$OS = 10{,}000\ mV / 2kg's = 5{,}000$$

Step 5: Select "Output Scaling" and enter 5000 (Note: scaling value has no units associated with it).